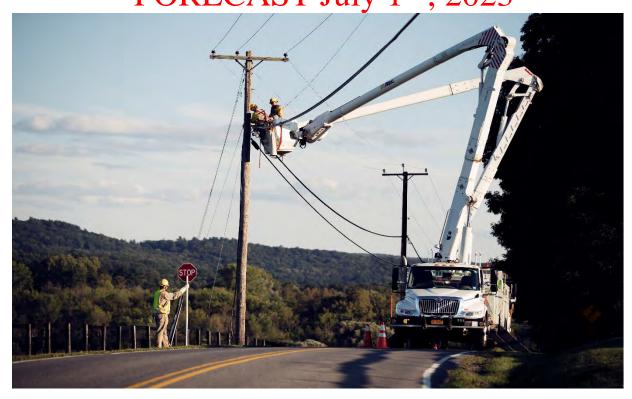




# CENTRAL HUDSON GAS & ELECTRIC 2024-2028 CORPORATE CAPITAL FORECAST July 1st, 2023



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# EXECUTIVE SUMMARY

This document presents the comprehensive Capital Expenditure Plan (Capital Plan) for the Electric, Gas and Common program areas of Central Hudson Gas & Electric Corporation (Central Hudson or the Company) for the forecast period 2024 through 2028. This Capital Plan positions Central Hudson to continue to provide safe and reliable service to customers over the long term. This Capital Plan is consistent with the purpose statement of the Company as shown below:

"Together we power endless possibilities."

This Capital Plan outlines forecasted addition expenditures of \$772 million in the electric delivery system (including \$17 million related to FERC-regulated projects), \$410 million in the gas delivery system and \$435 million in Common Program areas over the five-year period. The projects and programs proposed in this Capital Plan are what the Company has determined as the highest priority over the forecast period to respond to the day-to-day non-discretionary needs of the systems, maintain those system's standards, and implement system enhancements to meet future performance and energy policy goals. The Company is continually re-evaluating and reprioritizing projects, and the latter years of this Capital Plan will change because of these reevaluations and assessments. The Capital Plan is developed annually in accordance with the Company's Capital Prioritization Process Guidelines.

The five-year Capital Plan contains projects that are aligned with Central Hudson's strategy of providing exceptional value to our Stakeholders by focusing on four themes listed below:

- Business Modernization: Modernizing and transforming our business through electric and natural gas system investments and process improvements.
- Operational Excellence: Continuously improving our performance while maintaining cost effective, efficient, and secure operations.
- Energy Leadership: Advocating on behalf of customers and other stakeholders.
- Organizational Development: Investing in programs and employee development to position the organization for continued success in the future.

Capital Forecast – Add	litior	` ,										
		<u>2024</u>		<u>2025</u>		<u>2026</u>		<u>2027</u>		<u>2028</u>		TOTAL
ELECTRIC	\$	148,833	\$	146,035	\$	148,938	\$	155,194	\$	155,191	\$	754,192
FERC		254		271		347		593		15,952	\$	17,417
GAS		72,005		80,014		81,971		83,874		91,845		409,710
COMMON		80,668	_	84,847	_	94,453	_	73,549	_	101,886	_	435,402
CORPORATE TOTAL	\$	301,760	\$	311,167	S	325,709	\$	313,210	\$	364,874	\$	1,616,720

# Capital Forecast – Removal (\$000)

		2024		<u>2025</u>		2026		<u>2027</u>		2028		TOTAL
ELECTRIC	\$	15,283	\$	15,340	\$	13,797	\$	13,566	\$	12,504	\$	70,489
GAS		1,996		2,054		2,104		2,151		2,221		10,527
COMMON		95	_	249	_	530	_	250	_	284	_	1,408
CORPORATE TOTAL	S	17,374	\$	17,643	\$	16,431	\$	15,967	\$	15,009	<u>\$</u>	82,424

# Capital Forecast - Additions & Removal Totals (\$000)

		2024	2025	2026		<u>2027</u>		<u>2028</u>		<u>TOTAL</u>
ELECTRIC	\$	164,370	\$ 161,646	\$ 163,082	S	169,353	\$	183,647	\$	842,098
GAS		74,001	82,068	84,075		86,025		94,067		420,236
COMMON	_	80,763	85,096	 94,984	_	73,799	_	102,169	_	436,811
CORPORATE TOTAL	\$	319,134	\$ 328,810	\$ 342,141	\$	329,177	\$	379,883	\$	1,699,145

# Introduction

Central Hudson's Corporate Capital Forecast shows elevated levels of investment in 2024 through 2028 that are driven by continued electric capital investments, major facilities initiatives, and information technology upgrades. The capital plan includes a number of projects that advance sustainability initiatives in support of the State's climate goals as outlined in the Climate Leadership and Community Protection Act ("CLCPA"). The capital plan totals \$1,699 million in capital expenditures (Additions + Retirements) over the five-year period 2024-2028. The prior year's 5-year forecast from 2023-2027 was \$1,441 million. Significant variations between forecasts are driven

primarily by new projects that will require regulatory support to proceed, increased costs/inflation, and updated project estimates.

# 5-Year Corporate Capital Forecast Summary

A breakdown of the Capital Forecast is shown below indicating the level of spending as prioritized by summary categories. Non-discretionary is the level of spending that is necessary to meet the minimum standards of service or compliance with Public Service Law. Maintain System Standards is the level of spending required to continue our current level of service reliability and safety or to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our quality of service, reducing risk, lowering operating costs, or implementing design and technology changes that are responsive to energy policy objectives.



The System Enhancement Capital Spending has been further segregated into the following categories:

# - Projects with a Net Financial Customer Benefit

- o Projects revenue requirement of the capital investment is lower than the net benefit (e.g., cost savings) for customers
- o Reduces customer bills in the long term (after next rate case)
- o Increases earnings both short term and long term

# Projects that Reduce Risk

- o Investment reduces the risk of a system failure that would:
  - Reduce potential public safety at risk
  - Result in widespread incident, impacting system integrity
  - Spur significant punitive regulatory action

# - Projects that Improve Reliability

- o Investment improves reliability at a cost that (we believe) customers are willing to pay
- O Demonstrate that increased cost is warranted by the improvement in service quality (benchmark and compare cost per customer outage avoided).

### - Other Projects

- o Projects that do not clearly fit in the other categories, but can be justified for other reasons
- o Requires detailed individual business case
- o Demonstrate a clear strategic rationale
- o Show financial projections (customer bill impact and earnings impact)
- o Assess risks (regulatory disallowance, etc.)

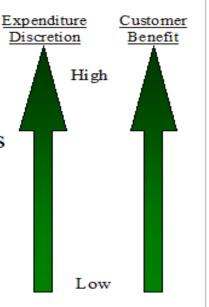
Each year through its planning and forecasting processes, Central Hudson develops a recommended Capital Expenditures Budget for the upcoming fiscal year, as well as a forecast for upcoming five-year period.

The Corporate Capital Forecast is developed through a bottom-up process where planning studies, infrastructure issues, compliance requirements, and other corporate initiatives identify specific capital needs. Following the Company's Capital Prioritization Process Guidelines, these needs are prioritized based on whether the need is non-discretionary (mandated or otherwise not optional), required to maintain the existing level of service or reliability, or a system or service enhancement. In addition to the costs of the projects, the timing of the projects is also analyzed to determine the most appropriate time for the capital investment to be made either due to load growth, risk of failure, or business need.

In addition to the summary categories, the needs are prioritized based on the investment categories shown below. It should be noted that those projects with the least amount of discretion also have the least amount of benefit for customers in terms of improving their level of service quality or reducing operating costs. It is important that we continue to develop sound justifications for the system enhancement projects since they do provide the most benefit to customers.

# Categories of System Capital Investments

- System Expansion/Enhancement
- · Study Based Load Growth
- Infrastructure/Planned Replacements
- New Business/Customer Additions
- Compliance
- Daily Operations/Repairs and Unplanned Replacements



The key driver of the expenditures included within the five-year Electric Capital Plan remains conditioned-based infrastructure replacements necessary to maintain current levels of reliability, 75% of the Company's planned expenditures in the Electric Capital five-year forecast are related to infrastructure replacements versus installing new infrastructure. This percentage increases to 93% across the electric operation budget categories ("Production," "Transmission," "Substation," and "Distribution" categories). While the Company's replacement strategies are condition-based versus time-based programs, as equipment reaches the end of its useful life, the condition assessment is more likely to identify issues that warrant replacement. In 2023, the Company performed an asset lifecycle assessment for three of the categories listed above ("Transmission," "Substation" and "Distribution"). The analysis determined that, apart from three out of twelve asset classes in the study, 20% or more of assets in each asset class are beyond their expected life with certain asset classes at 45% or more. Without a structured infrastructure replacement program, the number of assets remaining in-service past their useful life will continue to grow and may negatively impact system reliability. In 10 years, the total amount of system assets beyond the expected life would be approximately 40% across all asset classes. The Company's 2022 Long Range System Plan describes a number of these asset replacement programs.

In addition, the five-year electric plan includes a number of projects that will help meet the State's climate goals as outlined in the CLCPA. The Company's Electric Capital Plan includes projects classified as CLCPA Phase 1 projects. These represent projects that satisfy Reliability, Safety, and Compliance purposes but that can also address bottlenecks or constraints that limit renewable energy delivery within a utility's system or include the added benefit of increasing the capacity to host additional DERs. Approximately 30% of the electric 5-year capital plan is for projects that also will increase headroom and will do so by up to 547 MW by the end of the 5-year period. Two projects with

the potential to increase headroom by an additional 117 MW will be started within the 5-year period but will be completed outside of this timeframe. This MW level of headroom increase (up to 547 MW) represents approximately two times Central Hudson's total currently interconnected renewable generation nameplate capacity.

The single largest component of the Gas Capital Program is the Leak Prone Pipe ("LPP") elimination program. Central Hudson operates 1,318 miles of distribution main with 66,186 services (as of 2022), which currently includes 82 miles of LPP main. From 2016 through 2021, an average of 20 miles of LPP main was eliminated. In 2022, 15 miles of LPP was eliminated, and the Company plans to continue eliminating leak prone pipe at a rate of 15 miles per year which would result in the total elimination of distribution pipe currently classified as leak prone in six years. The main replacement projects are identified and prioritized using the GL Main Replacement Prioritization Program ("MRP") which develops a risk 'score' based on pipe and operating characteristics such as material, operating pressure, age, diameter, leak history, location (proximity to buildings, business district, flood prone areas) and cathodic protection status. This risk score measures the relative likelihood and the consequences of a leak associated with each pipeline segment. In addition, Subject Matter Expert ("SME") input review and planned highway rebuilds are taken into consideration when developing the proposed main replacement project listing.

The Gas New Business plan reflects a significant reduction from the prior five-year forecasts due to two contributing factors: 1) The forecast is in alignment with the most recent rate agreement, recognizing the fact that the Company has reduced its gas expansion program to tariff based customer requested service connections consistent with state energy policy; and 2) Expenditures associated with service replacements completed as part of LPP gas main replacement projects going forward will be transferred from the "New Business" program to the "Distribution Improvements" category. The 3-year average expenditures for these LPP service replacements are approximately \$2.5M per year.

The Common Capital Forecast consists of the following categories: Land & Buildings; Information and Operational Technology ("IT and OT"); Tools & Equipment; Security; Communication; and Transportation. The Land & Buildings capital forecast comprises of several significant projects including the Training Academy & Indoor Operations Training Area, a Primary Control Center for transmission and distribution operations, and infrastructure replacement projects due to age or equipment failures. The Tools forecast consists of replacements driven by the modernization of the vehicles they are utilized on, obsolescence and incompatibility, decreased reliability, discontinued manufacturer support, and conformance to changing OSHA or other regulations. Security's capital forecast consists of upgrades to our security infrastructure across the service territory. The transportation capital forecast is built primarily on the replacement of vehicles and equipment based on industry standard replacement criteria. Electrifying our transportation fleet is currently underway to fulfill New York State's clean energy emissions goal. Lastly, the IT and OT Capital Budget consists of investments for business-driven software implementations, upgrades to existing software solutions, and infrastructure or hardware lifecycle upgrades and ongoing extensions resulting from corresponding software updates or implementations. Significant detail regarding our IT expenditures plan is included in the Common Program section.

# **Resource Needs of Future Program**

Central Hudson will face the following opportunities and challenges as we implement this Capital Plan:

Recently, the high inflationary economic environment is requiring careful management to navigate supply constraints and price increases. The underlying forecast in the Capital Plan were developed with assumptions of lower inflation levels than those that have emerged as of the time of this writing. Executing the Capital Plan from 2024 to 2028 with these challenges will require additional prioritization as well as higher levels of investment.

On the electric side, the Company will need to continue to develop enhanced competencies in both asset management as well as centralized distribution system operations. Improvements are being made to the System Planning Process with a transition in forecasting methodologies and application of a more probabilistic approach to integrate distributed energy resources ("DERs") into the risk and growth profiles. This process will encompass both how we determine asset replacements and the methods used to optimize the portfolio of projects and programs. In addition, in recognition of the State's aggressive renewable goals as identified in the CLCPA and the Accelerated Renewable Energy Growth and Community Benefit Act (Accelerated Renewables Act), the Company is modifying its planning process to better align with these goals. As noted, our electric capital plan is comprised of condition-based infrastructure type projects. A number of these existing projects provide incremental hosting capacity benefits. As new project needs are studied, renewable penetration levels and potential hosting capacity improvements are included in analysis to determine the recommended solution. Preliminary study work has been completed to help identify additional potential projects that would facilitate the attainment of these goals based on system constraints and forecasted renewable penetration levels. To ensure that the Plan proceeds in the most optimal fashion, the Company will need to reassess the timing and reprioritize projects using both these improved asset management approaches and the understanding of system needs. Planning shall remain as a core competency for the Company.

On the gas side of the business, the elimination of leak prone distribution piping, integrity driven modifications to the transmission system, and regulator station modernization requires detailed project prioritization and system planning. Additionally, engineering design, permitting, estimating and field construction management and oversight resources will need to remain at current levels to maintain the high degree of safety, and ensure quality installations continue to occur.

In relation to executing our construction plans, the Company will continue to utilize contract resources to perform the incremental electric and gas transmission and distribution construction. It is anticipated that sufficient contract resources are available to complete the planned work.

# **ELECTRIC PROGRAM SUMMARY**

# **Electric System Overview**

The Central Hudson electric system serves approximately 309,000 electric customers in New York State's Mid-Hudson River Valley. Central Hudson's electric service territory extends from the suburbs of metropolitan New York City north to the Capital District at Albany.

The Central Hudson system is comprised of substations having an aggregate transformer capacity of approximately 5.2 million kilovolt amps, a transmission system that consists of 566 circuit miles and a distribution system that consists of 7,158 pole miles of overhead lines and 1,656 trench miles of underground lines, as well as customer service lines and meters.

The transmission system operates at nominal voltages of 69 kilovolts, 115 kilovolts and 345 kilovolts. The table below provides a more detailed breakdown of the transmission system.

Operating Voltage	Design Voltage	Overhead Circuit Miles	Pipe-Type Cable Circuit Miles	Total Circuit Miles
345 kV	345 kV	76	0	76
115 kV	115 kV	199.3	4.1	203.4
	69 kV	248		
69 kV	115 kV construction operating at 69 kV	39	0	305
Total		562.3	4.1	566.4 <sup>1</sup>

The distribution system operates at nominal voltages of 4.16 kilovolts, 4.8 kilovolts, 13.8 kilovolts, and 34.5 kilovolts. It also encompasses sub-transmission systems that operate at 13.8 kilovolts in three urban areas of our service territory, feeding into secondary networks. The table below provides a more detailed breakdown of the overhead portion of the distribution system, based upon the voltage at which a feeder exits the substation.

Conductor	Pole Miles of Line at Substation Exit
34.5 kV Overhead	209
13.8 kV Single Phase	4,536
13.8 kV Three Phase	2,379
5 kV or under	34
Total	7,158

<sup>&</sup>lt;sup>1</sup> Accounts for the sale of the SL Line in 2022

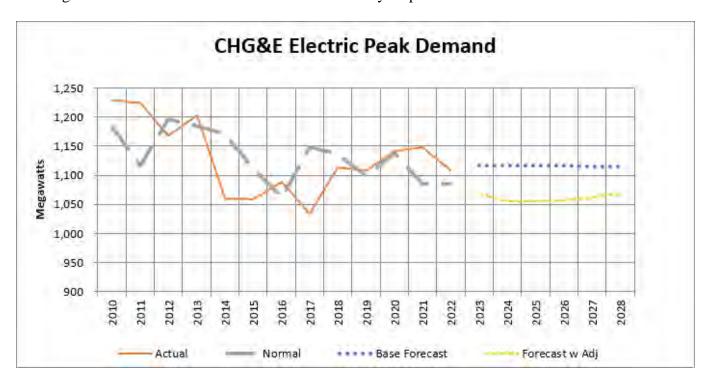
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Central Hudson's roughly 77 electric substations contain the power transformers that change the voltage from one level to another.

# **Electric Forecast Overview**

Central Hudson's electric capital forecast for the next five-year period is developed each year using the most recent planning studies, customer and sales forecasts, corporate load forecasts, and other corporate trends.

The current system peak forecast is shown on the graph below. On the graph, Central Hudson's peak demand has shown a modest decline based primarily on the regional economy, and the effects of the Company's energy efficiency and demand management programs. Forecast demand is also showing a modest decline and then flat for the next five-year period.



In addition, Central Hudson utilizes distribution planning areas to aid in the identification of needs, their timing, and the quantification of the risks, as well as assess the alternatives available to meet those needs. These distribution planning areas are based on where the ability exists to transfer load among area substations. The graphic on the next page shows the distribution planning area load groups.

# **CHGE Franchise Territory by Electric Load Group**



# **Electric Program Detail**

The Electric Capital Forecast is developed utilizing guidelines, planning standards and engineering judgment. The forecast is completed for each budget category and integrated into a comprehensive plan. The summaries below provide the annual forecasts for each of the Electric Program categories.

# Electric Capital Forecast – Additions (\$000)

1	<u>2024</u>	2025	<u>2026</u>	<u>2027</u>	2028	2	TOTAL
Production	\$ 4,367	\$ 6,417	\$ 5,178	\$ 3,533	\$ 5,560	\$	25,055
Transmission	31,010	28,794	29,063	36,312	32,835		158,013
Transmission FERC	254	271	347	593	15,952		17,417
Substation	26,230	20,219	22,589	22,874	22,731		114,644
New Business	12,688	13,301	13,766	14,426	15,156		69,338
Distribution Improvements	52,447	56,322	57,449	56,759	57,213		280,191
Transformers	17,640	16,443	16,255	16,564	16,879		83,782
Meters	2,768	2,827	2,886	2,941	2,997		14,418
Storm	1,682	1,712	1,751	1,785	1,820		8,750
Total	\$ 149,087	\$ 146,306	\$ 149,285	\$ 155,787	\$ 171,143	\$	771,609

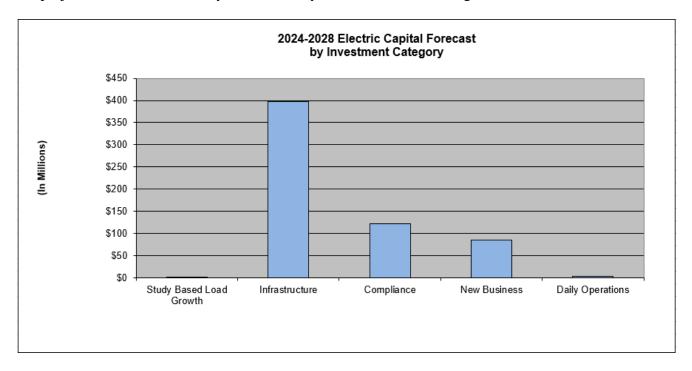
# Electric Capital Forecast – Removal (\$000)

_	<u>2024</u>		2025	2026	2027	2028	TOTAL
Production	\$	5 \$	1,258	\$ 94	\$ 50	4 \$ 33	\$ 1,445
Transmission	6,3	66	5,658	4,676	4,94	3,800	25,344
Substation	2,0	04	2,108	2,586	2,17	4 2,216	11,688
New Business	2	56	269	283	29	7 312	1,417
Distribution Improvements	5,′	38	5,619	5,720	5,64	9 5,689	28,415
Transformers	4	09	418	427	43	5 443	2,132
Meters		5	10	11	1	111	48
Total	\$ 15,0	83 \$	\$ 15,340	\$ 13,797	\$ 13,56	5 \$ 12,504	\$ 70,489

A breakdown of the Electric Capital Forecast is shown below indicating the level of spending the Company has prioritized. Non-discretionary is the level of spending that is necessary to meet the minimum standards of service or compliance with public service law. Maintaining System Standards is the level of spending required to maintain our current level of service reliability and to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our level of service, reducing risk, or reducing operating costs.



In addition, the projects within the Electric Program are categorized by the following Investment Category: growth (study-based load growth); new business; compliance; day-to-day business management; and infrastructure replacement. The bar graph below shows the breakdown of the projects in our current five-year forecast by these Investment Categories.



# State Policy and Regulatory Items Impacting Electric Program

In 2020, Central Hudson participated as a member of the Department of Public Service ("DPS") led Utility T&D Investment Working Group in response to the CLCPA and the Accelerated Renewables Act. The primary goal of the working group, in response to the May 2020 Public Service Commission ("Commission" or "PSC") Order, was to identify policy changes necessary to facilitate the interconnection of large-scale renewables necessary to meet the CLCPA targets, identify new transmission and distribution development needed to meet these goals, and identify and prioritize technologies to research to improve existing and future grid function. The technical analysis to identify projects required to unbottle forecasted renewable generation to help address the State's goals concluded in the fall of 2020. As part of this technical analysis, engineering identified projects that advance the State's energy targets as identified in the Acts, split into two phases. Phase 1 projects are immediately actionable projects that satisfy Reliability, Safety, and Compliance purposes but can also address bottlenecks or constraints that limit renewable energy deliverability within a utility's system and are in the utility's current capital pipeline. Phase 2 projects increase capacity on the local transmission and distribution system to specifically allow for interconnection and delivery of new renewable generation resources within the utility's system. In response to the Utility T&D Investment Working Group November 2020 filing, the Commission approved the proposed Phase 1 projects in February 2021 and ordered NY Utilities in September 2021 to modify headroom calculations based on Staff's proposal, file a revised Benefit Cost Analysis ("BCA"), and establish a Coordinated Grid Planning Proposal ("CGPP"). The NY Utilities filed their initial framework for the CGPP and revised BCA in December 2021. The NY Utilities also filed their revised headroom calculations starting in February 2022 and on a bi-annual basis thereafter. The revised BCA was approved by the Commission in June 2022. Additionally, as indicated within the initial CGPP framework, the NY Utilities filed a more comprehensive CGPP proposal in December 2022 which is awaiting Commission approval. The new CGPP will have longer term implications in developing T&D projects to meet the CLCPA and the development of a new planning process aimed at reducing the curtailment of renewable resources. In addition, the Commission ordered the upstate utilities (Central Hudson, National Grid and Avangrid) to propose solutions to "Areas of Concern" where the New York Independent System Operator ("NYISO") predicted greater future interconnections. This analysis proposed solutions for projects that are well along in the NYISO Interconnection Process.

The Company is actively working to complete Phase 1 projects and has identified additional Phase 1 projects included within the current five-year forecast. The Phase 1 projects are identified within the sections below and additional documentation based on the February 11, 2021, Order on Phase 1 Local Transmission and Distribution Project Proposals is included in Appendix A for each new Phase 1 project. In addition, two Phase 2 projects (rebuild Q Line at 115 kV and 10 and T-7 Station Connections) were identified in the follow-up DPS report (Initial Report on the New York Power Grid Study) as Priority Phase 2 Local Transmission Projects. The replacement of the 10 and T-7 Station Connectors has been incorporated into the current five-year plan. The Q Line rebuild at 115 kV, operate at 69 kV is included within the five-year plan as a Phase 1 project.

In February 2023, the Public Service Commission approved Phase 2 Areas of Concern Transmission Upgrades. The Phase 2 Areas of Concern were identified as locations within Central Hudson, NYSEG/RGE, and National Grid territory where strong developer interest in siting renewable generation exceeded the capability of the local transmission system. Within Central Hudson's territory, the approval of the Phase 2 Area of Concern proposal includes rebuilding the Company's NC

Line for 115 kV and operating at 69 kV. Additionally, the Order approved cost recovery for this project under the FERC load ratio share methodology.

In April 2022, the PSC issued an Order amending cost sharing rules within the NY Standardized Interconnection Requirements. The purpose of this Order is intended to reduce the capital burden on developers/applicants that trigger upgrades by providing upgrade costs to multiple developers/applicants that benefit from such upgrades. Part of this Order requires NY Utilities to share their Capital Investment Plan ("CIP") and identify substations included in the CIP that are eligible for cost sharing as well as have multi-value components (i.e., address a substation transformer asset condition which also results in an increase to DER hosting capacity). As part of this, developers may have the opportunity to impact initial capital plans to accommodate additional DERs.

### **Electric Production**

Most of the expenditures for the hydroelectric generating facilities are for condition-based infrastructure replacement projects with a smaller number of projects to improve operations and address security concerns brought about with remote starting capability.

The Company projects expenditures in 2024 of \$1.9 million for the replacement of the rubber gate and headgates at the Dashville facility. This is followed by major overhauls and runner replacements for Dashville Unit #1 in the 2024/2025 timeframe and Dashville Unit #2 in the 2025/2026 timeframe. The overhauls are budgeted for \$5.1 million (Unit #1) and \$5.3 million (Unit #2). The Dashville rubber gate is a replacement in kind project for the existing system that has reached the end of its useful life. Three additional smaller infrastructure projects are included for the Dashville facility (Concrete Reinforcement on the Spillway, Staircase to the Bottom Door, and Walkway over the Tailrace) to address issues with the 1920s vintage infrastructure. There are two projects included to address infrastructure issues at the Sturgeon Pool facility – Retaining Wall Penstock and Relay Protection and Breaker replacements. These projects address condition-based/aging infrastructure issues. The remaining infrastructure project is an upgrade of the High Falls Trash Rake scheduled for 2024. This project is a replacement in kind component for the current system.

The projects to improve operations include the addition of remote start capabilities at the Sturgeon Pool and Dashville plants and an upgrade of the plant excitation systems at all sites in the 2027/2028 timeframe: and for pond control at the Dashville Plant in the 2024/2025 timeframe. The security projects include the addition of camera systems at both our Sturgeon Pool and Dashville facilities. The camera systems are a requirement in automation to ensure safe conditions on site before starting the hydro production facilities remotely.

There are minimal capital expenditures for the Company's combustion turbine facilities in the five-year plan. The Company will be retiring these units in the 2024/2025 timeframe due to substantial capital expenditures required to meet new and more stringent emissions requirements, aligned with State energy goals, which make these units uneconomical going forward.

### **Electric Transmission**

For the Electric Transmission System, the purpose is to serve the expected load by developing a rational program to maintain reliability, avoid unacceptable risks, strive for the most economical reinforcements, and allow for equipment maintenance.

The facilities need to be planned, designed, operated, and maintained according to "Good Utility Practice." These are any of the practices, methods or actions required by FERC, NERC, NPCC, NYSRC, NYISO, PSC, applicable law, regulations, or policies and standards, or engaged in or approved by a significant portion of the electric utility industry. Electric Planning and Interconnections analyses are based on planning criteria where the transmission system is designed and operated to conform to applicable reliability rules: no electric transmission facility should be loaded beyond its normal rating prior to any contingency; no facility to be loaded beyond its applicable emergency rating following any contingency; and fault levels are to be within equipment ratings.

The thermal, voltage, and system stability performance is analyzed under the various customer/load scenarios to assess the load serving capability, identify alternatives to increase load serving capability where needed, and evaluate alternatives. 100% of the expenditures in the Electric Transmission category are associated with the condition-based replacement of older/aging infrastructure.

The significant Electric Transmission projects in the five-year forecast are the rebuild of several transmission lines, including: the Knapps Corners – Myers Corners 69 kV KM line; the Hurley Ave – Saugerties SB line for 115 kV; the Saugerties – North Catskill H line for 115 kV; the Honk Falls - Neversink 69 kV HG line; the Pleasant Valley – Rhinebeck Q Line for 115 kV; Central Hudson's portion of the North Catskill – National Grid 115 kV 5 Line; and the Knapps Corners – Spackenkill 115 kV SK Line. All these projects are driven by infrastructure conditions. These major rebuilds account for 70% of the planned Electric Transmission category expenditures.

A project that appeared in previous five-year forecasts, the Northwest Reinforcement Project (which adds a 345 kV interconnection to the Catskill District 115kV system) <sup>2</sup>, has been deferred due to the Targeted Demand Response (DR) Program; this DR program is expected to delay the Northwest Reinforcement in service date until at least 2029.

The rebuild of the 69 kV KM line is intended to address significant infrastructure issues on the line identified through our inspection program. Inspections have identified 58% of the line's wood pole structures as needing replacement. The line was originally constructed in the 1930's. In addition to addressing known infrastructure issues, potential benefits of the KM line rebuild include an increase of the transmission supply to the Myers Corners Substation. The main concern impacting the rebuild is its proximity to the Dutchess County Airport. The project will be constructed in late 2023 / early 2024 with an anticipated cost of approximately \$2.88 million within the 5-year forecast period. This project is one of Central Hudson's Phase 1 projects consistent with the State's CLCPA goals.

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<sup>&</sup>lt;sup>2</sup> The Northwest reinforcement was identified in the November 2, 2020 "Utility Transmission and Distribution Investment Working Group Report" as a potential Phase 2 project.

KM Line Condition										
		Structu								
<u>Section</u>	Miles	Replace	Repair	Probable Replacement <u>Percentage</u>						
Knapps Corners – P33581	1.0	10	5	65.2%						
P33581 – P33591	0.5	9	5	60.8%						
P33591 – P140218	0.35	0	0	0						
P140218 - Myers Corners	1.0	9	2	64.7%						
Totals	2.85	28	12	58.0%						

Rebuilding the 69 kV H&SB lines are identified in the five-year forecast. This transmission path is another of Central Hudson's oldest (c. 1919); its towers are mostly steel lattice construction. Inspections have shown 32% of structures needing replacement with another 36% in need of significant repair. These findings initiated a review of the line to develop the most economical alternative to rebuild the line, improve reliability, and (if possible) improve load-serving capability for the Northwest Area. Each line will be rebuilt to 115 kV but will continue to be operated at 69 kV for the foreseeable future. This project is expected to be constructed from 2022 through 2026 with an anticipated total cost of approximately \$33.82 million within the 5-year forecast period. The rebuild project is one of Central Hudson's Phase 1 projects consistent with the State's CLCPA goals, while the conversion to 115 kV operation is a potential Phase 2 project.

	H & SB Line Condition												
	Structures to												
				Replace/Add		<u>% of</u>							
			<u># of</u>	<u>mid-span</u>		structures that							
<u>Line</u>	<u>Section</u>	<u>Miles</u>	<u>Structures</u>	<u>pole</u>	<u>Repair</u>	require work							
Н	Saugerties – N. Catskill	12.061	138	41	66	78%							
SB	Hurley Ave Saugerties	11.11	118	41	25	56%							
	Total	23.171	256	82	91	68%							

Rebuild of the Honk Falls - Neversink 69 kV HG line is identified in the five-year forecast. This transmission path is another of Central Hudson's oldest (the oldest section was built in 1937); it is wood pole construction with 43 structures replaced in 2017 due to their poor condition. Of the 239 not replaced in 2017, 54% of structures have severity level 3, 4, or 5 deficiencies. These findings initiated a review of the line to develop the most economical alternative to rebuild the line, improve reliability, and (if possible) improve hosting capability for the Neversink Area. The rebuild will eliminate the existing sag limits and allow full hydro generation with certain portions of the WH line out of service. This project is expected to be constructed from 2025 through 2028 with an anticipated total cost of

approximately \$36.38 million within the 5-year forecast period. This project is one of Central Hudson's Phase 1 projects consistent with the State's CLCPA goals.

<b>HG Line Condition</b>											
CH Severity Level	1	2	3	4	5	Total Structures					
Structures with Defects	0	27	82	35	11	155					

Rebuild of the Knapps Corners – Spackenkill 115 kV SK Line is identified in the five-year forecast. This line was built in 1965 with wood poles. Out of the 37 structures that make up the SK Line, 28 are exhibiting conditions that would warrant repair or replacement and/or are in poor overall condition. This represents over 75% of the line's structures with an additional 5% containing significant defects. In addition to the infrastructure assessment, a recent survey conducted as part of Central Hudson's Right-of-Way Deficiency Program has indicated several deficiencies from centerline to edge of right-of-way along the length of the line that would support the need to acquire new easements. Based on a preliminary Engineering review, the existing corridor is sufficient in width such that these deficiencies could primarily be mitigated through the "centering" of the line within the currently established corridor. This would reduce the need to acquire new easement. A rebuild of the line is being proposed to both address the existing infrastructure conditions as well as the easement deficiencies. \$0.56 million is included in the 5-year forecast for this project with additional anticipated costs of approximately \$4.96 million in future years. Construction work for the project is planned for 2029. This project is one of Central Hudson's Phase 1 projects consistent with the State's CLCPA goals.

Rebuild of Central Hudson's portion of the North Catskill – National Grid Line Segment 115 kV 5 Line is identified in the five-year forecast. The line was originally built in the 1910's on lattice tower structures. Of the 30 structures that make up Central Hudson's section of the line before connecting to the National Grid section, 17 of the structures (56%) are carrying major conditions found during Central Hudson's comprehensive inspection program and need replacement. There are 11 additional structures (37%) which have defects that require some level of minor repair. In total, 28 structures (93% of the line) need some level of corrective work. The line conductors were installed in the 1950's making them more than 60 years old. The conductor is of a non-standard design and has been put into a dead-end configuration on a large number of structures when the line was reconditioned in the 1950's. This makes one-for-one replacement a difficult and inefficient means to correct outstanding tower conditions. Due to the high percentage of structures requiring work as well as the age of the conductor, the line is being proposed as a rebuild project to correct all the identified infrastructure conditions. The project will be constructed in 2027 at a total 5-year cost of approximately \$8.73 million. This project is one of Central Hudson's Phase 1 projects consistent with the State's CLCPA goals.

Rebuild of the Pleasant Valley – Rhinebeck 69 kV Q Line is identified in the five-year forecast as a complete rebuild of the line at 115 kV. The Q Line provides a link between the Northern Dutchess area and Pleasant Valley. The line was constructed in the late 1950s and is comprised of a 4-mile section of 40 lattice towers and a 16.5-mile section of 211 wood pole structures. The 40 lattice towers

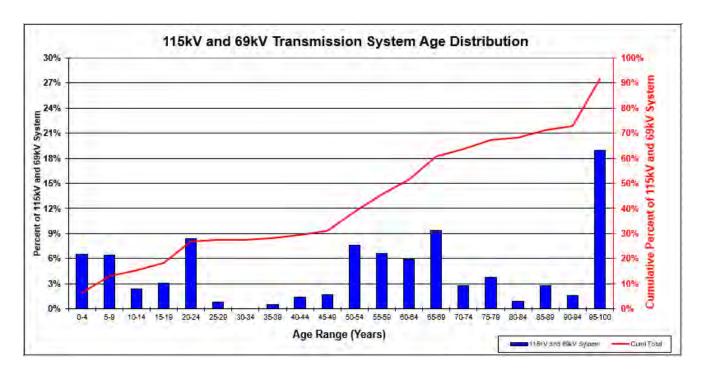
are double circuit towers shared with the 115 kV "X" Line from Pleasant Valley to Inwood Avenue. Despite conducting numerous maintenance projects on the line, inspection findings indicate that approximately 65% of the wood pole line section is still in need of replacement or repair because of aging infrastructure and poor overall condition. The vast majority of both the static wire and phase conductor is of the original line vintage. The project will be constructed from 2028 to 2030 with an anticipated total cost of approximately \$28.50 million within the 5-year forecast period. There are also additional anticipated costs of approximately \$25.2 million in future years. In the NYTO's November 2, 2020, report to the Commission<sup>3</sup> this project was listed as one of Central Hudson's potential Phase 2 projects consistent with the State's CLCPA goals with rebuild for 69 kV operation a Phase 1 project. With the incorporation of the 115 kV rebuild in the 5-year capital projects, the rebuild becomes a Phase 1 project.

	69 kV Q Line Structure Summary												
			Actional Repairs	s /	Probable I Repair	·s /	% of structure						
Section	Miles	Total Structures	Replacem Structures	ents %	Replacen Structures	<u>s that</u> <u>require</u> work							
Pleasant Valley to East Park Tap (common tower with X line)	4	40	0	0%	3	8%	8%						
East Park Tap to East Park	4.5	54	29	54%	6	11%	65%						
East Park to Staatsburg	4.25	56	29	52%	4	7%	59%						
Staatsburg to Rhinebeck	7.75	101	70	69%	6	6%	75%						
Total	20.5	251	128	51%	19	7.6%	59%						

Work to rebuild the Company's NC Line for 115 kV and operating at 69kV is included within the forecast as a Phase 2 Area of Concern project. Cost recovery for this project is through the FERC load ratio share methodology as approved by the PSC.

In addition to the above capital expenditures, there are several programs in Electric Transmission designed to reduce risk and improve infrastructure. The High Priority Replacements ("HPR") Program under the Electric Transmission Budget provides funding to respond to results of the inspections completed each year. HPR projects address infrastructure issues that will reduce the risk of system failure, contact incidents, or loss of reliability. The replacement work is prioritized based upon whether it is part of the 345 kV or underlying system and whether the feed is radial or networked. When an inspection severity of 4 or 5 has been indicated, structures, insulators, and other capital items are replaced according to a specified timeline. The graph directly below indicates the approximate Transmission System Age Distribution.

<sup>&</sup>lt;sup>3</sup> "Utility Transmission and Distribution Investment Working Group Report." Case 20-E-0197.



### **Electric Substation & Distribution**

Central Hudson Electric Substation and Distribution capital programs are developed based on our current planning criteria and address load serving capability, infrastructure, compliance, and reliability/operating issues. For infrastructure-based issues, Central Hudson utilizes its asset management process, including field inspections, condition monitoring, periodic testing and more indepth analysis and studies to identify trends, equipment issues and recommend replacement programs. Infrastructure based replacements also will be reviewed to determine whether to replace equipment inkind or pursue an alternative solution. Load serving capability projects related to substation equipment or distribution circuits are identified through our planning process. For each area and substation, the capacity and operability of the system under the various load forecast scenarios is analyzed. This analysis includes a review of the Substation and Distribution facilities, requiring a full understanding of the limiting components. For any areas or substations where load serving capability has been identified as a potential problem, plans and alternatives by area are evaluated to develop the best solution considering all costs, benefits, and long-range growth potential. The solution sets for these projects include both traditional utility projects and the use of Non-Wires Alternative solutions to replace or defer the potential capital upgrades.

The planning criteria are based on a combination of economic factors, current industry practice, design and practical considerations, reliability, and judgment. Influencing factors are:

- Infrastructure Condition If infrastructure must be replaced because it has reached the end of its life, consider the most effective means to replace it.
- Thermal limits related to the ability of the facility to withstand load related heating without damage.
- Protection
   — minimum fault current levels need to be maintained to ensure safe operation.

- Power Quality provide adequate voltage to customer premise ANSI C84.1, +/- 5.0% range during normal conditions (lower voltage in Conservation Voltage Reduction), +5.8% to -8.3% under emergency conditions; eliminate stray voltage.
- Reliability/Operational Flexibility proximity of solutions to load, \$/Customer Outage Avoided, \$/Customer Minute Interrupted, and integration of Distribution Automation.
- Regulatory Requirements NESC, NYPSC
- Renewable penetration levels and forecast
- Hosting capacity limitations/system congestion

From this process, substation upgrades, equipment replacement programs and projects establishing new substations or the addition of circuits and transformers in existing substations are identified. Due to the projected declining or flat load forecast in many of our planning areas, there are an extremely limited number of growth-driven major substation and distribution projects that have been identified through the planning process in this five-year forecast. Based on the age and the continuing condition assessment of our major substation and distribution infrastructure, there are several projects and programs to proactively replace equipment prior to the development of age/condition related operating issues. The need for upgrades in the Northwest Area of our service territory due to load growth and transmission/substation upgrades to reinforce and increase the load serving capability of those areas have been deferred outside of our five-year forecast due to Non-Wires Alternative solutions.

77% of the expenditures planned in the Substation category are associated with the condition-based replacement of older/aging infrastructure and 98% of the expenditures planned in the Distribution category are associated with the condition-based replacement of predominately older/aging infrastructure.

# **Electric Substation**

\$114.6 million is allocated to infrastructure-related substation programs and projects within the five-year forecast. Major substation rebuilds or partial rebuilds due to infrastructure considerations include work/upgrades at the following substations: Bethlehem Road; Kerhonkson; Modena; Greenfield Road (CLCPA Phase 1 project); Myers Corners; Coxsackie (CLCPA Phase 1 project); South Cairo (CLCPA Phase 1 project); Shenandoah; Pleasant Valley; Maybrook (CLCPA Phase 1 Project - required for Commercial/Industrial spot load near the Maybrook/Montgomery areas) and Woodstock . Additional major substation projects include: the addition of a second transformer for reliability and operational flexibility at the New Baltimore Substation (CLCPA Phase 1 project) in addition to avoiding otherwise required distribution system infrastructure work; and the installation of a new tapped 115/69 kV substation at the Tilcon site to continue to provide service to this larger industrial customer while allowing for the retirement of approximately 2.5 miles of a poor condition transmission line that runs through a residential neighborhood.

\$11.25 million is included for upgrades at the New Baltimore, Coxsackie, and South Cairo Substations due to the retirement of combustion turbines ("CTs") at Coxsackie and South Cairo Substations. Central Hudson submitted a compliance filing to the New York State Department of Environmental Conservation in March 2020 in response to its recently promulgated 6 NYCRR Subpart 227-3 "Ozone Season Oxides of Nitrogen (NOx) Emission Limit for Simple Cycle and Regenerative Combustion Turbines" which imposes more stringent emission standards for these units which makes

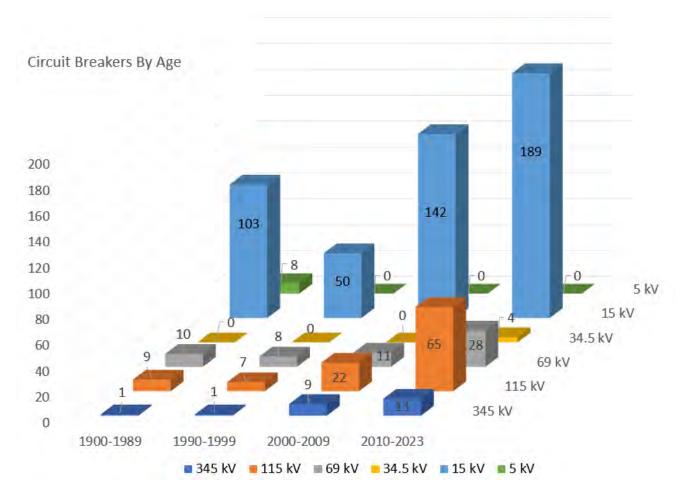
the CTs at these locations uneconomic. As these units are currently required for local transmission and distribution reliability needs, capital projects are necessary to address these needs prior to the retirement of the CTs. New transformers will be installed at both the Coxsackie and South Cairo substations (CLCPA Phase 1 projects) to provide reserve capability and statcom units/capacitor banks will be installed at New Baltimore and South Cairo to provide voltage support to the local transmission loop. These upgrades have an in-service date of 2024, allowing for the planned retirement of the CTs by December 2024.

A major substation infrastructure program included in the five-year forecast is the continuation of our Breaker Replacement Program that has been broken out into individual projects due to nearing the conclusion of the Program. This program was initiated to improve infrastructure and maintain system reliability through a planned prioritized equipment replacement program. The assessment process for the selection and prioritization of the breakers included in the replacement program is as follows:

- Breaker Duty: All power circuit breakers with breaker duties greater than 85% with highest priority given for breakers with duties greater than 100%.
- Condition: All the power circuit breakers identified based upon the recommendations from our Substation Engineering and Operations Division. These recommendations are based upon reports of failures or reports of poor testing results.
- Obsolescence: Several of the circuit breakers on our system still employ outdated technology, specifically relating to interrupter design. Others suffer from extended service lives and parts are no longer available for many others.
- Other Factors: Other power circuit breakers on our system meet the above breaker duty or condition selection criteria, but they have not been selected for this replacement program because they will be replaced with new breakers as part of new substation construction projects.

The Breaker Replacement Program has been in place since 2009; all the originally identified 196 breakers have been replaced. As a continuation of this program, 120 breakers have been identified for planned replacement in the five-year forecast horizon, with a cost of \$5.1 million. Many of these breakers targeted for replacement will be combined with other identified work at stations to create larger projects, as was the case with the 3 breakers identified for replacement in 2020. The chart below indicates the planned replacement plan from 2023-2028 and the following graph indicates the approximate Breaker Age Distribution.

Circuit Breaker Replacements by Year							
	2023	2024	2025	2026	2027	2028	
345 kV	1	0	0	0	0	0	
115 kV	7	3	0	2	0	0	
69 kV	5	0	1	1	0	0	
15 kV	18	1	31	14	19	15	
5 kV	0	0	2	0	0	0	
Total	31	4	34	17	19	15	

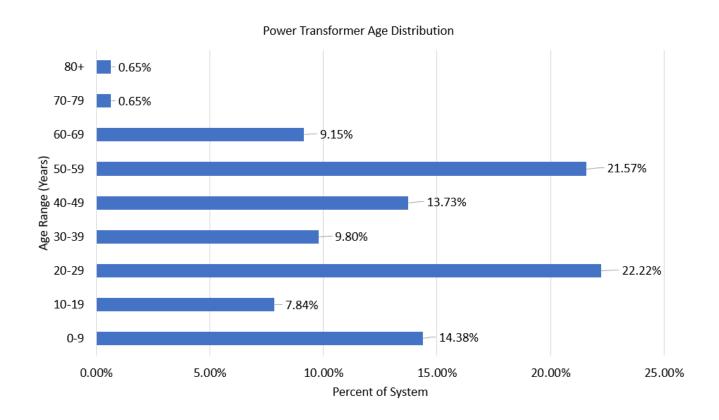


Additional major infrastructure replacement programs associated with substation equipment include the continued condition assessment and replacement of protective relaying equipment and substation power transformers. Targeted replacement programs for circuit switchers, disconnect switches, and motor-operated switches ("MOS"), have commenced based on feedback and maintenance trends from Substation Operations.

The comprehensive relay and metering modernization program included in the five-year forecast identifies outdated meters, relays, and communications infrastructure. This program has been integrated into comprehensive substation rebuilds or major upgrades to take advantage of construction efficiencies. There is \$11.2 million in the five-year forecast to complete these projects.

Regarding the substation power transformers, the condition of the power transformers varies and the ability to maintain them is tied closely to their age. Recent focused replacement of poor performing transformers has reduced the average age of our substation transformer fleet to approximately 35 years old; however, some transformers remain that are up to 80 years old and are in deteriorating condition. The transformers are monitored using dissolved gas analysis, oil screen/testing, and Doble power factor testing at an interval based on voltage level and equipment criticality. Transformers are replaced based on this testing and overall condition assessment. There are three substation transformer projects in the five-year forecast associated with the condition-based replacement of aging transformers totaling \$6.8 million. These projects include transformer

replacements at the following substations: Ancram (CLCPA Phase 1 Project); Pulvers Corners (CLPCA Phase 1 Project) and Converse Street. The replacement of the Ancram and Pulvers Corners transformers (CLCPA Phase 1 Projects) are being replaced due to their age and condition and will be sized to support local operational and hosting capacity needs. An overall Area study has been completed for the Pulvers/Ancram Area which incorporated recommendations for the Ancram substation. Additionally, there is the planned installation of two 115/69 kV transformers at the Kerhonkson Substation coordinated with the retirement of the Modena 115/69 kV transformer and the upgrade of the P and MK Lines to 115 kV operation (CLCPA Phase 1 project) and the planned installation of transformers at the Coxsackie and South Cairo Substations due to the retirement of the CTs at these locations. The graph below provides an overview of the age of the Company's Power Transformers.



A condition-based program has been created to identify and replace switchgear units that are in poor or deteriorating condition. This program has been separated out into individual projects to incorporate design and construction efficiencies with other work that needs to be completed at each substation. There is \$9.8 million in the five-year forecast allotted to start these replacements. The following substations have been included in the switchgear replacement projects in the five-year forecast: Coxsackie; Woodstock; Myers Corners; Montgomery Street; Tioronda; Converse Street; Shenandoah; and the purchase of a mobile switchgear.

Like the breaker replacement program, programs have been created to address concerns with the remaining life of substation circuit switchers, disconnect switches, and motor operated switches. Replacement programs have been created to proactively replace these devices subject to potential failure. Recent problems have been identified with certain style switches, and there are limited to no replacement parts available. There is \$6.1 million in the five-year forecast allotted to these replacements.

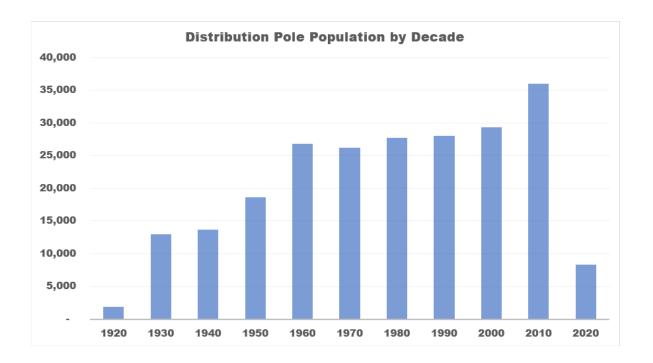
### Distribution

\$280.19M is included in the electric capital forecast for distribution improvements. The expenditures in this category are focused on addressing condition-based infrastructure replacements, expenditures related to the day-to-day capital requirements for distribution facilities, and projects necessary to maintain current levels of reliability performance by addressing local thermal/voltage, reliability, and operating issues.

The forecasted level of expenditures for the day-to-day items over the five-year forecast period is \$151.7 million. The expenditure levels for these projects are based on historical trend levels adjusted for known changes. These are projects that necessary are for the daily operations of the distribution system which include the following:

- <u>Distribution Improvement Blankets/Minors</u> Work orders developed for newly emerging operational work and are classified as blankets or minors/locals according to Central Hudson accounting rules
- Road/Bridge Rebuild Relocation Projects/Relocation Blankets Relocations of electric distribution facilities required based on State and local road rebuilds.
- <u>Distribution Improvement Conversions</u> Conversion from 4 kV to 13.2 kV operation due to customers experiencing low or errant voltage or an overloaded step-down transformer.
- <u>CATV Make-ready</u> Work orders developed to address emergent CATV work, as the
  communication companies continue to expand their infrastructure, the proper NESC clearances
  between communication and electric facilities must be maintained and the poles must have
  sufficient capability to carry the additional facilities, where if the infrastructure is aged, the
  utility is responsible for the cost of the upgrades.
- <u>Distribution Pole Replacements</u> Replacements based on the facility inspections program. All poles are inspected on a rotating five-year basis and are replaced if deemed to be compromised due to breaks, severe lean, rot, washout, evidence of flash over and woodpecker holes. The replacement of weak and failing poles is a key driver to maintaining customer reliability.

The number of distribution inspection driven pole replacements has shown an increasing trend in recent years. Based on the age demographic of the pole plant and this increasing trend, additional funding was included within the five-year forecast to address pole replacements (\$105.8M). The graph below provides an overview of the age of the company's distribution pole plant.



\$58.1M has been included for various condition-based infrastructure improvement programs targeting the replacement of older assets required to maintain service reliability for electric customers. These infrastructure improvement programs include the following:

- Overhead Secondary Replacement replacement of legacy open wire secondary wire with triplex or quadplex.
- <u>Primary Network Cable and Equipment Replacement</u> Replacing 14.4 kV Paper-Insulated Lead-Covered (PILC) cables, oil switches, and the legacy CE Mesh network monitoring system on the network primary feeders.
- <u>Secondary Network Upgrades</u> replacement of aged secondary network infrastructure, including failed cable, collapsed duct banks, and pull boxes and manholes that are in poor condition.
- <u>Underground Residential Distribution (URD) Cable Replacements</u> Central Hudson's URD cables are aging and are experiencing failures. Although the impact to reliability so far has been small, the utility industry recognizes the larger impact these aging cables will have on reliability in the future. Proactive measures are needed to curb these failures by eliminating legacy infrastructure and rebuild the aging circuitry to modern-day construction, reliability, and operational flexibility standards.
- <u>5 kV Aerial Cable Replacement (CLCPA Phase 1)</u> A program developed to mitigate all the reliability, loading, environmental, and safety concerns associated with the 90-year-old 5 kV aerial cable. The cable is aged and prone to failure and has also been the cause of many voltage

issues on the system. Additionally, when this cable is replaced, the typical practice is to convert the customers over to the 13.2 kV voltage class.

- <u>Copper wire replacement program (CLCPA Phase 1)</u> There is a proliferation of primary copper wire on Central Hudson's distribution system. These conductors are not only antiquated and prone to failure; they are frequently undersized for modern operational needs. They are also susceptible to burndown during reclose operations.
- <u>4800 V conversion (CLCPA Phase 1)</u> This program focuses on upgrading 4800 V mainline circuitry to 13.2kV operational voltage. The remaining pockets of 4800 V circuitry limit operational flexibility, load serving capability and hosting capacity for DERs. Much of the 4800 V circuitry is over 70 years old and has exceeded its useful life.

An additional \$4.2M is included for the construction of distribution facilities associated with substation and transmission reinforcements/retirements. 98% of the expenditures planned in this category are associated with the condition-based replacement of older/aging infrastructure.

Central Hudson has included \$28.3M in the five-year forecast to maintain the current levels of performance for the distribution system. This includes the following:

- <u>Thermal/voltage</u> load or voltage relief projects are often recommended to mitigate any loading, thermal, and voltage concerns. Polyphasing, reconductoring, and voltage conversions, building new lines, or leveraging modern technologies are examples of projects that could fall under this line item.
- Reliability Projects that are developed and prioritized according to a 5-year historical average \$/COA (customer outage avoided), but ancillary benefits to customer satisfaction and resiliency also are considered. Examples of improvement projects include relocating circuitry from off-road to on-road, closing gaps (i.e., new circuit ties), installing electronic reclosers, and replacing failure prone equipment.
- CEMI/Worst Circuits Projects that focus on areas of the system that experience multiple outages per year that are not always captured under larger scale capital improvement programs. This program is used to help the Company identify those areas which may require more specific attention to correct issues impacting reliability. The program originally targeted customers experiencing ten or greater outages in a 12-month period. The Company has recently expanded the program to include CEMI at levels lower than ten interruptions per year to be more proactive to meet customer reliability expectations and to expand the pool of projects. The Company maintains the use of a "cost per customer outages avoided" metric as a screening criterion to ensure the projects remain cost effective.
- Operating/Infrastructure (CLCPA Phase 1) Projects address operational limitations in the distribution circuitry. Customer outage duration reduction is a primary driver of projects in this category. In addition, aged infrastructure in poor condition may create operational limitations and/or future risk of an increase in outages. Projects to address operating issues are developed

with the primary goal of reducing the duration of outages. Typical projects involve developing a tie between feeders, or reconductoring the lines to make the tie stronger so more load can be reenergized through switching. Many of these projects also address failing infrastructure that does not fall under a specific program.

The Distribution Automation ("DA") Program (CLCPA Phase 1) is a major initiative that commenced in 2015 and continues to be included in the five-year forecast. By the end of 2024, most of the installation of DA devices in our five districts will have been completed and planned expenditures for DA are significantly reduced in the 2025-2027 timeframe. Central Hudson will continue with the Automatic Load Transfer ("ALT") switch and recloser replacement programs. As part of the Company's Grid Modernization initiative, these programs will be integrated with its Advanced Distribution Management System ("ADMS") to improve reliability, system safety, and system efficiency, enhancing the capability of ALTs to include more complex Fault Location, Isolation and Service Restoration ("FLISR"), scenarios while providing for Volt-VAr Optimization.

# **Storm Hardening**

While the five-year capital plan includes numerous items to improve system reliability that also have resiliency benefits, the areas impacted by storms may not always be prioritized based upon the Company's benefit/cost analysis metrics. The areas hardest hit by major storms are often located in the remote areas and/or on the edges of our service territory with low population density. The storm hardening program in the five-year capital plan is a continuation of the Company's plan included within our previous rate filing. The storm hardening program includes \$27.9 million for circuit hardening projects and an additional \$1.68 million for a strategic undergrounding project. The circuit hardening projects focus on rebuilding the mainline zones of protection that impact 500 customers or more on those circuits that have shown poor reliability performance including Code 1 (Major storms) reliability data. The five-year forecast included funding to address nine circuits, with projects developed to bring the circuit mainlines up to current design and construction standards and complete any danger tree removal that is required. The circuit hardening projects are CLCPA Phase 1 projects.

As part of the storm hardening program, a strategic undergrounding project is included in the forecast. This project will complete the undergrounding of approximately 1.3 miles of mainline that is currently off-road, cross lot circuitry prone to outages where traditional options such as overhead line relocation are not viable solutions.

In addition to this program for resiliency, Central Hudson is currently in the process of completing a Climate Change Vulnerability Study and Climate Change Resilience Plan pursuant to New York Public Service Law§66(29) and Public Service Commission Case 22-E-0222. The Vulnerability Study is designed to evaluate infrastructure, design specifications and procedures to better understand vulnerability to climate-driven risks. Following completion of the Climate Change Vulnerability Study, Central Hudson will prepare a resilience plan detailing mitigating actions to address those risks.

### New Business, Transformer, Meters, and Storm

The remainder of the Electric Capital Budget, the New Business, Transformers, Meters, and Storm capital forecasts are based on the projected customer growth from the corporate forecast and/or were trended based on historical experiences and adjusted for known changes.

Forecasted expenditures for the New Business category are based on expected residential and commercial customer additions as specified in the Company's sales forecast multiplied by an average cost of service installation. Service installation costs were calculated by taking the (3) year average across the entire New Business category and applying inflation and overheads. All project installation costs were included in the average from simple residential services to large industrial services, as recent meter additions achieved are expected to trend similarly based on known commercial/industrial projects and 12-month forward looking visibility into upcoming underground residential developments ("URD"). The overall forecast for the New Business category is an increase from the Company's prior Rate Agreement since actual expenditures measurably exceeded the prior budget.

Material cost increases associated with global supply chain constraints have resulted in firm pricing increases for the Transformers category. This has had a significant impact on our Transformers category expenditures identified in the five-year plan. Forecasted Meter expenditures have remained flat, and the five-year forecast is based on and aligned with historic trends.

Forecasted capital expenditures for storm restoration efforts (Storm) were included as a new line item identified within the five-year capital plan. These expenditures are non-discretionary in nature and the Company has historically monitored capital expenditures associated with addressing damage sustained during storm conditions to quantify and manage these incremental expenditures across other electric capital budget categories. Forecasted expenditures for this category were trended based on historical experience over the prior three years.

### GAS PROGRAM SUMMARY

The Central Hudson gas system contains well over 2,000 miles of transmission and distribution pipeline facilities ranging in age from new to over 100 years. It supplies gas service to approximately 84,000 customers in communities along the Mid-Hudson River Valley from Woodbury in the south to Coxsackie in the north and ranges from Carmel in the east to as far west as Montgomery.

The Company's gas transmission system consists of 162 miles of steel piping ranging from 6-16" in diameter, four transmission pipeline supplier gate stations and three flow control stations with a Maximum Allowable Operating Pressure (MAOP) of between 512-750 PSIG. The majority (81%) of the transmission system was installed during the 1950's and 1960's. The MPI and MPR transmission lines were the last to be installed (1990's) and account for 12.8% of the total transmission pipeline inventory. Three of the four gate stations date to the 1950's and early 1960's. The last gate station, Pleasant Valley, was constructed in the early 1990's to take gas from the then-new Iroquois gas transmission line. Additional details on the Company's gas transmission system are in our annual Transmission Integrity Management Plan ("TIMP").

A total of 142 gas regulator stations are utilized to supply the distribution system. The stations either reduce transmission pressure to distribution pressure, or further reduce distribution pressure to a lower pressure.

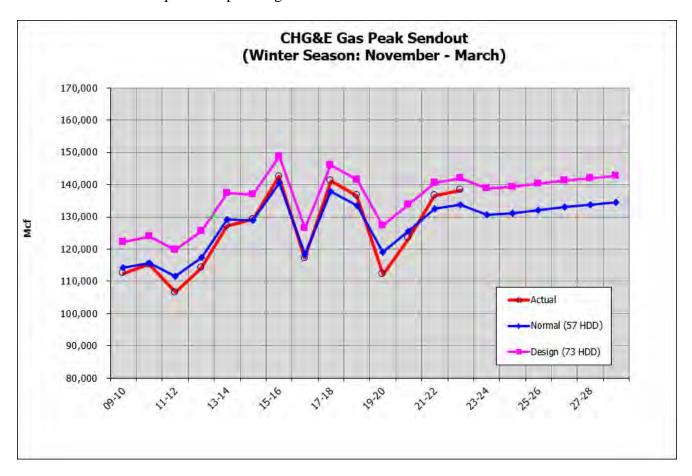
The gas distribution system is comprised of 1,318 miles of distribution main that operates at pressures from utilization (inches of water column) to 120 PSIG. Also included in this total is a short (2.8 mile) section of pipeline which operates at 325 PSIG which in compliance with current code requirements is classified as high-pressure distribution piping. Nominal pipe diameters range from ½" to 16 inch in size and are comprised of plastic, steel, wrought iron, and cast iron. The predominant material is plastic, which makes up 870 miles of the total inventory, and cathodically protected steel, which accounts for an additional 367 miles. Currently Central Hudson defines leak prone pipe (LPP) as cast iron, wrought iron and unprotected steel. This represents a total of 82 miles or 6.2% of the total distribution main inventory. The Company's gas service inventory totals 66,186 services, of which 52,474 are plastic, 9,066 are protected steel, and 35 are copper. The remainder are considered leak prone.

Low pressure systems exist in each of the larger Cities of Beacon, Newburgh, Poughkeepsie, and Kingston, and Villages of Saugerties and Catskill. Construction on these systems started in the early 1900s and piping have been added and replaced regularly since that time. These systems contain significant lengths of cast iron, bare steel, and wrought iron piping. Portions of the piping must be replaced to maintain a manageable leak inventory. These older communities have transformed from residential/commercial and industrial centers into primarily residential, light commercial and governmental centers and gas loads have stabilized or slightly declined over the years.

### **Gas Forecast Overview**

Central Hudson's gas capital forecast for the next five-year period is developed using a number of inputs such as planning studies, econometric forecasts, corporate load forecasts, facility inspection results, integrity recommendations, field operations feedback as well as others.

Central Hudson's gas peak load forecast is allocated into planning areas to identify system capacity needs and the timing of those needs, quantify the risks of the load growth outpacing our ability to serve that load, and assess the alternatives, historical pipe solution or non-pipes alternative, available to meet that load. As a result of these efforts, capital needs are identified, timing determined, and alternatives developed from planning studies.



The New Business and Meters capital forecast is based on the projected customer growth from the corporate forecast.

For the Gas System, the primary evaluation criteria for area studies are load serving capability, based on system configuration, capacity, and the resulting pressures during design day. The planning criteria are based on AGA Engineering Practices. The minimum operating pressures which are allowed under these planning criteria are 50% of the local system set pressure.

The planning criterion is based on single contingency failure. The planning process evaluates the risk associated with load growth uncertainties, the risk of pressure falling below required minimums, the number of customers impacted, and the time associated with restoration of service.

# Gas Program Detail

The Gas Capital forecast is developed utilizing guidelines, planning standards, and engineering judgment. The forecast is completed for each budget category and integrated into a comprehensive plan. The following is a summary of the five-year capital forecast for each of the categories.

Gas Capital Forecast - Additions

Gus Capital I orecust – M	<u>2024</u>	2025	2026	2027	2028	TOTAL
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	4,240	6,647	6,818	4,493	5,672	27,870
Regulating Stations	3,304	3,592	3,820	4,376	4,337	19,429
New Business	9,955	10,373	7,738	7,908	8,313	44,288
Distribution Improvements	51,581	56,374	60,382	63,691	69,912	301,940
Meters	2,926	3,028	3,213	3,405	3,611	16,183
Total	\$ 72,005	\$ 80,014	\$ 81,971	\$ 83,874	\$ 91,845	\$ 409,710

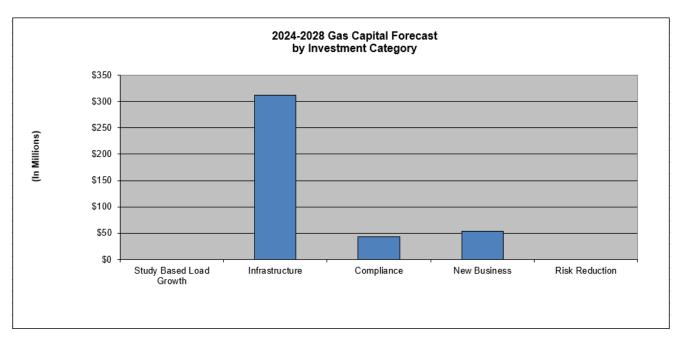
# Gas Capital Forecast - Removal

	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	2028	TOTAL
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	102	146	149	152	155	705
Regulating Stations	256	230	235	239	266	1,226
New Business	205	215	226	238	249	1,133
Distribution Improvements	1,433	1,463	1,494	1,522	1,551	7,463
Meters						
Total	\$ 1,996	\$ 2,054	\$ 2,104	\$ 2,151	\$ 2,221	\$ 10,527

A breakdown of the Gas Capital Forecast indicating the level of spending as prioritized is shown below. Non-discretionary is the level of spending that is necessary to meet the minimum standards of service or compliance with public service law. Maintaining System Standards is the level of spending required to maintain our current level of service regarding safety and reliability and to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our level of service, reducing risk, or reducing operating costs.



In addition, the projects within the Gas Program are categorized by the following Investment Categories: growth (study-based load growth), new business, compliance, risk reduction, and infrastructure replacement. The bar graph below shows the breakdown of the projects in our current five-year forecast by these Investment Categories.



### **Gas Transmission**

The Gas Transmission category consists of gate station and transmission capital projects. Sample projects may include transmission line replacement/relocations, transmission valve replacements, modernization of gate station flow control equipment, etc. The development of the Gas Transmission five-year Capital Forecast is derived from the following inputs:

- Transmission Integrity Management Program (TIMP)
- Mega Rule 49 CFR 192.624

- Regulatory requirements
- Equipment obsolescence/performance
- Inspection results
- Municipal projects
- Load growth

The Gas Transmission projects are designed to provide necessary capacity, reduce risk, and improve infrastructure. Gas Transmission Capital Projects are primarily a mix of compliance, risk reduction and infrastructure. They may stem from System Load Studies or studies performed as part of the Pipeline Integrity Program. These studies result in selected pipeline projects such as casing removals or the installation of remotely operated valves (ROVs). The transmission flow control equipment such as remote terminal units (RTUs) is evaluated to determine useful remaining life. The Gas Transmission five-year Capital forecast addresses several infrastructure and integrity issues. The remainder of the capital forecast focuses on the following areas for system improvement: TIMP related projects, flow control system upgrades, and remote operated valves.

The Mega Rule or "Safety of Transmission Pipes Final Rule" became effective July 1, 2020, and broadly affects onshore gas transmission line operators, such as Central Hudson, by expanding federal regulation and reporting requirements. The most significant impact for the Company relates to reconfirmation of maximum allowable operating pressure ("MAOP"). This must be accomplished by replacing existing segments of the transmission line that are in high consequence areas or class 3 or 4 locations where we do not have traceable, verifiable, or complete records that pressure tests were conducted at install.

Our initial engineering assessment of Mega Rule affected transmission pipelines is complete, and an implementation plan was filed with the Department of Public Service on June 30, 2021. The requirement is that 50% of identified actions must be completed by July 3, 2028, and 100% by July 2, 2035.

# **Gas Regulator Stations**

The Gas Regulator Station category consists of regulator station capital projects. The projects range from the installation of new stations to the replacement/upgrade of station equipment. The development of the Gas Regulator Station five-year Capital Forecast is driven by the following inputs:

- Regulatory requirements
- Equipment obsolescence/performance
- Inspection results
- Load growth

The Gas Regulator Station projects consist primarily of a mix of compliance and infrastructure projects. The main replacements associated with the LPP Elimination Program result in changes in the low and medium pressure system flows. As a result, modifications will be made to existing stations as needed to account for increased flow due to the modification of distribution system piping. In some cases, stations will be eliminated due to these elimination projects. The remainder of the Gas Regulator Station capital forecast is related to regulatory requirements, equipment obsolescence, maintenance issues, improved/remote pressure control, retirements, and relocations.

# **Gas Distribution Improvements**

The Gas Distribution Improvement category consists primarily of main and service replacements. Projects in this category include LPP main replacements, additional valve installations, etc. The development of the Gas Distribution five-year Capital Forecast is derived from the following inputs:

- Distribution Integrity Management Program (DIMP)
- Risk assessment (including leak history, material type, location, etc.)
- Regulatory updates/mandates
- Inspection results
- Municipal projects
- Load growth

The Gas Distribution five-year Capital Forecast is driven primarily by the mandated elimination of LPP. At this time, the Company defines leak prone pipe as cast iron, wrought iron and unprotected steel pipe. As detailed in its current rate order 20-G-0429, the Company must eliminate a minimum of 15 miles of leak prone pipe a year during the three-year rate order. Elimination of less than 15 miles will result in a negative revenue adjustment of 15 basis points. It is the Company's intent to achieve 15 miles of LPP elimination annually.

The LPP replacement projects are identified and prioritized using the GL Main Replacement Prioritization Program (MRP) which develops a risk 'score' based on pipe and operating characteristics such as material, operating pressure, age, diameter, leak history, location (proximity to buildings, business district, flood prone areas) and cathodic protection. This risk score measures the relative likelihood and the consequences of a leak associated with each pipeline segment. In addition, SME review is taken into consideration when developing the proposed main replacement project listing. Based on industry best practice, LPP projects consist of 1-2 mile 'neighborhood' projects which result in limited disruption to customers and more economical replacement of LPP. While this methodology does result in the replacement of existing short sections (< 100 feet) of plastic and protected steel previously replaced due to undermines or leak repairs, the overall efficiencies gained through bypassing and elimination of prolonged customer interruption are significantly more cost effective. As part of the LPP elimination program the Company is identifying locations where beneficial electrification of customers' natural gas appliances and equipment may be converted to electric. This will eliminate the need to replace a portion of LPP main that serves limited customers and is not detrimental to maintaining current levels of service to other customers on the system. Based on an LPP elimination rate of 15 miles per year, all identified LPP will be eliminated by 2029.

Included in the Gas Distribution capital budget is funding for main replacements or relocations associated with municipal projects such as road rebuilds. The actual project cost is included when the actual project is known, otherwise the budgeted amounts are trended from past year expenditures.

### **New Business & Meters**

The New Business section of the Gas Capital Budget is based primarily on the projected customer driven growth from the corporate forecast and the Category 24 budget established in 20-G-0429. The forecasted expenditure level was significantly reduced from the prior 5-year forecasts based

on the impacts of climate legislation and reduced focus on gas expansion unless required under tariff or where revenues support the investment. The Gas New Business program has budget support for \$49 million over the five-year period for residential and commercial customer driven additions.

The Gas Meters capital forecast is based on the projected customer growth from the corporate forecast. The meter forecast is based on the annual needs for non-load related meter installations (Meter Testing Program or ERT meter requests), approximately 1,000 meters during the forecast period, and the forecast level based on the customer growth, peak, and sales forecast.

#### **COMMON PROGRAM SUMMARY**

The Common Capital Forecast consists of the following categories: Land and Buildings; Information and Operational Technology; Tools & Equipment; Communication; and Transportation. The following is a summary of the five-year capital forecast for each of these categories:

## Common Capital Forecast – Additions

	<u>2024</u>	2025	<u>2026</u>	2027	2028	TOTAL
LAND AND BUILDINGS	\$ 17,479	\$ 21,996	\$ 30,628	\$ 18,293	\$ 25,802	\$ 114,199
OFFICE EQUIPMENT*	38,199	38,435	37,582	34,023	54,828	203,067
TOOLS	1,605	1,639	1,781	2,144	1,849	9,018
COMMUNICATION	9,559	8,662	10,051	4,404	4,442	37,119
TRANSPORTATION	13,824	14,115	14,411	14,685	14,964	71,999
TOTAL	\$ 80,668	\$ 84,847	\$ 94,453	\$ 73,549	\$101,886	\$ 435,402

<sup>\*</sup>Information Technology (I.T.) & Operational Technology (O.T.) included in Office Equipment

## Common Capital Forecast - Removal

Common Cup mus 2	2	024	2025	2026	2027	2028	TOTAL
Lands and Buildings	\$	544 \$	698	\$ 979	\$ 699	\$ 733	\$ 3,653
Office Equipment		-	-	-	-	-	-
Tools		-	-	-	-	-	-
Communication		1	1	1	1	1	5
Transportation		(450)	(450)	(450)	(450)	(450)	(2,250)
Total	\$	95 \$	249	\$ 530	\$ 250	\$ 284	\$ 1,408

#### **Land and Buildings**

There are several larger facility projects planned during the five-year forecast period. The first project is the completion of an integrated transmission and distribution system operations center ("PCC"). This project is planned to be in service and all expenditures received in 2024. The construction of this project began in 2022 and the total estimated Facility costs is \$44.5 million; of that \$4.6 million is estimated to be incurred during this 5-year budget period.

The second project consists of the completion of the buildout of the Training Academy. This project was previously proposed and approved in recent rate filings but was not included in the current (2022-2024) filing, therefore the construction of the Training Academy and Annex has been deferred. Funding for this project is including in the current 5-year budget. Currently \$20.2 million is planned to complete the Training Academy- Annex and \$25 million is planned to complete the Training Academy- However, if current material cost increases continue, there is a likelihood that additional funding for the project would be needed.

The third project is the construction of a new Tannersville building. Currently the employees assigned to Tannersville work out of a rented bay at the local fire department. The equipment and vehicles have outgrown this space and the fire department has indicated they are not willing to sign another lease. Procurement of land is expected to occur in 2023. The estimated cost of this project is \$4.2 million and is planned to occur within this five-year forecast.

Next are two projects that replace/rebuild existing buildings at operational headquarters. Rebuilding of the Butler Building in Fishkill will upgrade an existing structure at the end of its useful life and provide enhancements to support operations departments. The estimated cost of the project is \$4.7 million and is planned to occur primarily in 2026. Construction of a new automotive repair shop at the Eltings Corners location will provide a more appropriately sized building for this work, while allowing the existing garage to be used to store large and expensive equipment indoors. The estimated cost of this project is \$4.7 million and is planned to occur primarily in 2026.

The last project is the relocation of the Newburgh District Operating Headquarters. Several alternatives have been evaluated to increase the functionality of the headquarters and mitigate risk associated with its general low-lying location and proximity to the Lake Washington Dam. The proposed project will address safety and congestion issues at the current site while also relocating critical operational activities to a more geographically secure location. The current estimated cost of this project during the five-year forecast period is approximately \$2.5 million, which would allow for property procurement, design, permitting and other pre-construction needs, but most of the construction expenditures and project completion is anticipated to be in 2029-2030.

#### **Information & Operational Technology / Communications / Security**

Central Hudson is continuing to make strategic investments in Information Technology ("IT"), Operational Technology ("OT"), Communications, and Security to meet rapidly increasing demands of our customers, industry, regulators, workforce, and technological changes.

The Technology organization currently supports and maintains more than 350 business service offerings, 3,600 desktop software applications, nearly 600 servers, nearly 1,000 databases, Operations Technology (including but not limited to Control Centers and Supervisory Control and Data Acquisition ("SCADA")) and the underlying network infrastructure to enable the needs of the business and Central Hudson's external stakeholders. The technology investments directly support the Company's strategic initiatives to:

- 1) Provide a seamless customer experience,
- 2) Modernize/transform business operations to continue to provide safe, efficient, and reliable service to Central Hudson customers,
- 3) Transform safety culture and,

4) Develop, attract, and retain an inclusive and diverse workforce.

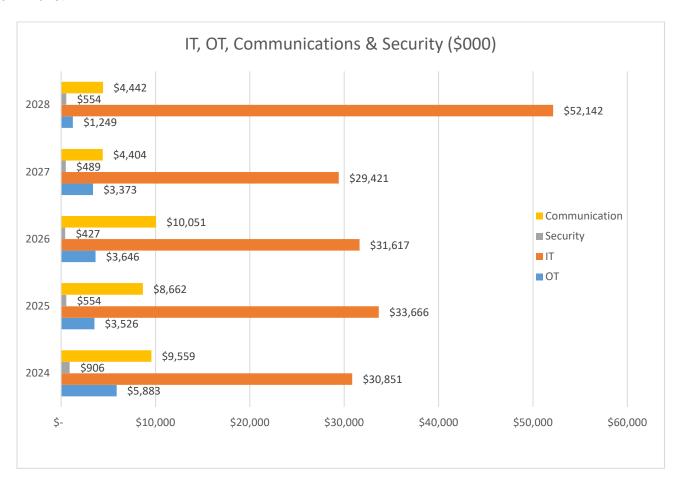
The average annual investment requirement for 2024-2027 is \$47 million, driven by investments required to fulfill the strategic initiatives mentioned above as well as increased investments in Customer Experience Optimization, Cybersecurity, infrastructure hardening & resiliency, and investments that were deferred from prior years due to the Company's focus on Customer Information System ("CIS") Modernization.

OT's Five-Year Capital Plan, \$17.7 million, reflects continued investment in the enhancement of the Distribution Management System ("DMS") to expand to the inclusion of Outage Management System ("OMS") capabilities. Additionally, \$5 million of OT's Capital Expenditures are allocated for the technological build-out of the Primary Control Center.

IT's Five-Year Capital Plan, \$177 million, reflects continued investment in the reoccurring license renewals, infrastructure and application upgrades, enhancements, and replacements.

Security's Five-Year Capital Plan, \$3 million, reflects continued investment in the upgrading of security hardware to provide our workforce the ability to support critical infrastructure that supports safe and reliable service to our customers.

The graph below outlines the Five-Year IT, OT & Communications & Security Capital Plan for 2024-2028:



Outlined below are the key technology investments that support each strategic business initiative during the 2024-2028 timeframe:

- <u>Digital Customer Experience</u> Ongoing investment in Digital (Web/Chat/Mobile/Social) customer enablement via extending self service capabilities, growing adoption of existing self-service offerings, and aligning customer experience across all channels.
  - o SAP Optimizations and Upgrade
    - Dunning (collections) automation within SAP and implementing enhancements that will reduce the manual workload that currently exists within the Business.
    - Monthly Meter Reading to enable the organization to transition to Monthly Meter Reading.
    - Major SAP Upgrade to ensure the software continues to receive vendor support and maintenance by remaining at a current software version.
  - o IVR Modernization improve customer contact center experience with the replacement of the current Interactive Voice Response ("IVR") system.
  - o Billing Re-Design creating and providing bills, forms, and letters in Spanish for customers in which Spanish is their preferred language.
  - o MyAccount Site Updates MyAccount page will reflect a more modern appearance with easy-to-understand information.
- <u>Modernize/transform Business Operations:</u> Ongoing investments to enhance and upgrade our business operations.
  - o Grid Modernization:
    - ADMS Modeling & Enhancements West of River development of the ADMS model for the West of River.
    - Field Area Network investments discontinue aging network communications equipment and improve the speed and reliability of the Central Hudson distribution network communications.
    - OMS implementation, utilizing the GE DMS & EMS solution.
    - Primary Control Center (PCC) Build out of the Network Strategy NOC and Operational Technology Supporting Systems and Applications at the new PCC.
  - o <u>Communications</u> Expanded use of a Network Integrity program (Cisco's Suite of Products) that will improve the security of the corporate network.
    - Land Mobile Radio ("LMR") Replacement with Digital Mobile Radio ("DMR")
       replace the existing LMR system with a new DMR system.
    - Backhaul Optical Fiber locations have been identified where optic fiber is needed to reinforce this communication network and provide redundant communication paths to increase system reliability or expand the communication network to reach new Electric Substations, Gas Regulator Stations, or gateway locations.

- Substation Upgrades Replace aged phone circuits for communications for services including voice circuits (POTs Lines), SCADA circuits, and Protective Relay circuits.
- o <u>Technology Infrastructure Optimization & Lifecycle Initiatives –</u> Ongoing life cycle and enhancement management of hardware across the enterprise to ensure minimal impacts to productivity and to ensure effective delivery of business applications.
  - Replacement of Mobile Workforce Management replace the Oracle solution with one that ensures continued vendor support for vulnerabilities and product development.
  - Upgrade(s) to Cascade migrate the software from an old Power Builder platform to a modern Web Base User Interface.
  - Upgrade(s) to DNV Inspection Manager Upgrade of DNV Inspection Manager, a compliance-based inspection software used to schedule and inspect gas system assets.
- <u>Enterprise Analytics Platform & IEDR Phase 1 &2</u> Deliver enterprise-wide analytics solutions to support the business in aligning to data driven business operations. This program is inclusive of the Integration Energy Data Resource ("IEDR") program as well.

#### o **GIS Modernization:**

- Utility Network Migration Upgrade and enhance ArcGIS to ArcGIS PRO.
- Underground Network Management Solution convert paper maps of manholes, underground pull boxes, cables, and duct banks in Poughkeepsie, Newburgh, and Kingston districts into detailed electronic models within Central Hudson's existing GIS Solution.

#### • Workforce Development, Attraction & Retention:

Learning Management System ("LMS") Consolidation - initiative seeks to consolidate
the multiple learning management platforms leveraged throughout Central Hudson's
operational areas onto an enterprise LMS.

#### • Transform Safety Culture:

- Cyber Security Program Ongoing investment in security layers to aid in prevention of customer and company data/information system breaches. Constant rigor required to ensure customer and company Cyber Security.
- O Identity and Access Management (IDAM) Phase 2 expanding the functionality of its IDAM tool to integrate with ServiceNow to provide seamless access provisioning to systems, SAP's GRC tool to ensure all core authentication/authorization platforms are configured for automated provisioning, and Azure AD/Exchange Online to streamline SharePoint and Teams access management.
- ServiceNow GRC This solution will aid Central Hudson's Cybersecurity Team in ensuring increasing maturity of processes, alignment to modern and current NIST standards, allow for risk measurement and reduction, and decreasing inefficiencies in manually tracking regulatory and compliance requirements.

• Aviat Router Replacement – phase out the Aviat equipment and replace with Cisco equipment.

Also included in the 5-year capital plan are investments to support ERP Phase III preparation.

- o ERP Assessment to analyze current and scope out the future state solution
- o Warehouse Barcoding implementing barcode scanning and inventorying.
- Document Information System ("DIS") Replacement move off its legacy DIS system to better leverage industry standards in managing and maintaining physical corporate records
- o Integrated Energy Accounting ("IEA") modernization Transitioning to a replacement solution.

The Central Hudson Technology group partners and collaborates with the 12 major areas responsible for Central Hudson operations to create the prioritized portfolio of technology projects in the 5-Year Capital Plan. In 2022, the Technology group implemented an objective prioritization framework to support the prioritization and selection of all capital technology investments. This framework, created in partnership with the Technology Steering Committee and the Capital Asset Review and Evaluation Committee ("CARE"), consists of six attributes derived from qualifying questions that are used to evaluate and classify project requests. These questions receive equal weighting when determining the priority of a request and are as follows:

- Does the project satisfy or fulfill a regulatory requirement?
- Does the project result in cost savings, cost avoidance, and/or revenue for Central Hudson or its stakeholders?
- Does the project enhance Central Hudson's customer experience?
- Does the project reduce risk, debt, or vulnerabilities (i.e., legal, cybersecurity, technology, infrastructure)?
- Does the project improve or enhance safety and wellness for Central Hudson employees, contractors, or the public?
- Is the project included in the current rate case authorization?

Projects are evaluated on a scale of 0 to 6 based on the number of attributes the investment satisfies, creating a priority score. Each project is then evaluated for relative urgency and classified as an 'immediate,' 'moderate,' or 'low' urgency initiative. The priority and urgency ratings combined with Central Hudson's classifications of 'maintaining standards,' 'system enhancements,' and 'non-discretionary' support the global ranking and sequencing of projects within the portfolio. Project ranking is leveraged to determine which projects receive capital funding.

Additionally, project requests are evaluated to ensure overall alignment with Technology strategic drivers. These drivers are designed to ensure that Central Hudson's Technology investments align with industry best practices, Central Hudson's operational support capabilities, and alignment with other factors such as risk and cost optimization:

Cloud – this strategy supports the adoption of cloud technologies for platforms
whenever appropriate. This approach aligns with industry trends in that it minimizes
software development and infrastructure overhead, enables rapid scalability, enables
frequent and periodic software upgrades to provide additional functionality and
address security vulnerabilities.

- Mobility this strategy focuses on equipping Central Hudson and its customers with
  the ability to access data, applications, and services anytime, anywhere, and from any
  device with the proper credentials. The strategy supports mobile computing and
  communication, while ensuring security, data privacy, and compliance controls are in
  place.
- Sustainability, Reliability, & Rationalization this strategy supports efforts that
  enhance Central Hudson's ability to sustain business operations or improve the
  reliability of key technologies. In alignment with industry best practices, Central
  Hudson has an obligation to continuously ensure technology assets are at current
  vendor-supported versions (N or N-1) to prevent functionality and cybersecurity risks.
  This strategy also focuses on consolidating (minimizing) redundant legacy
  applications whenever possible to centralized enterprise-wide solutions.
- Cyber & Information Security this strategy focuses on reducing technical risk and vulnerabilities, supporting data privacy and Central Hudson's overall cybersecurity posture.
- Process Automation this strategy aims to automate, streamline, and optimize business processes wherever possible to reduce errors, delays, and inefficiencies while increasing overall productivity and potentially reduce cost.

Leaders from each of the 12 operational areas meet regularly as a collective Technology Steering Committee to review and approve the investments in the Technology portfolio in alignment with the strategic plan. The Technology Steering Committee, chaired by the Chief Technology Officer, is also responsible for approving any changes to the plan. This prioritization process will continue to mature as incremental improvements are made in the upcoming years. The capital plan has been created and reviewed in accordance with this process.

#### **Transportation and Tools**

The Tools Capital Forecast provides for both the normal replacement of tools and instruments as well as the addition of any new and/or incremental tooling needs throughout the Company to allow our employees to complete their daily work. Typical items included within the tool budget include welders, gas tapping equipment, line voltage and fault testing equipment, automobile jacks and lifts, etc. The Company utilizes the historical spend for tools to develop the portion of the budget required for typical "tool replacement" and then develops a forward-looking plan for any incremental needs associated with any new initiatives or workforce expansion. The annual "tool replacement" spend has been set at an average of the 3-year historical spend while the incremental portion of the budget has been developed based on a needs inventory taking into consideration those tools required for the Indoor Operations Training Area.

The Transportation Capital Forecast includes all vehicles, including light and heavy-duty vehicles, trailers, forklifts, track/earthmoving equipment, and cranes. The Company uses the following industry appropriate criteria for determining the replacement cycle: Light duty vehicles are included on the replacement listing when they are seven years old or have 120,000 miles; Heavy duty vehicles are included on the replacement listing when they are 10 years old or have 10,000 machine hours; and other specialty equipment is specifically included within the Five-Year Capital Plan based on individual assessment. Within the Greenhouse Gas Emissions Reduction Plan, the Company has also committed to dedicating at least 10% of the annual vehicle capital budget to the procurement of

battery electric vehicles ("BEV") and/or plug-in hybrid electric vehicles ("PHEV's) through 2025. Additionally, the Company's goal is to have 10% of the fleet electrified by 2025 and 50% by 2030, dependent upon the pace of technological advances in charging infrastructure and heavy-duty vehicle electrification. As such, the plan included herein includes expenditures to replace gas powered vehicles with an electric vehicle or a plug-in electric vehicle where feasible. These replacements will be completed in conjunction with the normal replacement cycle of the vehicle. The Company is planning to replace vehicles at the end of their useful life in-order to meet these goals. These goals are in alignment with the Greenhouse Gas Emissions Reduction Plan and support New York's overall transportation electrification objectives. The Company has performed an analysis on its current fleet comparing its current state against that of its future state over each of the next five years (utilizing average annual mileage or hours to project the future state of each vehicle or piece of equipment). This analysis was the basis to determine which vehicles/equipment would warrant replacement based on the established replacement criteria. Findings from this analysis have shown that we are currently significantly behind on our scheduled replacement cycles (driven by extended delivery times associated with supply chain constraints) and that a very sizeable expenditure in year one of this fiveyear replacement plan would be required to "catch up." To appropriately develop an executable replacement plan, considering extended order times for vehicles, a levelized budgeting approach utilizing a consistent spend over the Five-Year Common Capital Plan was developed. This levelized plan allows the Company to get back in alignment with our replacement schedule by the end of the Five-Year Common Capital Plan as it provides the most manageable procurement plan (taking into consideration supply chain challenges) for the Company while also consistently spreading the cost equitably throughout the five-year period. Prior to the onset of the COVID-19 pandemic, lead times for vehicles/trucks built to the Company's specifications were approximately a year. As the effects of the COVID-19 pandemic are being experienced in various supply chains, the lead times on these same trucks are a minimum of three years, and up to five years. Finally, based on the current and anticipated future requirements from the New York State Department of Transportation (with respect to Highway Work Permits and the required use of protective vehicles with truck/trailer mounted impact attenuators), it is estimated that a total of nine attenuators will be required to meet Company needs. Attenuators are safety vehicles with an attenuating crash cushion intended to reduce the risks of injuries and fatalities resulting from crashes in construction work zones. Therefore, expenditures for a total of nine attenuators have been included within the first 3 years of the Transportation Forecast (3) per year for the first 3 years).

SUMMARY	SCHEDULI	ES 2024-202	8 FORECAST

# 2024-2028 Construction Forecast (\$000's) INSTALLATION W/ AFUDC

(with inflation & OH adjustment)

			`	a orradjastriont/			
				Expenditures with AFUDC		3/23/2023	
				-			
		2024 Proposed Budget	2025 Proposed Budget	2026 Proposed Budget	2027 Proposed Budget	2028 Proposed Budget	2024-2028 Proposed Budget Total
ELECTRIC PROGRAM							Budget Fotal
Hydro & Gas Turbines	11	4,367	6,417	5,178	3,533	5,560	25,055
Transmission	12A	31,010	28,794	29,063	36,312	32,835	158,013
Transmission FERC	12B	254	271	347	593	15,952	17,417
Substations	13	26,230	20,219	22,589	22,874	22,731	114,644
New Business	14	12,688	13,301	13,766	14,426	15,156	69,338
Dist. Improvements	15	52,447	56,322	57,449	56,759	57,213	280,191
Transformers	16	17,640	16,443	16,255	16,564	16,879	83,782
Meters	17	2,768	2,827	2,886	2,941	2,997	14,418
Storm	19	1,682	1,712	1,751	1,785	1,820	8,750
Total Electric Program		148,833	146,035	148,938	155,194	155,191	754,192
		·	,	·	,	,	·
GAS PROGRAM							
Production	21	-	-	-	-	-	-
Transmission	22	4,240	6,647	6,818	4,493	5,672	27,870
Regulator Stations	23	3,304	3,592	3,820	4,376	4,337	19,429
New Business	24	9,955	10,373	7,738	7,908	8,313	44,288
Dist. Improvements	25	51,581	56,374	60,382	63,691	69,912	301,940
Meters	27	2,926	3,028	3,213	3,405	3,611	16,183
Total Gas Program		72,005	80,014	81,971	83,874	91,845	409,710
COMMON PROGRAM							
Buildings	41	17,479	21,996	30,628	18,293	25,802	114,199
Buildings Minors		9,959	8,794	10,554	8,337	7,276	44,920
Major Expansion		7,521	13,202	20,074	9,956	18,526	69,279
Office Equipment	42	38,199	38,435	37,582	34,023	54,828	203,067
General	4210	560	689	1,893	740	884	4,765
EMS	4230	5,883	3,526	3,646	3,373	1,249	17,676
EDP	4222	5,706	3,392	6,144	3,328	3,489	22,058
Software	4220	25,144	30,274	25,473	26,093	48,653	155,638
Security	4240	906	554	427	489	554	2,930
Tools	43	1,605	1,639	1,781	2,144	1,849	9,018
Communication	44	9,559	8,662	10,051	4,404	4,442	37,119
Transportation	45	13,824	14,115	14,411	14,685	14,964	71,999
Total Common Program		80,668	84,847	94,453	73,549	101,886	435,402
PSC ADDITIONS TOTAL		301,506	310,896	325,362	312,617	348,922	1,599,303
PSC REMOVALS TOTAL		17,374	17,643	16,431	15,967	15,009	82,424
SUBTOTAL PSC CAPITAL		318,880	328,539	341,794	328,584	363,931	1,681,728
FERC TOTAL		254	271	347	593	15,952	17,417
CORPORATE TOTAL		319,134	328,810	342,141	329,177	379,883	1,699,145

# 2024-2028 Construction Forecast (\$000's) REMOVAL

(with inflation)

Transmission 12 6,266 5,688 4,676 4,945 3,300 25,34 Substations 13 2,604 2,108 2,566 2,174 2,216 11,68 New Business 14 256 269 283 297 312 1,41 Dist. Improvements 15 5,738 5,619 5,720 5,649 5,689 28,41 Transformers 16 409 418 427 435 443 2,13 Meters 17 5 10 11 11 11 11 11 4 Slorm 19				Expen				
Part   Part				·				
ELECTRIC PROGRAM								
Hydro & Gas Tuthines			2024 Proposed Budget	2025 Proposed Budget	2026 Proposed Budget	2027 Proposed Budget	2028 Proposed Budget	
Transmission 12 6,266 5,688 4,676 4,445 3,800 25,54 Substations 13 2,604 2,108 2,566 2,174 2,216 11,68 Now Business 14 2,566 269 283 297 312 1,44 Dist. Improvements 15 5,738 5,619 5,720 5,649 5,689 28,41 Transformers 16 409 418 427 435 443 2,13 Meters 17 5 10 11 11 11 11 11 4 Storm 19	ELECTRIC PROGRAM		2024 i Topocca Baagot	2020 i Topocca Baagot	2020 : Topocoa Baagot	2027 Troposca Baagot	2020 i Toposca Buagot	Budget Total
Transmission 12 6.266 5.658 4.676 4.945 3.800 2.534 Substations 13 2.804 2.108 2.566 2.174 2.216 11.68 New Business 14 2.56 2.69 2.83 2.97 312 1.44 2.16 Dist. Improvements 15 5.738 5.619 5.720 5.649 5.689 2.841 1.40 1.4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Hydro & Gas Turbines	11	5	1 258	94	54	33	1,445
Substations   13	Transmission	12		·				25,344
New Business   14	Substations	13		· ·	·			11,688
Dist Improvements	New Business	14	l ' '	·	· ·	,	,	1,417
Transformers 16	Dist. Improvements	15						28,415
Meters	Transformers	16	·	•	·			2,132
Storm	Meters	17					_	48
CAS PROGRAM   Production   21	Storm	19	-	-			_	-
Production   21	Total Electric Program		15.283	15.340	13.797	13.566	12.504	70,489
Production         21         - <th< td=""><td></td><td></td><td>-,</td><td></td><td>-,</td><td>-,</td><td>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</td><td>.,</td></th<>			-,		-,	-,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,
Transmission 22 102 146 149 152 155 70 Regulator Stations 23 256 230 235 239 266 1,22 Rew Business 24 205 215 226 238 249 1,13 Dist. Improvements 25 1,433 1,463 1,494 1,522 1,551 7,46 Meters 27	GAS PROGRAM							
Regulator Stations 23 256 230 235 239 266 1,22 New Business 24 205 215 226 238 249 1,13 Dist. Improvements 25 1,433 1,463 1,494 1,522 1,551 7,46 Meters 27	Production	21	-	-	-	-	-	-
New Business   24	Transmission	22	102	146	149	152	155	705
Dist. Improvements         25 Meters         1,433         1,463         1,494         1,522         1,551         7,46           Meters         27	Regulator Stations	23	256	230	235	239	266	1,226
Dist. Improvements         25 Meters         1,433         1,463         1,494         1,522         1,551         7,46           Meters         27         -	New Business	24	205	215	226	238	249	1,133
Total Gas Program	Dist. Improvements	25	1,433	1,463	1,494	1,522	1,551	7,463
Buildings	Meters	27	-	-	-	-	-	-
Buildings         41         544         698         979         699         733         3,65           Buildings Minors         544         698         899         699         733         3,57           Major Expansion         -         -         -         80         -         -         -         8           Office Equipment         42         -         -         -         -         -         -         8           Office Equipment         421         -         -         -         -         -         -         -         -         8           EMS         421         -<	Total Gas Program		1,996	2,054	2,104	2,151	2,221	10,527
Buildings         41         544         698         979         699         733         3,65           Buildings Minors         544         698         899         699         733         3,57           Major Expansion         -         -         -         80         -         -         -         8           Office Equipment         42         -         -         -         -         -         -         8           Office Equipment         421         -         -         -         -         -         -         -         -         8           EMS         421         -<								
Buildings Minors Major Expansion  Office Equipment 42								
Major Expansion         -         -         80         -         -         8           Office Equipment         42         -         <	=	41	544	698	979	699	733	3,653
Office Equipment         42         -			544	698	899	699	733	3,573
General       421       -	Major Expansion		-	-	80	-	-	80
General       421       -	05 5 .							-
EMS       423       - <td>• •</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-  </td>	• •		-	-	-	-	-	-
EDP       4222       - <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td>			-	-	-	-	-	-
Software         4220         . <th< td=""><td></td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>- </td></th<>			-	-	-	-	-	-
Security         424         _			-	-	-	-	-	-
Tools         43         - <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>- </td>			-	-	-	-	-	-
Communication         44         1         2	•		-	-	-	-	-	-
Transportation         45         (450)         (450)         (450)         (450)         (450)         (450)         (450)         (2,25)           Total Common Program         95         249         530         250         284         1,40			<u>-</u>	-				
Total Common Program         95         249         530         250         284         1,40			=		-	•	· ·	5 (2.250)
		43		, ,		` '		(2,250)
	Total Common Flogram		95	249	530	250	<u>[ 284</u>	1,408
CORPORATE TOTAL 17,374 17,643 16,431 15,967 15,009 82,42	CORPORATE TOTAL		17.374	17.643	16.431	15.967	15.009	82,424

**ELECTRIC PROGRAM INDIVIDUAL PROJECT SUBMITTAL** 







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Current Life-Cycle Phase: 3 Pre-Construction **Submitted By: B** Yager

#### A. GENERAL

Project/Program Name: Dashville Rubber Gate Replacement & Headwork Modification Work Order #:

**Funding Project Number:** 1-1122-00-18

**Budget Group: Budget Category:** Electric 11 Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 4/1/2022 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

#### Describe the project objective and scope of work:

- 1. The objective is to replace, in kind, the Rubber Crest Gate system, due to it reaching the end of its life, to continue maximizing plant output for our customers.
- 2. Since the area will need to be dewatered, the headwork wall will also be modified to eliminate the safety issue of water entering the building and eventually compromising the structural integrity of the building.

### Describe specific scope exclusions, assumptions and constraints:

The assumption is that the headwork wall will be able to be modified at a reasonable cost and the material costs for a new rubber gate will not have changed significantly due to supply chain delays created by COVID-19. The Rubber Gate estimate was based on discussions with a vendor in early 2021.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The rubber gates, with existing units, are worth an average 2,650 MWh per year. With the anticipated Major overhauls, this value increase to 3,830 MWh. Using a levelized energy value of \$67.51/MWh, that is a total annual value between \$179k and \$259k, gain or loss if we don't replace them. The carrying charges on \$2M for this investment is \$199k. Since we budgeted the overhauls, that makes this project cost justified with net benefit of \$60k/yr.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)
See above.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which Strategic Objective does project most align with?

Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with?

Performance Management

Which Team Goal does project most align with?

Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental,

social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

- 1. "Do Nothing" option
- 2. Going back to the wooden flashboards

#### Why was the proposed project scope chosen over other alternatives?

"Do Nothing" option would cost the customers \$256K per year. This is a least cost solution and has a net benefit of \$60k per year. Going back to the wooden flashboards would require a more extensive regulatory review and not likely to be accepted since the Rubber Gate system is safer for employees and is less likely to cause a dam failure.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? System has reached the end of life.

What are the risks and consequences of not completing this project? System failure and possible damage to the dam structure.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			r cost estimates s e adjustments for			
	\$2,448,005	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	2,391,881	538,881	1,853,000					
Т	Overheads	0							
I	AFUDC*	56,000	6,000	50,000					
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,447,881	544,881	1,903,000	0	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	124		0	124				
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	124	0	0	124	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							

Current Approved Rate Case Funding (\$): 2,189,000 2,189,000

2021-2023 2024

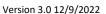
Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):   Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Cost estimate Range: Minimum (\$):   per estimate level, but may be overwritten if desired.
Material availability could impact both cost and schedule. The other risk is regulatory review of project could significantly delay project. This project cannot be done at the same time as the budgeted Major overhauls at Dashville in 2024 and 2025. This would be a blackout period to implement this project.
Basis for estimate: Historical Data + Job Specific Adjustments
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  The Rubber Gate estimate was based on discussions with an engineering design firm and one possible vendor in early 2021.
F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: B yager Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Dashville #1 Major Overhaul Work Order #:

order #:

Budget Group: Electric Budget Category: 11 Funding Project Number: 1-1122-00-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/31/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

#### Describe the project objective and scope of work:

The objective is to bring the unit that has reached the end of its life back to near OEM specification. Complete overhaul of wet section (including new runner) and minor generator work of the hydroelectric generating unit.

#### Describe specific scope exclusions, assumptions and constraints:

This project scope excludes a major overhaul of the generator. The full scope of the work cannot be determined until the unit is disassembled and a detailed investigation is performed.

See attached Dashville Planning Study (EP2021-013)





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Economic

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

\* Sustainability status is achieved

for the project if the ESG checklist

shows that there is at least one

component each for

environmental, social and

Describe the justification for this project. Include attachments or links to planning studies if applicable:

See attached Sturgeon Pool Planning Study (EP2021-002)

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See attached Sturgeon Pool Planning Study (EP2021-002)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Performance Management Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

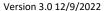
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: Maybe - Requires further scope development

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development governance.

56





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? See attached Sturgeon Pool Planning Study (EP2021-002)

Why was the proposed project scope chosen over other alternatives? See attached Sturgeon Pool Planning Study (EP2021-002)

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? See attached Dashville Planning Study (EP2021-013)

What are the risks and consequences of not completing this project? See attached Dashville Planning Study (EP2021-013)

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## E. COST ESTIMATE

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu				ar cost estimates should include lle adjustments for inflation.			
	\$5,193,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	347,440		25,870	321,570				
	Labor (Monthly Payroll)	63,190		6,910	56,280				
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	4,205,045		437,480	3,767,565				
Т	Overheads	490,150		52,740	437,410				
I	AFUDC*	175			175				
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,106,000	0	523,000	4,583,000	0	0	0	0
	Labor (Weekly Payroll)	38,700			38,700				
E	Labor (Monthly Payroll)	0							
Hi	Contractors (A/P tax exempt)	27,300			27,300				
R	Overheads	21,000			21,000				
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	87,000	0	0	87,000	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

535,000

5,032,000

4,497,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Cost estimate developed based on anticipated work scope. Actual work scope cannot be determined until the unit is completely disassembled.
Basis for estimate: Historical Data + Job Specific Adjustments
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. See attached Dashville Planning Study (EP2021-013)
F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By: B** Yager

#### A. GENERAL

Project/Program Name: Dashville #2 Major Overhaul

Work Order #:

**Budget Group: Budget Category:** 11 Electric **Funding Project Number:** 1-1122-00-18 Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 7/1/2024 In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

#### Describe the project objective and scope of work:

The objective is to bring the unit that has reached the end of its life back to near OEM specification. Complete overhaul of wet section (including new runner) and minor generator work of the hydroelectric generating unit.

#### Describe specific scope exclusions, assumptions and constraints:

This project scope excludes a major overhaul of the generator. The full scope of the work cannot be determined until the unit is disassembled and a detailed investigation is performed.

See attached Dashville Planning Study (EP2021-013)





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Economic

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

See attached Sturgeon Pool Planning Study (EP2021-002)

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See attached Sturgeon Pool Planning Study (EP2021-002)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Performance Management Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

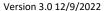
Checklist Fully Completed: Yes Environmental Component: Yes

Environmental Component: Yes
Social Component: No

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? See attached Sturgeon Pool Planning Study (EP2021-002)

Why was the proposed project scope chosen over other alternatives? See attached Sturgeon Pool Planning Study (EP2021-002)

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? See attached Dashville Planning Study (EP2021-013)

What are the risks and consequences of not completing this project? See attached Dashville Planning Study (EP2021-013)

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



## **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu			All future year cost estimates should include applicable adjustments for inflation.				
	\$5,365,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	328,440			65,870	262,570			
	Labor (Monthly Payroll)	69,190		5,000	6,910	57,280			
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
1	Contractors (A/P tax exempt)	4,228,056		20,000	394,350	3,813,706			
Т	Overheads	490,084			52,740	437,344			
I	AFUDC*	160,230		1,000	17,130	142,100			
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,276,000	0	26,000	537,000	4,713,000	0	0	0
	Labor (Weekly Payroll)	18,700				18,700			
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	49,300				49,300			
R	Overheads	21,000				21,000			
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	89,000	0	0	0	89,000	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							

2021-2023 2024

535,000

Prior years funding; not actuals.

4,972,000

4,437,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	ılas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): ← per est	timate level, but may be vritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You mapplicable cost estimating files as appropriate.  See attached Dashville Planning Study (EP2021-013)	nay add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add	it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: B Yager Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Sturgeon Pool Remote Start

Work Order #:

Budget Group: Electric Budget Category: 11 Funding Project Number: 1-1122-00-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/31/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

This project is linked to bringing the Dashville units back to OEM specification, this option is the most beneficial under this scenario.

#### Describe the project objective and scope of work:

The objective is to increase the energy produced at the plant, while not increasing staff or the power output of the units (which would trigger a FERC review). This project will add the ability to remote start the units. This will allow the unit to start and stop automatically to maximize the usage of the available water 24x7. See attached Sturgeon Pool Planning Study (EP2021-002) at: https://contentcentral.cenhud.com/otcs/cs.exe/link/34273840.

#### Describe specific scope exclusions, assumptions and constraints:

See attached Sturgeon Pool Planning Study (EP2021-002) at: https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Production%20Facilities/2-%20HYDRO/Sturgeon%20Pool/Sturgeon%20Pool%20Planning%20Study%202020/EP2021-002%20Sturgeon%20Pool%20Hydroelectric%20Planning%20Study.pdf?csf=1&web=1&e=wG4WBg





#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Growth Sustaining** Load Based/Infrastructure: System Enhancements **Daily Operations** Discretion Level: **Investment Type:** 

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Economic

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

See attached Sturgeon Pool Planning Study (EP2021-002) at: https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Production%20Facilities/2-%20HYDRO/Sturgeon%20Pool/Sturgeon%20Pool%20Planning%20Study%202020/EP2021-

002%20Sturgeon%20Pool%20Hydroelectric%20Planning%20Study.pdf?csf=1&web=1&e=wG4WBg

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See attached Sturgeon Pool Planning Study (EP2021-002)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? Performance Management Which Team Goal does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

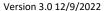
**Checklist Fully Completed: Yes Environmental Component:** Yes

**Social Component:** No

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? See attached Sturgeon Pool Planning Study (EP2021-002)

Why was the proposed project scope chosen over other alternatives? See attached Sturgeon Pool Planning Study (EP2021-002)

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? See attached Sturgeon Pool Planning Study (EP2021-002)

What are the risks and consequences of not completing this project? See attached Sturgeon Pool Planning Study (EP2021-002)

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				All future year cost estimates should include applicable adjustments for inflation.				
	\$1,215,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	0								
ľ	Contractors (A/P tax exempt)	1,174,998			38,998	21,000	1,115,000			
Т	Overheads	0								
I	AFUDC*	40,002			2	10,000	30,000			
O N	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,215,000	0	0	39,000	31,000	1,145,000	0	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
T	Contractors (A/P tax exempt)	0								
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								
C	current Approved Rate Case Funding (\$):	131,000		131,000						

**2021-2023 2024** *Prior years funding;* 



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	ence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges	
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  It is not known what controls equipment will be still supported at the start of the project. Still defining scope.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  See attached Sturgeon Pool Planning Study (EP2021-002)	
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form	, you may add it here (optional):



Version 3.0 12/9/2022

le. Power. Possibilitie

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By: B** Yager

#### A. GENERAL

Project/Program Name: Sturgeon Pool Southern Wall Foundation Reinforcement

Work Order #:

**Budget Group:** Electric **Budget Category:** 11 **Funding Project Number:** 1-1122-00-18 Is this a Specific Project, Program or Blanket? Target Schedule - Start: 2/1/2027 In-Service: 12/1/2027 Specific

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

#### Describe the project objective and scope of work:

Replacement of floor section at sturgeon pool. Voids were created below during a historical equipment failure (historic issue resolved/ floor still to be fixed).

### Describe specific scope exclusions, assumptions and constraints:

Assumed that damage is isolated to one area and that there has been no damage due to the void.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

An engineering study discovered voids under a section of the foundation. The building is stable however, repairs should be made.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Repair allows for the inspection of below grade penstock areas.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

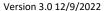
**Social Component:** Maybe - Requires further scope development

Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do Nothing

Why was the proposed project scope chosen over other alternatives?

The cost to fully verify that the void is an isolated occurrence would be very similar to resolving the issue.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To confirm the void is isolated and will not cause settling issues.

What are the risks and consequences of not completing this project?

Settling of the plant foundation putting the units out of alignment.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

This project should be completed in addition to previously planned projects.

What other factor were considered during the prioritization process?

Foundation settling can affect the alignment of the units in the plant.

No



	Capital Estimate Summary	Year 1 = 1s 5-year bu				r cost estimates s e adjustments for			
	\$1,105,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	100,000					100,000		
	Labor (Monthly Payroll)	17,000					17,000		
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	967,000					967,000		
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	21,000					21,000		
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,105,000	0	0	0	0	1,105,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0					0		
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023

Prior years funding;

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary  Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Full scope is not determinable until areas are exposed.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Budgetary estimate by industry personnel	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you m	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: B Yager Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: Sturgeon Pool Replace Toe of Dam

Work Order #:

- 1

**Budget Group:** Electric

Budget Category: 11

Funding Project Number: 1-1122-00-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 3/1/2028

In-Service: 12/1/2029

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

#### Describe the project objective and scope of work:

Fill in erosion downstream of the dam before it works its way under the toe.

# Describe specific scope exclusions, assumptions and constraints:

Rifton bank is structurally sound. During the summer the toe fully dries up. Minimal rock removal is necessary.





#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Growth Sustaining** Load Based/Infrastructure:

Maintain System Standards Infrastructure Discretion Level: **Investment Type:** 

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Toe of the Dam is key for stability. The toe is a typically one of the first parts of a dam to erode. The toe is nearing the end of its useful life and must be replaced before erosion gets under the dam.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Important for dams' structural stability. Not yet a regulatory requirement from inspections but soon will be.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve safety and security culture

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

# ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

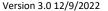
> **Social Component:** Yes

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do Nothing

Why was the proposed project scope chosen over other alternatives? Will become a regulatory issue if not tended to

# D. PRIORITIZATION

Why do we need to complete this project in the period requested?

An engineering study will be completed to determine current condition and project timeline requirements.

What are the risks and consequences of not completing this project?

Regulatory action, Compromised dam

Was this project included in a prior 5-year forecast?

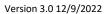
No

If No, why should this project be completed instead of a planned project?

This project should be completed in addition to previously planned projects. This project was not previously included as it is planned for 2028-29.

What other factor were considered during the prioritization process?

The toe of the dam deteriorates slowly however the more it deteriorates the more expensive the costs for replacement gets.





	Capital Estimate Summary	Year 1 = 1si 5-year bu				cost estimates s e adjustments for			
	\$1,150,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	50,000						50,000	
	Labor (Monthly Payroll)	19,000						19,000	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	300,000						300,000	
I	Contractors (A/P tax exempt)	674,000						674,000	
Т	Overheads	84,000						84,000	
I	AFUDC*	23,000						23,000	
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,150,000	0	0	0	0	0	1,150,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	0	0	0					

2021-2023

Prior years funding;
not actuals.

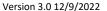
2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Volume has to be fully calculated.
Basis for estimate: Historical Data + Job Specific Adjustments
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  Estimated off industry estimate calculation using yards of concrete.  F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):
in there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional).







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By: B** Yager

# A. GENERAL

Project/Program Name: Sturgeon Pool Relay Protection / Breakers

Work Order #: 11 **Budget Category: Funding Project Number:** 1-1122-00-18

**Budget Group:** Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

None

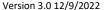
#### Describe the project objective and scope of work:

Electric

Upgrade Breakers and protective devices to protect the major electrical components in the plant.

# Describe specific scope exclusions, assumptions and constraints:

Conductor can be reutilized, and all components can be spec'd as a replacement in kind.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

**Discretion Level:** System Enhancements **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The plant still utilizes the protection system put in place during initial installation in the 20's and has oil filled breakers. Upgrading these components will help to protect our investments put into the generators.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Non-toxic and non-flammable

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: No

Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

J







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

The only alternative explored was to not move forward with this investment.

Why was the proposed project scope chosen over other alternatives?

Due to the potential hazards of oil breakers and increased protection provided to the generators.

# D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Risk reduction

What are the risks and consequences of not completing this project?

Generator damage, fire/ explosion, PCB Hazards

Was this project included in a prior 5-year forecast?

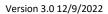
No

If No, why should this project be completed instead of a planned project?

This project should be completed in addition to previously planned projects. Recent unit rebuilds created insight to upgrades needed in protection before other system components can be upgraded.

What other factor were considered during the prioritization process?

Increasing protection systems for plant infrastructure and removal of hazardous materials from site.





	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh e adjustments for i			
	\$1,724,300	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	117,000					64,000	53,000	
	Labor (Monthly Payroll)	33,000					18,000	15,000	
A	Stock Materials	44,000					22,000	22,000	
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	1,390,300					857,700	532,600	
Т	Overheads	32,000					5,000	27,000	
	AFUDC*	54,000					14,000	40,000	
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,670,300	0	0	0	0	980,700	689,600	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	54,000					54,000	0	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		54,000	0	0	0	0	54,000	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
(	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Equipment pricing has not been quoted	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derive applicable cost estimating files as appropriate.  Budgetary estimate from industry contractors.	ed. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you	ı may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: B Yager Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: Sturgeon Pool Retaining Wall Penstock

Work Order #:

Budget Group: Electric Budget Category: 11 Funding Project Number: 1-1122-00-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2028 In-Service: 11/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

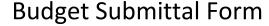
None

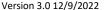
#### Describe the project objective and scope of work:

Secure the rock face adjacent to the penstocks to avoid rock debris hitting the pipes

# Describe specific scope exclusions, assumptions and constraints:

Engineering required due to proximity to dam. Assumed that some rock material can be removed.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project is important for the integrity of the Penstocks, as rocks have broken free from the hillside and come close to hitting the penstock.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

This is a cost avoidance project as a broken penstock could be hundreds of thousands in damages and repair costs.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Transform Safety Culture Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

# ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: No Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do Nothing

Why was the proposed project scope chosen over other alternatives? It is important to protect the infrastructure that we have in place.

# D. PRIORITIZATION

Why do we need to complete this project in the period requested? Hillside is eroding more with each freeze cycle.

What are the risks and consequences of not completing this project? Damage to infrastructure.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

This project should be completed in addition to previously planned projects. This project was not previously included as it is planned for 2028.

What other factor were considered during the prioritization process? Location of loose rock on hillside.

No



	Capital Estimate Summary	Year 1 = 1s 5-year bu	,			cost estimates si e adjustments for			
	\$1,691,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	32,000						32,000	
	Labor (Monthly Payroll)	15,000						15,000	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	16,000						16,000	
ı	Contractors (A/P tax exempt)	1,547,000						1,547,000	
Т	Overheads	47,000						47,000	
I	AFUDC*	34,000						34,000	
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,691,000	0	0	0	0	0	1,691,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Amount of loose rock during removal will greatly affect price.
Basis for estimate: Historical Data + Job Specific Adjustments
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. Budgetary estimate for intended scope.
F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: March 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: High Priority Replacement Program

t Program Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: 1-1221-90-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

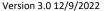
There are no other specific work orders associate with the HPR Program. On occasion, in order to take advantage of mobilization and construction synergies, other projects will be done in conjunction with HPR projects.

#### Describe the project objective and scope of work:

Transmission lines are inspected on a cyclical basis with varying methods ranging from aerial patrols to comprehensive ground patrols. Inspection results are stored in a searchable database, currently CASCADE. This database contains data recorded from all types of inspection methods including aerial patrol, comprehensive aerial inspection, comprehensive ground inspection, ground line testing and treatment, climbing inspection, corona camera inspection, infrared inspection, etc... Inspection data is recorded for all transmission assets including poles, insulators, guy wires and anchors, structure hardware, foundations, grounding, conductors, static wires, suspect clearances, and right of ways (including encroachments, vegetation, access, etc). After the completion of each inspection cycle, results are analyzed and condition assessments are assigned to the appropriate component of each structure. These conditions are rated on a scale from "1" to "6" with "6" being in the most need of repair. Components with ratings of either "6", "5" or "4" must be repaired or replaced within 2 weeks, 1 year and 3 years, respectively, after the date of the condition assessment. There is a need to provide funding to respond to the results of the inspection process described above. In some instances components can simply be replaced while in other instances an entire structure might need to be replaced. The design work is then completed and materials ordered. Aside from emergency replacements, HPR driven replacements are typically grouped in packages by line and location to efficiently utilize field resources.

# Describe specific scope exclusions, assumptions and constraints:

Program scopes are based on a majority of identified findings being mitigated through the replacement of structures. If other alternate mitigation methods are utilized it will affect the programs's project mix by allowing additional projects to be completed. It does not take into account emergent work that can be discovered through the scoping and design processes and/or unforseen environmental and access improvements, land agreements or permits.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure; Risk Reduction; Reliability; Regulatory; Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Identified severity 4, 5 or 6 conditions discovered as part of Central Hudson's comprehensive inspection program represent a risk to the overall safe operation and reliability of the Electric Transmission System. Conditions found as part of the 5-year comprehensive inspection cycle are reported to the PSC and have mitigation timeframes associated with them based on the date of identification.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The replacement of the structures in the scope will improve reliability and mitigate risk as well as avoid the cost of potential emergency repairs or replacements.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

# ESG (Environmental, Social and Governance) and Sustainability:

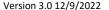
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Various condition mitigation options are considered through the project scoping process such as repair or replacement of individual structure components as opposed to the replacement of an entire structure.

#### Why was the proposed project scope chosen over other alternatives?

Project Engineers evaluate various mitigation methods for each individual project and identified condition based on a variety of factors such as access difficulty, proximity to environmentally sensitive areas, overall condition of the structure / component, etc. In conjunction with the other internal CHG&E stakeholders, they then develop the project scope based on the best balance of the inputs and concerns.

# D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Conditions identified in the comprehensive inspection cycle have the potential to represent risk to the safety and reliability of the electric transmission system and need to be addressed consistent with the timeframes specified by both the PSC and our internal severity rating criteria.

# What are the risks and consequences of not completing this project?

There is a heightened possibility of failure if identified conditions are not repaired in-timeframe leading to the need for unplanned emergency repair and/or replacement work at elevated cost.

Yes

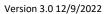
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

#### What other factor were considered during the prioritization process?

Conditions are grouped by the transmission line they are on and by the timeframes in which they are due. Priority is given to conditions and lines with the greater number of outstanding conditions and their severity. Critical bulk electric system lines are prioritized over others.





**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1si 5-year bu				cost estimates she adjustments for i			
	\$54,083,315	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	4,404,277	1,761,077	530,000	528,300	528,300	528,300	528,300	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	11,010,694	4,402,694	1,325,000	1,320,750	1,320,750	1,320,750	1,320,750	
ī	Contractors (A/P tax exempt)	28,627,803	11,447,003	3,445,000	3,433,950	3,433,950	3,433,950	3,433,950	
Т	Overheads	0							
1	AFUDC*	2,059,000		2,000	210,000	465,000	553,000	829,000	
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	46,101,774	17,610,774	5,302,000	5,493,000	5,748,000	5,836,000	6,112,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	7,646,541	2,459,541	1,187,000	1,000,000	1,000,000	1,000,000	1,000,000	
R	Overheads	335,000		28,000	45,000	67,000	87,000	108,000	
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	7,981,541	2,459,541	1,215,000	1,045,000	1,067,000	1,087,000	1,108,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

23,592,000 17,489,000

6,103,000



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: The following could affect final annual HPR Program costs: Infationary costs related to materials and labor, size of final project scopes, environmental conditions requiring costly permitting and/or access improvements, use of alternative and more costly structure types in final project designs, permitting restrictions, etc...

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

The HPR Cost estimate was derived using an estimate of the number of structures anticipated to be completed in a given year based on inspection results and assuming a pro-forma based cost per structure of approximately \$83K "A" and \$18K "R". Modifications are assumed to have an estimate cost of \$17K "A" per occurance. Pro-Forma costs were derived from Historical 3-year averages (2021-2023).

# F. ADDITONAL INFORMATION

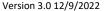
**Basis for estimate:** Historical Data + Job Specific Adjustments

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on a conceptual pro-forma per single pole structure. The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Prior-year estimate column represents 2023 budget + total actual spending from 2021-2022 with historical percentage split applied.

	Actual	Estimated (A	Avg. of 2023-	2025)		
Analysis						
	2023	2024	2025	2026	2027	2028
Overdue Defects Due	106	93	118	105	105	105
Assumed # of Replacements		47	59	53	53	53
"A" Costs	, ,	3,901,000	4,897,000	4,399,000	4,399,000	4,399,000
"R" Costs	954,000	846,000	1,062,000	954,000	954,000	954,000
Assumed # of Capital Modifications	53			52	52	52
"A" Costs	901,000	782,000	1,003,000	884,000	884,000	884,000
	5,300,000	4,683,000	5,900,000	5,283,000	5,283,000	5,283,000
TOTAL "A"						
TOTAL "A" TOTAL "R"	954,000	846,000	1,062,000	954,000	954,000	954,000
	954,000	846,000	1,062,000	954,000	954,000	954,000
TOTAL "R"	954,000	846,000	1,062,000	954,000	954,000	954,000
TOTAL "R"	954,000	846,000	1,062,000	954,000	954,000	954,000
TOTAL "R"	954,000 2023	846,000 2024	1,062,000 2025	954,000 2026	954,000 2027	954,000 2028
TOTAL "R"		2024	2025			
TOTAL "R"  Requested Funding	<b>2023</b> 106	<b>2024</b> 106	2025	2026	2027	2028
TOTAL "R"  Requested Funding  Overdue Defects Due *	<b>2023</b> 106 53	<b>2024</b> 106	<b>2025</b> 105	<b>2026</b> 105	<b>2027</b> 105	<b>2028</b> 105
TOTAL "R"  Requested Funding  Overdue Defects Due * Assumed # of Replacements	<b>2023</b> 106 53 4,399,000	<b>2024</b> 106 53	<b>2025</b> 105 53	<b>2026</b> 105 53	<b>2027</b> 105 53	<b>2028</b> 105 53
TOTAL "R"  Requested Funding  Overdue Defects Due *  Assumed # of Replacements "A" Costs	<b>2023</b> 106 53 4,399,000	2024 106 53 4,399,000	<b>2025</b> 105 53 4,399,000	<b>2026</b> 105 53 4,399,000	<b>2027</b> 105 53 4,399,000	<b>2028</b> 105 53 4,399,000
TOTAL "R"  Requested Funding  Overdue Defects Due * Assumed # of Replacements "A" Costs	<b>2023</b> 106 53 4,399,000	2024 106 53 4,399,000 954,000	<b>2025</b> 105 53 4,399,000	<b>2026</b> 105 53 4,399,000	<b>2027</b> 105 53 4,399,000	<b>2028</b> 105 53 4,399,000
TOTAL "R"  Requested Funding  Overdue Defects Due * Assumed # of Replacements "A" Costs "R" Costs	<b>2023</b> 106 53 4,399,000 954,000	2024 106 53 4,399,000 954,000	2025 105 53 4,399,000 954,000	2026 105 53 4,399,000 954,000	2027 105 53 4,399,000 954,000	2028 105 53 4,399,000 954,000
TOTAL "R"  Requested Funding  Overdue Defects Due *  Assumed # of Replacements	<b>2023</b> 106 53 4,399,000 954,000	2024 106 53 4,399,000 954,000	2025 105 53 4,399,000 954,000	2026 105 53 4,399,000 954,000	2027 105 53 4,399,000 954,000	2028 105 53 4,399,000 954,000
TOTAL "R"  Requested Funding  Overdue Defects Due * Assumed # of Replacements "A" Costs "R" Costs "R" Costs Assumed # of Capital Modifications	<b>2023</b> 106 53 4,399,000 954,000	2024 106 53 4,399,000 954,000	2025 105 53 4,399,000 954,000	2026 105 53 4,399,000 954,000	2027 105 53 4,399,000 954,000	2028 105 53 4,399,000 954,000

Notes \* Replacements based on assumed replacement Rate of 50% - Remaining Structure to be addressed via Capital Reinforcements







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: 69kV FV Line Indian Lake Crossing

Work Order #: 2 4 8 2 - K

Budget Group: Electric Budget Category: 12 Funding Project Number: 1-1221-90-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 6/1/2025

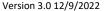
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The 69kV FV Line runs 4.6 miles from the Smithfield Substation to the N.Y.S. line with C.T. where changes ownership with Eversource. This change in ownership occurs within a 2050ft span over Indian Lake. CHG&E has outstanding conditions in the span that would require the replacement of the conductor. Eversource has also approached CHG&E about replacing the span consistent with their rebuild of the C.T. portion which was completed in 2022. This project represents CHG&E's portion of the project to replace the crossing over the lake, to be done in

# Describe specific scope exclusions, assumptions and constraints:

Detailed design and permitting work has not been completed. Estimates to-date do not account for specific conditions related to matting, access, permitting, outage constraints, etc...





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance; Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project is needed to mitigate the conditions found on the line in order to maintain reliability.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of the line will reduce the risk of an in-service failure and resulting unplanned emergency repair work at a premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP); Local municipality (1)

# ESG (Environmental, Social and Governance) and Sustainability:

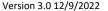
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

The replacement of the conductor in the span was considered to address the CHG&E inspection findings. Given the age of the towers, the inter-dependence of the connected Eversource assets, and the in-progress replacement work being done on the C.T. side of the line, it was decided to work with Eversource to replace the crossing.

#### Why was the proposed project scope chosen over other alternatives?

Replacing the crossing will allow it to be brought up to current-day strength and clearance criteria. It will also provide for the installation of larger conductor to match the rebuild Eversource portion of the line.

# D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Given the conditions identified as part fo the inspection process, it is important to complete the project to reduce the risk of an in-service failure. The work must also be done in conjunction with the replacement of the corresponding Eversource assets consistent with their timeframes.

# What are the risks and consequences of not completing this project?

Delaying the project would increase the risk of an unplanned outage and subsequent repair.

# Was this project included in a prior 5-year forecast?

No

# If No, why should this project be completed instead of a planned project?

This is an emergent project that got added based on inspection findings as well as the timing of the inter-dependent Eversource project.

#### What other factor were considered during the prioritization process?

This line is an interconnection to another utility.



	Capital Estimate Summary	Year 1 = 1s 5-year bu							
	\$2,817,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	262,500	7,500	10,000	245,000				
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	656,250	18,750	25,000	612,500				
Ī	Contractors (A/P tax exempt)	1,706,250	48,750	65,000	1,592,500				
Т	Overheads	0							
I	AFUDC*	97,000			97,000				
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,722,000	75,000	100,000	2,547,000	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	9,500			9,500				
	Contractors (A/P tax exempt)	85,500			85,500				
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	95,000	0	0	95,000	0	0	0	0
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

**Cost Estimate Level:** Conceptual

(that final cost will be within +/-30% of the estimate): **Cost Estimate Confidence: High Confidence** 

No further estimate range is required.

Maximum (\$): Cost Estimate Range: Minimum (\$): 1,971,900 3,662,100

Formulas give standard ranges ← per estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Permitting, material and construction costs may vary causing a potential variance in the pro-forma estimate. A more accurate estimate will be created upon completion of preliminary design work.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see provided estimate for details on assumptions. Cost figures were based on historical costs for projects of similar construction and permitting requirements.

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals were split based on a 90%/10% split of Contractor (AP) and Monthly Labor respectively.



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

<u>WO #:</u> 2482

**Project Name:** FV/690 Line Indian Lake Crossing Project

ake Crossing Project <u>Date:</u> Revision(s):

<u>Prepared By:</u> Kyle Bragg <u>Cost Estimate Level:</u> Conceptual Estimate

+/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

11/4/2022

0

Part 1: Additions							* All unit	and total co	ost figure	es should b	e "raw costs	s", <u>without</u> any	overhead ı	markups. Mark	cups are ger	nerated at the er	nd of the es	stimate.
		Costs Incurred To-Date*	Monthly Payroll*			Weekly Payroll*			Stock Materials*		Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes			
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Transmission Design	600	Hours		1.0	600	65.00	39,000		0		0		0		0		0	
A.2 Drafting	80	Hours		1.0	80	65.00	5,200		0		0		0		0			Support / Closeouts
A.3 LiDAR	1	PC			0		0		0		0		0		0	25,000.00	25,000	
A.4 Geotechnical Analysis / Foundation Design	2	PC			0		0		0		0		0		0	10,000.00	20,000	
A.5 Contract Engineering	1	LOT			0		0		0		0		0		0	41,000.00	41,000	
					0		0		0		0		0		0		0	
					0		0		0		0		0		0		0	
					0		0		0		0		0		0		0	
					0		0		0		0		0		0		0	
					0		0		0		0		0		0		0	
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES B.1 Project Management Support B.2 Environmental Affairs B.3 Real Property Services B.4 B.5 B.6 B.7	100 40 40	Hours Hours Hours		1.0 1.0 1.0	100 40 40 0 0 0	65.00 65.00 65.00	6,500 2,600 2,600 0 0		0 0 0 0 0		0 0 0 0 0 0		0 0 0 0 0		0 0 0 0 0 0		0 0 0 0 0	
B.8					0		0		0		0		0		0		0	
B.9					0		0		0		0		0		0		0	
B.10					0		0		0		0		0		0		0	
C GENERAL CONDITIONS	1	LOT	1		-				_							05.000.00	05.000	Chaldran Constitution
C.1 Construction Staking	1	LOT	1		0		0		0		0		0		0			Staking + Sagging
C.2 Laydown Rental	4	Months	1		0		0	-	0		0		0	-	0	,	20,000	
C.3 Crane	1	Months	1		0		0		0		0		0		0		100,000	Large Specialty Crane
C.4 SWPP Inspections	2	Months	<u> </u>		0		0		0		0		0		0	10,000.00	20,000	
C.5					0		0		0		0		0		0		0	
C.6					0		0		0		0		0		0		0	
C.7					0		0		0		0		0		0		0	
C.8					0		0		0		0		0		0		0	
C.9					0		0		0		0		0		0		0	
C.10			1		0		0		0		0		0		0		0	
<u></u>					v			1			<u> </u>		+				0	

				Costs Incurred To-Date*		Monthly Payroll*		Weekly Payroll*			Stock Materials*  Non-Stock Materials* (A/P Taxable)				Contractors & Fees* (A/P Tax-Exempt)		Notes		
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	MAJOR EQUIPMENT & MATERIALS																		
D.1	Engineered Pole 1654	1	PC			0		0		0		0		0	200,000.00	200,000		0	Based on SB Rebuild Pole Order
D.2	Engineered Pole 1653	1	PC			0		0		0		0		0	38,000.00	38,000			Based on SB Rebuild Pole Order
D.3	1654 Caisson Foundation	1	PC			0		0		0		0		0	350,000.00	350,000			Based on 2022 301 Foundation Pricing
	1653 Caisson Foundation	1	PC			0		0		0		0		0	250,000.00	250,000		0	Based on 2022 301 Foundation Pricing
D.5	Deadend Hardware	1	LOT			0		0		0		0		0	8,000.00	8,000		0	
	Tangent Hardware	1	LOT			0		0		0		0		0	3,000.00	3,000		0	
	Conductor "Dove" 556 ACSS	7,500	FT			0		0		0		0		0	3.00	22,500			3-phase @ 2000ft + 500ft setup @ 3\$/ft
D.8	OPGW (144 Fiber) 0.669	2,500	FT			0		0		0		0		0	3.50	8,750			Single Static Line
D.9	FAA Lights (1 System)	1	AS			0		0		0		0		0	6,000.00	6,000		0	(1) Solar-Powered System
D.10						0		0		0		0		0		0		0	
E	CONSTRUCTION																		
E.1	Environmental/Restoration	1	LOT			0		0		0		0		0		0	21,000.00	21,000	10% of Line Labor Costs
	Install R.O.W. Improvements/Access Controls (Gates, etc)	1	LOT			0		0		0		0		0		0	100,000.00	100,000	
E.3	R.O.W. Improvements - Matting	1	LOT			0		0		0		0		0		0	100,000.00	100,000	
E.4	Line Contractor	6	Weeks			0		0		0		0		0		0	35,000.00	210,000	70% of Line Cost
	Line Supervision	8	Weeks		60.0	480	65.00	31,200		0		0		0		0		0	
	Switching	2	Days			0		0	16.0	32	60.00	1,920		0		0		0	
E.7	<u> </u>					0		0		0		0		0		0		0	
E.8						0		0		0		0		0		0		0	
E.9						0		0		0		0		0		0		0	
E.10						0		0		0		0		0		0		0	
0 87,100  Manhours Monthly Payroll									Manhours	32 Weekly	Payroll	1,920		0		886,250		682,000	

Par	* All unit and total cost figures should be "raw costs", without any overhead markups. All markups are generated at the end of the estimated															estimate.			
				Costs Incurred To-Date*	3 3			Weekly Payroll*				Stock Materials*		Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes	
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
R.1	Line Contractor	5	Weeks			0		C		0		0		0		0	5,000.00	25,000	15% of Line cost
R.2	Disposal	1	LOT			0		C		0		0		0		0	40,000.00	40,000	
						0		C		0		0		0		0		0	
						0		C		0		0		0		0		0	
						0		C		0		0		0		0		0	
						0 0				0		0		0		0		0	
						0 0			0 0		0		0			0			
				0		0	, [	C		0	ī [	0		0		0		65,000	

				Costs Incurred To-Date*	N	/lonthl	y Payroll*			Weekly	Payroll*		Stock Materials*		Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

Manhours Monthly Payroll

Manhours Weekly Payroll

				Costs Incurred To-Date*	N	Monthly	y Payroll*		١	Weekly	Payroll*		Stock Mat	erials*	Non-Stock N		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

**ADDITIONS + REMOVALS:** 

TIONS SUMMARY:		
red To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	<del>-</del>
Estimated Future Raw Costs:	\$1,657,270	
Estimated Future Overheads:	\$339,915	
Estimated Future AFUDC:	\$21,721	
Subtotal Future Costs:	\$2,018,906	<del>-</del>
Contingency Applied:	\$605,672	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$2,624,578	
		=
OVALS SUMMARY: red To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	=
Estimated Future Raw Costs:	\$65,000	
Estimated Future Overheads:	\$8,303	<u>_</u>
Subtotal Future Costs:	\$73,303	_
Contingency Applied:	\$21,991	30.0% Contingency factor from Overheads & AFUDC Calculator (optional) Contingency will be factored on top of future costs only.
	40-00-	<b>7</b>
GRAND TOTAL REMOVALS:	\$95,294	

\$2,719,872

# Assumptions, Notes, Clarifications, etc.:

Estimate assumes the installation of (2) new structures on the NY-side of Indian Lake on the 69kV "FV" Line and associated conductor / static wire. Materials and labor assumed in estimate represent only what is needed for the CHG&E-Owned portion of the project. Estimate assumes no modification to FV Tower 1652. Tower 1653 is anticipated to be an 80ft self-supported mono-pole with caisson foundation and Tower 1654 is anticipated to be a 240ft self-supported mono-pole also with caisson foundation. No part 102C report is anticipated due to the length of the project. No costs are included related to municipal approvals. Outages are assumed to be continuous with good availability.



Version 3.0 12/9/2022

Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

# A. GENERAL

Project/Program Name: 115kV DW line - West Balmville WN / 4012 Underbuild

Work Order #:

**Budget Group:** Electric **Budget Category:** 12 **Funding Project Number:** 

1-1221-90-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 1/1/2024

In-Service: 6/1/2026

# Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There will be the potential for future Cat#13 and Cat#15 work orders associated with this project to provide for a new transmission line connection into West Balmville as well as the installation of new distirbution underbuild on the replaced DW Line Structures.

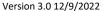
# Describe the project objective and scope of work:

This project is being proposed to replace (5) DW Line structures in a 0.3 mile stretch of line adjacent to the West Balmville Substation in support of the replacement of (2) existing underbuilt distribution circuits.

# Describe specific scope exclusions, assumptions and constraints:

Detailed design and permitting work has not been completed. Estimates to date do not account for specific conditions related to matting, access, permitting, outage constraints, etc...







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure; Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Existing towers are vintage and require replacement to support the new distribution circuit installations.

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of the lines will reduce the risk of an in-service failure and resulting unplanned emergency repair work at a premium cost. This will also proclude the need to find an alternate route for the proposed distribution circuit replacements.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

#### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

# ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

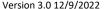
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

**Governance Component:** Maybe - Requires further scope development

Is complete <u>Sustainability</u> status achieved by this project?\* Maybe - Requires further scope development

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Reconductoring the distribution circuits on the existing towers was considered as well as moving/rebuilding the distribution circuits onto the adjacent roadway and off of the towers.

#### Why was the proposed project scope chosen over other alternatives?

Rebuilding the (5) DW Line structures as well as the underbuilt distribution in the same configuration will provide more resilient and reliable structures that are designed to current-day standards and current working distances for effective maintenance of the circuits underneath the active transmission line. There is no space on the adjacent roadway due to the presence of several other distirbtuion circuits making the on-road option not feasible.

# D. PRIORITIZATION

# Why do we need to complete this project in the period requested?

It is important to complete the project in the proposed timeframe to help reduce the risk of an in-service failure on the distribution. The work must also be done in conjunction with the replacement of the (2) underbuilt circuits.

# What are the risks and consequences of not completing this project?

Delaying the project would increase the risk of an unplanned outage and subsequent repair and potentially affect the distribution replacement schedule and/or reliability.

# Was this project included in a prior 5-year forecast?

No

# If No, why should this project be completed instead of a planned project?

This is an emergent project that got added based on the emergent distribution captial project.

# What other factor were considered during the prioritization process?

N/A



	Capital Estimate Summary		t year of the Idget plan							
	\$1,891,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Yea 202		Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	166,200				5,200	160,000			
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	415,500			1.	5,500	400,000			
1	Contractors (A/P tax exempt)	1,080,300			4	0,300	1,040,000			
Т	Overheads	0								
I	AFUDC*	143,000				2,000	141,000			
O N	Journal Vouchers (JVs)	0				-				
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,805,000	0		0 6	4,000	1,741,000	0	0	0
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	8,100					8,100			
H	Contractors (A/P tax exempt)	72,900					72,900			
R	Overheads	5,000					5,000			
E	Journal Vouchers (JVs)	0				-				
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	86,000	0		0	0	86,000	0	0	0
	* AFUDC may require adjustment after Finance Depa									
	Expense \$ (if applicable):	0								
C	urrent Approved Rate Case Funding (\$):	0	0		0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

**Cost Estimate Level:** Conceptual

(that final cost will be within +/-30% of the estimate): **Cost Estimate Confidence: High Confidence** 

No further estimate range is required.

Maximum (\$): **Cost Estimate Range:** Minimum (\$): 1,323,700 2,458,300

Formulas give standard ranges ← per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Permitting, material and construction costs may vary causing a potential variance in the pro-forma estimate. A more accurate estimate will be created upon completion of preliminary design work.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see provided estimate for details on assumptions. Cost figures were based on historical costs for projects of similar construction and permitting requirements.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals were split based on a 90%/10% split of Contractor (AP) and Monthly Labor respectively.



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

WO #:

Project Name: DW Line - West Balmville Tower Replacements with [ Date: xxx

Prepared By: Evan Gally Revision(s): xxx

Cost Estimate Level:

Par	t 1: Additions							* All unit	and total co	ost figure	es should b	e "raw costs	s", <u>without</u> an <u>y</u>	y overhead ı	markups. Mark	cups are ger	nerated at the e	nd of the es	stimate.
				Costs Incurred To-Date*	M	lonthly	Payroll*			Weekly	y Payroll*		Stock Ma	aterials*	Non-Stock   (A/P Ta		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
Α	PLANNING & ENGINEERING																		
	Engineering Design	100	Hours		1.0	100	71.00	7,100		0		0		0		0		0	
A.2	Engineering Supervision; Project Sponsor	25	Hours		1.0	25	71.00	1,775		0		0		0		0		0	
A.3	Engineering Drafting	25	Hours			0		0	1.0	25	65.00	1,625		0		0		0	
A.4	Surveyors / Structure Stakeout	1	Units			0		0		0		0		0		0	5,000.00	5,000	
4.5	Consultant Engineering	1	Units			0		0		0		0		0		0	20,000.00	20,000	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
<b>B</b>	PROJECT MANAGEMENT, ENVIRONMENTAL & SUPPORT SERVICES Environmental Services	25	Hours		1.0	25	71.00	1,775		0		0		0		0		0	
	Real Properties	25	Hours		1.0	25	71.00	1,775		0		0		0		0		0	
	T&D Supervision	100	Hours		1.0	100	71.00	7,100		0		0		0		0		0	
3.4						0		0		0		0		0		0		0	
.5						0		0		0		0		0		0		0	
.6						0		0		0		0		0		0		0	
7						0		0		0		0		0		0		0	
.8						0		0		0		0		0		0		0	
.9						0		0		0		0		0		0		0	
10						0		0		0		0		0		0		0	
	OFNEDAL CONDITIONS																		
	GENERAL CONDITIONS																		
	Matting					0		0		0		0		0		0		0	
	Environmental Controls/ Restoration					0		0		0		0		0		0	25,000.00	0	
.3						0		0	-	0		0		0		0		0	
.4						0		0		0		0		0		0		0	
5						0		0	-	0		0		0		0		0	
6						0		0		0		0		0		0		0	
7						0		0		0		0		0		0		0	
.8						0		0		0		0		0		0		0	
.9						0		0		0		0		0		0		0	
.10						0		0		0		0		0		0		0	
	MAJOR EQUIPMENT & MATERIALS																		

				Costs Incurred To-Date*		Monthly Payroll	*		Weekly P	Payroll*		Stock Mate	rials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH Cost/MH	Cost	Production MH/Unit	MH C	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	Engineered Pole / Hardware	5	Units			0	0		0		0		0	40,000.00	200,000		0	SB Line Rebuild Phase 1
D.2						0	0		0		0		0		0		0	
D.3						0	0		0		0		0		0		0	
D.4						0	0		0		0		0		0		0	
D.5						0	0		0		0		0		0		0	
D.6						0	0		0		0		0		0		0	
D.7						0	0		0		0		0		0		0	
D.8 D.9						0	0		0		0		0		0		0	
D.9 D.10						0	0		0		0		0		0		0	
D.10						0	U		U		U		U		U		U	
Ε	CONSTRUCTION																	
E.1	Line Construction	15	Days			0	0		0		0		0		0	10,800.00	162,000	
E.2	Foundation	5	Units			0	0		0		0		0		0	125,000.00	625,000	
E.3	ROW Improvements / Gates	1	Unit			0	0		0		0		0		0		0	
E.4	Showup / Dumpsters	1	Unit			0	0		0		0		0		0	1,600.00	1,600	
E.5	Construction Moves	1	Unit			0	0		0		0		0		0	2,250.00	2,250	
	Foreman / Field Supervision	150	Hours		1.0	150 71.00	10,650		0		0		0		0		0	
	Field Clerks / Electricians / Riggers	50	Hours			0	0		0		0		0		0		0	
E.8						0	0		0		0		0		0		0	
E.9						0	0		0		0		0		0		0	
E.10						0	0		0		0		0		0		0	
				0			30,175	<u> </u> 			1,625		0		200,000		815,850	
					•	425			25			<u> </u>		<u> </u>		יי ני		I
					Manhours	s Monthly Payroll		Manhour	s Weekly Pa	ayroll								

Par	t 2: Removals							* All unit a	nd total cost	t figures :	should be	"raw costs"	, <u>without</u> any o	verhead ma	arkups. All mai	rkups are ge	enerated at the	end of the e	estimate.
				Costs Incurred To-Date*	N	Monthly	/ Payroll	<b>k</b>		Weekly	Payroll*		Stock Ma	terials*	Non-Stock M		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
F.1	Line Construction	15	Days			0		0		0		0		0		0	2,700.00	40,500	
F.2	Showup / Dumpsters	1	Unit			0		0		0		0		0		0	6,000.00	6,000	
F.3	ROW Improvements / Gates	1	Unit			0		0		0		0		0		0		0	
4	Foreman	50	Hours		1.0	50	71.00	3,550		0		0		0		0		0	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
						0		0		0		0		0		0		0	
				0	Manhours	50 Monthly		3,550	Manhours	0 s Weekly	Payroll	0		0		0		46,500	

			Costs Incurre To-Date		Monthly	y Payroll*			Weekly	/ Payroll*		Stock Mat	terials*	Non-Stock N		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity U	through	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

**GRAND TOTAL** 

ADDITIONS + REMOVALS:

ADDITIONS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	=
Estimated Future Raw Costs:	\$1,047,650	
Estimated Future Overheads:	\$230,546	
Estimated Future AFUDC:	\$0	_
Subtotal Future Costs:	\$1,278,196	-
Contingency Applied:	\$383,459	30.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$1,661,655	

REMOVALS SUMMARY: Incurred To-Date:		
Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date:	\$0 \$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$50,050	
Estimated Future Overheads:	\$12,232	
Subtotal Future Costs:	\$62,282	<del></del>
Contingency Applied:	\$18,685	Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$80,967	

\$1,742,622

# Assumptions, Notes, Clarifications, etc.:

Replacement of (5) existing 115kV DW Line Structures with Engineered mono-poles with concrete caisson foundations. Poles to be sized appropriately to carry up to (3) underbuilt distribution circuits.



Version 3.0 12/9/2022

Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

#### A. GENERAL

**Project/Program Name: Transmission Minors Project** Work Order #:

**Funding Project Number:** 1-1211-00-18

**Budget Category: Budget Group:** Electric 12 Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

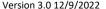
There are no specific Work Orders associated with this project overall. If possible, the work identified in Transmission Minors may be constructed in conjunction with other projects (HPR, etc...) to take advantage of potential synergies with regards to access, mobilizations, etc...

#### Describe the project objective and scope of work:

The Minor Transmission Projects Program is intended to cover small emergent projects that arise during the course of the year due to the discovery of priority inspection findings or are prompted by the failure of a transmission line component (Insulator, Conductor, pole, structure component, etc...). Projects covered under this funding project include the repair and/or replacement of existing equipment not specifically tied to a major project.

#### Describe specific scope exclusions, assumptions and constraints:

Specific project constraints related to access, matting, drilling and environmental controls would be unknown until the jobs are identified which could represent a significant portion of the project costs. These projects are typically of an emergency nature and may be subject to additional costs related to the unplanned nature of the work.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure; Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As transmission line equipment is identified as being failed or that failure is deemed inevitable, these components, structures and/or conductors must be replaced in a timely manner in order to maintain the integrity of the electric transmission system to the greatest extent possible.

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Avoiding component failure due to pre-emptive replacement will be much less costly than addressing an in-service failure. If in-service failure occurs, promptly replacing the failed asset and placing the transmission line back into service is critical to ensuring system integrity and continued reliability.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

#### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

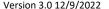
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Repairs to damaged assets are always considered against replacement of the asset or structure on a project-by-project basis.

#### Why was the proposed project scope chosen over other alternatives?

Scopes will be dictated on a project-by-project basis related to the specific nature of the failed component and/or the critical condition that is identified.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Any critical finding or failed component must be addressed promptly to ensure system integrity and reliability.

#### What are the risks and consequences of not completing this project?

If projects are not completed in a timely manner there is an enhanced risk for a decrease in the reliability of the electric transmission system.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			cost estimates sh adjustments for i			
	\$1,942,694	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	141,887	43,887	19,600	19,600	19,600	19,600	19,600	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	354,718	109,718	49,000	49,000	49,000	49,000	49,000	
Ĭ	Contractors (A/P tax exempt)	922,266	285,266	127,400	127,400	127,400	127,400	127,400	
Т	Overheads	77,000			8,000	17,000	21,000	31,000	
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,495,871	438,871	196,000	204,000	213,000	217,000	227,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	32,500		6,500	6,500	6,500	6,500	6,500	
	Contractors (A/P tax exempt)	392,323	99,823	58,500	58,500	58,500	58,500	58,500	
R	Overheads	22,000		2,000	3,000	4,000	6,000	7,000	
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	446,823	99,823	67,000	68,000	69,000	71,000	72,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	1,113,000	742,000	371,000					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Costs can vary significanty from Project to Project depending on the nature of the repair or replacement that is needed as well as other factors such as access, environmental controls, etc...

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Cost estimate for years 2024-2028 are based on the potential replacement of (5) structures per year at an approx. cost of \$40K per structure "A" and \$13K per structure "R".

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on a conceptual pro-forma per single pole structure. The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Prior Year spending is a combination of 2021-2022 actuals and 2023 projections, applicable cost split has been applied to this as well. Removals are split 90/10 by Contractors(AP) / Internal Labor respectively.



Version 3.0 12/9/2022

Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Electric Transmission Structure Coating Program

Work Order #: PEND

- -

Budget Group: Electric

**Budget Category:** 12

Funding Project Number: Target Schedule - Start: 7/1/2024 In-Se

In-Service: 12/31/2030

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There may be other Cat#12 work orders associated with the High Priority Replacement Program that could be initiated in conjunction with this work to take advantage of any access efficiencies.

#### Describe the project objective and scope of work:

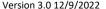
Is this a Specific Project, Program or Blanket? Program

This project will involve the installation of new coating systems on existing Electric Transmission Structures in an effort to extend their useful life. The program involves the coating of approximately 586 electric transmission structures over the course of the proposed 7-year program.

#### Describe specific scope exclusions, assumptions and constraints:

Progam estimates are based on conceptual one-for-one structure replacement estimates and does not inloude provisions for scope-specific needs like matting, erosion and sediment control, drilling, access agreements, etc...







#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Transmission Sustaining** Load Based/Infrastructure:

Maintain System Standards **Discretion Level:** Infrastructure **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Infrastructure; Risk Reduction; Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Please see the provided documentation and cost benefit analysis comparing the capital costs associated with coating Vs. replacement.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Benefit of extending the useful life of the asset by coating to defer the need for a larger capital investment if replaced.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### **ESG (Environmental, Social and Governance) and Sustainability:**

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes** 

**Environmental Component:** Yes **Social Component:** Yes

**Governance Component:** Maybe - Requires further scope development

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development governance.

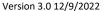
119

\* Sustainability status is achieved for the project if the ESG checklist

shows that there is at least one

component each for

environmental, social and





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Replacement of the structures was considered as an alternative to coating.

#### Why was the proposed project scope chosen over other alternatives?

Coating the structures provides the ability to address any corrosion-based defects while both extending the useful life of the structures and defering the need for a significantly higher-cost capital project.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Completing the program in the proposed timeline is important to ensure that structures with more advanced coating or corrosion conditions will be mitigated in order to realize the greatest life-extension possible from application of the new coatings.

#### What are the risks and consequences of not completing this project?

If the project is not completed, coatings and corrosion on existing structures will continue to advance to a point when applications of new coatings will no longer be able to meaningfully extend the life of the asset and a more substantial and costly capital replacement project will be needed.

#### Was this project included in a prior 5-year forecast?

No

#### If No, why should this project be completed instead of a planned project?

Project is being requested as part of the upcoming 2024-2028 capex forecst and is not being substituted into the capex plan for any other project.

What other factor were considered during the prioritization process?

N/A



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan		•	cost estimates sh e adjustments for i			
	\$11,080,900	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	1,049,400		150,200	150,100	150,300	192,300	123,800	282,700
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	2,623,500		375,500	375,250	375,750	480,750	309,500	706,750
ī	Contractors (A/P tax exempt)	6,821,000		976,200	975,650	976,950	1,249,950	804,700	1,837,550
Т	Overheads	0							
I	AFUDC*	587,000			60,000	132,000	201,000	194,000	
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	11,080,900	0	1,501,900	1,561,000	1,635,000	2,124,000	1,432,000	2,827,000
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart	artment review.							
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023

Prior years funding;

2024



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Estimate is based on single per-structure replacement estimates. Definitive costs could vary based on actual scope, access, erosion and sediment controls, matting, contractor selection, permitting requirements, etc... Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see attached cost benefit analysis

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively.

<u>Line</u>	# of Structure Type	Structure Type	<u>Tangent</u> <u>Structures</u>	<u>Deadend</u> <u>Structures</u>	Total Coating <u>Estimate</u>	Total Replacement <u>Estimate</u>
303	22	Pole	13	9	\$1,252,360.00	\$24,080,000.00
303	6	Tower	5	1	\$249,240.00	\$5,520,000.00
301	18	Pole	12	6	\$1,042,840.00	\$18,720,000.00
301	1	Tower	0	1	\$41,540.00	\$1,520,000.00
311	7	Pole	5	2	\$416,660.00	\$7,040,000.00
PX	61	Tower	21	40	\$833,860.00	\$11,728,000.00
EM	46	Tower	11	35	\$628,760.00	\$9,199,500.00
M	2	Tower	0	2	\$27,320.00	\$410,000.00
С	1	Tower	0	1	\$13,660.00	\$205,000.00
E	118	Tower	68	50	\$1,612,980.00	\$21,674,000.00
Е	2	Pole	0	2	\$63,820.00	\$740,000.00
E/G	18	Towers	10	8	\$245,980.00	\$3,409,000.00
D/J/CW	53	Tower	18	35	\$724,480.00	\$10,421,000.00
I	24	Tower	7	17	\$328,040.00	\$8,567,700.00
1	1	Pole	1	0	\$35,160.00	\$275,000.00
X	11	Tower	8	3	\$150,360.00	\$2,020,000.00
DW	71	Tower	47	24	\$970,560.00	\$12,816,000.00
N/O	52	Tower	31	21	\$710,820.00	\$9,777,500.00
DB	1	Tower	0	1	\$13,660.00	\$205,000.00
DR	1	Tower	0	1	\$13,660.00	\$205,000.00
DR/DB	15	Tower	7	8	\$205,000.00	\$4,715,000.00
FT/WF	5	Poles	4	1	\$153,300.00	\$1,470,000.00
OR	33	Tower	26	7	\$451,080.00	\$5,803,000.00
2	16	Tower	12	4	\$218,660.00	\$2,836,000.00
Р	1	Pole	1	0	\$35,160.00	\$275,000.00
				Totals	\$10,438,960.00	\$163,631,700.00

<u>Line</u>	# of Structure Type	Structure Type	Contractor Coating Cost	Bucket Truck Rental 1	Coating Material Cost <sup>2</sup>	Environmental Testing <sup>3</sup>	Environmental Disposal <sup>4</sup>	Access Cost 5	Total Coating Estimate	Induron Repaint Prioirty	Coating Year
303	22	Pole	\$25,000.00	\$100,000.00	\$36,960.00	\$2,200.00	\$13,200.00	\$25,000.00	\$1,252,360.00	1	2024
303	6	Tower	\$15,000.00	\$0.00	\$5,040.00	\$600.00	\$3,600.00	\$25,000.00	\$249,240.00	4	2024
301	18	Pole	\$25,000.00	\$100,000.00	\$30,240.00	\$1,800.00	\$10,800.00	\$25,000.00	\$1,042,840.00	1	2025
301	1	Tower	\$15,000.00	\$0.00	\$840.00	\$100.00	\$600.00	\$25,000.00	\$41,540.00	4	2025
311	7	Pole	\$25,000.00	\$50,000.00	\$11,760.00	\$700.00	\$4,200.00	\$25,000.00	\$416,660.00	1	2025
PX	61	Tower	\$10,000.00	\$0.00	\$34,160.00	\$600.00	\$36,600.00	\$2,500.00	\$833,860.00	2	2026
EM	46	Tower	\$10,000.00	\$0.00	\$25,760.00	\$400.00	\$27,600.00	\$2,500.00	\$628,760.00	3	2026
M	2	Tower	\$10,000.00	\$0.00	\$1,120.00	\$0.00	\$1,200.00	\$2,500.00	\$27,320.00	2	2026
С	1	Tower	\$10,000.00	\$0.00	\$560.00	\$0.00	\$600.00	\$2,500.00	\$13,660.00	3	2026
Е	118	Tower	\$10,000.00	\$0.00	\$66,080.00	\$1,100.00	\$70,800.00	\$2,500.00	\$1,612,980.00	2	2027
Е	2	Pole	\$25,000.00	\$6,500.00	\$1,120.00	\$0.00	\$1,200.00	\$2,500.00	\$63,820.00	2	2027
E/G	18	Towers	\$10,000.00	\$0.00	\$10,080.00	\$100.00	\$10,800.00	\$2,500.00	\$245,980.00	2	2027
D/J/CW	53	Tower	\$10,000.00	\$0.00	\$29,680.00	\$500.00	\$31,800.00	\$2,500.00	\$724,480.00	2	2028
ı	24	Tower	\$10,000.00	\$0.00	\$13,440.00	\$200.00	\$14,400.00	\$2,500.00	\$328,040.00	2	2028
I	1	Pole	\$25,000.00	\$6,500.00	\$560.00	\$0.00	\$600.00	\$2,500.00	\$35,160.00	2	2028
Х	11	Tower	\$10,000.00	\$0.00	\$6,160.00	\$100.00	\$6,600.00	\$2,500.00	\$150,360.00	2	2028
DW	71	Tower	\$10,000.00	\$0.00	\$39,760.00	\$700.00	\$42,600.00	\$2,500.00	\$970,560.00	2	2029
N/O Line	52	Tower	\$10,000.00	\$0.00	\$29,120.00	\$500.00	\$31,200.00	\$2,500.00	\$710,820.00	2	2029
DB	1	Tower	\$10,000.00	\$0.00	\$560.00	\$0.00	\$600.00	\$2,500.00	\$13,660.00	3	2030
DR	1	Tower	\$10,000.00	\$0.00	\$560.00	\$0.00	\$600.00	\$2,500.00	\$13,660.00	3	2030
DR/DB	15	Tower	\$10,000.00	\$0.00	\$8,400.00	\$100.00	\$9,000.00	\$2,500.00	\$205,000.00	3	2030
FT/WF	5	Poles	\$25,000.00	\$10,000.00	\$2,800.00	\$0.00	\$3,000.00	\$2,500.00	\$153,300.00	3	2030
OR	33	Tower	\$10,000.00	\$0.00	\$18,480.00	\$300.00	\$19,800.00	\$2,500.00	\$451,080.00	3	2030
2	16	Tower	\$10,000.00	\$0.00	\$8,960.00	\$100.00	\$9,600.00	\$2,500.00	\$218,660.00	3	2030
Р	1	Pole	\$25,000.00	\$6,500.00	\$560.00	\$0.00	\$600.00	\$2,500.00	\$35,160.00	3	2030

	Yearly Cost Breakdown
2024	\$1,501,600.00
2025	\$1,501,040.00
2026	\$1,503,600.00
2027	\$1,922,780.00
2028	\$1,238,040.00
2029	\$1,681,380.00
2030	\$1,090,520.00

#### Assumptions/Notes

Assumes structures can be coated at a rate of 3 per week <sup>1</sup>

~\$25K / month for 125' tracked bucket 1

Paint Cost ~ \$70 / gallon 2

~12 Gallon per 345 kV structure <sup>2</sup>

~8 Gallons per 115/69 kV structure <sup>2</sup>

\$100 per pole paint test 3

\$200 per drum for paint chip disposal 4

Assumed all 69/ 115 kV lattice towers can be climbed 5

Assumed - 500 ft of matting per 345 kV Structure @ \$50/ft  $^{\rm 5}$ 

Assumed no matting for 69 / 115 kV structures <sup>5</sup>

#### Repaint Priority

1 Immediate protective painting 0-2 years

2

- Preventative maintenance 3-5 years
- 3 Preventative maintenance 6-8 years
- 4 Preventative maintenance 8-10 years

<u>Line</u>	# of Structure Type	Structure Type	Number of Circuits	Tangent Structures	Deadend Structures	Access Cost	Structure Replacement Cost
303	22	Pole	Single Circuit	13	9	\$50,000.00	\$24,080,000.00
303	6	Tower	Double Circuit	5	1	\$50,000.00	\$5,520,000.00
301	18	Pole	Single Circuit	12	6	\$50,000.00	\$18,720,000.00
301	1	Tower	Single Circuit	0	1	\$50,000.00	\$1,520,000.00
311	7	Pole	Single Circuit	5	2	\$50,000.00	\$7,040,000.00
PX	61	Tower	Single Circuit	21	40	\$5,000.00	\$11,728,000.00
EM	46	Tower	Double Circuit	11	35	\$5,000.00	\$9,199,500.00
M	2	Tower	Single Circuit	0	2	\$5,000.00	\$410,000.00
C	1	Tower	Single Circuit	0	1	\$5,000.00	\$205,000.00
E	118	Tower	Single Circuit	68	50	\$5,000.00	\$21,674,000.00
E	2	Pole	Single Circuit	0	2	\$5,000.00	\$740,000.00
E/G	18	Towers	Double Circuit	10	8	\$5,000.00	\$3,409,000.00
D/J/CW	53	Tower	Double Circuit	18	35	\$5,000.00	\$10,421,000.00
1	24	Tower	Double Circuit	7	17	\$5,000.00	\$8,567,700.00
1	1	Pole	Single Circuit	1	0	\$5,000.00	\$275,000.00
X	11	Tower	Double Circuit	8	3	\$5,000.00	\$2,020,000.00
DW	71	Tower	Single Circuit	47	24	\$5,000.00	\$12,816,000.00
N/O Line	52	Tower	Double Circuit	31	21	\$5,000.00	\$9,777,500.00
DB	1	Tower	Single Circuit	0	1	\$5,000.00	\$205,000.00
DR	1	Tower	Single Circuit	0	1	\$5,000.00	\$205,000.00
DR/DB	15	Tower	Double Circuit	7	8	\$5,000.00	\$4,715,000.00
FT/WF	5	Poles	Double Circuit	4	1	\$5,000.00	\$1,470,000.00
OR	33	Tower	Single Circuit	26	7	\$5,000.00	\$5,803,000.00
2	16	Tower	Single Circuit	12	4	\$5,000.00	\$2,836,000.00
Р	1	Pole	Single Circuit	1	0	\$5,000.00	\$275,000.00

#### Notes

Access Cost are assumed to be double the cost for coating due to the need of additional equipment for replacing

Replace costs have been estimated as a one for one spot replacment not as a whole line rebuild.

See attached spreadsheets for breakdown of replacment costs

#### Per Structure Replacement Cost

345 kV

Engineered Deadend \$1,470,000.00

Engineered Tangent \$750,000.00

69 kV / 115 kV

Engineered Deadend \$365,000.00

Engineered Tangent \$270,000.00

69 kV / 115 kV Single Circuit

Replacment \$168,000.00

Replacement \$205,000.00

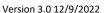
69 kV / 115 kV Double Circuit

Direct Embed Tangent Lattice Direct Embed Deadend Lattice Replacement \$174,500.00

Replacement \$208,000.00

126







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 2 Design

#### A. GENERAL

Project/Program Name: MG and GK Line 115kV Upgrade (Modena - Kerhonkson) Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: 10480

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 2/28/2024

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

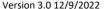
This Project is being completed in conjunction with the FK Line and P Line 115kV Upgrade projects in Cat#12 as well as various other Cat#13 projects with the goal of completing the objective of the original P, MK, HK Article VII project scope and energizing the related lines and substations up to 115kV operation.

#### Describe the project objective and scope of work:

Central Hudson's "P", "FK", "MG", "GK", "MK" and "HK" lines were constructed in the mid-90s as part of a PSC Article VII project and are currently operated at a voltage of 69kV. As part of the open Article VII permit, these lines are intended to be energized to 115kV pending the completion of several related substation improvement projects. Given the age of the lines, any outstanding infrastructure concerns that may exist as a result will need to be completed to ensure that these lines meet the appropriate clearance and strength criteria to support the upgrade. There are also several substation exits that will need to be re-routed as well and are included on the appropriate line scope. The "MG" and "GK" Lines between Modena and Kerhonkson will need to be reviewed and any potential infrastructure-related issues or clearance issues addressed in advance of the upgrade. A small re-route will also need to be done at the Modena Substation to connect the line to the 115kV dead end structure.

#### Describe specific scope exclusions, assumptions and constraints:

Scope may not take into account specific requirements for access, drilling, erosion & sediment control, etc... based on actual site conditions and final project scope.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure; Regulatory; Reliability; Risk Reduction; Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is being completed in accordance with Planning Memo "E.P#2010-008" & "E.P#2017-014".

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The project will reduce the risk of any potential unplanned outage caused by an unexpected in-service failure. Such an outage would require an unplanned emergency repair project to be executed at premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

#### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

#### Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric; Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

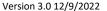
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Please refer to the planning memo for information on the 115kV Upgrade. Repair and replacement options will both be considered when designing the upcoming project to ready the line for 115kV operation in the most efficient and cost effective manner possible.

#### Why was the proposed project scope chosen over other alternatives?

Preliminary line analysis indicates some conductor clearance issues at both structures and spans that will need to be addressed to allow for 115kV operation. It is assumed based on the age and condition of the line that synergies with inspection condition mitigation and these potential issues can be addressed together via structure replacements.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

In order to support the timeline of the Cat#13 projects and 115kV cut-over date, this and other Cat#12 projects need to be completed in advance.

#### What are the risks and consequences of not completing this project?

If the Cat#12 projects supporting the 115kV upgrade are not completed consistent with the Cat#13 project timelines there will be a risk of delaying the upgrade or putting new Substation equipment in an abnormal operating condition.

### Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

### What other factor were considered during the prioritization process?

The Project also includes work that would typically be done under the High Priority Replacement Program. Prioritizing the 115kV project allows us to apply synergies between the two project objectives and help reduce the risk of in-service failures while also readying the line for 115kV Operation.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates s e adjustments for			
	\$1,971,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	151,100	109,100	42,000					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	377,750	272,750	105,000					
ī	Contractors (A/P tax exempt)	982,150	709,150	273,000					
Т	Overheads	1,000		1,000					
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,512,000	1,091,000	421,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	46,000	44,000	2,000					
	Contractors (A/P tax exempt)	413,000	395,000	18,000					
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	459,000	439,000	20,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depa	rtment review.							
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	622,000	622,000	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Scope assumes replacement of structures and some minor line modification work, if those assumptions change based on the detailed design and scoping process then the project costs will need to be adjusted. Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Cost Estimates are based on a tentative scope and inlcuded as "MG" Line 115kV Upgrade and "GK Line 115kV Upgrade.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on a conceptual estimates provided. The cost breakdown provided for estimates and actuals is based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removal costs are split 90/10 by Contractor AP and Internal Labor respectively. This applies to both prior year actuals / projections as well as 2024-2028.

Copy to: Mr. P. E. Haering Mr. E. A. Loeven

Mr. P. Harpolis Mr. K. D. Bragg
Mr. H. W. Turner Mr. W. J. Mancroni
Mr. B. Arteta Mr. T. P. Burns
Mr. G. H. Yozzo E.P.# 2017-014

September 11, 2017

Mr. C. Rottkamp

Re: Remaining Work for P/FK/HK/MK/GK/MG Upgrade to 115 kV Operation

#### **Reference**

- Chan, Ruby. "P & MK Area Study," E.P.# 2010-008. May 2, 2011.
- Genesee, Stephanie. "Spare 10/12 MVA Transformer Relocations," E.P. #2016-012. August 18, 2016.

#### **Article VII Conditions and Requirements**

As the rebuild of the P/FK/HK/MK/GK/MG lines (at the time of the rebuild known as the P&MK Project) was accomplished under the provisions of Article VII of Public Service Law of the State of New York; a series of agreed to conditions and requirements emanated when receiving Public Service Commission (PSC) approval prior to the onset of reconstruction. These included:

- An approved Environmental Management & Construction Plan (EM&CP) General procedures included within the EM & CP describe project administration, consultations, construction, restoration and environmental mitigation.
- Series of Ordering Clauses detailing both construction related practices and requirements for post construction activities.
- ➤ PSC notification (review and involvement including possible PSC approval) before conducting many future tasks associated with both the transmission lines and various electric substations.
- > Specific agreements emanating from the Article VII approval process such as the Minnewaska Access Agreement.

#### Remaining Work

The remaining work to upgrade the P/FK/HK/MK/GK/MG area to 115 kV operation is listed below:

#### Must be completed prior to 115 kV Operation

In order

- 1. Install OPGW for the P/FK/HK/MK/MG area in 2019/2020 as included in the Network Strategy plans (Note that the plan doesn't include installing OPGW for the GK line because of the difficult access through Minnewaska State Park).
- Connect the OPGW to the primary relays for 115 kV primary line protection and possibly direct transfer trip. Reset the relays in the area. Primary and backup distance relays are installed at High Falls Substation, Galeville Substation, Sturgeon Pool Substation and Kerhonkson Substation. For the GK line, determine whether to use wireless Tier 1 or power line carrier for communication.

E.P.# 2017-014; September 11, 2017

No particular order required

- Remove the FK-186, FK-187 and FK-188 switches and the associated connections at Accord Substation.
- o Install two 115/69 kV transformers and associated equipment at Kerhonkson Substation.
- Specify the 115 kV transformer fixed tap setting (NLTC) at High Falls (115-13.8 kV), Galeville (115-13.8 kV) and Kerhonkson (115-13.8 kV and 115/69 kV).

#### Must be completed immediately prior to 115 kV Operation

- o Check each pole and connections prior to operating at 115 kV to ensure no 69 kV equipment remains.
- Develop a timeline and coordinated plan among System Operations, Electric Transmission Design, Substation Design, Operations Services, Electric Transmission Planning and Electric T&D for the 115 kV Operation conversion which includes steps to do the following:
  - Relocate the P line at Sturgeon Pool Substation from the 69 kV bus to the 115 kV
  - Relocate the MG line at Modena Substation from the 69 kV bus to the 115 kV bus.
  - Replace all the 69 kV CCVTs with 115 kV CCVTs at High Falls and Galeville.
  - Replace all the necessary 69 kV CCVTs with 115 kV CCVTs at Kerhonkson.
  - Change the transformer connections from 69-13.8 kV to 115-13.8 kV for the following transformers:
    - High Falls Transformer #1
    - High Falls Transformer #2
    - Kerhonkson Transformer #1
    - Kerhonkson Transformer #2
    - Galeville Transformer #1
    - Galeville Transformer #2

#### Can be completed any time (before or after conversion to 115 kV Operation) - no particular order required

- Install third breaker at Modena Substation to form a ring bus.
- o Rebuild the three spans adjacent to the existing Honk Falls Substation. Those three spans currently share structures (HK and MK lines) and have 1/0 Cu conductors.
- o Split another six pairs of HK & MK structures guyed together. A failure of a structure guyed to another could result in loss of load to the Ellenville area.
- o Install a 69 kV bus tie breaker at the retired WH-962 breaker position in Honk Falls Substation to preclude loss of both 69 kV Kerhonkson inputs for a bus fault and install Honk Falls Bus 1 and 2 differential relays.

#### To be completed after conversion to 115 kV Operation

- o Retire existing 115/69 kV Modena transformer and Modena 69 kV yard.
- o The available 69-13.8 kV transformer (T-10000-18) at Modena to be installed at Greenfield Road Substation.

Ruby Chan
Ruby Chan
R Bur



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Project Name: GK Line 115kV Upgrade Date: 4/8/2022 WO #: PEND

Prepared By: Patrick Robinson Revision(s): 00

<u>Cost Estimate Level:</u> Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Par	t 1: Additions							* All unit	and total cos	st figure	s should be	e "raw costs	s", <u>without</u> ar	ny overhead	markups. Mark	cups are ger	nerated at the er	nd of the e	stimate.
				Costs Incurred To-Date*	M	lonthly	Payroll*		,	Weekly	/ Payroll*		Stock M	/laterials*	Non-Stock   (A/P Ta		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
Α	PLANNING & ENGINEERING																		
	Engineering Design	150	Hours		1.0	150	60.00	9,000		0		0		0		0		0	
	Engineering Supervision; Project Sponsor	150	Hours		1.0	150	60.00	9,000		0		0		0		0		0	
	Engineering Drafting	75	Hours			0		0	1.0	75	65.00	4,875		0		0		0	
A.4	Surveyors / Structure Stakeout	1	Units			0		0		0		0		0		0	5,000.00	5,000	
4.5						0		0		0		0		0		0		0	
A.6						0		0		0		0		0		0		0	
٩.7						0		0		0		0		0	1	0		0	
8.A						0		0		0		0		0	1	0		0	
A.9						0		0		0		0		0		0		0	
A.10						0		0		0		0		0		0		0	
4.11																			
В	PROJECT MANAGEMENT, ENVIRONMENTAL & SUPPORT SERVICES																		
	Environmental Services	21	Hours		1.0	21	60.00	1,260		0		0		0	†	0		0	
	Real Properties	21	Hours		1.0	21	60.00	1,260		0		0		0		0		0	
	T&D Supervision	150	Hours		1.0	150	60.00	9,000		0		0		0		0		0	
B.4	<u> </u>					0		0		0		0		0		0		0	
B.5	-					0		0		0		0		0		0		0	
B.6	-					0		0		0		0		0		0		0	
B.7	-					0		0		0		0		0		0		0	
3.8	-					0		0		0		0		0		0		0	
3.9						0		0		0		0		0		0		0	
3.10						0		0		0		0		0		0		0	
C	GENERAL CONDITIONS																		
	Environmental Controls / Restoration	1	Unit			0		0		0		0		0	1	0	100 000 00	100 000	Matting Likely Near Modena
0.2	Environmental Controls / Nesteration	1	Jill			0		0		0		0		0		0	100,000.00	0	matting Entery Hour Moderia
2.3						0		0	-	0		0		0		0		0	
C.4						0		0		0		0		0		0		0	
C.5						0		0	-	0		0		0	1	0		0	
C.6						0		0		0		0		0	1	0		0	
C.7	-		1			0		0		0		0		0		0		0	
C.8	-		1			0		0		0		0		0		0		0	
C.9						0		0		0		0		0		0		0	
2.10						0		0		0		0		0		0		0	
			1	1		-									1				
	MAJOR EQUIPMENT & MATERIALS																		

				Costs Incurred To-Date*		Monthly Payro	<b>  </b> *		Weekly I	Payroll*		Stock Mate	erials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	Standard Stock Poles	20	Units			0	0		0		0	12,000.00	240,000		0		0	90' Poles Typical
	Standard Stock Hardware	10	Units			0	0		0		0	4,000.00	40,000		0		0	
D.3						0	0		0		0		0		0		0	
D.4						0	0		0		0		0		0		0	
D.5						0	0		0		0		0		0		0	
D.6						0	0		0		0		0		0		0	
D.7						0	0		0		0		0		0		0	
D.8						0	0		0		0		0		0		0	
D.9						0	0		0		0		0		0		0	
D.10						0	0		0		0		0		0		0	
	CONSTRUCTION																	
E.1	Line Construction	28	Days			0	0		0		0		0		0	7,000.00	196,000	
E.2	Pole Holes / Anchors	20	Units			0	0		0		0		0		0	3,000.00	60,000	
E.3	ROW Improvements / Gates	1	Unit			0	0		0		0		0		0	15,000.00	15,000	
E.4	Showup / Dumpsters	1	Unit			0	0		0		0		0		0	2,000.00	2,000	
	Construction Moves	1	Unit			0	0		0		0		0		0	10,000.00	10,000	
	Foreman / Field Supervision	400	Hours		1.0	400 60.00	24,000		0		0		0		0		0	
	Field Clerks / Electricians / Riggers	200	Hours			0	0	1.0	200	65.00	13,000		0		0		0	
E.8						0	0		0		0		0		0		0	
E.9						0	0		0		0		0		0		0	
E.10						0	0		0		0		0		0		0	
				0		892	53,520		275		17,875		280,000		0		388,000	
					Manhours	s Monthly Payroll		Manhour	s Weekly F	Payroll								

Par	t 2: Removals						* All unit a	nd total cost	figures	should be "	raw costs'	', <u>without</u> any o	verhead m	arkups. All ma	rkups are ge	nerated at the	end of the	estimate.
				Costs Incurred To-Date*	M	onthly Payro	II*	V	Neekly	Payroll*		Stock Mat	erials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH Cost/Mi	d Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
F.1	Line Construction	28	Days			0	0		0		0		0		0	3,000.00	84,000	
F.2	Showup / Dumpsters	1	Unit			0	0		0		0		0		0	7,500.00	7,500	
F.3	ROW/ Gates	1	Unit			0	0		0		0		0		0	3,000.00	3,000	
F.4	Restoration	1	Unit			0	0		0		0		0		0	50,000.00	50,000	
F.5	Foreman	150	Hours		1.0	150 60.00	9,000		0		0		0		0		0	
F.6						0	0		0		0		0		0		0	
F.7						0	0		0		0		0	<u> </u>	0		0	
				0	Manhours	150 Monthly Payroll	9,000	Manhours	0 Weekly	] Payroll	0		0		0		144,500	

		Costs Incurred To-Date*	Monthly Payroll*	Weekly Payroll*	Stock Materials*	Non-Stock Materials* (A/P Taxable)	Contractors & Fees* (A/P Tax-Exempt)	Notes
#	# Work Breakdown Structure (WBS) Quantity Units	through xx/xx/xx	Production MH Cost/MH Cost	Production MH Cost/MH Cost	Cost/Unit Cost	Cost/Unit Cost	Cost/Unit Cost	

# Part 3: Cost Estimate Summary

ADDITIONS + REMOVALS:

Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$739,395	
Estimated Future Overheads:	\$290,569	
Estimated Future AFUDC:	\$10,150	<u></u>
Subtotal Future Costs:	\$1,040,114	_
Contingency Applied:	\$0	0.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$1,040,114	
VALS SUMMARY:		
d To-Date:		
Raw Costs Incurred To-Date:	\$0	
	\$0	This figure must be manually entered if applicable
Overhead Costs Incurred To-Date:	<del></del>	
	\$0	<del></del>
Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs:		
Subtotal Costs To-Date:	\$0	_
Subtotal Costs To-Date: Estimated Future Raw Costs:	<b>\$0</b> \$153,500	<del>-</del> =
subtotal Costs To-Date: Estimated Future Raw Costs: Estimated Future Overheads:	<b>\$0</b> \$153,500 \$32,427	Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.

\$1,226,041

Assumptions, Notes, Clarifications, etc.:



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

<u>Project Name:</u> MG Line 115kV Upgrade <u>Date:</u> 4/8/2022 <u>WO #:</u> 8652

Prepared By: John Dittmann Revision(s):

<u>Cost Estimate Level:</u> Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Par	t 1: Additions						* All u	nit and total c	ost figure	es should be	e "raw cost	s", <u>without</u> aı	ny overhead r	markups. Mark	cups are ger	nerated at the e	nd of the e	stimate.
				Costs Incurred To-Date*	Me	onthly Pay	roll*		Weekly	y Payroll*		Stock M	/laterials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH Cost/	MH Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	PLANNING & ENGINEERING																	
	Engineering Design	50	Hours		1.0		00 3,00		0		0		0		0		0	
	Engineering Supervision; Project Sponsor	50 24	Hours	1	1.0	50 60 0	00 3,00		0		1.5(0		0		0		0	
	Engineering Drafting Surveyors / Structure Stakeout	1	Hours Units	1		0		0 1.0	24		1,560		0		0	5,000.00	5,000	
A.5	Surveyors / Structure Stakeout		UTIILS			0		0	0		0		0		0	5,000.00	3,000 N	
A.6						0		0	0		0		0		0		0	
A.7						0		0	0		0		0		0		0	
A.8		1		1		0		0	0		0		0		0		0	
A.9						0		0	0		0		0		0		0	
A.10						0		0	0		0		0		0		0	
A.11																		
В	PROJECT MANAGEMENT, ENVIRONMENTAL & SUPPORT SERVICES																	
	Environmental Services	8	Hours		1.0		00 48		0		0		0		0		0	
	Real Properties	8	Hours		1.0		00 48		0		0		0		0		0	
	T&D Supervision	60	Hours		1.0		00 3,60	00	0		0		0		0		0	
B.4				1		0		0	0		0		0		0		0	
B.5				1		0		0	0		0		0		0		0	
B.6						0		0	0		0		0		0		0	
B.7 B.8						0		0	0		0		0		0		0	
B.9						0		0	0		0		0		0		<u> </u>	
B.10						0		0	0		0		0		0		0	
D. 10						0		0	0		0				0		0	
C	GENERAL CONDITIONS			†														
	Environmental Controls / Restoration	1	Unit	1		0		0	0		0		0		0	50,000.00	50 000	Matting Likely Near Modena
C.2	Environmental Contiols / Nestoration	1	OTIIL			0		0	0		0		0		0	30,000.00	30,000	Matting Likely Near Moderia
C.3				1		0		0	0		0		0		0		0	
C.4				†		0		0	0		0		0		0		0	
C.5						0		0	0		0		0		0		0	
C.6				1		0		0	0		0		0		0		0	
C.7						0		0	0		0		0		0		0	
C.8						0		0	0		0		0		0		0	
C.9						0		0	0		0		0		0		0	
C.10						0		0	0		0		0		0		0	
	MAJOR EQUIPMENT & MATERIALS																	

				Costs Incurred To-Date*		Monthly Payroll	k		Weekly	Payroll*		Stock Mate	erials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	Standard Stock Poles	8	Units			0	0		0		0	12,000.00	96,000		0		0	90' Poles Typical
	Standard Stock Hardware	8	Units			0	0		0		0	4,000.00	32,000		0		0	
	Conductor	2,000	Feet			0	0		0		0	2.00	4,000		0			Drake ACSR
	Static Wire	1,000	Feet			0	0		0		0	1.50	1,500		0		0	Petrel ACSR
D.5						0	0		0		0		0		0		0	
D.6						0	0		0		0		0		0		0	
D.7						0	0		0		0		0		0		0	
D.8						0	0		0		0		0		0		0	
D.9						0	0		0		0		0		0		0	
D.10						0	0		0		0		0		0		0	
Е	CONSTRUCTION																	
E.1	Line Construction	10	Days			0	0		0		0		0		0	7,000.00	70,000	
E.2	Pole Holes / Anchors	8	Units			0	0		0		0		0		0	3,000.00	24,000	
E.3	ROW Improvements / Gates	1	Unit			0	0		0		0		0		0	7,500.00	7,500	
E.4	Showup / Dumpsters	1	Unit			0	0		0		0		0		0	2,000.00	2,000	
E.5	Construction Moves	1	Unit			0	0		0		0		0		0	10,000.00	10,000	
	Foreman / Field Supervision	150	Hours		1.0	150 60.00	9,000		0		0		0		0		0	
E.7	Field Clerks / Electricians / Riggers	75	Hours			0	0	1.0	75	65.00	4,875		0		0		0	
E.8						0	0		0		0		0		0		0	
E.9						0	0		0		0		0		0		0	
E.10						0	0		0		0		0		0		0	
				0		 	19,560			<u> </u>	6,435		133,500	<u> </u> 	0	<u> </u>	168,500	
				<u> </u>	l [	326	17,500	<u>"</u> [	99	<u>L</u>	0,433		133,300	<u> </u>	0	y l	100,000	
					Manhours	Monthly Payroll		Manhour	s Weekly I	Payroll								

Par	rt 2: Removals							* All unit a	nd total cost	figures	should be	"raw costs",	, <u>without</u> any o	overhead ma	arkups. All ma	rkups are ge	enerated at the	end of the e	estimate.
				Costs Incurred To-Date*	M	lonthly	Payroll	<b>k</b>	,	Weekly	Payroll*		Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
F.1	Line Construction	10	Days			0		0		0		0		0		0	3,000.00	30,000	
F.2	Showup / Dumpsters	1	Unit			0		0		0		0		0		0	7,500.00	7,500	
F.3	ROW/ Gates	1	Unit			0		0		0		0		0		0	3,000.00	3,000	
F.4	Restoration	1	Unit			0		0		0		0		0		0	25,000.00	25,000	
F.5	Foreman	50	Hours		1.0	50	60.00	3,000		0		0		0		0		0	
F.6						0		0		0		0		0		0		0	
F.7						0		0		0		0	_	0		0		0	
				0	Manhours	50 Monthly	1	3,000	Manhours	0 s Weekly	Payroll	0		0		0		65,500	

				Costs Incurred To-Date*	N	Monthl <sub>.</sub>	y Payroll*			Weekly	Payroll*		Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

**GRAND TOTAL** 

ADDITIONS + REMOVALS:

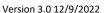
TIONS SUMMARY: red To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	=
Estimated Future Raw Costs:	\$327,995	
Estimated Future Overheads:	\$128,836	
Estimated Future AFUDC:	\$4,502	_
Subtotal Future Costs:	\$461,333	=
Contingency Applied:	\$0	0.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$461,333	

\$0	
\$0	This figure must be manually entered if applicable
\$0	<del>_</del>
\$68,500	
\$13,929	
\$82,429	<del>_</del>
\$0	O.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
\$82,429	
	\$0 \$0 \$68,500 \$13,929 \$82,429 \$0

\$543,762

Assumptions, Notes, Clarifications, etc.:







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: FK Line 115kV Upgrade (Kerhonkson - High Falls)

Budget Group: Electric Budget Category: 12

Funding Project Number: 10401

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/31/2024

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

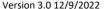
This Project is being completed in conjunction with the MG Line, GK Line and P Line 115kV Upgrade projects in Cat#12 as well as various other Cat#13 projects with the goal of completing the objective of the original P, MK, HK Article VII project scope and energizing the related lines and substations up to 115kV operation.

#### Describe the project objective and scope of work:

Central Hudson's "P", "FK", "MG", "GK", "MK" and "HK" lines are were constructed in the mid-90s as part of a PSC Article VII project and are currently operated at a voltage of 69kV. As part of the open Article VII permit, these lines are intended to be energized to 115kV pending the completion of several related substation improvement projects. Given the age of the lines, any outstanding infrastructure concerns that may exist as a result will need to be completed to ensure that these lines meet the appropriate clearance and strength criteria to support the upgrade. There are also several substation exits that will need to be re-routed as well and are included on the appropriate line scope. The "FK" Line between Kerhonkson and High Falls will need to be reviewed and any potential infrastructure-related issues or clearance issues addressed in advance of the

#### Describe specific scope exclusions, assumptions and constraints:

The conceptual scope does not account for any specific construction, matting, access and/or environmental control provisions in excess of the proforma pricing.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is being completed in accordance with Planning Memo "E.P#2010-008" & "E.P#2017-014".

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The project will reduce the risk of any potential unplanned outage caused by an unexpected in-service failure. Such an outage would require an unplanned emergency repair project to be executed at premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

#### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric

#### ESG (Environmental, Social and Governance) and Sustainability:

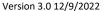
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Please refer to the planning memo for information on the 115kV Upgrade. Repair and replacement options will both be considered when designing the upcoming project to ensure the line is ready for 115kV operation in the most efficient and cost effective manner possible.

#### Why was the proposed project scope chosen over other alternatives?

Preliminary line analysis indicates some conductor clearance issues at both structures and spans that will need to be addressed to allow for 115kV operation. It is assumed based on the age and condition of the line that synergies with inspection condition mitigation and these potential issues can be addressed together via structure replacements.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

In order to support the timeline of the Cat#13 projects and 115kV cut-over date, this and other Cat#12 projects need to be completed in advance.

#### What are the risks and consequences of not completing this project?

If the Cat#12 projects supporting the 115kV upgrade are not completed consistent with the Cat#13 project timelines there will be a risk of delaying the upgrade or putting new Substation equipment in an abnormal operating condition.

### Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

#### What other factor were considered during the prioritization process?

The Project also includes work that would typically be done under the High Priority Replacement Program. Prioritizing the 115kV project allows us to apply synergies between the two project objectives and help reduce the risk of in-service failures while also readying the line for 115kV Operation.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$1,096,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
A D D I T I O N S	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	95,400		95,400					
	Stock Materials	0							
	Non-Stock Material (A/P taxable)	241,000		241,000					
	Contractors (A/P tax exempt)	626,600		626,600					
	Overheads	0							
	AFUDC*	0							
	Journal Vouchers (JVs)	0							
	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	963,000	0	963,000	0	0	0	0	0
E T I R E M E N T	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	13,000		13,000					
	Contractors (A/P tax exempt)	117,000		117,000					
	Overheads	3,000		3,000					
	Journal Vouchers (JVs)	0							
	Salvage CREDIT	0							
	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL REMOVALS:	133,000	0	133,000	0	0	0	0	0
* AFUDC may require adjustment after Finance Department review.									
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	1,327,000	1,327,000	0					

2021-2023 Prior years funding;

2024



Version 3.0 12/9/2022

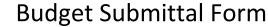
**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Scope assumes replacement of structures and some minor line modification work, if those assumptions change based on the detailed design and scoping process then the project costs will need to be adjusted. Basis for estimate: Historical Data + Job Specific Adjustments

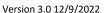
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Cost Estimate is based on a tentative scope of 11 Structure Replacements at a rate of \$90K per Structure (\$80K "A" & \$10K "R").

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on a conceptual base pro-forma per single pole structure. The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removal costs are split 90/10 by Contractor AP and Internal Labor respectively. Splits are applied to estimates as well as prior year / projections column as well.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: P Line 115kV Upgrade (High Falls - Sturgeon Pool)

Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: 10402
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2022 In-Service: 12/31/2024

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

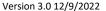
This Project is being completed in conjunction with the MG Line, GK Line and FK Line 115kV Upgrade projects in Cat#12 as well as various other Cat#13 projects with the goal of completing the objective of the original P, MK, HK Article VII project scope and energizing the related lines and substations up to 115kV operation.

#### Describe the project objective and scope of work:

Central Hudson's "P", "FK", "MG", "GK", "MK" and "HK" lines are were constructed in the mid-90s as part of a PSC Article VII project and are currently operated at a voltage of 69kV. As part of the open Article VII permit, these lines are intended to be energized to 115kV pending the completion of several related substation improvement projects. Given the age of the lines any outstanding infrastructure concerns that may exist as a result will need to be completed to ensure that these lines meet the appropriate clearance and strength criteria to support the upgrade. There are also several substation exits that will need to be re-routed as well and are included on the appropriate line scope. The "P" Line from Sturgeon Pool to High Falls will need to be reviewed and any potential infrastructure-related issues or clearance issues addressed in advance of the upgrade. A small re-route will also need to be done at the Sturgeon Pool Substation to connect the line to the 115kV Dead end structure.

### Describe specific scope exclusions, assumptions and constraints:

Actual project scope may vary from the assumed in the estimate based on the detailed design and permitting.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is being completed in accordance with Planning Memo "E.P#2010-008" & "E.P#2017-014".

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The project will reduce the risk of any potential unplanned outage caused by an unexpected in-service failure. Such an outage would require an unplanned emergency repair project to be executed at premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

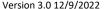
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

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### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Please refer to the planning memo for information on the 115kV Upgrade. Repair and replacement options will both be considered when designing the upcoming project to ready the line for 115kV operation in the most efficient and cost effective manner possible.

#### Why was the proposed project scope chosen over other alternatives?

Preliminary line analysis indicates some conductor clearance issues at both structures and spans that will need to be addressed to allow for 115kV operation. It is assumed based on the age and condition of the line that synergies with inspection condition mitigation and these potential issues can be addressed together via structure replacements.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

In order to support the timeline of the Cat#13 projects and 115kV cut-over date, this and other Cat#12 projects need to be completed in advance.

### What are the risks and consequences of not completing this project?

If the Cat#12 projects supporting the 115kV upgrade are not completed consistent with the Cat#13 project timelines there will be a risk of delaying the upgrade or putting new Substation equipment in an abnormal operating condition.

Yes

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $N\!/\!A$ 

### What other factor were considered during the prioritization process?

The Project also includes work that would typically be done under the High Priority Replacement Program. Prioritizing the 115kV project allows us to apply synergies between the two project objectives and help reduce the risk of in-service failures while also readying the line for 115kV Operation.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates s e adjustments for			
	\$991,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	90,000	51,000	39,000					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	225,000	127,500	97,500					
Ĭ	Contractors (A/P tax exempt)	585,000	331,500	253,500					
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	900,000	510,000	390,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	81,000	49,500	31,500					
	Contractors (A/P tax exempt)	9,000	5,500	3,500					
R	Overheads	1,000		1,000					
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	91,000	55,000	36,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depa	rtment review.							
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	622,000	622,000	0					

2021-2023

Prior years funding; not actuals.

2024



Formulas give standard ranges

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT

**Cost Estimate Level:** Conceptual

(that final cost will be within +/-30% of the estimate): **Cost Estimate Confidence: High Confidence** 

No further estimate range is required.

← per estimate level, but may be Maximum (\$): **Cost Estimate Range:** Minimum (\$): 693,700 1,288,300

No explanation on confidence level required.

overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

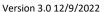
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Cost Estimate is based on a tentative scope of 11 Structure Replacements at a rate of \$90K per Structure assuming above average difficulty in each replacement to account for other actions that may be needed with regards to the the 115kV upgrade.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on a conceptual pro-forma per single pole structure. The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals are split 90/10 but Contractor AP and Internal Labor respectively. Splits apply to estimates as well as prior year / projected costs.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

### A. GENERAL

**Project/Program Name: ROW Repair Project (Deficiencies)** 

Work Order #:

**Budget Group:** Electric **Budget Category:** 12 **Funding Project Number:** 

1-1232-00-18

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

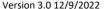
This program is comprised of various work orders identified and opened annually based on the upcoming capital project schedule.

#### Describe the project objective and scope of work:

Central Hudson had committed voluntarily to obtain additional right of way as follow up to the Northeast Blackout of 2003. The report to the PSC stated that we would identify easements that were deficient in width from the standard of 100 foot on 69kV and 115kV lines and 150 foot on 345kV lines. Central Hudson is identifying easement deficiencies along its 69kV, 115kV and 345kV transmission line corridors. The adjacent property owners are being identified and, if not already, will be contacted in an attempt to acquire the additional ROW as needed to mitigate the deficiencies. A vendor will be chosen to provide all of the required work and services to document and obtain additional easement agreements throughout the service territory.

### Describe specific scope exclusions, assumptions and constraints:

Individual line deficiency scopes will vary depending on the number of R.O.W. deficiencies identified as well as the rate of acquisition.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The projected is needed to help reduce risk by securing adequate rights along our existing electric transmission corridors to ensure safe operation and maintenance.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The acquisition of additional access and easement rights in our transmission corridors will increase our ability to access our structures in emergencies and for maintenance projects thereby reducing costs. It could also reduce the risk of costly claims or payouts to customers for access or restoration.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

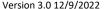
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

In some cases, line relocation can serve as an alternative to acquiring additional Easement to mitigate deficiencies. This can be an effective option for small stretches of line where property owner negotiation does not prove successful or on a complete project rebuilds where there is more design flexibility.

### Why was the proposed project scope chosen over other alternatives?

In most cases where the line in question does not require rebuild, and the deficiency is isolated to a single or small location, the most cost effective option is to pursue the additional easement rights. Depending on the extent of the deficiency, acquiring a complete corridor in either case is preferred.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

The lines being surveyed and analyzed for deficiency acquisition opportunities are one that have upcoming capital projects that will benefit from the additional rights. It is important to continue to pursue the additional rights in advance of project construction.

Yes

### What are the risks and consequences of not completing this project?

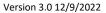
If additional rights are not acquired, it could inhibit our ability to access and maintain our lines as well as affect reliability by not affording us the ability to completely trim our corridors to the greatest extent possible or respond to emergencies.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





### **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates st e adjustments for l			
	\$2,801,257	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	200,000		40,000	40,000	40,000	40,000	40,000	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	2,445,257	645,257	360,000	360,000	360,000	360,000	360,000	
Т	Overheads	156,000			16,000	35,000	42,000	63,000	
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,801,257	645,257	400,000	416,000	435,000	442,000	463,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

1,550,000

2,307,000

757,000



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Cost estimate is based on a placeholder for the ROW Deficiency Program of \$400K. Actual expenditures may vary depending on the length of the lines surveyed, number and extent of deficiencies found and response of landowners to offer requests. Basis for estimate: Historical Proforma Pricing

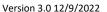
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Cost Estimate is based on the company pursuing the survey 2 to 3 Lines per year at an estimated cost of \$100K per year with associated supporting internal / contracted supporting services and potential acquisitions.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Estimates are split 90/10 Contractor AP and Internal Labor respectively.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Trap Rock Substation Tie-In and Retirement of 69kV TR Line

Work Order #:

1-1212-05-17

**Budget Group:** Electric

Budget Category:

Funding Project Number: Target Schedule - Start: 1/1/2024 In-Se

In-Service: 6/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There will potentially be other Cat#13 Work Orders required to support the installation of a new Substation on Tilcon's property and the retirement / removal of the existing Knapp's Corners Substation.

12

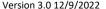
#### Describe the project objective and scope of work:

Is this a Specific Project, Program or Blanket? Specific

The TR Line is a 69 kV line approximately 2.4 miles long, connecting the Knapps Corners Substation to the Tilcon Quarry. The majority of the line has 1/0 Copper conductor from 1929 and older wood structures that have reached the end of thier useful life. Given the existing right-of-way constraints of the "TR" Line corridor, Central Hudson is currently investigating the feasibility of installing a small substation and 115/69kV transformer at the existing intersection of the 69kV "TR" Line and 115kV "SC" Line to allow for the retirement of all but 0.4 Miles of the existing "TR" Line and its removal through a densely populated residential area.

### Describe specific scope exclusions, assumptions and constraints:

Conceptual Project assumptions do not assume special provisions for access, matting, environmental controls or permitting.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure; Reliability; Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is needed to remove existing assets that have reached the end of their useful life.

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The retirement and removal of the line from the existing residential areas will reduce the need for costly access and restoration during maintenance projects and reduce overall risk by removing the facilities from a high-density residential area.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

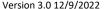
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

A complete rebuild of the existing 69kV TR Line was considered as an alternative to the "SC" Line Substation option.

### Why was the proposed project scope chosen over other alternatives?

The installation of the proposed "SC" Line substation on the Tilcon Quarry property would shorten the length of the TR Line, remove a portion of the line that traverses several heavy residential areas and confine it to Tilcon's property while providing the ability to retire the existing line assets in all residential and commercial areas near Route 9. It would also allow for the retirement and removal of the existing Knapp's Corners Substation 69kV structures on Spring Road.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

Completing the project in the requested timeframe will reduce the risk of an aged asset failing unexpectedly and causing damage to private property and requiring a costly unplanned repair.

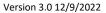
### What are the risks and consequences of not completing this project?

The longer the old assets remain in place, there is an elevated risk of failure.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





### **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates s e adjustments for			
	\$1,932,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	137,800	51,000				86,800		
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	247,000	30,000				217,000		
ı	Contractors (A/P tax exempt)	642,200	78,000				564,200		
Т	Overheads	91,000					91,000		
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,118,000	159,000	0	0	0	959,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	74,000					74,000		
	Contractors (A/P tax exempt)	676,000	16,000				660,000		
R	Overheads	64,000					64,000		
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	814,000	16,000	0	0	0	798,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

1,404,000

1,404,000

0



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be Minimum (\$): **Cost Estimate Range:** Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Specific project details relevant to the removal of the structures is still unknown such as environmental and access constraints and local permitting. Plans for the new SC Line Substation also need to be finalized pending negotiations with Tilcon. Basis for estimate: Historical Data + Job Specific Adjustments

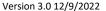
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Conceptual Transmission cost estimates to support the substation option were based on the removal of (40) single pole wood structures and associated conductor at \$18k per structure (includes wire removal) and the installation of (10) new single pole steel structures at approx. \$90k per structure to account for permitting and potential ROW acquisition costs.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Estimates assumes a 90/10 split for AP and internal labor charges related to the removal of the line. For the installation of the new structure, an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively was used. These splits were generally applied to 2021-2023 Actuals / Projections.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 3 Pre-Construction

### A. GENERAL

**Budget Group:** 

Project/Program Name: 69kV KM Line Rebuild - Knapps to Myers

Budget Category: 12

Work Order #: 5 7 7 2 - F

1-1212-15-16

**Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 2/1/2017 In-Service: 6/1/2024

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There will be other work orders in Cat#13 related to any required substation modification work as a result of the new line.

#### Describe the project objective and scope of work:

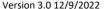
Electric

Replacement of the 2.9-mile long 69 kV electric transmission line between Knapps Corners Substation (Town of Poughkeepsie) and Myers Corners Substation (Town of Wappinger) due to an aging and deteriorating condition. Inspections indicate that approximately 58% of the structures on the line are in need of replacement. Additionally, portions of the static wire are 5/16" steel, which has been been identified as problematic and is in need of replacement/upgrade. All structures, conductor and static wire will be replaced.

### Describe specific scope exclusions, assumptions and constraints:

Three of the replacement poles (KM 50, KM 51 and KM 52) are located on the Knapps Corners Substation property and are permitted for replacement via the New Knapps Corners Substation project. However, they will be replaced under work order 5772 A/R. Consequently, from a permitting perspective the Site Plan Application for the KM Line Replacement project covers replacement poles KM 1 through KM 49.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Please reference EP Memos "EP2018-010" and "EP2005-010"

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Infrastructure replacement is required to maintain reliability of the electric transmission line.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

PSL Part 102 with municipal approval(s)

### ESG (Environmental, Social and Governance) and Sustainability:

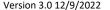
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

The KM Line is critical electric infractructure that must be maintained safely, reliably and cost effectively. The decision to replace the facility in-kind on on it's existing ROW was evaulated as the most cost-effective option.

### Why was the proposed project scope chosen over other alternatives?

Please see response above as well as the referenced planning memos.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

Prior inspections of the KM Line in concert with its ongoing deteriotation status have resulted in the need to replace the KM Line at this time, in order to maintain system reliability and integrity.

Yes

What are the risks and consequences of not completing this project?

Loss of system reliability and integrity.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

### What other factor were considered during the prioritization process?

Inspections and reviews of other electric transmission lines in terms of condition, reliability and integrity.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st 5-year bu				r cost estimates s e adjustments for			
	\$8,888,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	772,100	510,800	261,300					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,930,250	1,277,000	653,250					
ī	Contractors (A/P tax exempt)	5,018,650	3,320,200	1,698,450					
Т	Overheads	266,000		266,000					
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	7,987,000	5,108,000	2,879,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	89,400	59,300	30,100					
H	Contractors (A/P tax exempt)	804,600	533,700	270,900					
R	Overheads	7,000		7,000					
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	901,000	593,000	308,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depa	rtment review.							
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	3,618,000	3,618,000	0					

2021-2023

Prior years funding;
not actuals.

2024



Formulas give standard ranges

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 7,110,400 Maximum (\$): 10,665,600 

— per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

The Cost Estimate Range provided above is based on the current proforma, with some understanding that (unplanned) weather-related issues could impact the final project cost (+ or -).

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on the total conceptual project cost provided and detailed in the provided estimate. The cost breakdown provided above is displayed based on an averaged historical percentage split of project Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. This historical split has also been applied to the prior year actuals / projections column as well.



 $Note: \ \textit{Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important}$  $formulas. \ If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. \ Caution$ should be used in order to keep the integrity of the spreadsheet.

Miles

Project Name: KM Line Rebuild Prepared By: Sam Pozorski

Date: 12/30/2022

Revision(s):

WO #: 5772

3.16

Cost Estimate Level:

Pa	rt 1: Additions							* All unit	and total co	st figures	s should b	e "raw cost	s", <u>without</u> any	overhead n	markups. Mark	cups are ge	enerated at the e	nd of the e	estimate.	
				Costs Incurred To-Date*		Month	ly Payroll'	<b>k</b>		Weekly	Payroll*	•	Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes	
#	Work Breakdown Structure (WBS)	Quantity	Units	through 12/31/22	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		2023/202 Projectio
Α	PLANNING & ENGINEERING																			
A.1	Elec Trans Design - Engr (121)-MP WP	52	weeks	75,466	16.0			59,072	0.1	5	71.00	369		0		0		0		
A.2	Elec Trans Desn-Supv&Supt (121)-MP	52	weeks	14,308	4.0			14,768		0		0		0		0		0		
A.3	Elec System Protection (125) - MP	26	weeks	48	1.0			1,846		0		0		0		0		0		
A.4	Elec System Planning (126) - MP	26	weeks	3,132	1.0			1,846		0		0		0		0		0		
<b>A</b> .5	Engr Drafting (132) - MP WP	20	days	8,495	0.5			710			71.00	11,360		0		0		0		
A.6	Op. Svcs General (211) - MP	3	days	0	1.0		71.00	213		0		0		0		0		0		
A.7	Engineering - Admin. (310) - MP	5	days	81	4.0	20	71.00	1,420		0		0		0		0		0		
A.8	System Ops (330) - MP WP	3	days	0		0		0	3.0	9	71.00	639		0		0		0		
A.9	Network Strategy (331) - MP	3	days	0	5.0			1,065		0		0		0		0		0		
A.10	EMS / SCADA (730) - MP	3	days	0	5.0	15	71.00	1,065		0		0		0		0		0		
В	PROJECT MANAGEMENT, ENVIRONMENTAL & OTHER SUPPORT SERVICES																			
B.1	Project Mgmt (110) - MP	52	weeks	35,202	8.0	416	71.00	29,536		0		0		0		0		0		
B.2	Real Property Svcs (124) - MP	52	weeks	10,674	1.0	52		3,692		0		0		0		0		0		
B.3	Environmental Affairs (726) - MP	52	weeks	3,166	1.0	52	71.00	3,692		0		0		0		0		0		
B.4	Network Mapping - AP	1	lot	3,879		0		0		0		0		0		0	3,786.42	3,786		
B.5	Survey Staking (Maser/Colliers) - AP	1	lot	7,891		0		0		0		0		0		0	40,000.00	40,000		
B.6	Orion Magnetics - AP			2,400		0		0		0		0		0		0		0		
B.7	Williams Aviation - AP	1	lot	25,250		0		0		0		0		0		0	5,000.00	5,000		
B.8	Environ. Design & Research (EDR) - AP	1	lot	118,559		0		0		0		0		0		0	40,000.00	40,000		
B.9	Cuddy & Feder - AP	1	lot	199,976		0		0		0		0		0		0	10,000.00	10,000		1
B.10	SEDC Engineering - AP			43,461		0		0		0		0		0		0	1,853.00	0		1
B.11						0		0		0		0		0		0		0		
						0		0		0		0		0		0		0		1
						0		0		0		0		0		0		0		1
						0		0		0		0		0		0		0		1

			Costs Incurred To-Date*	ı	Monthly Payroll*		١	Weekly Payro	ll*	Stock Mat	erials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes	
# Work Breakdown Structure (WBS)	Quantity	Units	through 12/31/22	Production MH/Unit	MH Cost/MH	Cost	Production MH/Unit	MH Cost/M	H Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		2023/2024 Projection
C GENERAL CONDITIONS																	
C.1 LaBelle Prop (Equip Laydn&Office)-AP	18	months	12,000		0	0		0	0		0		0	3,000.00	54,000		
C.2 Sean Thompson - AP	18	months	29,000		0	0		0	0		0		0	1,000.00	18,000		1
C.3 JPF Dev AP			106,400		0	0		0	0		0		0		0		
C.4 Cross Court - AP			28,000		0	0		0	0		0		0		0		
C.5 Todd Fowler - AP			17,085		0	0		0	0		0		0		0		
C.6 Purchasing Card (Citizen Bank) - AP	1	lot	1,614		0	0		0	0		0	5,000.00	5,000		0		
C.7 Canon/Pitney Bowes - AP	1	lot	1,309		0	0		0	0	_	0	500.00	500		0		
C.8 Town of Wappinger - AP	1	lot	13,175		0	0		0	0		0		0	10,000.00	10,000		
C.9 Town of Poughkeepsie - AP	1	lot	4,525		0	0		0	0		0		0	6,000.00	6,000		
C.10 JRL VCHR + WOADJ: (JV+WOA)			297,121		0	0		0	0		0		0		0	Reduced by 12/22 Riggs Estimate of \$22	4361 for Drilling and KM51
D MAJOR EQUIPMENT &																	
MATERIALS																	
D.1 Steel Poles (45)	1	lot			0	0		0	0		0	327,381.00	327,381			PO#93688	April 2023
D.2 Hybrid Poles (11)	1	lot			0	0		0	0	0.00	0	201,379.00	201,379			PO#93649	April 2023
D.3 Conductor		LB			0	0		0	0	3.92	179,085		0			30-50-140	Late 2023 or early 2024
D.4 OPGW	20,000	F I			0	0		0	0	3.34	66,850		0			30-50-205	Late 2023 or early 2024
D.5 Standard Stock D.6 Braced Post Insulator Assemblies	1	lot			0	0		0	0	117,929.80	117,930	101,105.46	101,105			Estimated Tan, Swing, DE, 2P Tan Strs PO#93165	Late 2023 or early 2024 February 2023
D.7 Post Insulators	1	Int			0	0		0	0		0	16,547.76	16,548			PO#93147	February 2023
D.8 OPGW Suspension Clamps	45	DC			0	0		0	0		0	103.92	4,676		0	F 0# 73 147	June 2023
D.9 FAA Lights	2	as			0	0		0	0		0	5,846.40	11,693		0		June 2023
D.10 Misc Rebuild Material	1	lot			0	0		0	0	10,000.00	10,000	20,000.00	20,000		0		2024
D.11 KM Knps Crnr Poles - Sabre (KM50 to KM 52)	1	lot	70,298		0	0		0	0	10/000100	0	0.00	0		0	PO#92276	2022
D.12 KM Knapps Corners Braced Post Ass	1	lot			0	0		0	0		0	2,660.67	2,661		0	PO#92436	February 2023
D.13 KM Knapps Corners High Angle Suspension Clamps	1	lot			0	0		0	0		0	1,844.58	1,845		0	PO#92376	January 2023
D.14 KM Knapps Corners Station Tie Poles		lot			0	0		0	0	14,541.00	14,541		0		0		February 2023
D.15 KM Knapps Corners Station Tie Clamps		lot			0	0		0	0		0	1,535.90	1,536			PO#92246	January 2023
D.16 KM Knapps Corners Station Tie Cond		LB			0	0		0	0	2.21	2,417		0			30-50-134	February 2023
D.17 KM Knapps Corners Station Tie Static	152	LB			0	0		0	0	1.44	219		0		0	30-50-133	February 2023
D.18 Standard Stock - Knapps Corners and Station Tie	1	lot			0	0		0	0	21,307.61	21,308		0		0		February 2023
D.19 KM Knapps Corners Tie Connectors	10	рс	211		0	0		0	0			0.00	0		0	PO#94356	2022
D.20 Misc	1	lot			0	0		0	0	500.00	500	1,000.00	1,000		0		February 2023

			Costs Incurred To-Date*	N	Monthly Payr	oll*		Weekly	Payroll*		Stock Mat	terials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes	
# Work Breakdown Structure (WBS)	Quantity	Units	through 12/31/22	Production MH/Unit	MH Cost/N	H Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		2023/2024 Projection
E CONSTRUCTION																		Remainder in 2024 e
E.1 Line Construction	1.0	lot			0	0		0		0		0		0	897,030.75		TV Bid \$/str unit pricing for KM scope	
E.2 Drilling	1.0	lot	134,648		0	0		0		0		0		0	584,049.57		((TV Bid)*51/103)*1.3. 54 Total KM struc	
E.3 KM51 Foundation	1	lot	89,713		0	0		0		0		0		0	26,111.65	26,112		January 2023
E.4 Matting	0.8	lot			0	0		0		0		0		0	404,835.89	323,869	((TV Bid)*54/107)*1.3)	Use January Estima
E.5 Matting (2022) Out On A Limb-AP			316,800		0	0		0		0		0		0		0		
E.6 Matting (2022) KW Reese- AP	1	lot	388,864		0	0		0		0		0	0.00	0		0	TBD	
E.7 Civil / Envir / Rest	6.0	months			0	0		0		0		0		0	92,400.00		TV Est/2*1.3 (80/20)	  -
E.8 ROW/Gates	0.8				0	0		0		0		0		0	50,000.00	40,000		=
E.9 Project Construction (215) - MP WP	26	weeks	7,283	14.0	364 71.0	0 25,844	48.0	1,248	71.00	88,608		0		0		0		
E.10 Clerical (216) - WP	26	weeks	26		0	0	0.2	5	71.00	369		0		0		0		
E.11 Op Svc-Gen (221,223,224,225,226)-WP	26	weeks	0		0	0	12.0	312	71.00	22,152		0		0		0		
E.12 Op. Svcs General (592) - WP	26	weeks	0		0	0	4.0	104	71.00	7,384		0		0		0		
E.13 NY Drilling Svcs & Riggs Distler - AP			18,639		0	0		0		0		0		0		0		
E.14 Independent Helicopter - AP			1,270		0	0		0		0		0		0		0	TBD	
E.15 Out On A Limb-AP			34,961		0	0		0		0		0		0		0	TBD	
E.16					0	0		0		0		0		0		0		
E.17					0	0		0		0		0		0		0		
			2,124,930			144,769	<u> </u> 			130,881		412,849		695,324		2,612,247		1

2,039 1,843 Manhours Monthly Payroll Manhours Weekly Payroll

Pa	rt 2: Removals						5	* All unit ar	nd total cost	figures s	should be	"raw costs"	, <u>without</u> any o	verhead m	arkups. All mai	rkups are g	enerated at the	end of the	estimate.
				Costs Incurred To-Date*	N	/lonthl	y Payroll'	*	,	Neekly	Payroll*		Stock Ma	terials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through 12/31/22	Production MH/Unit	МН	Cost/MH		Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
R.1	Project Mgmt (110) - MP	52	weeks	35,240	2.0	104	71.00	7,384		0		0		0		0		0	
	Line Construction	1.0	lot			0		0		0		0		0		0	188,677.50		TV Bid \$/str unit pricing for KM scope
	G Line Removal	1.0	lot			0		0		0		0		0		0	72,751.80	72,752	. ,
	Matting	0.2				0		0		0		0		0		0	404,835.89		1/4 of TV (80/20)
	Civil / Envir / Rest	6.0	months			0		0		0		0		0		0	28,600.00		TV Est/2*1.3 (80/20)
	ROW/Gates	0.2				0		0		0		0		0		0	50,000.00	10,000	
R.2	Project Construction (215) - MP WP	26	weeks	0		0		0	12.0	312	71.00	22,152		0		0		0	
R.3	Op. Svcs Genl (224) - WP	52	weeks	0		0		0	0.1	5	71.00	369		0		0		0	
R.4	Out On A Limb - AP			697		0		0		0		0		0		0		0	TBD
	Out On A Limb-Matting Purch. (2022) - AP			79,200															
R.5	KW Reese-Matting Purch. (2022) - AP	1	lot	97,216		0		0		0		0		0	0.00	0		0	TBD
R.6	Riggs Distler - AP			181		0		0		0		0		0		0		0	TBD
R.7	Journal Voucher - JV			9,016															
						0		0		0		0		0		0		0	
-	<u> </u>		•	221,550				7,384				22,521		0		0		523,996	
				<u> </u>		104	] "			317	]		1		<u>.</u>		4 L		I

		Costs Incurred To-Date*	Monthly I	Payroll*	We	eekly Payroll*	<b>,</b>	Stock Mat	terials*	Non-Stock N		Contractors (A/P Tax-E		Notes	
#	Work Breakdown Structure (WBS) Quantity	Units through 12/31/22	Production MH C	Cost/MH Cost	Production MH/Unit	MH Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		2023/2024 Projection

Manhours Monthly Payroll Manhours Weekly Payroll

# Part 3: Cost Estimate Summary

DITIONS SUMMARY:		
urred To-Date: Raw Costs Incurred To-Date:	\$2,124,930	
Overhead Costs Incurred To-Date:	\$284,293	This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:	\$241,954	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$2,651,177	<del></del>
Estimated Future Raw Costs:	\$3,996,070	
Estimated Future Overheads:	\$499,577	
Estimated Future AFUDC:	\$332,643	<u> </u>
Subtotal Future Costs:	\$4,828,290	
Contingency Applied:	\$241,415	5.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$7,720,881	
MOVALS SUMMARY:		
urred To-Date:		
Raw Costs Incurred To-Date:	\$221,550	
Overhead Costs Incurred To-Date:	\$58,768	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$280,318	
Estimated Future Raw Costs:	\$553,902	
Estimated Future Overheads:	\$30,477	
Subtotal Future Costs:	\$584,379	<del></del>
Contingency Applied:	\$29,219	5.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$893,916	
GRAND TOTAL	69.614.709	
ADDITIONS + REMOVALS:	\$8,614,798	

Assumptions, Notes, Clarifications, etc.:

June 3, 2016

TO: Hal Turner, Manager – Electric Engineering Services

CC: Chris Rottkamp Chris DeRoberts Ruby Chan

Eric Loeven Brett Arteta Luke Mangels Rich Wright Cliff Hay Pat Harder

**Kyle Bragg** 

FROM: Brian Dimisko, Project Manager

RE: 69 kV G-Line South Reinforcement / Rebuild Project (3406 A/R)

Assessment of Alternatives Analysis: RECOMMENDATION

Hal,

The 69 kV G-Line South Reinforcement / Rebuild project is being pursued to address an aging infrastructure of the G, KM and TV electric transmission lines. At the same time, the ability to provide incremental area load via the Myers Corners substation also is a consideration, although not a requirement based on load studies. Transmission Planning staff indicate that current load (and projected future load) can be adequately maintained by either a 69 kV or 115 kV solution.

The analysis included a review of the following substation endpoint configurations: (a) Knapps Corners - Myers Corners - Fishkill Plains; and (b) Knapps Corners - Myers Corners - North Chelsea. The analysis included a review of existing ROWs for both configurations, and an alternate ROW corridor that traverses Rt. 9, between Knapps Corners substation and the Nine Mall Plaza (or Kohl's Plaza). It is noted that a traverse of the Rt.9 corridor also would require a new ROW to connect from behind the Nine Mall Plaza to the existing ROW for the TV line corridor.

Since either line voltage provides a solution, a Line Alternatives Analysis was performed to identify the best option. Input was received from Transmission Design, Substation Design, Real Property and Environmental/Permitting. Attributes were identified and scored by the team (using a weighted formula method), which were collectively used to develop a project recommendation.

The following Alternatives were reviewed by the team:

- 1. Upgrade to 115 kV on existing ROW (Knapps Corners Myers Corners Fishkill Plains)
- 2. Upgrade to 115 kV w/ portion on Rt. 9 (Knapps Corners Myers Corners Fishkill Plains)
- 3A. Upgrade to 115 kV on existing ROW (Knapps Corners Myers Corners North Chelsea)
- 3B. Rebuild the 69 kV on existing ROW (Knapps Corners Myers Corners North Chelsea)
- 4A. Upgrade to 115 kV w/ portion on Rt. 9 (Knapps Corners Myers Corners North Chelsea)
- 4B. Rebuild the 69 kV w/ portion on Rt. 9 (Knapps Corners Myers Corners North Chelsea)
- \*5. Upgrade to 115 kV on existing ROW (Knapps Corners Myers Corners North Chelsea): UNDERGROUND transmission (1.5 miles) between Knapps Corners and New Hackensack Rd.; OVERHEAD transmission for remainder (7.4 miles) to Myers Corners and North Chelsea.

<sup>\*</sup> This Alternative was not scored in the Alternatives Analysis spreadsheet (Attribute table).

Based on the Line Alternatives Analysis performed by the project team, the highest (best) score of 511 points was achieved on Alternative 3B: Rebuild the 69 kV line on the existing ROW (Knapps Corners - Myers Corners - No. Chelsea). Scores in descending order were tallied as follows:

Alternative 3A: 448 points
Alternative 1: 424 points
Alternative 4A: 342 points
Alternative 2: 325 points
Alternative 4B: 317 points

Based on the cost estimate analysis performed by the project team, <u>Alternative 3B experienced the lowest (best) cost estimate at \$14.5 million</u>. Ascending cost estimates were tallied as follows:

Alternative 3A: \$14.6 millionAlternative 1: \$17.6 million

Alternative 4B: \$27.8 million

Alternative 4A: \$33.5 millionAlternative 5: \$37.2 million

Alternative 2: \$44.2 million

Alternative 5 (Underground): Based on a 115 kV system traversing the existing ROW for Knapps Corners – Myers Corners – N. Chelsea end points, construction of the underground segment from Knapps Corners substation to New Hackensack Road (at 1.5 miles) is estimated to cost \$25.52 million. Construction of the overhead section for the remainder of the system (at 7.4 miles) is estimated to cost \$7.4 million. The total estimated cost for the entire transmission line is approximately \$37.2 million, which includes estimated costs for the required substation modifications, environmental/permitting needs and ROW acquisitions (for overhead line only; easements currently do not exist for an underground line length of 5,500' between Knapps Corners substation and Wappingers Creek).

The project team is recommending that Alternative 3B be selected as the rebuild project herein. This Option provides for current and future load requirements, and has been vetted by a comprehensive analysis. Upon approval of this option by senior management, the project can move forward to the permitting and design stage.

Submitted By:		
Brian Dimisko		
Project Manager		

Attachment: Line Alternatives Analysis Spreadsheet



**G-Line South Rebuild Project Route Alternatives Analysis** 

SCORING KEY:

A higher score is more favorable than a lower score.

Attribute Weighting:

Raw Scoring:

Weighted Score:

Degree of Difficulty (1=worst case; 2=very challenging; 3=moderately challenging; 4=less challenging; 5=least challenging; 4=least challenging; 5=least challenging; 4=least challenging; 5=least challenging; 4=least challenging; 5=least challenging; 4=least challenging; 4=least challenging; 4=least challenging; 5=least challenging; 4=least challengi

		115 kV	OPTION 1 ONLY: Existing ROW Overhead Route (KC-I				PTION 2 verhead Route - via Rt.			115 kV O	OPTIO NLY: Existing ROW O	Overhead Route (KC-N				OPTION 3B NLY: Existing ROW Overhead Route (KC-MC-NC)		115 kV ONLY:	OPTIO Alternate ROW Over	head Route - via Rt. 9 (KC			Alternate ROW Over	ON 4B head Route - via Rt. 9	
Attribute	Attribute Weighting	Quantity or Desc.	Pros Cons	Raw Weigh Score Sco	ted Quantity	Pros	Cons	Raw Score	Weighted Score	Quantity	Pros	Cons	Raw Score	Weighted Score	Quantity	Pros Cons Raw Wei	ighted core	Quantity	Pros	Cons R	weighte Score	Quantity	Pros		Raw Weighted Score Score
Total Line Length	3	8.5 miles		4 12				3	9	8.9 miles				12	8.9 miles		12	10.3 miles			2 6	10.3 miles			3 9
Use of Engineered Structures	4	0	Expansion of ROW in an	5 20	12		More costly and complex to Engineer, Procure and install		8	0			5	20	0	5	20	12	no need for supporting guy wires	More costly and complex to Engineer, Procure and install	2 8	12		More costly and complex to Engineer, Procure and install	2 8
Gen'l Design Complexity	3		Existing Overhead lines in existing corridor those corridors currently (Clearing) with both Gas and Electric Facilities	3 9			Distribution underbuild and roadway design could be very complex	2	6	-			4	12		4	12			Distribution underbuild and roadway design could be very complex	2 6			Distribution underbuild and roadway design could be very complex	2 6
Distribution Underbuild	4			3 12				2	8				4	16			16				2 8				2 8
DOT Issues	4			2 8				1					3	12			12				1 4				1 4
FAA/Airport Issues  Meet In-service Date	5			2 10				4	20				2	10			10				4 20				4 20
of Dec. 2020 Total Cost of Transm	5			4 20				3	15				4	20			25				3 15	-			3 15
Line Work	5	\$10,747,000		3 15	\$15,115,000			2	10	\$10,377,000			4	20	\$10,046,000  Need a larger foot print	4	20	\$14,526,000			2 10	\$13,628,000 Need a larger foot print			2 10
Gen'l Design Complexity	3	Original design		5 15	Original design			5	15	Original design			5	15	to make room for the Auto-transformer on the souteast side.	Additional equipment and site work needed.	9	Original Design			5 15	to make room for the Auto-transformer on the souteast side.		Additional equipment and site work needed.	3 9
Equipment Maintenance	1			5 5				5	5	-			5	5	Second Auto-transforer, second 69kV breaker, two additional sets of M.O. switches.	2	2				5 5	Second Auto-transforer second 69kV breaker, two additional sets of M.O. switches.			2 2
Total Cost of Substation Work	5	FOR 115 kV: KC: New sub. meets req; FP; two 115 kV bdrs w/ relay panel; three CCVTs; four Disc. Sw. w/ Motor; fiber optic MC: repl 69 kV bdr w/ 115 kV bdr; repl 600A disc; reset xfmr taps for 115 kV; repl/add CCVTs & pilot prot; concrete; grounding		4 20	FOR 115 kV:  New sub. meets req. £P: two 115 kV bbrs w relay panel; three CCVTs; four Disc. Sw. v Motor; MC-repl é kV bbr w/ 115 kV bbr repl 600 disc, reset xfm taps for 115 kV, repl/add CCVTs & pile prot; concrete; grounding	v/ v/ sig		4	20	FOR 115 MV: KC. New subst. meets rgmt; NC. 115 kV bev already being regl in '16 (?); relay panel wy fiber optic comm. (?); CCVTs (3); Disc. Sw. w/ motor op.; grounding. MC: repl 69 kV br w/ 115 kV br, repl 600A disc, reset xfmr taps for 115 kV, repl/404 CCVTs & plot prot.; concrete, grounding grounding			5	25	FOR 69 kV: KC_115/69  IV 5/mr; 115 kV 8/kr; 69 kV 9/kr; 2/sckage subst. (?); site dev. (?) KE_115/69 kV 9/kr; 115 kV Vert. 8/k Disc; Steel str; concrete; MC_8xess cond. of existing 69 kV b/kr; Repl. 600 A Disc. Switches (?);	Revise Cat 13 budget 2	10 E	FOR 115 kV: KC: New subst. meets rgmt.; NC: 115 kV bkr already being repli n¹ (6/); relay panel w/ fiber optic comm. (?); CCVTS (3); Disc. Sw. w/ motor op.; grounding MC: repl 69 kV bkr w/ 115 kV bkr, repl 600A disc, reest kfm taps for 115 kV, repl/add CCVTs & pilot prot.; concrete; grounding			5 25	FOR 69 kV: KC;115/69 kV 4mm; 115 kV 8ktv, 69 kV 8krkr; Package subst. (?), site dev. (?) NC; 115/69 kV 4mm; 115 kV Vert. Brk. Disc; Steel str.; concrete; MC; Assess cond. of existing 69 kV brkr; Repl. 600 A Disc. Switches (?);		Revise Cat 13 budget	2 10
Meet In-service Date of Dec. 2020	5			5 25				5	25				5	25		5	25				5 25				5 25
Impact to Property Owners	5			1 5				1	5				1	5		5	25				2 10				2 10
Difficulty in Obtaining Easements	5			1 5				1	5				2	10		5	25				1 5				1 5
Total Cost of Real Property Work	5			3 15				1	5				3	15		5	25				2 10				2 10
Meet In-service Date of Dec. 2020	5			3 15				1	5				3	15		5	25				2 10				1 5
Visual Impacts: New ROW; Structure types, hts, Access/Work areas	5			2 10				3	15				2	10		4	20			3	15				3 15
ROW Clearing (restrictions)	5			2 10				1	5				2	10		5	25			1	5				1 5
Total Cost of Environmental Work	1			5 5				3	3				4	4		5	5			3	3				4 4
ARTICLE VII (Option 4A only)																									
Wetlands & Wildlife: NYSDEC	5			3 15				2	10	-			3	15		3	15			2	10				2 10
Wetlands: USACE	5			3 15				2	10				3	15		3	15			2	10				2 10
Total Cost of Permitting Work  Meet Inservice Date	1			5 5				3	3				4	4		5	5			3	3	1			3 3
Meet In-service Date of Dec. 2020 Conflicts w/ Other	5			5 25				4	20				5	25			25				4 20				4 20
Utilities  Amount of Angles	5			3 15				1	5				3	15			15				1 5				1 5
Required	1			5 5				5	5				5	5 8			8				5 5				1 4
Access and Work Areas								1					-												
Traffic Control Shut Downs, Delays	5			3 12					5 12				3				12				1 5 3 12				3 12
Restoration Issues	4			3 12				1	4				3			3	12				1 4				1 4
Meet In-service Date of Dec. 2020	5			5 25				5	25				5	25		5	25				5 25				5 25
Access for Maintenance	5			2 10				3	15				2	10		2	10				3 15				3 15
Vegetation  Management	3			2 6				3	9				2	6		2	6				3 9				3 9
Damage Pot'l (tree hits, vehicle hits)	5			3 15				2	10				3	15			15				2 10				2 10
			TOTAL WEIGHTED SCORE OPT	ΓΙΟΝ 1: 42		TOTAL WE	EIGHTED SCORE OPT	TION 2:	325		TOTAL WEIG	HTED SCORE OPTI	ION 3A:	448		TOTAL WEIGHTED SCORE OPTION 3B:	511		TOTAL WEIG	HTED SCORE OPTION	4A: 342		TOTAL	WEIGHTED SCORE OPT	TION 4B: 317

	Estim	UNDERGROUND					
Element of Project	<b>1</b> (115 kV only)	<b>2</b> (115 kV only)	<b>3A</b> (115 kV)	<b>3B</b> (69 kV)	<b>4A</b> (115kV)	<b>4B</b> (69 kV)	<b>5</b> (115 kV only)
Transmission Design <sup>1</sup>	\$10,747	\$15,115	\$10,377	\$10,046	\$14,526	\$13,628	\$32,920
Substation Design <sup>2</sup>	\$2,785	\$2,785	\$2,259	\$4,100	\$2,259	\$4,100	\$2,259
Real Property (ROW) <sup>3,4</sup>	\$3,755	\$25,818	\$1,604	\$38	\$16,267	\$9,637	\$1,604
Environmental/Permitting <sup>5</sup>	\$350	\$450	\$350	\$300	\$450	\$400	\$450
TOTAL	\$17,637	\$44,168	\$14,590	\$14,484	\$33,502	\$27,765	\$37,233

#### **NOTES:**

#### **OPTION 1**

115 kV ONLY: Existing ROW Overhead Route (KC-MC-FP)

OPTION 3 (A & B)

115 kV or 69 kV: Existing ROW Overhead Route
(KC-MC-NC)

#### **OPTION 5**

115 kV ONLY: Existing ROW Underground & Overhead Route
(KC-MC-NC)

#### **OPTION 2**

115 kV ONLY: Alternate ROW Overhead Route - via Rt. 9 (KC-MC-FP)

#### OPTION 4 (A & B)

115 kV OR 69 kV: Alternate ROW Overhead Route - via Rt. 9
(KC-MC-NC)

<sup>&</sup>lt;sup>1</sup> The increased costs associated with the Alternate (Rt. 9) ROW are based mainly on the need for Engineered Steel Poles and Engineered Foundations, coupled with a longer construction timeline (i.e., Engineering Construction Support and related equipment). Light Duty Steel Poles would be used on existing ROWs.

<sup>&</sup>lt;sup>2</sup> The Substation Design costs are based on approved 2019 (in-service) new substation construction for Knapps Corners, and future modifications to Fishkill Plains & Myers Corners substations (tentatively planned for 2020). A cost of \$0 is identified for Knapps Corners substation in Options 1, 2, 3A and 4A, and \$1.68 million in Options 3B & 4B. A cost of \$1.345 million is identified for Myers Corners substation in Options 1, 2, 3A and 4A, and \$93K in Options 3B and 4B. A cost of \$1.44 million is identified for Fishkill Plains substation in Options 1 & 2. North Chelsea substation requires a cost of \$2.327 million for Options 3B & 4B, and \$914K for Options 3A & 4A.

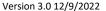
<sup>&</sup>lt;sup>3</sup> The dollar amounts identified represent only estimated payout costs to property owners. NOT included are additional administrative fees pertaining to condemnation proceedings, permitting, internal and/or contracted administrative labor, or additional surveying requirements. The TV Line corridor will need to be surveyed in order to provide more indepth analysis (and possible change to the estimated costs, as applicable).

<sup>&</sup>lt;sup>4</sup> <u>For 115 kV ROW:</u> Used 100' for single structure corridors & 150' for dual structure corridor; For 69 kV ROW: Used 60' for single structure corridors & 90' for dual structure corridor.

<sup>&</sup>lt;sup>5</sup> Cost estimates initially based on the average of five vendor bids provided for the G-Line North project, since this project has some similarities to the G-Line South project in terms of line length, line rating (69 kV) and number of municipalities involved (for existing ROW conditions). The cost estimates provided herein have been recalibrated to account for the alternate ROW (Rt. 9), and 115 kV and 69 kV ROW variations.



0 8 5 3 - D





Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 4 Construction

### A. GENERAL

Project/Program Name: H Line Rebuild (69kV to 115kV) Article VII Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: 1-1232-67-05

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 9/1/2005 In-Service: 6/1/2026

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

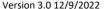
H-Line Rebuild #0853-D; H-Line Re-Route Easement #2553-I; Land Purchase on SB-Line 40.5-acres Town of Ulster, #5036-H; future work order for gas line AC induction mitigtion system; SB-Line / I-Line rebuild Rail Trail Section, #s 8799-J / 8946-J Respectively; distribution underbuild w/ I-Line for approx. 0.7-miles outside Hurley Ave. Sub.

#### Describe the project objective and scope of work:

Rebuild the electric transmission H-Line, which is a subset of the overall H&SB-Lines Rebuild project. The H-Line runs from Saugerties Substation to the Catskill Substation, with an approximate length of 12.0-miles. The rebuild includes an upgrade from 69kV to 115kV, and requires Article VII submission and respective Certificate of Need from the Public Service Commission. The scope also includes access improvements including the procurement of permanent off-ROW rights, and an approximate 0.7-mile reroute around the Great VIy Wildlife Management Area.

### Describe specific scope exclusions, assumptions and constraints:

The project is constrained by all the Conditions specifically setforth in the Certificate of Need issued by The Public Service Commission (PSC), effective August 14, 2020. The project will also be bound by the Environmental Management and Construction Plan (EM&CP), approved by PSC on August 11th, 2022. It is assumed that the Lines will remain operating at 69-kV for the foreseeable future, so substation upgrades for 115kV operation are not being considered at this time.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance; Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Reference Planning Study dated 8/4/2015 and Article VII Application Exhibit E-4 "Engineering Justification" submitted 12/29/2017.

ECM link to study: https://contentcentral.cenhud.com/otcs/cs.exe/link/16346942

ECM link to justification: https://contentcentral.cenhud.com/otcs/cs.exe/link/23018738

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Given the age of existing lattice structures and the fact that they have generally reached the end of their useful life, the rebuild will result in operational cost savings and cost avoidance (new structures will require less planned and emergency repair work for years/decades to come).

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric; Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

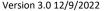
Checklist Fully Completed: Yes Environmental Component: Yes

**Environmental Component:** Yes **Social Component:** Yes

**Governance Component:** Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Reference Article VII Exhibit 3 "Alternatives", revised version dated 5/25/2018.

ECM link to Exhibit 3 "Alternatives": https://contentcentral.cenhud.com/otcs/cs.exe/link/23027326

### Why was the proposed project scope chosen over other alternatives?

Reference Article VII Exhibit 3 "Alternatives", revised version dated 5/25/2018.

ECM link to Exhibit 3 "Alternatives": https://contentcentral.cenhud.com/otcs/cs.exe/link/23027326

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

The H Line was constructed in the early 1900's and the majority of the structures and conductors have reached the end of their useful life. The existing infrastructure is need of replacement to mitigate the increased risk of failure due to advanced age.

### What are the risks and consequences of not completing this project?

Due to the age and condition of existing structures and conductor, the most sugnificant risk of not completing the project are increased outages due to component failures. The consequences include negative impacts to both SAIFI and CAIDI metrics.

### Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project? N/A

### What other factor were considered during the prioritization process?

The project has also been submitted by Central Hudson as a Phase I project that supports NYS CLCPA and renewable energy goals.



### **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1si 5-year bu		All future year cost estimates should include applicable adjustments for inflation.					
	\$35,867,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
A	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	2,991,900	612,200	850,000	1,200,000	329,700			
	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	7,479,750	1,530,500	2,125,000	3,000,000	824,250			
I T I O N	Contractors (A/P tax exempt)	19,444,350	3,979,300	5,522,000	7,800,000	2,143,050			
	Overheads	767,000			477,000	290,000			
	AFUDC*	0							
	Journal Vouchers (JVs)	0							
	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	30,683,000	6,122,000	8,497,000	12,477,000	3,587,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	496,600	28,200	139,700	158,700	170,000			
	Contractors (A/P tax exempt)	4,469,400	253,800	1,257,300	1,428,300	1,530,000			
R	Overheads	218,000		33,000	71,000	114,000			
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	5,184,000	282,000	1,430,000	1,658,000	1,814,000	0	0	0
	* AFUDC may require adjustment after Finance Depart		-						
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

26,810,000 17,449,000

9,361,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 28,693,600 Maximum (\$): 43,040,400 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

A detailed quantity takeoff has not yet occurred; we have noticed a significant increase in both materials and contractor pricing over last several years (COVID pandemic years) which has cast some uncertainty in the unit-cost historical pricing we are using to help derive the preliminary cost

Basis for estimate: Historical Data + Job Specific Adjustments; Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

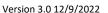
3 major components: 1) Article VII Application Exhibit 9 "Cost of Proposed Facility" rev. 5/25/2018 (https://contentcentral.cenhud.com/otcs/cs.exe/link/23183378); 2) 1/2020 Updates to Preliminary Cost Estimate (https://contentcentral.cenhud.com/otcs/cs.exe/link/29557587); 3) 1/2022 increases per Chris R. & Kyle B. to accommodate recent materials & labor

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Reference Certificate of Need "Order Adopting Joint Proposal" effective August 14, 2020

(https://contentcentral.cenhud.com/otcs/cs.exe/link/31379817) and Environmental Management & Construction Plan (EM&CP) approved by the Public Service Commission (PSC) on August 11, 2022 (multiple files, all on record in ECM and on NYS DPS public DMM system). The cost breakdown provided above is displayed based on an averaged historical percentage split of project Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. This historical split has also been applied to the prior year actuals / projections column as well.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 4 Construction

### A. GENERAL

Project/Program Name: SB Line Rebuild (69kV to 115kV) Article VII Work Order #: 0 8 5 4 - D

Budget Group: Electric Budget Category: 12 Funding Project Number: 1-1232-67-05

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 9/1/2005 In-Service: 6/1/2024

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

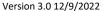
H-Line Rebuild #0853-D; H-Line Re-Route Easement #2553-I; Land Purchase on SB-Line 40.5-acres Town of Ulster, #5036-H; future work order for gas line AC induction mitigtion system; SB-Line / I-Line rebuild Rail Trail Section, #s 8799-J / 8946-J Respectively; distribution underbuild w/ I-Line for approx. 0.7-miles outside Hurley Ave. Sub.

#### Describe the project objective and scope of work:

Rebuild the electric transmission SB-Line, which is a subset of the overall H&SB-Lines Rebuild project. The SB-Line runs from Hurley Avenue Substation to the Saugerties Substation, with an approximate length of 11.5-miles. The rebuild includes an upgrade in line construction from 69kV to 115kV, and requires Article VII submission and respective Certificate of Need from the Public Service Commission. The scope also includes access improvements including the procurement of permanent off-ROW rights.

### Describe specific scope exclusions, assumptions and constraints:

The project is constrained by all the Conditions specifically setforth in the Certificate of Need issued by The Public Service Commission (PSC), effective August 14, 2020. The project will also be bound by the Environmental Management and Construction Plan (EM&CP), approved by PSC on August 11th, 2022. It is assumed that the Lines will remain operating at 69-kV for the foreseeable future, so substation upgrades for 115kV operation are not being considered at this time.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance; Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Reference Planning Study dated 8/4/2015 and Article VII Application Exhibit E-4 "Engineering Justification" submitted 12/29/2017.

ECM link to study: https://contentcentral.cenhud.com/otcs/cs.exe/link/16346942

ECM link to justification: https://contentcentral.cenhud.com/otcs/cs.exe/link/23018738

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Given the age of existing lattice structures and fact that they have generally reached the end of their useful life, the rebuild will result in operational cost savings and cost avoidance (new structures will require less planned and emergency repair work for years/decades to come).

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric; Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

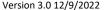
Checklist Fully Completed: Yes Environmental Component: Yes

**Environmental Component:** Yes **Social Component:** Yes

**Governance Component:** Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Reference Article VII Exhibit 3 "Alternatives", revised version dated 5/25/2018.

ECM link to Exhibit 3 "Alternatives": https://contentcentral.cenhud.com/otcs/cs.exe/link/23027326

### Why was the proposed project scope chosen over other alternatives?

Reference Article VII Exhibit 3 "Alternatives", revised version dated 5/25/2018.

ECM link to Exhibit 3 "Alternatives": https://contentcentral.cenhud.com/otcs/cs.exe/link/23027326

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

The SB Line was constructed in the early 1900's and the majority of the structures and conductors have reached the end of their useful life. The existing infrastructure is in need of replacement to mitigate the increased risk of failure due to advanced age.

### What are the risks and consequences of not completing this project?

Due to the age and condition of existing structures and conductor, the most sugnificant risk of not completing the project are increased outages due to component failures. The consequences include negative impacts to both SAIFI and CAIDI metrics.

### Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

### What other factor were considered during the prioritization process?

The project has also been submitted by Central Hudson as a Phase I project that supports NYS CLCPA and renewable energy goals.



#### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates s e adjustments for			
	\$31,408,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	2,797,900	1,872,700	925,200					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	6,994,750	4,681,750	2,313,000					
Ī	Contractors (A/P tax exempt)	18,186,350	12,172,550	6,013,800					
Т	Overheads	8,000		8,000					
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	27,987,000	18,727,000	9,260,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	338,900	202,100	136,800					
	Contractors (A/P tax exempt)	3,050,100	1,818,900	1,231,200					
R	Overheads	32,000		32,000					
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	3,421,000	2,021,000	1,400,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	26,527,000	26,527,000	0					

Prior years funding; not actuals.

2021-2023

2024



### **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT

**Cost Estimate Level: Preliminary** 

(that final cost will be within +/-20% of the estimate): Cost Estimate Confidence: **High Confidence** 

No further estimate range is required.

Formulas give standard ranges Maximum (\$): 37,689,600 Cost Estimate Range: Minimum (\$): 25,126,400 No explanation on confidence level required.

← per estimate level, but may be overwritten if desired.

A detailed quantity takeoff for the majority of the SB Line Rebuild has not yet occurred; There remains a level of uncertainty in both materials and contractor pricing due to ongoing supply and labor difficulties which has resulted in departures from the historical unit-cost pricing we are using to help derive the preliminary cost estimate.

**Basis for estimate:** Historical Data + Job Specific Adjustments; Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

3 major components: 1) Article VII Application Exhibit 9 "Cost of Proposed Facility" rev. 5/25/2018 (https://contentcentral.cenhud.com/otcs/cs.exe/link/23183378); 2) 1/2020 Updates to Preliminary Cost Estimate (https://contentcentral.cenhud.com/otcs/cs.exe/link/29557587); 3) 1/2022 increases per Chris R. & Kyle B. to accomodate recent materials & labor increases and extended schedule. 2021-2023 actuals + Projections split based on 65% / 25% / 10% split for AP Charges, Materials, and Labor respectively.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Reference Certificate of Need "Order Adopting Joint Proposal" effective August 14, 2020 (https://contentcentral.cenhud.com/otcs/cs.exe/link/31379817) and Environmental Management & Construction Plan (EM&CP) approved by the Public Service Commission (PSC) on August 11, 2022 (multiple files, all on record in ECM and on NYS DPS public DMM system). The cost breakdown provided above is displayed based on an averaged historical percentage split of project Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. This historical split has also been applied to the prior year actuals / projections column as well.

### **H & SB Electric Transmission Lines Rebuild**

### January 2020 Updates to Preliminary Cost Estimate

Description	H-Line (52%)	SB-Line (48%)
11-2017 Preliminary Estimate with Application \$41,045,731	\$21,343,780	\$19,701,951
2019 Adjustments:		
Change 7 guyed structures to engineered	\$1,250,000	ı
Change 13 guyed structures to engineered, excl. Rail Trail	1	\$2,650,000
Replace added 5 lattice structures in Catskill	\$3,500,000	-
Rail Trail redesign	-	\$1,500,000
Bluestone Forest area redesign	ı	\$750,000
January 2020 Adjustments:		
Cost increase adjustment for quarry reroute	\$619,987	-
Heavy earthwork grading increase adjustment for access & workpads	\$2,340,000	\$2,160,000
Increase contingency from 5% to 10%	\$1,404,306	\$1,296,283
Subtotals:	\$30,458,073	\$28,058,234
Grand Total:	\$58,5	16,307
Per-Mile Estimate:	\$2,47	9,505

# BEFORE THE NEW YORK STATE PUBLIC SERVICE COMMISSION

In the Matter of the Application of Central Hudson Gas & Electric Corporation For a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law to Rebuild the H and SB Lines of Approximately 23.6 miles from 69 kilovolts to 115 kilovolt standards in the City of Kingston and Towns of Ulster and Saugerties in Ulster County, and the Town of Catskill and Village of Catskill in Greene County.

Case	Nο·	17-T-	
Casc	INO	1/-1-	

# CENTRAL HUDSON GAS & ELECTRIC CORPORATION H AND SB ELECTRIC TRANSMISSION LINES REBUILD PROJECT

### EXHIBIT E-4 ENGINEERING JUSTIFICATION

**EXHIBIT E-4 – ENGINEERING JUSTIFICATION** 

This section addresses the requirements of 16 NYCRR §88.4.

E-4.0 Introduction

Central Hudson Gas & Electric Corporation (CHG&E or the Applicant) is proposing to rebuild the existing 69 kilovolt (kV) H and SB transmission lines (H and SB Lines) to 115 kV requirements located between Kingston in Ulster County and Catskill in Greene County, New York (the Project). Approximately 1.2 miles of the H Line route is proposed to be relocated to avoid a sensitive environmental resource area designated by the New York State Department of Environmental Conservation (NYSDEC) as the Great VIy Wildlife Management Area (WMA). The proposed reroute conditions are detailed in Alternatives (Exhibit 3).

E-4.1 Need for the Proposed Project

While the lines will be designed and constructed for 115 kV operation, they will continue to be operated at 69 kV in the near term. Future operation at 115 kV would be needed for any of the following: sudden load growth that cannot be mitigated with non-wires alternative projects; increased UPNY-SENY flow resulting in overload conditions on the 115 kV Feura Bush (National Grid) to North Catskill line; and a need to increase hosting capacity for photovoltaic and storage projects. Given what the Applicant considers to be reasonably likely scenarios, rebuilding for just 69 kV use would be short sighted and not cost efficient. Future modifications at the three substations and one tap station would be required prior to 115kV operation as detailed in Exhibit E-2 Other Facilities.

Moreover, in addition to being the sole transmission supply for the 35-40 MWs of peak distribution load currently served from the Saugerties and Woodstock Substations, the H and SB Lines provide an important input to the system in the northwest portion of Central Hudson's franchise area (Northwest Area). The H Line also is the sole supply for the Lehigh Cement Co. in the Towns of Saugerties and Catskill. Historic and forecast area loads are provided below in Table E-4.1.

Table E-4.1 Historic and Forecast Area Loads

	Year		Coincider	nt Peak (MW)		Weather Norn	nalized (MW) 1
	real	Date	System Peak	Saugerties	Woodstock	Saugerties	Woodstock
	2006	August 2	1295	24.7	19.4		
	2007	August 8	1185	23.8	17.1		
	2008	June 10	1187	22.4	17.9		
	2009	August 17	1107	24.7	16.9		
	2010	July 6	1229	19.8	18.7		
Historic	2011	July 22	1225	22.9	19.6		15.9
Hist	2012	July 17	1168	21.7	17.6		18.2
	2013	July 18	1202	22.5	18.6	23.6	18.7
	2014	July 23	1060	20.8	15.9	23.7	18.8
	2015	July 29	1059	20.5	16.3	23.4	18.5
	2016	August 13	1088	21.2	18.0		
	2017	July 20	1034	20.4	16.1		
+-	2018					23.0	19.0
cas	2019					22.9	19.2
Forecast	2020					22.7	19.5
ш	2021					22.6	19.8

The existing 69 kV H and SB Lines originally were installed in 1928 as double circuit steel lattice structures using 1/0 Cu conductor for each of the circuits; the double circuits subsequently were converted to single circuits with two 1/0 Cu conductors per phase. Some of the steel lattice structures have been replaced with wood poles through the years. An assessment of the condition of the structures was conducted in 2015 and revealed that 32.0% of the lines' structures were in need of replacement or the addition of mid-span poles to correct sag issues; an additional 35.5% of structures are in need of maintenance repairs. Issues found include: damage to numerous tower legs; many insulators in need of replacement; tower foundation issues; woodpecker damage to wood poles; and need for mid-span structures to correct sag issues. In addition, the installation of mid-span structures most likely would result in the need to replace adjacent tangent structures. Some identified issues found were severe enough to prompt replacements of eight (8) structures in 2017-2018.

#### E-4.2 Project Benefits

The proposed rebuild will have both reliability and economy benefits for CHG&E and its interconnected network.

Reliability benefits are twofold: increased reliability to the Saugerties and Woodstock substations; and a more reliable source to CHG&E's Northwest Area. This increased reliability would be in the form of fewer line trips associated with

<sup>&</sup>lt;sup>1</sup> Central Hudson Gas & Electric Corporation, "Central Hudson Initial Distributed System Implementation Plan," June 30, 2017. Table VI-7.

new construction and the increased clearances for 115 kV design. For example, for the period 2013-October 2017 the H and SB Lines experienced 27 line trips (1.16 / mile) as compared to 37 line trips for all of CHG&E's approximately

230 miles of 115 kV lines (0.16 / mile).

Economy benefits would result from the increase in conductor size (i.e., from two 1/0 Cu to 795 ACSR) which will lower

the circuit resistance by approximately 55% with an associated reduction in electrical (I<sup>2</sup>R) losses. Based on 2016

hourly flows and NYISO Zone G LBMPs<sup>2</sup>, we estimate an annual reduction in losses of approximately 4,100 MWhr for

an annual energy cost reduction of approximately \$130,000.

This project will not increase the load serving capabilities of the Saugerties or Woodstock stations. Those load serving

capabilities are approximately 50 MVA and 20 MVA, respectively.

E-4.3 Proposed Completion Date and Impact of Schedule Delays

The proposed completion of work (in-service) is by December 2022. If work is not completed by this date, the higher

risk of a system failure due to the aging infrastructure will remain or even be exacerbated. Extended delays will result

in the continued deterioration of existing facilities that could result in either reduced reliability or a need to repair or

replace individual structures and conductor sections; these new structures or spans may require subsequent

replacement when the lines are rebuilt. Should the lines deteriorate to a state where they are unusable, the Applicant

would need to find an alternate source for the load currently supplied from Saugerties and Woodstock substations.

E-4.4 System Studies

CHG&E's load flow analyses indicated that this project would increase the UPNY-SENY transfer limit by less than 25

MW. Based on that analysis, on October 31, 2015, NYISO Staff indicated that since this project is not expected to

impact interface transfer limits by more than 25 MW, no System Impact Study would be required. As a result, the

Applicant will include in its Motion for Waivers, the requirement that it comply with 16 NYCRR § 88.4(a)(4).

<sup>2</sup> LBMP: Locational Based Marginal Price

Exhibit E-4: Engineering Justification Page 4

Central Hudson Gas & Electric Corporation H and SB Electric Transmission Lines Rebuild Project

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# **Project Cost Estimate**

Project Name: H Line 69kV Rebuild - Single Circuit

Prepared By: Kyle Bragg

Cost Estimate Level: Conceptual Estimate

Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the password "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

<u>Date:</u> 5/06/2015

Revision(s):

<u>WO #:</u> 0853 A/R

+/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Part 1: Additions						* All	I unit and to	otal cost figu	ures sho	ould be futu	ire "raw cos	ts", <u>without</u> a	any overhea	d markups. All	markups ar	re generated at	the end of	the estimate.
			Costs Incurred To-Date	M	onthly	y Payroll*			Weekly	y Payroll'	<b>,</b>	Stock Ma	aterials*	Non-Stock M		Contractors (A/P Tax-E		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Planning Labor	100	Hours		1.0	100	55.00	5,500		0		0		0		0		0	
A.2 Base Survey (Contract)	1	Contract			0		0		0		0		0		0	180,000.00	180,000	Based off of WH 1&2 Bids
A.3 Geotechnical Borings	1	Contract			0		0		0		0		0		0	40,000.00	40,000	Approx. 25 Borings for Engr. Str.s
A.4 Visual Renderings	1	Contract			0		0		0		0		0		0	30,000.00	30,000	
A.5 Lightening / Grounding Study	1	Contract			0		0		0		0		0		0	25,000.00	25,000	
A.6 Engineering Construction Administration	250	Hours		1.0	250	55.00	13,750		0		0		0		0		0	
A.7 Transmission Line Design	550	Hours		1.0	550	55.00	30,250		0		0		0		0		0	
A.8 Lidar - Asbuilts (Contract)	13	Mile			0		0		0		0		0		0	1,300.00		\$1.3K Per Mile
A.9 Foundation Designs (Contract)	1	Contract			0		0		0		0		0		0	35,000.00	35,000	
A.10 E.M.F. Study	1	Contract			0		0		0		0		0		0	30,000.00	30,000	
A.11 E.S.D. Supervision / Construction Support	12	Per Month		40.0	480	55.00	26,400		0		0		0		0		0	Assumed 4-5 Field Visits Per Month
A.12 Drafting - Design Prints	200	Hours			0		0	1.0	200	55.00	11,000		0		0		0	1/C Drafter
A.13 Drafting - Closeout Prints	50	Hours			0		0	1.0	50	55.00	2,750		0		0		0	1/C Drafter
A.14					0		0		0		0		0		0		0	
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
B.1 Real Property Services	220	Hours		1.0	220	55.00	12,100		0		0		0		0		0	
B.2 Environmental Services	220	Hours		1.0	220	55.00	12,100		0		0		0		0		0	
B.3 Environmental / Permitting Consultant	1	Contract			0		0		0		0		0		0	200,000.00		1/3 of \$600K Bid Estimate
B.4 Legal Consultation (Contract)	1	Contract		1.0	0	55.00	0		0		0		0		0	60,000.00	60,000	
B.5 Project Management	550	Hours		1.0	550	55.00	30,250		0	-	0		0		0		0	
B.7 Project Sponsors	175	Hours		1.0	175	65.00	11,375		0		0		0		0		0	
B.8 Easements	10	Mile			0		0		0		0		0		0	00.000.00	0	
B.9 Purchase Additional R.O.W.	13	Mile	1		0		0		0		0		0		0	20,000.00	250,000	
B.10 Off R.O.W. Access Agreements	13	Mile	1		0		0		0	-	0		0		0	10,000.00	125,000	
B.6			1		^				^	-			_				0	
B.7					0		0		0		0		0		0		0	
B.8					0		0		0		0		0		0		0	
B.9			1		0		0		0		0		0		0		0	
B.10					0		0		0		0		0		0		0	
C GENERAL CONDITIONS																		
C.1 Construction Trailers	12	months			0		0		0		0		0		0	1,000.00	12,000	
C.2 Temporary Toilet Facilities	12	months			0		0		0		0		0		0	500.00	6,000	
C.3					0		0		0		0		0		0		0	

				Costs Incurred To-Date	M	lonthly	r Payroll*	r		Weekly	Payroll*		Stock Ma	aterials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
C.4						0		0		0		0		0		0		0	
C.5 C.6						0		0		0		0		0		0		0	
C.7						0		0		0		0		0		0		0	
C.8						0		0		0		0		0		0		0	
C.9						0		0		0		0		0		0		0	
C.10						0		0		0		0		0		0		0	
)	MAJOR EQUIPMENT & MATERIALS																		
D.1 L	ight Duty Steel Poles w/ Vangs & Arms	105	Each			0		0		0		0		0	8,500.00	892,500		0	
D.2 E	ingineered Steel Poles	25	Each			0		0		0		0		0	30,000.00	750,000		0	
	Ingineered Foundations	25	Each			0		0		0		0		0	75,000.00	1,875,000		0	
	Conductor (795 TERN)	220,000	Feet			0		0		0		0		0	2.00	440,000		0	
	Static (OPGW)	75,000	Feet			0		0		0		0		0	3.50	262,500		0	Clampa Calica Daves Miss Hardware (Fra
	DPGW Hardware (Nonstock) Standard Stock Materials - Tangent	13 100	Mile Each			0		0		0		0	300.00	30,000	5,000.00	65,000 0		0	Clamps, Splice Boxes, Misc Hardware (Frc
	Standard Stock Materials - Tangent Standard Stock Materials - Dead End	30	Each			0		0		0		0	1,500.00	45,000		0		0	
	Bucket / Digger Rental	12	Month			0		0		0		0	1,300.00	43,000		0	60,000.00	720,000	
	Crane Service	25	Location			0		0		0		0		0		0	2,000.00	50,000	
	quipment Moves	13	Mile			0		0		0		0		0		0	12,000.00		Assumed 3 Moves per Mile @ \$4K Per Mo
D.12						0		0		0		0		0		0		0	·
	CONSTRUCTION																		
	Construction Staking (Contract)	1	Contract			0		0		0		0		0		0	60,000.00		Based off of WH 1&2 Bids
E.2 E	rosion / Sediment Control Installation	13	Mile			0		0		0		0		0		0	5,000.00	62,500	
	nstall R.O.W. Access Controls (Gates, tc)	13	Mile			0		0		0		0		0		0	8,000.00	100,000	\$2K per Gate Assumed 4 Gates Per Mile
	R.O.W. Improvements - Access (Bulding / Ipgrading Roads, Culverts, etc)	13	Mile			0		0		0		0		0		0	15,000.00	187,500	
	R.O.W. Improvements - Matting	2	Mile			0		0		0		0		0		0	650,000.00	1,300,000	Assumed 2 Miles of Matting Needed
	R.O.W. Improvements - Trimming	13	Mile			0		0		0		0		0		0	30,000.00	375,000	
	Orill Pole Holes - Soil ( Contract )	90	Per Hole			0		0		0		0		0		0	800.00	72,000	
	Orill Pole Holes - Rock (Contract)	50	Per Hole			0		0		0	FF 00	0		0		0	1,000.00	50,000	A Discourage of the Allin Day To the
	Off Load Pole Delivery	9	Per Truck			0		0			55.00	7,920		0		0		0	4 Riggers for 4 Hrs Per Truck
E.10 N	Move Poles to Site Locations (Riggers)	140 140	Per Pole Per Pole			0		0			55.00 55.00	61,600 184,800		0		0		0	6 Man Crew x 4Hrs
	rame Single Pole Tangent	100				0		0		3,000	55.00	165,000		0		0		<b>.</b>	6 Man Crew x 6Hrs
	rame Single Pole Tangent	30	Per Str Per Str			0		0	55.0	1,650	55.00	90,750		0		0			6 Man Crew x 10Hrs
	String Conductor (3 Phases)	13	Mile			0		0	300.0	3,750	55.00	206,250		0		0			6 Man Crew x 5 10Hr Days
	string OPGW	13	Mile			0		0	180.0	2,250	55.00	123,750		0		0			6 Man Crew x 3 10Hr Day
	Clip In Conductors / Static	13	Mile			0		0	240.0	3,000	55.00	165,000		0		0			6 Man Crew x 4 10Hr Days
	rame Three-Pole Dead End					0		0		0		0		0		0		0	,
E.16 S	Supervision - Foreman	11	Month			0		0	150.0	1,650	60.00	99,000		0		0		0	10 Month Job
	Supervision - Construction Management	12	Month			0		0	100.0	1,200	55.00	66,000		0		0			12 Months
E.20 F	R.O.W. / Site Restoration	13	Mile			0		0		0		0		0		0	10,000.00	125,000	

				Costs Incurred To-Date	N	/lonthly	y Payroll	*		Weekly	y Payroll*		Stock Ma	aterials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.21	Install OPGW Splice Locations	25	Per Site			0		0		0		0		0	1,500.00	37,500	1,000.00	25,000	2 Boxes per Mile (Includes Box + Splicing)
E.22						0		0		0		0		0		0		0	
E.23						0		0		0		0		0		0		0	
E.24						0		0		0		0		0		0		0	
E.25						0		0		0		0		0		0		0	
E.26						0		0		0		0		0		0		0	
E.27						0		0		0		0		0		0		0	
E.28						0		0		0		0		0		0		0	
				0				141,725				1,183,820		75,000		4,322,500		4,286,900	
						2,545	] '			21,374	] "				, l		<u>.</u>		1

Manhours Weekly Payroll

Manhours Monthly Payroll

Manhours Monthly Payroll

Part 2: Removals \* All unit and total cost figures should be "raw costs", without any overhead markups. All markups are generated at the end of the estimate. Costs Non-Stock Materials\* Contractors & Fees\* Monthly Payroll\* Weekly Payroll\* Stock Materials\* Incurred (A/P Taxable) (A/P Tax-Exempt) To-Date\* Notes through Production Production Work Breakdown Structure (WBS) MH МН Cost/MH Cost Cost/Unit Quantity Cost/MH Cost Cost/Unit Cost Cost Cost/Unit Cost Units MH/Unit MH/Unit xx/xx/xx 0

Manhours Weekly Payroll

				Costs Incurred To-Date		lonthl	y Payroll*	<b>,</b>		Weekly	y Payroll*		Stock Ma	terials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

TIONS SUMMARY:		
ed To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:	<u></u> \$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	<del>-</del>
Estimated Future Raw Costs:	\$10,009,945	
Estimated Future Overheads:	\$1,209,842	
Estimated Future AFUDC:	<b>\$</b> 0	
Subtotal Future Costs:	\$11,219,787	<del>-</del>
Contingency Applied:	\$3,365,936	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$14,585,723	

REMOVALS SUMMARY:		
ncurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	=
Estimated Future Raw Costs:	\$0	
Estimated Future Overheads:	\$0	_
Subtotal Future Costs:	\$0	=
Contingency Applied:	\$0	Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$0	

GRAND TOTAL
ADDITIONS + REMOVALS:

\$14,585,723

## Assumptions, Notes, Clarifications, etc.:

Total Line Length Assumed to be 12.5 Miles / Majority of structures assumed to be single pole Direct Embed Class Equivalent Structures / 25 Engineered Structures for Long Spans and Angles / 30 Deadend Locations (Approx. one every 1/2 Mile) / All Holes assumed to be contracted and through rock or hard strata.



# **Project Cost Estimate**

Project Name: H Line 115kV Rebuild - Single Circuit Date: 7/14/2014

Prepared By:

Cost Estimate Level:

WO #: 0853 A/R Kyle Bragg Revision(s): Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

should be used in order to keep the integrity of the spreadsheet.

 $Note: \ \textit{Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important$ 

formulas. If user needs to add/delete rows, or make other edits, the password "Estimate" may be used to unlock the spreadsheet. Caution

Part 1: Additions						* All	unit and t	otal cost figu	res sho	uld be future	e "raw cos	ts", <u>without</u> a	any overhea	d markups. All	markups a	re generated at	the end of	the estimate.
			Costs Incurred To-Date	M	lonthly	Payroll*			Weekly	y Payroll*		Stock Ma	aterials*	Non-Stock Non-St		Contractors (A/P Tax-E		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Planning Labor	100	Hours		1.0	100	55.00	5,500		0		0		0		0		0	
A.2 Base Survey (Contract)	1	Contract			0		0		0		0		0		0	'		Based off of WH 1&2 Bids
A.3 Geotechnical Borings	1	Contract			0		0		0		0		0		0	'		Approx. 25 Borings for Engr. Str.s
A.4 Visual Renderings	1	Contract	<u> </u>		0		0		0		0		0		0	'	30,000	
A.5 Lightening / Grounding Study	1	Contract			0		0		0		0		0		0	25,000.00	25,000	
A.6 Engineering Construction Administration	250	Hours		1.0	250	55.00	13,750		0		0		0		0		0	
A.7 Transmission Line Design	600	Hours		1.0	600	55.00	33,000		0		0		0		0		0	
A.8 Lidar - Asbuilts (Contract)	13	Mile			0		0		0		0		0		0	'		\$1.3K Per Mile
A.9 Foundation Designs (Contract)	1	Contract			0		0		0		0		0		0	'	35,000	
A.10 E.M.F. Study	1	Contract			0		0		0		0		0		0	30,000.00	30,000	
A.11 E.S.D. Supervision / Construction Support	12	Per Month		40.0	480	55.00	26,400		0		0		0		0		0	Assumed 4-5 Field Visits Per Month
A.12 Drafting - Design Prints	200	Hours			0		0	1.0	200	55.00	11,000		0		0		0	1/C Drafter
A.13 Drafting - Closeout Prints	50	Hours			0		0	1.0	50	55.00	2,750		0		0		0	1/C Drafter
A.14					0		0		0		0		0		0		0	
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
B.1 Real Property Services	220	Hours	<u> </u>	1.0	220	55.00	12,100		0		0		0		0		0	
B.2 Environmental Services	220	Hours		1.0	220	55.00	12,100		0		0		0		0		0	
B.3 Environmental / Permitting Consultant	1	Contract	<u> </u>		0		0		0		0		0		0			52% of \$600K Bid Estimate
B.4 Legal Consultation (Contract)	1	Contract			0		0		0		0		0		0	100,000.00	100,000	
B.5 Project Management	550	Hours		1.0	550	55.00	30,250		0		0		0		0		0	
B.7 Project Sponsors	175	Hours		1.0	175	65.00	11,375		0		0		0		0		0	
B.8 Easements	1	Mile			0		0		0		0		0		0	00.777.7	0	
B.9 Purchase Additional R.O.W.	13	Mile		<del>                                     </del>	0		0		0		0		0		0	20,000.00	250,000	
B.10 Off R.O.W. Access Agreements	13	Mile		<del>                                     </del>	0		0		0		0		0		0	10,000.00	125,000	
B.6	<u> </u>			<del>                                     </del>									_		-		0	
B.7	-			<b></b>	0		0		0		0		0		0		0	
B.8					0		0		0		0		0		0		0	
B.9					0		0		0		0		0		0		0	
B.10				<b>_</b>	0		0		0		0		0		0		0	
				1														
C GENERAL CONDITIONS	1										,							
C.1 Construction Trailers	12	months			0		0		0		0		0		0	1,000.00	12,000	
C.2 Temporary Toilet Facilities	12	months			0		0		0		0		0		0	500.00	6,000	
C.3					0		0		0		0		0		0		0	

				Costs Incurred To-Date	N	onthly	Payroll'	*		Weekly	Payroll*		Stock Ma	aterials*	Non-Stock N		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
C.4						0		0		0		0		0		0		0	
C.5						0		0		0		0		0		0		0	
C.6						0		0		0		0		0		0		0	
C.7						0		0		0		0		0		0		0	
C.8						0		0		0		0		0		0		0	
C.9						0		0	+	0		0		0		0		0	
C.10						0		0		0		0		0		0		0	
	MAJOR EQUIPMENT & MATERIALS																		
	ight Duty Steel Poles w/ Vangs & Arms	115	Each			0		0		0		0		0	8,500.00	977,500		0	
	Engineered Steel Poles	25	Each			0		0		0		0		0	30,000.00	750,000		0	
	Engineered Foundations	25	Each			0		0		0		0		0	75,000.00	1,875,000		0	
	Conductor (795 TERN)	220,000	Feet			0		0		0		0		0	2.00	440,000		0	
	Static (OPGW)	75,000	Feet			0		0		0		0		0	3.50	262,500		0	Clarena Cellea Deves Mil. 11. 1. 75
	DPGW Hardware (Nonstock)	13	Mile			0		0		0		0	400.00	0	5,000.00	65,000		0	Clamps, Splice Boxes, Misc Hardware (Fr
	Standard Stock Materials - Tangent	110	Each			0		0		0		0	400.00	44,000		0		0	
	Standard Stock Materials - Dead End	30 12	Each Month			0		0		0		0	2,000.00	60,000		0	60,000.00	720,000	
	Bucket / Digger Rental Crane Service	25	Location			0		0		0		0		0		0	2,000.00	50,000	
	Equipment Moves	13	Mile			0		0		0		0		0		0	12,000.00		Assumed 3 Moves per Mile @ \$4K Per Mo
D.11	_quipment woves	13	IVIIIE			0		0		0		0		0		0	12,000.00	130,000	Assumed 5 Moves per Mile @ \$4K Fer Mic
D. 12						U		U		0		0		U		U		0	
F (	CONSTRUCTION																		
	Construction Staking (Contract)	1	Contract			0		0		0		0		0		0	60,000.00	60.000	Based off of WH 1&2 Bids
	Erosion / Sediment Control Installation	13	Mile			0		0		0		0		0		0	5,000.00	62,500	Dased Oil Oil Will T&Z Blus
		13	IVIIIE			U		U		U		U		U		U	5,000.00	02,500	
	nstall R.O.W. Access Controls (Gates, etc)	13	Mile			0		0		0		0		0		0	8,000.00	100,000	\$2K per Gate Assumed 4 Gates Per Mile
	R.O.W. Improvements - Access (Bulding / Upgrading Roads, Culverts, etc)	13	Mile			0		0		0		0		0		0	15,000.00	187,500	
E.5 F	R.O.W. Improvements - Matting	2	Mile			0		0		0		0		0		0	650,000.00	1,300,000	Assumed 2 Miles of Matting Needed
	R.O.W. Improvements - Trimming	13	Mile			0		0	<b>-</b>	0		0		0		0	30,000.00	375,000	, , , , , , , , , , , , , , , , , , ,
	Orill Pole Holes - Soil ( Contract )	90	Per Hole			0		0		0		0		0		0	800.00	72,000	
	Orill Pole Holes - Rock ( Contract )	50	Per Hole			0		0		0		0		0		0	1,000.00	50,000	
	Off Load Pole Delivery	9	Per Truck			0		0			55.00	7,920		0		0		0	4 Riggers for 4 Hrs Per Truck
	Move Poles to Site Locations (Riggers)	140	Per Pole			0		0			55.00	61,600		0		0		0	
E.11 S		140	Per Pole			0		0	1		55.00	184,800		0		0			6 Man Crew x 4Hrs
	Frame Single Pole Tangent	110	Per Str			0		0	36.0	3,960	55.00	217,800		0		0			6 Man Crew x 6Hrs
	Frame Single Pole Dead End	30	Per Str			0		0		1,800	55.00	99,000		0		0			6 Man Crew x 10Hrs
	String Conductor (3 Phases)	13	Mile			0		0		3,750	55.00	206,250		0		0			6 Man Crew x 5 10Hr Days
	String OPGW	13	Mile			0		0		2,250	55.00	123,750		0		0			6 Man Crew x 3 10Hr Day
	Clip In Conductors / Static	13	Mile			0		0	<b>-</b>	3,000	55.00	165,000		0		0		0	6 Man Crew x 4 10Hr Days
	Frame Three-Pole Dead End	11	Morabla			0		0		1 (50	/0.00	0 000		0		0		0	10 Month Joh
	Supervision - Foreman	11	Month			0		0	150.0		60.00	99,000		0		0		U	10 Month Job
	Supervision - Construction Management	12	Month			0		0	100.0	1,200	55.00	66,000		0		0	10.000.00		12 Months
E.20 F	R.O.W. / Site Restoration	13	Mile			0		0		0		0		0		0	10,000.00	125,000	

				Costs Incurred To-Date	٨	/lonthly	/ Payroll	*		Weekly	y Payroll*		Stock Ma	aterials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.21	Install OPGW Splice Locations	25	Per Site			0		0		0		0		0	1,500.00	37,500	1,000.00	25,000	2 Boxes per Mile (Includes Box + Splicing)
E.22						0		0		0		0		0		0		0	
E.23						0		0		0		0		0		0		0	
E.24						0		0		0		0		0		0		0	
E.25						0		0		0		0		0		0		0	
E.26						0		0		0		0		0		0		0	
E.27						0		0		0		0		0		0		0	
E.28						0		0		0		0		0		0		0	
				0		2,595	, <u> </u>	144,475		22,484	_ [	1,244,870		104,000		4,407,500		4,438,900	

Manhours Weekly Payroll

Manhours Monthly Payroll

Manhours Monthly Payroll

Part 2: Removals \* All unit and total cost figures should be "raw costs", without any overhead markups. All markups are generated at the end of the estimate. Costs Non-Stock Materials\* Contractors & Fees\* Monthly Payroll\* Weekly Payroll\* Stock Materials\* Incurred (A/P Tax-Exempt) (A/P Taxable) To-Date\* Notes through Production Production МН Work Breakdown Structure (WBS) MH Cost/MH Cost/MH Cost Cost/Unit Quantity Cost Cost/Unit Cost Cost Cost/Unit Cost Units MH/Unit MH/Unit xx/xx/xx 0

Manhours Weekly Payroll

				Costs Incurred To-Date		/lonthly	y Payroll'	*		Weekly	y Payroll*		Stock Ma	iterials*	Non-Stock M		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

## Part 3: Cost Estimate Summary

\$0	
\$0	This figure must be manually entered if applicable
<b>\$</b> 0	This figure must be manually entered if applicable
\$0	_
\$10,339,745	
\$1,276,878	
<b>\$</b> 0	<u></u>
\$11,616,623	<del>_</del>
\$3,484,987	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
\$15,101,610	
	\$0 \$0 \$0 \$10,339,745 \$1,276,878 \$0 \$11,616,623 \$3,484,987

REMOVALS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$0	
Estimated Future Overheads:	\$0	_
Subtotal Future Costs:	\$0	_
Contingency Applied:	\$0	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$0	

GRAND TOTAL
ADDITIONS + REMOVALS:

\$15,101,610

## Assumptions, Notes, Clarifications, etc.:

Total Line Length Assumed to be 12.5 Miles / Majority of structures assumed to be single pole Direct Embed Class Equivalent Structures / 25 Engineered Structures for Long Spans and Angles / 30 Deadend Locations (Approx. one every 1/2 Mile) / All Holes assumed to be contracted and through rock or hard strata.



# **Project Cost Estimate**

Project Name: H Line 115kV Rebuild Double Circuit

Prepared By: Kyle Bragg

<u>Cost Estimate Level:</u> Conceptual Estimate

Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the password "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

<u>Date:</u> 7/14/2014

WO #:

0853 A/R

Revision(s): 1
+/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Part 1: Additions						* All	unit and to	otal cost figu	ıres shou	uld be futu	re "raw cost	ts", <u>without</u> a	ny overhea	d markups. All	markups ar	re generated at	the end of	the estimate.
			Costs Incurred To-Date	M	onthly	Payroll*			Weekly	Payroll*		Stock Ma	aterials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Planning Labor	100	Hours		1.0	100	55.00	5,500		0		0		0		0		0	
A.2 Base Survey (Contract)	1	Contract			0		0		0		0		0		0	180,000.00	180,000	Based off of WH 1&2 Bids
A.3 Geotechnical Borings	1	Contract			0		0		0		0		0		0	100,000.00	100,000	Boring at every location
A.4 Visual Renderings	1	Contract			0		0		0		0		0		0	30,000.00	30,000	
A.5 Lightening / Grounding Study	1	Contract			0		0		0		0		0		0	25,000.00	25,000	
A.6 Engineering Construction Administration	250	Hours		1.0	250	55.00	13,750		0		0		0		0		0	
A.7 Transmission Line Design	600	Hours		1.0	600	55.00	33,000		0		0		0		0		0	
A.8 Lidar - Asbuilts (Contract)	13	Mile			0		0		0		0		0		0	1,300.00	16,900	\$1.3K Per Mile
A.9 Foundation Designs (Contract)	1	Contract			0		0		0		0		0		0	35,000.00	35,000	
A.10 E.M.F. Study	1	Contract			0		0		0		0		0		0	30,000.00	30,000	
A.11 E.S.D. Supervision / Construction Support	12	Per Month		40.0	480	55.00	26,400		0		0		0		0		0	Assumed 4-5 Field Visits Per Month
A.12 Drafting - Design Prints	200	Hours			0		0	1.0	200	55.00	11,000		0		0		0	1/C Drafter
A.13 Drafting - Closeout Prints	50	Hours			0		0	1.0	50	55.00	2,750		0		0		0	1/C Drafter
A.14					0		0		0		0		0		0		0	
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
B.1 Real Property Services	220	Hours		1.0	220	55.00	12,100		0		0		0		0		0	
B.2 Environmental Services	220	Hours		1.0	220	55.00	12,100		0		0		0		0		0	
B.3 Environmental / Permitting Consultant	1	Contract			0		0		0		0		0		0	312,000.00		52% of \$600K Bid Estimate
B.4 Legal Consultation (Contract)	11	Contract			0		0		0		0		0		0	100,000.00	100,000	
B.5 Project Management	550	Hours		1.0	550	55.00	30,250		0		0		0		0		0	
B.7 Project Sponsors	175	Hours		1.0	175	65.00	11,375		0		0		0		0		0	
B.8 Easements	1	Mile			0		0		0		0		0		0		0	
B.9 Purchase Additional R.O.W.	13	Mile			0		0		0		0		0		0	20,000.00	250,000	
B.10 Off R.O.W. Access Agreements	13	Mile			0		0		0		0		0		0	10,000.00	125,000	
B.6							-						_				0	
B.7					0		0		0		0		0		0		0	
B.8					0		0		0		0		0		0		0	
B.9					0		0		0		0		0		0		0	
B.10					0		0		0		0		0		0		0	
C GENERAL CONDITIONS C.1 Construction Trailers	12	months			0		0		0		0		0		0	1,000.00	12,000	
C.2 Temporary Toilet Facilities	12	months			0		0		0		0		0		0	500.00	6,000	
C.3	·-				0		0		0		0		0		0		0	

				Costs Incurred To-Date		Monthly	y Payroll*			Weekly	v Payroll*		Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
C.4 C.5						0		0		0		0		0		0		0	
C.6						0		0		0		0		0		0		0	
C.7						0		0		0		0		0		0		0	
C.8						0		0		0		0		0		0		0	
C.9						0		0		0		0		0		0		0	
C.10						0		0		0		0		0		0		0	
D	MAJOR EQUIPMENT & MATERIALS																		
	Light Duty Steel Poles w/ Vangs & Arms		Each			0		0		0		0		0	8,500.00	0		0	
	Engineered Steel Poles	140	Each			0		0		0		0		0	25,000.00			0	
	Engineered Foundations	140	Each			0		0		0		0		0	35,000.00			0	
	Conductor (795 TERN) Static (OPGW)	875,000 150,000	Feet Feet			0		0		0		0		0	2.00 3.50	1,750,000 525,000		0	
	OPGW Hardware (Nonstock)	130,000	Mile			0		0		0		0		0	10,000.00	130,000		0	Clamps, Splice Boxes, Misc Hardware (Frc
	Standard Stock Materials - Tangent	110	Each			0		0		0		0	400.00	44,000	10,000.00	0		0	Clamps, Spilee Boxes, Mise Hardware (Fre
	Standard Stock Materials - Dead End	30	Each			0		0		0		0	2,000.00	60,000		0		0	
D.9	Bucket / Digger Rental	12	Month			0		0		0		0		0		0	60,000.00	720,000	
	Crane Service	140	Location			0		0		0		0		0		0	1	280,000	
	Equipment Moves	13	Mile			0		0		0		0		0		0	12,000.00	150,000	Assumed 3 Moves per Mile @ \$4K Per Mo
D.12						0		0		0		0		0		0		0	-
	CONSTRUCTION																		+
		1	Contract			0		0		0		0		0		0	60,000.00	40.000	Based off of WH 1&2 Bids
	Construction Staking (Contract)  Erosion / Sediment Control Installation	13	Mile			0		0		0		0		0		0	5,000.00	62,500	
E.2		13	IVIIIe			U		U		U		U		U		U	5,000.00	02,300	
E.3	Install R.O.W. Access Controls (Gates, etc)	13	Mile			0		0		0		0		0		0	8,000.00	100,000	\$2K per Gate Assumed 4 Gates Per Mile
E.4	R.O.W. Improvements - Access (Bulding / Upgrading Roads, Culverts, etc)	13	Mile			0		0		0		0		0		0	15,000.00	187,500	
E.5	R.O.W. Improvements - Matting	2	Mile			0		0		0		0		0		0	650,000.00	1,300,000	Assumed 2 Miles of Matting Needed
	R.O.W. Improvements - Trimming	13	Mile			0		0		0		0		0		0	'	375,000	
	Drill Pole Holes - Soil (Contract)	0	Per Hole			0		0		0		0		0		0		0	
	Drill Pole Holes - Rock ( Contract ) Off Load Pole Delivery	100	Per Hole Per Truck			0		0	8.0	800	55.00	44,000		0		0	,	0	4 Riggers for 4 Hrs Per Truck
	Move Poles to Site Locations (Riggers)	140	Per Pole			0		0		1,120	55.00	61,600		0		0		0	4 Riggers for 4 Hrs Fer Truck
	Set Pole	140	Per Pole			0		0		3,360		184,800		0		0		0	6 Man Crew x 4Hrs
	Frame Single Pole Tangent	110	Per Str			0		0	1	5,280	55.00	290,400		0		0			6 Man Crew x 8Hrs
	Frame Single Pole Dead End	30	Per Str			0		0	72.0	2,160	55.00	118,800		0		0			6 Man Crew x 12Hrs
	String Conductor (3 Phases)	26	Mile			0		0		7,800	55.00	429,000		0		0			6 Man Crew x 5 10Hr Days
	String OPGW	26	Mile			0		0		4,680	55.00	257,400		0		0			6 Man Crew x 3 10Hr Day
	Clip In Conductors / Static	26	Mile			0		0		6,240	55.00	343,200		0		0		0	6 Man Crew x 4 10Hr Days
	Frame Three-Pole Dead End	11	Month			0		0		1 450	/0.00	00,000		0		0		0	10 Month Joh
	Supervision - Foreman	11	Month			0		0	150.0		60.00	99,000		0		0		0	10 Month Job
	Supervision - Construction Management	12	Month			0		0	100.0	1,200	55.00	66,000		0		0		0	12 Months
E.20	R.O.W. / Site Restoration	13	Mile			0		0		0		0		0		0	10,000.00	125,000	

				Costs Incurred To-Date		Monthl <sub>.</sub>	y Payroll*			Weekly	Payroll*		Stock Ma	aterials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.21	Install OPGW Splice Locations	25	Per Site			0		0		0		0		0	1,500.00	37,500	1,000.00	25,000	2 Boxes per Mile (Includes Box + Splicing)
E.22						0		0		0		0		0		0		0	
E.23						0		0		0		0		0		0		0	
E.24						0		0		0		0		0		0		0	
E.25						0		0		0		0		0		0		0	
E.26						0		0		0		0		0		0		0	
E.27						0		0		0		0		0		0		0	
E.28						0		0		0		0		0		0		0	
						-													
				0		2 595	1	144,475		34 540		1,907,950		104,000		########		4,606,900	

					Manhours Monthly Payroll		Manhour	s Weekly	Payroll								
Par	t 2: Removals					* All unit an	d total cost	figures s	should be "	raw costs",	without any overhead	markups. A	ll markups a	ire gen	nerated at the	end of the	estimate.
				Costs Incurred To-Date*	Monthly Payroll	*		Weekly	Payroll*		Stock Materials*		ck Materia Taxable)		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	through					Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit Cost	Cost/Ur	it Cos	t	Cost/Unit	Cost	
					0	0		0		0		)		0		0	
					0	0		0		0		)		0		0	
					0	0		0		0		)		0		0	
					0	0		0		0				0		0	
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					0	0		0		0				0		0	
		_	_	0		0				0				0		0	

Manhours Weekly Payroll

Manhours Monthly Payroll

				Costs Incurred To-Date		/lonthl	y Payroll	*		Weekly	y Payroll*		Stock Ma	iterials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

\$0	
\$0	This figure must be manually entered if applicable
\$0	This figure must be manually entered if applicable
\$0	<del>_</del>
\$17,605,825	
\$1,873,650	
\$0	
\$19,479,475	<del>_</del>
\$5,843,843	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
\$25,323,318	
	\$0 \$0 \$0 \$17,605,825 \$1,873,650 \$0 \$19,479,475 \$5,843,843

REMOVALS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$0	
Estimated Future Overheads:	\$0	<u></u>
Subtotal Future Costs:	\$0	_
Contingency Applied:	\$0	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$0	

GRAND TOTAL
ADDITIONS + REMOVALS:

\$25,323,318

### Assumptions, Notes, Clarifications, etc.:

Total Line Length Assumed to be 12.5 Miles / Majority of structures assumed to be single pole engineered steel with concrete caisson foundations. Assumed 30 Deadend Locations (Approx. one every 1/2 Mile) / All Holes assumed to be contracted and through rock or hard strata.

Location:	t#8 Estimate for SB Line Rebuild —PREFERRED ROUTE (NO NEW Between theHurley Ave and Saugerties Substations	RIGHT OF V	WAY)							<u>B</u>	2/11/2013 sy:R.K.Fournier
Project No:		U	NIT COST								
TOTAL		MATERIAL	LA	BOR	TOTAL		L COST	Over			es overheads)
UNITS	Construction Activity  Met Access (by mileges) (based on 2021 inc data)	(\$)	MH/unit	\$/MH	Man Hrs.	Material (\$)	Labor (\$)	Material	Labor	Material	Labor
1	Mat Access (by mileage) (based on 303 Line data)  Tree Trimming (lump sum)	650,000 50,000	Contract Contract	Contract Contract	0	650,000 50,000	0	52,000 4,000	0	702,000 54,000	0
1	Site Restoration	100.000	Contract	Contract	0	100,000	0	8,000	0		0
1	Erosion Control (silt fence, hay bales, etc)	50,000	Contract	Contract	0	50,000	0	4,000	0		0
1	Building Access Roads (stone, etc)	100,000	Contract	Contract	0	100,000	0	8,000	0		0
0	Drill Pole Holes (includes auger and dewater)	0	8	125	0	0	0	0	0	0	C
172	Drill ROCK Pole Holes (per hole)	1,200	Contract	Contract	0	206,400	0	41,280	0	247,680	0
8	Equipment Moves (mobilization)	0	4	125	32	0	4,000	0	800	0	4,800
172	Haul Materials (from storage site to job site)  Pole and Anchor Staking (survey work)	0	8	125	1,376	0	172,000	0	34,400	0	206,400
263 12	Edge of ROW Staking (survey work) (per mile)	75 225	Contract Contract	Contract Contract	0	19,725 2,700	0	1,578 216	0	21,303 2,916	0
150	Set Pole (wood or steel)	0	20	125	3,000	2,700	375.000	0	75,000	2,310	450.000
150	Frame Single Pole Tangent/Angle (Post or Davit)	0	40	125	6,000	0	750,000	0	150,000	0	900,000
0	Frame Double Pole Tangent/Angle (H-Frame)	0	75	125	0	0	0	0	0	0	0
0	Frame Single Pole Deadend (veritcal or Davit)	0	50	125	0	0	0	0	0	0	0
0	Frame Three-Pole Structure	0	100	125	0	0	0	0	0	0	0
0	Install Bog Shoe Assembly (per structure)	8,000	Contract	Contract		0		0	0	0	0
0	Install 20' Culvert for Swamp Pole Installation	11,100	Contract	Contract		0		0	0		0
22	Install Foundation	60,000	Contract	Contract	70-	1,320,000	00.00-	105,600	40.000	1,425,600	400.000
18 113	Install Engineered Single Pole Structure Install Anchor	20,000	40 20	125 125	720 2,260	360,000 0	90,000 282,500	28,800 0	18,000 56,500	388,800	108,000 339,000
113	Install Guy	0	10	125	1,130	0	282,500 141,250	0	28,250	0	169,500
172	Transfer Static (one wire - per structure)	0	10	125	1,130	0	141,250	0	28,250	0	129,000
172	Transfer Conductor (three wires - per structure)	0	15	125	2,580	0	322,500	0	64,500	0	387,000
34	String New Conductor (per mile - per phase)	0	100	125	3,400	0	425,000	0	85,000	0	510,000
12	String New Static/OPGW (per mile per phase)	0	100	125	1,200	0	150,000	0	30,000	0	180,000
45	Sag Wires (per mile per phase)	0	100	125	4,500	0	562,500	0	112,500	0	675,000
688	Clip in Wire (Per structure, per phase)		1	125	688		86,000	0	17,200	0	103,200
4	Thruway crossing (possible underground transistion)	30,000	50	125	200	120,000	25,000	9,600	5,000	129,600	30,000
0.75	Underground beneath Thruway (per mile)	1,000,000	Contract	Contract	0	750,000	0	60,000	0		0
4	Soil borings for Thurway	10,000	Contract	Contract	0	40,000	0	3,200	0		0
18 12	Soil borings for engineered structures  Rental Trailer (per month)	45,000 1,000	Contract Contract	Contract Contract	0	810,000 12,000	0	64,800 960	0		0
12	Rental Facilities (per month)	1,000	Contract	Contract	0	12,000	0	960	0		0
150	Non Stock Poles	4,900	0	0	0	735,000	0	58,800	0		0
0	Non Stock Cross Arms	1,100	0	0	0	0	0	0	0		0
0	Non Stock Bracing	900	0	0	0	0	0	0	0	0	0
185000	Non Stock Conductor (per foot)	2	0	0	0	370,000	0	29,600	0	399,600	0
62000	Non Stock Static Wire/OPGW (per foot)	4	0	0	0	248,000	0	19,840	0		0
0	Non Stock Other (per structure)	500	0	0	0	0	0	0	0		0
172	Standard Stock Materials (per structure)	950	0	0	0	163,400	0	57,190	0		0
12	Material Staging Areas (rent/month)	1,000	0	0	0	12,000	0	960	0	12,960	00.770
32 0	Switching Distribution Switching	0		60 60	256 0	0	15,360 0	0	21,412	0	36,772
0	Distribution Switching			00	0	U	0	U	0	U	0
	Management & Other Services		1							I .	1
4	Drafting (per week)	0	30	40	120	0	4,800	0	6,691	0	11,491
1.5	CH Project Management	0	500	60	750	0	45,000	0	47,655	0	92,655
1.5	CH Engineering & Engineering Management	0	800	60	1,200	0	72,000	0	76,248	0	148,248
1	Contract Enigneering (Design)	0	Contract	Contract	0	0	0	0	0	0	0
1	Contract Engineering (Technician)	60,000	Contract	Contract	0	60,000	0	4,950	0	64,950	0
1	CH Environmental Management (DEC Reg. Wetlands)	0	500	60	500	0	30,000	0	31,770	0	61,770
1	CH Special Services Management System Construction Management (MP)	0	300	60 60	300	0	18,000	0	19,062	0	37,062
1.5	Construction Supervision (CHGE Foreman) (WP)	0	800 700	60	1,200 1,050	0	72,000 63,000	0	76,248 87,822	0	148,248 150,822
1.5	Contract Legal	200,000			1,050	200,000	03,000	16,500	0 87,822	-	150,822
1	Contract Permitting (EDR)	100,000		Contract	0	100,000	0	8,250	0	-,	0
0	ROW Costs	100,000	0	0	0	0	0	0,230	0		0
1	LiDAR Survey	16,000	Contract		0	16,000	0	1,320	0	17,320	0
	- SUBTOTALS -		<u> </u>		20.000	6,507,225	3,813,410			7,097,629	4,878,968
	Total District M-hrs.(w/o contingency)		<del> </del>		33,322						
	Overheads		1								
	Weekly Labor O.H. @ 139.4% (included above)										
	Monthly Labor O.H. @105.9% (included above)  Direct Purch. Matl. O.H. @8.25% (included above)		-								
	Contract O.H. @22% (included above) (See Note 3)		1								
	Stock Matl. O.H. @35% (included above)										
			-	-							
	Subtotals		1								
	Total Matl. & Labor with O.H.									7,097,629	4,878,968
	Accounting O.H. @14% of first \$300k		l								42,000
	Estimated AFUDC Contingency @15%		1								131,743 1,796,490
	Grand Tótal		<u> </u>		33,322						13,946,829
	Approximate				33,320						13,947,000

Approximate

Note 1: Construction labor is based on the lump sum bid proposed by awarded contractor - Thirau LLC on 9/21/2012

Note 2: Rock Hole line Item assumes the use of a contractor for 100% of the poles called out on the scope at a price of \$1,200 per hole

Note 3: 22% Overhead applied to all contracts recommended by Construction based on costs incurred to-date on recent projects.

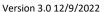
This Estimate is for the SB Line. It does not include costs for "PHASE III" the new 115kV line from Hurley Ave to North Catskill This estimate assumes using Class Wood Pole equivalent Steel Poles without foundations and a side guy where necessary to stabilize the structure in the NESC H Overload conditions where available.

Current design utilizes single pole single circuit davit arm design. Foundation installed where necessary.

Approximately \$1,255,000 per mile
Approximately \$81,000 per structure (this is higher than the "pro forma" lattice tower replacement because of the addition of possible boring and undergrounding at the NYS Thruway)
Estimate assumes approximately 12 months for construction.

\*Substantial ROW my be required depending on the final route selection







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: 69kV HG Line Rebuild - (Honk Falls - Neversink) - Part102 Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: 10261

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2020 In-Service: 6/1/2028

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Portions of the existing HG-Line include an electric distribution underbuild that will require an associated rebuild and/or relocation and connection work orders. Project may require OPGW fiber terminations in the substations.

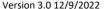
#### Describe the project objective and scope of work:

Rebuild the 16.25-mile 69kV HG-Line located in both Neversink and Wawarsing. Approximately 54% of the existing structures on the line have been identified as part of the company's comprehensive inspection program as having conditions warranting replacement. While various maintance projects have been completed on the line, a majority of the infrastructure is exhibiting advanced age and has reached the end of its useful life. Comprehensive rebuild of the line including conductors, poles, static wires, etc.. is needed.

#### Describe specific scope exclusions, assumptions and constraints:

This rebuild project is early in its planning stage and the need and/or scope of the following project components have not yet been well quantified and/or defined: access improvements including any significant earthwork; easement deficiencies; encroachments; FAA lighting; constraints related to protection of sensitive environmental resources.

### **Budget Submittal Form**





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Compliance; Infrastructure; Reliability; Resilience; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project is needed to address the aging transmission infrastructure present on the HG Line consistent with Planning Memo "EP2018-009".

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Given the age of existing pole structures and the fact that they have generally reached the end of their useful life, the rebuild will result in operational cost savings and cost avoidance (new structures will require less planned and emergency repair work for years/decades to come).

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

#### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

#### Do you anticipate the project to require significant jurisdictional approvals?

PSL Part 102 with municipal approval(s); Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

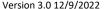
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

### **Budget Submittal Form**





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Repair of the existing assests or other transmission system upgrades are considered in the early design and planning memo process, in this case a comprehensive rebuild was chosen as the best option given the age of the assets. Localized re-routes, alternate structure configurations and material types are considered as part of detailed planning, design and permitting processes.

#### Why was the proposed project scope chosen over other alternatives?

Rebuild of the majority of the line on existing ROW proved to be the most cost effective option.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

If the project is not completed in the identified timeframe there is a heighted risk of in-service failure of the existing infrastructure prompting uplanned and costly repairs as well as impacts to the local hyro-generation facilities procluding them from being able to generate.

#### What are the risks and consequences of not completing this project?

Due to the age and condition of existing structures and conductor, the most significant risk of not completing the project are increased outages due to component failures. The consequences include negative impacts to both SAIFI and CAIDI metrics.

Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?

N/A

#### What other factor were considered during the prioritization process?

This project was submitted to NYS DPS as one that helps supports the state's CLCPA goals and should be prioritized accordingly.



#### **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu				r cost estimates si le adjustments for			
	\$40,417,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	3,358,200	46,700	25,000	480,000	1,100,000	1,100,000	606,500	
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	8,395,500	116,750	62,500	1,200,000	2,750,000	2,750,000	1,516,250	
ī	Contractors (A/P tax exempt)	21,828,300	303,550	162,500	3,120,000	7,150,000	7,150,000	3,942,250	
Т	Overheads	3,263,000			191,000	968,000	1,152,000	952,000	
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	36,845,000	467,000	250,000	4,991,000	11,968,000	12,152,000	7,017,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	331,400			25,000	135,000	134,900	36,500	
	Contractors (A/P tax exempt)	2,982,600			225,000	1,215,000	1,214,100	328,500	
R	Overheads	258,000			11,000	90,000	118,000	39,000	
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	3,572,000	0	0	261,000	1,440,000	1,467,000	404,000	0
	* AFUDC may require adjustment after Finance Depart		-						
	Expense \$ (if applicable):	0							

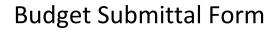
2021-2023 2024

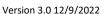
Prior years funding; not actuals.

482,000

3,872,000

3,390,000







Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 28,291,900 Maximum (\$): 52,542,100

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

The provided cost estimate was based on historical project data from completed project actuals of a similar type.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Total project cost estimate is based on the total conceptual project cost detailed in the provided estimate. The cost breakdown provided above is displayed based on an averaged historical percentage split of project Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals are similarly split 90/10 by Contractor AP charges and Internal Labor respectively. This historical split has also been applied to the prior year actuals / projections column as well.

# Cost Estimate Summary: 397.5 ACSR

ADDITIONS SUMMARY: Incurred To-Date: Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: AFUDC Costs Incurred To-Date: Subtotal Costs To-Date:	\$0 \$0	This figure must be manually entered if applicable  This figure must be manually entered if applicable
Estimated Future Raw Costs: Estimated Future Overheads: Estimated Future AFUDC: Subtotal Future Costs:	\$10,958,780 \$882,016 \$387,054 \$12,227,850	=
Contingency Applied:  GRAND TOTAL ADDITIONS:	\$3,668,355 <b>\$15,896,205</b>	30.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
REMOVALS SUMMARY: Incurred To-Date: Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs: Estimated Future Overheads: Subtotal Future Costs:	\$0 \$0 <b>\$0</b> \$923,000 \$26,058 <b>\$949,058</b>	This figure must be manually entered if applicable
Contingency Applied:  GRAND TOTAL REMOVALS:	\$284,717 <b>\$1,233,775</b>	30.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS + REMOVALS:	\$17,129,981	

### Assumptions, Notes, Clarifications, etc.:

- 397 Ibis ACSR
- Underbuild distribution 336 Merlin ACSR
- OPGW overhead Shield wire, 42/57/669, FIBER
- 16 mile line
- 283 total structures. 240 new structures and 43 structures to be re-used.
- 2 miles of matting required
- Assumes no temporary or permanent off ROW access acquisitions

## Cost Estimate Summary: 795 ACSR

urred To-Date: Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: AFUDC Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable  This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$12,804,780	
Estimated Future Overheads:	\$955,338	
Estimated Future AFUDC:	\$449,793	
Subtotal Future Costs:	\$14,209,911	=
Contingency Applied:	\$4,262,973	Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$18,472,885	
MOVALS SUMMARY:		
urred To-Date:	¢n	
urred To-Date: Raw Costs Incurred To-Date:	\$0 \$0	This figure must be manually entered if annlicable
urred To-Date: Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
urred To-Date:  Raw Costs Incurred To-Date:  Overhead Costs Incurred To-Date:  Subtotal Costs To-Date:	\$0 <b>\$0</b>	This figure must be manually entered if applicable
urred To-Date:  Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs:	\$0 <b>\$0</b> \$968,000	This figure must be manually entered if applicable
urred To-Date:  Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs: Estimated Future Overheads:	\$0 <b>\$0</b> \$968,000 \$24,800	This figure must be manually entered if applicable
urred To-Date:  Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs:	\$0 <b>\$0</b> \$968,000	This figure must be manually entered if applicable
urred To-Date:  Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date: Subtotal Costs To-Date: Estimated Future Raw Costs: Estimated Future Overheads:	\$0 <b>\$0</b> \$968,000 \$24,800	This figure must be manually entered if applicable  Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.

# Assumptions, Notes, Clarifications, etc.:

- 795 Tern ACSR
- Underbuild distribution 336 Merlin ACSR
- OPGW overhead Shield wire, 42/57/669, FIBER
- 16 mile line
- 283 total structures. 250 new structures and 33 structures to be re-used.
- 2 miles of matting required
- Assumes no temporary or permanent off ROW access acquisitions



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Rebuild Length

Project Name: HG Line Rebuild - Part 102 69kV Date: 1/6/2023 WO #:

Part 1: Additions						* All unit a	and total co	st figures should	be "raw cost	s", <u>without</u> an	y overhead	markups. Mark	ups are ger	nerated at the e	nd of the es	stimate.
			Costs Incurred To-Date		nthly Payro	*		Weekly Payro	<b>  </b> *	Stock M	aterials*	Non-Stock I (A/P Tax		Contractor: (A/P Tax-I		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	H Cost/Mi	l Cost	Production MH/Unit	MH Cost/MI	H Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																
A.1 Engineering Design -121	16	miles		348.4 5,0				0	0		0		0			0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
A.2 Engineering Supervision; Project Sponsor - A.3 Drafting - 132	16 16	miles miles		6.5	06 60.0	0 6,337	49.7	0 7 801 60.00	0 48,090		0		0			0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
A.4 ESP - 125	16	miles		7.8	26 60.0		49.1	0	40,090		0		0			0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +50% for multiple substations
A.5 Planning - 126	16	miles			96 60.0	0 17,787		0	0		0		0		0	0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
A.6 Misc Internal Support	16	miles		4.7	76 60.0	0 4,580		0	0		0		0			0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
A.7 LIDAR	16 16	miles miles			0	0		0	0		0		0	2,400.00		1 pre/post project LIDAR flights 8 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
A.8 Engineering and Related Contractors A.9	10	miles			0	0		0	0		0		0	22,512.60	303,300 N	0 AVG 01 PAIL 102S (G/EF/HF/CL/TV/KN/I) + 10%
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																
B.1 Environmental Consultant	16	miles			0	0		0	0		0		0	40,409.60		O Avg of G, CL, TV, KM. EF, HF ignored due to short length and high cost. H&SB and A&C ignored due to Article VII. +10%
B.2 Legal Consultant	16	miles		202.2	0 40.0	0 105.057		0	0		0		0	57,532.20	928,455	5 Avg of G, TV, KM. +10%. CL, EF, HF ignored due to lack of signficant legal costs. Varies signficantly with PMO approach and municipalities 0 Avg of G, EF, HF, CL, TV, KM \$/mile to hrs/mile +10%
B.3 Project Manager - 110 B.4 Environmental - 726	16 16	miles miles		202.3 3,3 55.5	264 60.0 395 60.0			0	0		0		0			0 Avg of G, EF, HF, CL, TV, KNI \$/mile to nrs/mile +10% 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
B.5 Real Property Services - 124	16	miles			778 60.0			0	0		0		0			0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
B.6 System Ops - 330	16	miles		15.5	250 60.0	0 15,008	18.6	300 60.00	17,994		0		0			O Avg of G, EF, HF, CL, TV. +25% for multiple substations
B.7					0	0		0	0		0		0		0	0
C GENERAL CONDITIONS C.1 Surveying/Staking C.2 Easements/Access Right/Laydown Yards	16 16	miles miles			0	0		0	0		0		0	22,647.90 21,116.70		2 Avg of G, EF, HF, CL, TV. +10% 1 Avg of G, EF, HF, CL, TV, KM, H&SB, A&C. +10%
C.3	10	IIIICS			0	0		0	0		0		0	21,110.70	340,701	0
C.4 Filing Fees	16	miles			0	0		0	0		0		0	6,279.90		5 Avg of G, EF, HF, CL, TV, KM. +10%
C.5 Misc AP (ecluding material)	16	miles			0	0		0	0		0		0	9,227.90	148,920	0 Avg of G, EF, HF, CL, TV. +10%
C.6					0	0		0	0		0		0		0	0
D MAJOR EQUIPMENT & MATERIALS D.1 Conductor 397 ACSR Ibis (30-50-134)	268,407	FT			0	0		0	0	1.90	510,721		0		0	D Adjusted CME Quote 11/21/22. \$/FT for 1033.5 Ortloan * (Ibis X-Sect Area/Ortolan X-Sect Area)
D.2 OPGW (30-50-205)	92,025				0	0		0	0		307,595		0		0	0 MMS price as of 12/5/22
D.3 Poles	1	314	4		0	0		0	0		0	4,372,000.00	4,372,000		0	0 SB PO#91505: 80' H4 Tangent Davit Item #3 - 20% for 69kV post, , +1 for each 2-pole structure. +1 for each swing angle Engineered Stru
D.4 Major Engineered Structures	4	Str			0	0		0	0	-	0	75,000.00	150,000		0	0
D.5 Moderate Engineered Structures  D.6 69kV Inline post Structure	230				0	0		0	0		265,142	37,500.00	130,000		<u>U</u>	0 SS Cost as of 11/4/22
D.7 69kV Swing Angle Structure	20	Str			0	0		0	0		62,082		0			0 SS Cost as of 11/4/22
D.8 69kV Deadend Structure	30	Str			0	0		0	0	8,521.36			0			0 SS Cost as of 11/4/22
D.9 Crossarms and X-Braces for 2-poles	46	Str			0	0		0	0	1,238.00			85,100		0	0 34-79-006,008,009 MMS \$ as of 117/22
D.10 Misc Material D.10	280	str	1		0	0		0	0	500.00	140,000	250.00	70,000		0	U
D.10			1		J	0		U	0		1		0		U	<u> </u>
E CONSTRUCTION																
E.1 Line Construction	16	miles			0	0		0	0		0		0	396,420.20	6,397,429	9 Avg of recent Part 102s (EF/HF/CL/TV). +10%
E.2 Major Drilled Pier Foundations	0	Str			0	0		0	0		0		0	350,000.00	0	0
E.3 Moderate Drilled Pier Foundations	4	Str			0	0		0	0		0		0	175,000.00	700,000	0
E.4 Drilling / Site Work / Matting / Access / Trimming / Restoration / etc.	16	miles			0	0		0	0		0		0	495,642.40		7 Avg of Part 102s (G/EF/HF/CL/TV). Combined all associated costs because of overlap between contractors. +10%
E.5 Equipment Moves/Rentals	16	miles	1		0	0		0	0		0		0	6,747.40	108.890	0 Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.6 T&D Foreman - 215	16	miles			0	0	485.0		469,624		0		0	5,7 17.10		O Avg of recent Part 102s (CL/TV) with foreman more soley dedicated to project. +10%
E.7 T&D Engineer, Planner, Director - 215	16	miles		130.5 2,		0 126,340		0	0		0		0		0	0 Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.8 OS Foreman - 221	16	miles	1		0	0	6.8				0		0			0 Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.9 Storekeepers - 223	16	miles			0	0	2.1	33 60.00	1,988		0		0		0	0 Avg of Part 102s (G/EF/HF/CL/TV). +10%

				Costs Incurred To-Date*		•	Payroll*			Weekly	y Payroll	*	Stock Ma	terials*	Non-Stock (A/P Ta		Contractor (A/P Tax-		Notes	
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	н с	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		
E.10	Mechanics - 224	16	miles			0		0	29.8	481	60.00	28,847		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	ı
E.11	Electricians - 225	16	miles			0		0	45.6	736	60.00	44,158		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +25%	for multiple substations
E.12	Substation Technicians - 226	16	miles			0		0	90.5	1,460	60.00	87,623		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	1
E.13	District Line Crews	16	miles			0		0	19.8	319	60.00	19,154		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	ı.
E.14	Misc WP	16	miles			0		0	1.6	25	60.00	1,509		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	1
				0		1		811,238			- -	725,536		1,598,128		4,677,100		18,144,158		
					13, Manhours M		Payroll		Manhour	12,092 s Weekly										

Part 2: Removals

<sup>\*</sup> All unit and total cost figures should be "raw costs", without any overhead markups. All markups are generated at the end of the estimate.

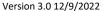
			Costs Incurred To-Date*		Month	ly Payroll*	•		Weekly	Payroll*		Stock Ma	iterials*	Non-Stock (A/P Ta	Materials* axable)	Contractor (A/P Tax-		Notes			
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost				
'	'		Costs Incurred To-Date*		Month	ly Payroll*				Payroll*		Stock Ma	iterials*	Non-Stock (A/P Ta	Materials* axable)	Contractor (A/P Tax-		Notes			
# Work Breakdown Structure (WBS)	, , =,				n MH	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost				
Line Construction	16	miles			0		0		0		0		0		0	98,726.10	1,593,242	Avg of Part 102s (EF/HF/CL/TV). +10%			
Drilling / Site Work / Matting / Access / Trimming / Restoration / etc.	16	miles			0		0		0		0		0		0	73,480.00	1,185,820	Avg of Part 102s (G/EF/HF/CL/TV). Combined	all associated costs because of overlap b		
Equipment Moves/Rentals	16	miles			0		0		0		0		0		0	1,276.00		Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Misc AP (Including Dumpsters)	16	miles			0		0		0		0		0		0	4,041.40		Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Transmission Foreman - 215	16	miles			0		0	36.7			35,521		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Mechanics - 224	16	miles			0		0	2.1			2,041		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Electricians - 225	16	miles			0		0	3.6			3,444		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%			
District Line Crews	16	miles			0		0	0.9		60.00	852		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Misc WP	16	miles		04 =	0	10.00	0	0.8	13	60.00	799		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%			
Project Management - 110	16	miles		21.7	350	60.00	20,983		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM). +10%			
					0		0		0		0		0		0		0				
					0		0		0		0		0		0		0				
			+		0		0		0		<u> </u>		0		0		0				
							0		0		<u> </u>		0		0		0				
		1	0	†			20,983	1		<u>'                                    </u>	42,658	1	0		0		2,864,874	1			
				<u>н</u> Manho	350 urs Month	] Ily Payroll	20,700		711 rs Weekly		12,000	Ц	<u> </u>	IJ		<b>]</b>	2,031,071	4			

### Part 3: Cost Estimate Summary

	-	
DDITIONS SUMMARY:		
curred To-Date: Raw Costs Incurred To-Date:	\$0	
	ŞU	T1: C
Overhead Costs Incurred To-Date: AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
	<del></del>	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$25,956,160	
Estimated Future Overheads:	\$2,692,280	
Estimated Future AFUDC:	\$1,880,402	<u>_</u>
Subtotal Future Costs:	\$30,528,843	_
Contingency Applied:	\$3,052,884	10.0% Contingency factor from Overheads & AFUDC Calculator (optional).
<i>.</i>	. , ,	Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$33,581,727	
EMOVALS SUMMARY:		
curred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$2,928,514	
Estimated Future Overheads:	\$84,370	
Subtotal Future Costs:	\$3,012,885	=
Contingency Applied:	\$301,288	10.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$3,314,173	
GRAND TOTAL REMOVALS:	\$3,314,173	
GRAND TOTAL		
ADDITIONS + REMOVALS:	\$36,895,901	
ADDITIONS + REIVIOVALS.		<b>_</b>

Assumptions, Notes, Clarifications, etc.:







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

#### A. GENERAL

Project/Program Name: Retirement of O&OB Line Section from Dasville to Ohioville

Work Order #:

4 3 1 9 - G

**Budget Group:** Electric

**Budget Category:** 12 **Funding Project Number:** 

1-1212-02-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 1/1/2022

In-Service: 12/31/2025

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There will potentially be other Cat#12 and Cat#13 Work Orders to retire the old Ohioville Substation as part of this project, re-route and remove the transmission lines immeadiately outside of the existing Ohioville Substation and make modifications to the station as required to remove the lines.

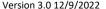
#### Describe the project objective and scope of work:

In 2016, Central Hudson's new 115kV Sturgeon Pool Substation was put into service. This will ultimately allow the upgrade of the existing 69kV "P", "FK", "HK", "MG", "MK" and "GK" Lines to 115kV. As a consequence of these upgrades, Central Hudson will be retiring approximately 6.2 Miles (60 Towers) of the existing 69kV "O" and "OB" Lines from "O/OB" Tower 131 heading south to the Ohioville Substation.

#### Describe specific scope exclusions, assumptions and constraints:

Conceptual Project assumptions and estimates do not assume special provisions for access, matting, environmental controls or permitting.

### **Budget Submittal Form**





#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Transmission Sustaining** Load Based/Infrastructure:

Maintain System Standards **Discretion Level:** Infrastructure **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Infrastructure; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is needed to remove existing assets that are no longer in use and have reached the end of their useful life. Please also see EP Memo "EP2012-015" for further justification and details associated with the removal of the line.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

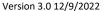
**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

### **Budget Submittal Form**





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Please see EP Memo referenced above.

Why was the proposed project scope chosen over other alternatives? Please see EP Memo referenced above.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Completing the project in the requested timeframe will reduce the risk of an aged asset failing unexpectedly and causing damage to private property.

What are the risks and consequences of not completing this project?

The longer the old assets remain in place, there is an elevated risk of failure

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



#### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1st 5-year bu				cost estimates s adjustments for			
	\$1,753,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	0	0	0	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	172,900	104,900	32,400	35,600				
	Contractors (A/P tax exempt)	1,556,100	944,100	291,600	320,400				
R	Overheads	24,000		8,000	16,000				
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	1,753,000	1,049,000	332,000	372,000	0	0	0	0
	* AFUDC may require adjustment after Finance Depart	rtment review.							
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	744,000	420,000	324,000					

**2021-2023**Prior years funding; not actuals.

2024



### **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 1,227,100 Maximum (\$): 2,278,900

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Base estimate for the removal of approximately 60 towers from 2023-2025 is based on a per tower removal cost of \$18K per tower plus \$11K per tower for span removals. Prior year spending accounts for actuals associated with removal of the conductors.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Estimate assumes a 90/10 split for AP and internal labor charges. This split was applied to prior year / projections column.

PRELIMINA	ARY Installation Estimate for Transmission Line reroutes (OR, C	B, O, and F	) associa	ted with r	new Sturge	opn Pool Sul					8/28/2012
Location:	OR, O, OB and P Lines around Sturgeon Pool RIFTON CROSSII	NG OPTION								<u>B</u> y	:R.K.Fournier
Project No:	TBD										
			NIT COST								
TOTAL		MATERIAL		BOR	TOTAL		L COST	Overl	nead	Total (include	s overheads)
UNITS	Construction Activity	(\$)	MH/unit	\$ / MH	Man Hrs.	Material (\$)	Labor (\$)	Material	Labor	Material	Labor
1	Building Access Road (stone, swamp mats, tree removal)	5,000	Contract	Contract	0	5,000	0	1,100	0	6,100	C
1	Erosion Control (silt fence, hay bales, etc.) and Restoration		Contract		0		0	550	0	3,050	
1	Restoration		Contract		0	.,	0	1,650	0	9,150	<u> </u>
1	Construction Labor (See Note 1) (Thirau USA)		Contract		0		0	26,400	0	146,400	C
1	ROW Clearing		Contract		0		0		0	25,000	<u> </u>
21	Dig Rock Hole (See Note 2)	1,200	Contract		0		0	0	0	25,200	C
4	Switching (Electricians Rate = 1.5)	0	Charleson Hotel	50	32	0	1,600	0	2,230	0	3,830
21	Non Stock Materials (steel poles, wood poles, ect.)	5,000		0	O		0	8,663	0	113,663	C
1	Non Stock Materials (wire)	33,000		0	O	A CONTRACT OF THE PARTY OF THE	0	2,723	()	35,723	C
21	Standard Stock Materials (average \$ per structure)	1,000	0	10	O	21,000	0	7,350	0	28,350	C
	Management & Other Services										
1	Drafting	0		40	150	0	6,000	0	8,364	0	14,364
1	CH Engineering & Engineering Management	10				10	8,250		8,737	10	16,987
1	CH Environmental Management (DEC Reg. Wetlands)	0				0	8,250		8,737	0	16,987
1	CH Special Services Management	0				0	8,250		8,737	0	16,987
1	System Construction Supervision	0				0	13,000		13,767	0	26,767
1	Construction Supervision (CHGE Foreman)	0				0	13,000		18,122	0	31,122
1	ROW	65,000			0	65,000	0		0	65,000	C
	- SUBTOTALS -					344,210	58,350			392,645	127,044
	Total District M-hrs.(w/o contingency)				1,032						
	Overheads										
	Weekly Labor O.H. @ 139.4% (included above)										
	Monthly Labor O.H. @105.9% (included above)										
	Direct Purch. Matl. O.H. @8.25% (included above)									-	·
	Stock Matl. O.H. @35% (included above)										-
	Subtotals										
	Total Matl. & Labor with O.H.									392,645	127,044
	Accounting O.H. @14% of first \$300k										42,000
	Estimated AFUDC										6,000
	Contingency @15%										77,953
	Grand Total				1,032						645,642
	Approximate				1.030						646,000

Note 1: This line item represents recent pricing accepted from Thirau USA Inc. This assumes 14 structures on the OR (7 into sub and 7 out of sub), 5 structures on the P, and 2 on the N/OB

It is assumed that the OR structures can be done without an outage, with decent access it is assumed that 2 structures could be installed each day. All other structure work assumes a rate of 1.5 structures per day. Note 2: Rock Hole line item assumes the use of a contractor for 100% of the poles called out on the scope at a price of \$1,200 per hole

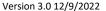
			Unit cost	Material		Unit	Labor cost	
Description	Quantity	Units	(\$)	cost (\$)	Quantity	cost	(\$)	Total (\$)
69 kV cable	4,000	lr+	80	220.000	7	E0 000	350,000	670.000
69 kv terminations		Ea	10,000	320,000 40,000	7	50,000 6,000	350,000 24,000	670,000
69 kV arresters		Ea	2,500	10,000	4	3,000	12,000	22,000
vault grounding		Ea	5,000	20,000	4	3,000	12,000	32,000
link box/SVL	4	Ea	700	2,800	4	1,800	7,200	10,000
fiber optic cable	2,000	ft	1	2,000	2,000	_ 3	6,000	8,000
continuity conductor	2,200	ft	6	13,200	2,200	4	8,800	22,000
testing					2	10,000	20,000	20,000
Subtotals				408,000			440,000	848,000
er structures		E-	42.000	460.000		12.000	40.000	200.000
69kv riser structure	4	Ea	40,000	160,000	4	12,000	48,000	208,000
Subtotals ctbank/Earthwork	+			160,000			48,000	208,000
conduit	2 000	Et	8	16.000	2,000	7	14,000	30,000
spacers		units	3	450	150	11	1,650	2,100
rock excavation	650	<u> </u>		.50	650	200	130,000	130,000
Thermal Backfill		Cu Yd	125	50,000	400	35	14,000	64,000
duct encasement	400	Cu Yd	200	80,000	400	50	20,000	100,000
electric manholes	2	Ea	10,000	20,000	2	5,000	10,000	30,000
comm. manholes	2	Ea	8,000	16,000	2	4,000	8,000	24,000
electric vaults		Ea	20,000	40,000	2	15,000	30,000	70,000
horizontal boring	650	Ft	250	162,500	650	500	325,000	487,500
Subtotals				384,950			552,650	937,600
whood Structure PA - different		<u> </u>			l .			
rhead Structure Modifications  New single pole OR struct	2	Ea	7,000	21,000	150	120	18,000	39,000
New OB/O Structure		Ea	6,000	6,000	150	120	18,000	24,000
New OB/N Structure		Еа	6,000	6,000	150	120	18,000	24,000
Installation of new OB Conductor	600		2	1,200	150	240	36,000	37,200
Installation of new O Conductor		Ft	2	300	150	60	9,000	9,30
Installation of new N Conductor	150	Ft	2	300	150	60	9,000	9,30
Installation of new OR Conductor	2,400	Ft	2	4,800	150	360	54,000	58,800
Installation of new OR OPGW	800	Ft	3	2,400	150	300	45,000	47,400
Installation of new OB OPGW			3	600	150	300	45,000	45,600
Dig Pole Hole		Ea	1,500	7,500	0	0	0	7,500
Standard Stock Materials	5		1,000	5,000	0	0	0	5,000
Nonstock Materials	5		6,000	30,000	400		C 400	C 400
Switching	500		0	9E 100	100	64	6,400	6,400
Subtotals nagement and Other Services		l .	l l	85,100	l		258,400	343,50
Drafting	40	Man Hr	50	250		l	2,000	
CH Engineering & Eng. Management			33	250			8,000	
Contract Engineering							15,000	
CH Environmental Man. (DEC Wetlands)							10,000	
CH Special Services Management							5,000	
Construction Supervision	100	Man Hr	50	<del></del>			5,000	
Contract Permitting (legal fees included)				100,000			0	
Right of Way Cost				0			0	
Right of Way Restoration				30,000			0	
Subtotals				130,250	-		45,000	175,250
		<u> </u>			<u> </u>			
engin./admin./other		15%				I	1	299,04
engini, admini, other		13%	1				+	233,040
1								
Totals for Southern Section				1,083,200			1,085,650	2,811,39
				,			,	
s estimate used data from CHA	l	1	11		1			

217

850' (Over Rid	lge Adjaceı	nt to Stur	geon Pool	Substation)	- RKF 8/23,	/12		
Description	Quantity	Units	Unit cost (\$)	Material cost (\$)	Quantity	Unit cost	Labor cost (\$)	Total
le and accessories		T	1		ı			
115 kV cable	6,600		80	528,000	7	50,000	350,000	878,
115 kv terminations	4	Ea	10,000	40,000	4	6,000	24,000	64,
115 kV arresters	4	Ea	2,500	10,000	4	3,000	12,000	22,
vault grounding	4	Ea	5,000	20,000	4	3,000	12,000	32
link box/SVL	4	Ea	700	2,800	4.	1,800	7,200	10
fiber optic cable	2,000	ft	1	2,000	2,000	3	6,000	8
continuity conductor	2,200	ft	6	13,200	2,200	4.	8,800	22
testing					2	10,000	20,000	20
Subtotals				616,900			440,000	1,056
					l line.			
er structures		4411		JV III				
115kv riser structure	4	Ea	40,000	160,000	4	12,000	48,000	208
Subtotals				160,000			48,000	208
tbank/Earthwork		•					•	
conduit	2,000	Ft	8	16,000	2,000	7	14,000	30
spacers	200	units	3	600	200	11	2,200	2
rock excavation	850				850	200	170,000	170
Thermal Backfill		Cu Yd	125	62,500	500	35	17,500	80
duct encasement	500	Cu Yd	200	100,000	500	50	25,000	125
electric manholes	2	Ea	10,000	20,000	2	5,000	10,000	30
comm. manholes	2	Ea	8,000	16,000	2	4,000	8,000	24
electric vaults		Ea	20,000	40,000	2	15,000	30,000	70
horizontal boring	850		250	212,500	850	500	425,000	637
Subtotals			250	467,600	030	500	701,700	1,169
New single pole OR struct Installation of new OR Conductor Installation of new OR OPGW	600		6,000	6,000 1,200 300	150 150	120 240 60	18,000 36,000	24 37
			_		150		9,000	9
Dig Pole Hole	1	Ea	1,500	1,500	0	0	0	1
Standard Stock Materials	1		1,000	1,000	0	0	0	1
Nonstock Materials	1		6,000	6,000	100	C 4	C 400	_
Switching Subtotals	500		0	0 <b>16.000</b>	100	64	6,400 <b>69,400</b>	85
Subtotals				10,000			03,400	0.
nagement and Other Services							•	
Drafting	40	Man Hr	50	250			2,000	
CH Engineering & Eng. Management							8,000	
Contract Engineering							15,000	
CH Environmental Man. (DEC Wetlands)							10,000	
CH Special Services Management							5,000	
Construction Supervision	100	Man Hr	50				5,000	
Contract Permitting (legal fees included)				100,000			0	
Right of Way Cost				0			0	
Right of Way Restoration				30,000			0	
Subtotals				130,250			45,000	175
I I								
ineering								364
ineering engin./admin./other		15%						
		15%						
engin./admin./other		15%		1 373 850			1 234 700	3 059
		15%		1,373,850			1,234,700	3,058

	1500' (Over Ri	dge Adjace	nt to Stu	rgeon Pool	Substation)	- RKF 8/24/	/12		
	Description	Quantity	Units	Unit cost (\$)	Material cost (\$)	Quantity	Unit cost	Labor cost (\$)	Total (\$)
Cabl	e and accessories								
	115 kV cable	6,600	Ft	80	528,000	7	50,000	350,000	878,00
	115 kv terminations	4	Ea	10,000	40,000	4	6,000	24,000	64,00
	115 kV arresters	4	Ea	2,500	10,000	4	3,000	12,000	22,00
	69 kV cable	4,000	Ft	80	320,000	7	50,000	350,000	670,00
	69 kv terminations	4	Ea	10,000	40,000	4	6,000	24,000	64,00
	69 kV arresters	4	Ea	2,500	10,000	4)	3,000	12,000	22,00
	vault grounding	8	Ea	5,000	40,000	4	3,000	12,000	52,00
	link box/SVL	8	Ea	700	5,600	4	1,800	7,200	12,80
	fiber optic cable	4,000		1	4,000	4,000	3	12,000	16,00
	continuity conductor	4,400	ft	1 6	26,400	4,400	_4	17,600	44,00
	testing Subtotals		<b>-</b>		1,024,000	4	10,000	40,000 <b>860,800</b>	40,00 <b>1,884,8</b> 0
lise	r structures				P -		Į.	L	
	115kv riser structure	4	Ea .	40,000	160,000	4	12,000	48,000	208,00
	69kv riser structure	4	Ea	40,000	160,000	4	12,000	48,000	208,00
	Subtotals				320,000			96,000	416,00
Duct	bank/Earthwork			•		•	•		
	conduit	4,000	Ft	8	32,000	4,000	7	28,000	60,00
	spacers	350	units	3	1,050	350	11	3,850	4,90
	rock excavation	1,500				1,500	200	300,000	300,00
	Thermal Backfill	900	Cu Yd	125	112,500	900	35	31,500	144,00
	duct encasement	900	Cu Yd	200	180,000	900	50	45,000	225,00
	electric manholes	4	Ea	10,000	40,000	4	5,000	20,000	60,00
	comm. manholes	4	Ea	8,000	32,000	4	4,000	16,000	48,00
	electric vaults	4	Ea	20,000	80,000	4	15,000	60,000	140,00
	horizontal boring	1500	Ft	250	375,000	1,500	500	750,000	1,125,00
	Subtotals				852,550			1,254,350	2,106,90
Ove	rhead Structure Modifications								
	Switching	500		0	0	100	64	6,400	6,40
	Subtotals				0			6,400	6,40
/lan	agement and Other Services								
	Drafting	40	Man Hr	50	250			2,000	
	CH Engineering & Eng. Management							8,000	
	Contract Engineering							15,000	
	CH Environmental Man. (DEC Wetlands)							10,000	
	CH Special Services Management							5,000	
	Construction Supervision	100	Man Hr	50				5,000	
	Contract Permitting (legal fees included)				100,000			0	
	Right of Way Cost				0			0	
	Right of Way Restoration				30,000			0	
	Subtotals				130,250			45,000	175,25
ngi	neering		<u>.                                    </u>					I	
	engin./admin./other		15%					_	661,15
	Totals for Southern Section				2,326,800			2,256,150	5,250,50
	. State 15. Southern Section				_,==5,000			_,,	<u>,</u>







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

### A. GENERAL

**Budget Group:** 

Project/Program Name: Q Line Electric Transmission Rebuild

Work Order #: **Budget Category:** 12 Electric **Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 5/1/2020 In-Service: 12/30/2030

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

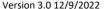
Project will require OPGW fiber terminations in the substations as well as various other improvements. More extensive upgrades to other substation equipment may be required if the line is energized to 115kV.

#### Describe the project objective and scope of work:

The Q line is 20.5 miles in length traversing from Pleasant Valley to Rhinebeck. The line was originally constructed in the 1950's and based on results from Central Hudson's 5-year comprehensive inspections, approximately 65% of the structures are in need of replacement with numerous other exhibiting an array of minor defect. Due to the condition of the line, Central Hudson is evaluating a more comprehensive approach to mitigation and developing recommendations to rebuild the line at 115kV.

### Describe specific scope exclusions, assumptions and constraints:

This rebuild project is early in its planning stage and the need and/or scope of the following project components have not yet been well quantified and/or defined: access improvements including any significant earthwork; easement deficiencies; encroachments; FAA lighting; constraints related to protection of sensitive environmental resources. Discussions are still staking place regarding the potential to build the line to 115kV which would affect the required scope and permitting requirements through NYS DPS.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Compliance; Infrastructure; Reliability; Resilience; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Despite conducting numerous maintenance projects on the line, inspection findings indicate that approximately 65% of the wood pole line section is still in need of replacement or repair as a results of aging infrastructure and poor overall condition. In addition to the required structure work, Central Hudson has also experienced several in-service failures of the static wire which has resulted in outages.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Given the age of existing structures and the fact that they have generally reached the end of their useful life, the rebuild will result in operational cost savings and cost avoidance (new structures will require less planned and emergency repair work for years/decades to come).

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Electric; Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

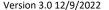
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

governance





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

The repairing of defective structures (over 65% of existing line) was considered but would not be able to meaningfully extend the life of the structures given their age and current condition. Spot replacement of each structure individually was also considered but creates other long-term operational constraints for the line moving forward as opposed to a more comprehensive rebuild.

### Why was the proposed project scope chosen over other alternatives?

Repairing defective structures (over 65% of existing line) will not prove to be cost effective over time and will make design and construction difficult when trying to meet current NEC and CHG&E standards. Repairs would also limit the ability to enhance/improve the structure locations to create better access or to avoid sensitive environmental resources.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

The majority of the structures and conductors on the Q Line have reached the end of their useful life. The existing infrastructure is in need of replacement to mitigate the increased risk of failure due to advanced age.

### What are the risks and consequences of not completing this project?

Due to the age and condition of existing structures and conductor, the most sugnificant risk of not completing the project are increased outages due to component failures. The consequences include negative impacts to both SAIFI and CAIDI metrics.

Was this project included in a prior 5-year forecast?

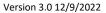
Yes

If No, why should this project be completed instead of a planned project?

N/A

### What other factor were considered during the prioritization process?

The project has also been submitted by Central Hudson as a Phase I project that supports NYS CLCPA and renewable energy goals.





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			r cost estimates si le adjustments for			
	\$66,363,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	5,670,000	32,200	60,000	60,000	100,000	800,000	1,500,000	3,117,800
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	14,175,000	80,500	150,000	150,000	250,000	2,000,000	3,750,000	7,794,500
ı	Contractors (A/P tax exempt)	36,855,000	209,300	390,000	390,000	650,000	5,200,000	9,750,000	20,265,700
Т	Overheads	3,303,000			24,000	88,000	838,000	2,353,000	
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	60,003,000	322,000	600,000	624,000	1,088,000	8,838,000	17,353,000	31,178,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	610,000					50,000	200,000	360,000
	Contractors (A/P tax exempt)	5,490,000					450,000	1,800,000	3,240,000
R	Overheads	260,000					44,000	216,000	
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	6,360,000	0	0	0	0	544,000	2,216,000	3,600,000
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	746,000	519,000	227,000					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see provided conceptual estimate for details - Estimate was created using historic pricing on projects of a similar scope and permitting requirements with project specific adjustments.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Cost Estimate breakdown is based on the total conceptual project cost provided and detailed in the provided estimate. The cost breakdown provided above is displayed based on an averaged historical percentage split of project Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. This historical split has also been applied to the prior year actuals / projections column as well. Removals are split between Accounts Payable / AA and Internal Labor at a rate of 90% and 10% respectively.



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Q Line Rebuild - Article VII 115kV Project Name: Date: 11/7/2022

Rebuild Ler WO #: 2002A/R-H Sam Pozorski Revision(s): 16.681 Prepared By: Cost Estimate Level: Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Part 1: Additions							* All unit	and total co	st figures	should be	"raw costs	s", <u>without</u> any	overhead r	markups. Marki	ups are ger	nerated at the e	nd of the est	iimate.
			Costs Incurred To-Date*		Month	y Payroll*			Weekly	Payroll*		Stock Ma	terials*	Non-Stock N (A/P Tax		Contractor (A/P Tax-		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Engineering Design -121	17	miles		395.9	6,604	60.00	396,257		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) +25%
A.2 Engineering Supervision; Project Sponsor -310	17	miles		7.4	124	60.00	7,444		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM)
A.3 Drafting - 132	17	miles			0		0	45.2	753	60.00	45,189		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM)
A.4 ESP - 125	17	miles		10.4	173	60.00	10,409		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) x2 for multiple
A.5 Planning - 126	17	miles		33.4	557	60.00	33,429		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) x2 for multiple
A.6 Misc Internal Support	17	miles		5.4	90	60.00	5,380		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) +25%
A.7 LIDAR	17	miles			0		0		0		0		0		0	2,400.00	40,034	pre/post project LIDAR flights
A.8 Engineering and Related Contractors	17	miles			0		0		0		0		0		0	25,565.00	426,450	Avg of G/EF/HF/CL/TV/KM/H&SB/A&C +25%
A.9					0		0		0		0		0		0		0	
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
B.1 Environmental Consultant	17	miles			0		0		0		0		0		0	110,239.00	1,838,897	H&SB as of 11/4/22 +\$30k/mile for during construction
B.2 Legal Consultant	17	miles			0		0		0		0		0		0	30,000.00		Typical cost per mile for Article VII. Assumed lower le
B.3 Project Manager - 110	17	miles		321.7	5,366	60.00	321,943		0		0		0		0			Avg of A&C, H&SB \$/mile to hrs/mile +25% for contin
B.4 Environmental - 726	17	miles		158.7	2,648	60.00	158,866		0		0		0		0			Avg of A&C, H&SB \$/mile to hrs/mile +25% for continuous
B.5 Real Property Services - 124	17	miles		80.7	1,346	60.00	80,761		0		0		0		0			Avg of A&C, H&SB \$/mile to hrs/mile +15% for contin
B.6 System Ops - 330	17	miles		15.5	259	60.00	15,513	18.6	310	60.00	18,599		0		0			Avg of G, EF, HF, CL, TV. +25% for multiple substati
B.7					0		0		0		0		0		0		0	J
C GENERAL CONDITIONS																		
C.1 Surveying/Staking	17	miles			0		0		0		0		0		0	40,884.53	681 995	Avg of H&SB+50% and A&C, +10%
C.2 Easements/Access Right/Laydown Yards	17	miles			<u> </u>		<u> </u>		0		0		n		0	58,276.05		H&SB +5% for minor continued charges
C.3	17	TIMOS			0		0		0		0		n		0		,,z,103	That the following continued charges
C.4 Filing Fees	17	miles			0		0		0		0		0	1	0		11 358	Avg of H&SB, A&C +10%
C.5 Misc AP (ecluding material)	17	miles			0		0		0		0		0		0	+		Avg of G, EF, HF, CL, TV, A&C. +20% for Art VII
C.6	.,	1111100			0		0		0		0		0		0	10// 10:10	0	
D MAJOR EQUIPMENT & MATERIALS																		
D.1   Conductor 795 Drake ACSR (30-50-180)	277,438	FT			0		0		0		0	3.81	1,057,121	1	0		0	Adjusted CME Quote 11/21/22. \$/FT for 1033.5 Ortlo
D.2 OPGW (30-50-205)	95,122	FT			0		0		0		0		317,944		0			MMS price as of 12/5/22
D.3 Poles	1	235 Poles			0		0		0		0	0.01	0.7,7,11	3,657,977.00	3,657.977			SB PO#91505: 85' H4 Tangent Davit Item #5, 85' H4
D.4 Major Engineered Structures	4	Str			0		0		0		0		0	85,000.00	340,000		0	a service of the serv
D.5 Moderate Engineered Structures	14	Str			0		0		0		0		0	42,500.00			0	
D.6 115kV Tangent Davit Structure	169	Str			0		0		0		0	1,311.56	221,654	12,000.00	0 0		0	SS Cost as of 11/4/22
D.7 115kV Swing Angle Structure	30	Str			0		0		0		0	3,262.87	97,886	1	0	1		SS Cost as of 11/4/22
D.8 115kV Deadend Structure	13	Str			0		0		0		0	9,155.63			0			SS Cost as of 11/4/22

Page 2 of 4 4/25/2023

				Costs Incurred To-Date*		Monthly	y Payroll*			Weekly	Payroll*		Stock Mat	erials*	Non-Stock N (A/P Tax		Contractor: (A/P Tax-I		Notes	
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		
D.9	Crossarms and X-Braces for 2-poles	41	Str			0		0		0		0	1,238.00	50,758	1,850.00	75,850		0	34-79-006,008,009 MMS \$ as of 117/22	
D.10	Misc Material	212	str			0		0		0		0	500.00	106,000	250.00	53,000		0		
D.10						0		0		0		0		0		0		0		
E	CONSTRUCTION																			
E.1	Line Construction	17	miles			0		0		0		0		0		0	432,458.40	7,213,839	Avg of recent Part 102s (EF/HF/CL/TV). +20	20% for Art VII
E.2	Major Drilled Pier Foundations	4	Str			0		0		0		0		0		0	375,000.00	1,500,000		
E.3	Moderate Drilled Pier Foundations	14	Str														50,000.00	700,000		
E.4	Drilling / Site Work / Matting / Access / Trimming / Restoration / etc.	17	miles			0		0		0		0		0		0	585,759.20	9,771,049	Avg of Part 102s (G/EF/HF/CL/TV). Combir	ned all associ
E.5	Equipment Moves/Rentals	17	miles			0		0		0		0		0		0	7,360.80	122,786	Avg of Part 102s (G/EF/HF/CL/TV). +20%	
E.6	T&D Foreman - 215	17	miles			0		0	661.4	11,032	60.00	661,944		0		0		0	Avg of recent Part 102s (CL/TV) with forema	nan more sole
E.7	T&D Engineer, Planner, Director - 215	17	miles		177.9	2,968	60.00	178,078		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +50% for	for Article VII
E.8	OS Foreman - 221	17	miles			0		0	6.8	113	60.00	6,771		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
	Storekeepers - 223	17	miles			0		0	9.3	156		9,341		0		0			Avg of Part 102s (G/EF/HF/CL/TV). x5 for A	Article VII
	Riggers/Mechanics - 224	17	miles			0		0	33.9	565	60.00	33,883		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +25%	
	Electricians - 225	17	miles			0		0	45.6	761	60.00	45,643		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +25%	
	Substation Technicians - 226	17	miles			0		0	90.5	1,510		90,571		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
	District Line Crews	17	miles			0		0	19.8	330	60.00	19,799		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
E.14	Misc WP	17	miles			0		0	1.6	26	60.00	1,560		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
								1 000 000	1		IF	200.00	i i	1 070 06 :	1	1 701 05-		00.050.65		
				0	]	20,135		1,208,080	1	15,555	] [	933,300	<u> </u>	1,970,386	J l	4,721,827	J l	23,958,234	<u>]</u>	

					Costs Incurred To-Date*		Month	ly Payroll*			Weekly	Payroll*		Stock Mat	terials*	Non-Stock N (A/P Tax		Contractor (A/P Tax-		Notes
	#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
-	·					Manhou	rs Month	ly Payroll		Manhours	s Weekly	Payroll					-			

_	rt 2: Removals															, ,	nerated at the			
				Costs Incurred To-Date*		Month	ly Payroll*		,	Weekly	Payroll*		Stock Mat	erials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes	
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		
	Line Construction	17	miles			0		0		0		0		0		0	107,701.20	1,796,564	Avg of recent Part 102s (EF/HF/CL/TV). +	-20% for A
	Drilling / Site Work / Matting / Access / Trimming / Restoration / etc.	17	miles			0		0		0		0		0		0	86,840.00	1,448,578	Avg of Part 102s (G/EF/HF/CL/TV). Coml	oined all as
	Equipment Moves/Rentals	17	miles			0		0		0		0		0		0	1,276.00	21,285	Avg of Part 102s (G/EF/HF/CL/TV). +10%	<del>,</del> )
	Misc AP (Including Dumpsters)	17	miles			0		0		0		0		0		0	4,041.40	67,415	Avg of Part 102s (G/EF/HF/CL/TV). +10%	<del>,</del> 0
	Transmission Foreman - 215	17	miles			0		0	50.0	834		50,068		0		0			Avg of Part 102s (G/EF/HF/CL/TV). Allocation	
	Mechanics - 224	17	miles			0		0	0.8	14		817		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
	Electricians - 225	17	miles			0		0	4.0	67		4,045		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +259	
	District Line Crews	17	miles			0		0	0.9	15		881		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
	Misc WP	17	miles			0		0	0.8	14	60.00	826		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%	
	Project Management - 110	17	miles		29.6	493	60.00	29,575		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM). +	50% (No <i>A</i>
						0		0		0		0		0		0		0		
						0		0		0		0		0		0		0		
						0		0		0		0		0		0		0		
						0		0		0		0		0		0		0		
						0		29,575	Ļ	0		0		0	<u> </u>	0		3,333,841		

Manhours Weekly Payroll

# Part 3: Cost Estimate Summary

DITIONS SUMMARY:		
urred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	<del>-</del>
Estimated Future Raw Costs:	\$32,791,827	
Estimated Future Overheads:	\$3,373,127	
Estimated Future AFUDC:	\$2,374,628	
Subtotal Future Costs:	\$38,539,582	<del>-</del>
Contingency Applied:	\$3,853,958	10.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$42,393,540	7

Manhours Monthly Payroll

# Assumptions, Notes, Clarifications, etc.:

Scope of work includes a rebuild of the existing pole section of the line from the East Park Tap to the Rhinebeck Substation (16.7 miles) via the East Park and Staatsburg Substations. Line configuration to be monopole davit tangent structures with 2-pole swing angle and deadend structures. Poles to be predominately direct-embedded weathering steel, with 795 ACSR conductors and AC-34/56/669 OPGW static wire. Line to be rebuilt on existing ROW, with access and easement deficiencies consistent with recent example projects. Line to be rebuilt at 115kV and permitted as an Article VII project. Assumes a continuous outage and typical construction practices and sequencing.

Quantities of "major" and "moderate" sized custom engineered structures w/ foundations as assumed based on conceptual line review. Final number will be refined as design is developed and permitting progresses.

				Costs Incurred To-Date*		Month	ly Payroll*			Weekly	y Payroll*		Stock Ma	terials*	Non-Stock   (A/P Ta		Contractor (A/P Tax-		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
Incurr	PVALS SUMMARY:  ed To-Date:  Raw Costs Incurred To-Date:  Overhead Costs Incurred To-Date:  Subtotal Costs To-Date:  Estimated Future Raw Costs:  Estimated Future Overheads:  Subtotal Future Costs:  Contingency Applied:	=	\$3,42 \$104 \$3,52	60 60 20,054 4,247 24,301	10.0%	Continge	nanually ente ncy factor fro	om Overhead	ds & AFUDC (					portion of access. To and/or a li are develon the likely i	the Fall Kill not his section maine re-route. To pped. The allo need for these	ear Creek F ay require s This has bed owance for de e style struc	Rd in Poughke significant acc en excluded fi engineered st	eepsie, with eess improve rom specific ructures me ocation if an	made pennisulas into a dammed up very limited on and off ROW ements, easement acquisitions, estimate line items until options entioned above should account for alternative route is not acquired.
	GRAND TOTAL REMOVALS:  GRAND TOTAL			70.272	<u>]</u> 1														

\$46,270,272

ADDITIONS + REMOVALS:

I -> X

2.857

X Line

40

14



I Line Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet. Structures Structures Factor

Date: 12/5/2022 WO #: 2002-H or TBD

<u>Prepared By:</u> Sam Pozorski (factored C. Rottkamp SB Line estimate) <u>Revision(s):</u> Cost Estimate Level: Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Project Name: Q-Line Rebuild Tower Section w/ X Line

Manhours Monthly Payroll

Manhours Weekly Payroll

Part 1: Additions										* All un	nit and total	cost figures s	hould be "ra	aw costs", <u>witho</u>	out any ove	erhead markups.	Markups	os are generated at the end of the estimate.
			Costs Incurred To-Date		Monthl	y Payroll	*		Weekly	/ Payroll*		Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
# Work Breakdown Structure (WBS)	Quantity	y Units	through 9/9/2022	Production MH/Unit	n MH	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Raw Costs Accrued To-Date in Work Order		Isum	568,646	0.1	0 0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	(	0 Per PowerPlan 9/9/2022
A.2 Transfer Precon. Costs from WO #0854-D	3	Isum	0	0.0			0	0.0		0.00	0	0.00	0	0.00	0			O Per request to Plant Accounting 9-7-22. SCP:x0 for Q est because assumed these costs are captured in Q pole sec
A.3 Transmission Engineer - Construction	74	weeks	0	13.			71,203	0.0		0.00	0	0.00	0	0.00	0			0 Per Kyle B. email 8/5/2022 (27 hrs/week split between SB-Line and I-Line)
A.4 Transmission Engineer - Administration	74	weeks	0	4.0	_		21,097	0.0		0.00	0	0.00	0	0.00	0	0.00		0 Per Kyle B. email 8/5/2022
A.5 Engineering - Survey for Sagging	9	days	0	0.1	0 0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	750.00	6,42	Per Kyle B. email 8/5/2022 (\$1,500/day split between SB-Line and I-Line)
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
B.1 Project Manager - Preconstruction Phase	11	weeks	0	4.	0 46	71.00	3,246	0.0	0	0.00	0	0.00	0	0.00	0	0.00	(	0 Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.2 Project Manager - Construction Phase	74	weeks	0	20.	0 1,486	71.00	105,486	0.0	0	0.00	0	0.00	0	0.00	0	0.00		0 Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.3 Project Manager - Restoration/Closeout	17	weeks	0	6.	_		7,303	0.0			0	0.00	0	0.00	0			0 Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.4 Env. Affairs - Preconstruction Phase	11	weeks	0	4.	_		3,246	0.0		0.00	0	0.00	0	0.00	0			0 Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.5 Env. Affairs - Construction Phase	74	weeks	0	8.			42,194	0.0		0.00	0	0.00	0	0.00	0	0.00		O Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.6 Env. Affairs - Restoration/Closeout	17	weeks	0	2.			2,434	0.0		0.00	0	0.00	0	0.00	0	0.00		O Per discussions between Chris R. and Erika R. 9/8/22 (no billing against I-Line planned)
B.7 Real Property Services Support	0	weeks	0	0.			0	0.0		0.00	0	0.00	0	0.00	0			O Per discussions with Kate W. 9/8/22, we do not anticipate any further Real Property support on the WO.
B.8 Vegetation Manager	3	Isum	0	0.	_		0	0.0		0.00	0	0.00	0	0.00	0			77 Allowance
B.9 Daily Environmental Monitor, Construction	409	days	0	0.	_		0	0.0		0.00	0	0.00	0	0.00		.,		Assumes 10-hrs/day, 5.5-days per week; rate includes labor, truck, meals, lodging (EDR)
B.10 SWPPP Inpections Post-Construction B.11 Env. Consultant Support As-Needed	11	days Isum	0	0.0			0	0.0		0.00	0	0.00	0	0.00	0	1,092.00 2,000.00		00 Assumes 0.5-day per week for 8 weeks (EDR)  14 Allowance for EDR
B.11 Eliv. Collsultant Support As-Needed	3	ISUIII	U	0.	0 0	0.00	U	0.0	U	0.00	U	0.00	0	0.00	U	2,000.00	3,714	4 Allowalice for EDR
C GENERAL CONDITIONS																		
C.1 Marshalling Yard Lease "Duke's Pit"	17	months	0	0.	0 0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	400.00	6.85	Distribution of \$1,000/month lease provided by Pat H. 9/9/22
C.2 CHG&E Trailer, Storage, Rent, Sanitary	35	weeks	0	0.0			0	0.0		0.00	0	0.00	0	0.00	0	170.00		77 Per Pat H. detailed construction cost estimate received 7-6-2022; Weeks = 26x46.7% per Pat H.
C.3 Marshalling Yard/Laydown Improvements	3	Isum	0	0.			0	17.0			4,371	0.00	0	1,700.00	4,857			0 Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
C.4 Matting in laydown/marshalling yards	3	Isum	0	0.	0 0	0.00	0	149.0	426	90.00	38,314	0.00	0	0.00	0	0.00	(	0 Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
C.5 Snow Removal Allowance	3	Isum	0	0.0	0 0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	17,000.00	48,57	71 \$20,000 Allowance, split 85% A, 15% R
C.6 Security (lighting; signage; fencing, etc.)	3	Isum	0	0.	0 0	0.00	0	40.0	114	90.00	10,286	0.00	0	2,000.00	5,714	0.00	(	0
C.7 Surveying Offsets & Remarking as needed	3	Isum	0	0.		0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	4,000.00		9 Initial survey markouts already in costs incurred to-date
C.8 Miscellaneous Expenses	3	Isum	0	0.	0 0	0.00	0	0.0	0	0.00	0	500.00	1,429	1,000.00	2,857	1,000.00	2,85	57
D MAJOR EQUIPMENT & MATERIALS	S																	
D.1 BILL OF MATERIALS Estimate	3	Isum	0	0.0	0 0	0.00	0	0.0	0	0.00	0	(28,446.00)	(81,274)	287,211.00	820,603	0.00	(	0 See spreadsheet by Sharon 9/8/22; Reduced Stock Material by \$93,598 already charged to WO
E CONSTRUCTION					+			-					-					
E.1 Construction Bid / Contract Award	3	Isum	n	0.0	0 0	0.00	n	0.0	0	0.00	0	0.00	n	0.00	n	1.248 692 00	3.567 69	Per Pat H. detailed construction cost estimate received 7-6-2022
E.2 Line Clearance; Tree Trimming; Mowing	3	Isum	n	0.0			n	38.0	109		9,771	0.00	n	0.00	0			O Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
E.3 Flagging	3		0	0.0	_		^	10.0	29	90.00	2,571	0.00	0	0.00	0	0.00		O Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
	_	Isum	0				0						0		0			0 (85%/15% A/R Split) Edited labor rate
E.4 Foremen (Field Supervision) E.5 Operations Services Foreman	74	weeks	0	0.0			0	43.0 7.0			287,486 1,800	0.00	0	0.00	Ū			0 (85%/15% A/R Split) 0 (85%/15% A/R Split)
E.6 T&D Field Clerk	6	day	0	0.0			0	8.0			3,246	0.00		0.00		0.00		0   (85%/15% A/K Spill) 0   Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
E.7 Operations Services Electricians Switching	3	Isum	0	0.0			0	64.0			12,983	0.00		0.00		0.00		O Per Pat H. detailed construction cost estimate received 7-6-2022; "Edited labor rate"  O Per Pat H. detailed construction cost estimate received 7-6-2022; "Edited labor rate"
E.8 T&D General Supervision	74		0	) 7.	_	71.00	36,920	0.0			12,703 N	0.00		0.00		0.00		O Per Pat H. detailed construction cost estimate received 7-6-2022; Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
E.9 T&D Engineer	74		0	8.		71.00		0.0		0.00	n	0.00		0.00		0.00		O Per Pat H. detailed construction cost estimate received 7-6-2022; Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
E.10 T&D Planner	74		0	) 2.		71.00					0	0.00		0.00		0.00		O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate  O Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
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· · · · · · · · · · · · · · · · · · ·	-	-	568,646	,	•	· İ	348,509		•	İ	370,829		(79,846)	)	834,031	i i	4,116,92	23
			(-	=-	4,909	1		•	4,169	1		1		<b>=</b> -		<b>=</b>		
				Manka	rc Monthly	±I u Dovroll		Manhau	rc Wookly									

229

			Costs Incurred To-Date*	, ,	Weekly Payroll*	Stock Materials*	Non-Stock Materials* (A/P Taxable)	(A/P Tax-Exempt)	Notes
#	Work Breakdown Structure (WBS)	Quantity Uni	through 9/9/2022	Production MH Cost/MH Cost	Production MH Cost/MH Cost	Cost/Unit Cost	Cost/Unit Cost	Cost/Unit Cost	

Part 2: Removals										* All uni	and total c	ost figures sho	uld be "raw	costs", <u>witho</u>	<u>ut</u> any overh	nead markups	s. All markuj	ps are generated at the end of the estimate.
			Costs Incurred To-Date*	N	Monthly	y Payroll*		,	Weekly	Payroll*		Stock Materials*			Non-Stock Materials* (A/P Taxable)		ors & Fees* c-Exempt)	Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through 9/9/2022	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
R.1 Raw Costs Accrued To-Date in Work Order	3	Isum	3,324	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.0	0	0 Per PowerPlan 9/8/2022
R.2 Construction Bid / Contract Award	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	220,357.0	0 629,591	Per Pat H. detailed construction cost estimate received 7-6-2022
2.3 Marshalling Yard Lease "Duke's Pit"	17	months	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	100.0	0 1,714	4 Distribution of \$1,000/month lease provided by Pat H. 9/9/22
R.4 CHG&E Trailer, Storage, Rent, Sanitary	35	weeks	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	30.0	0 1,037	Per Pat H. detailed construction cost estimate received 7-6-2022; Weeks = 26x46.7% per Pat H.
R.5 30 CY Dumpsters	9	each	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	1,200.00	10,286	0.0	0 (	Per Pat H. detailed construction cost estimate received 7-6-2022
R.6 Marshalling Yard/Laydown Improvements	3	Isum	0	0.0	0	0.00	0	3.0	9	90.00	771	0.00	0	300.00	857	0.0	0 (	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
2.7 Line Clearance; Tree Trimming; Mowing	3	Isum	0	0.0	0	0.00	0	7.0	20	90.00	1,800	0.00	0	0.00	0	0.0	0 (	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
R.8 Matting in laydown/marshalling yards	3	Isum	0	0.0	0	0.00	0	26.0	74	90.00	6,686	0.00	0	0.00	0	0.0	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
R.9 Foremen (Field Supervision)	74	weeks	0	0.0	0	0.00	0	8.0	594	90.00	53,486	0.00	0	0.00	0	0.0	0 (	0 (85%/15% A/R Split)
.10 Operations Services Foreman	3	day	0	0.0	0	0.00	0	1.0	3	90.00	257	0.00	0	0.00	0	0.0	0 (	0 (85%/15% A/R Split)
1.11 Snow Removal Allowance	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	3,000.0	0 8,571	1 \$20,000 Allowance, split 85% A, 15% R
.12 Additional Allowance for Tower Removal	40	str		5.0	200	60.00	12,000	8.0	320	60.00	19,200		0		0	5,000.0	0 200,000	0
					0		0		0		0		0		0		(	0
		•	3,324				12,000				82,200		0		11,143		840,914	4

# Part 3: Cost Estimate Summary

ADDITIONS + REMOVALS:

ADDITIONS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$568,646	
Overhead Costs Incurred To-Date:	\$336,431	This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:	\$823	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$905,900	-
Estimated Future Raw Costs:	\$5,590,446	
Estimated Future Overheads:	\$751,604	
Estimated Future AFUDC:	\$369,384	
Subtotal Future Costs:	\$6,711,433	-
Contingency Applied:	\$761,733	10.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$8,379,067	
REMOVALS SUMMARY:		

Manhours Monthly Payroll

Manhours Weekly Payroll

GRAND TOTAL ADDITIONS:	\$6,575,067	
REMOVALS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$3,324	
Overhead Costs Incurred To-Date:	\$2,669	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$5,993	_
Estimated Future Raw Costs:	\$946,257	
Estimated Future Overheads:	\$116,507	
Subtotal Future Costs:	\$1,062,764	_
Contingency Applied:	\$106,876	10.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$1,175,632	
GRAND TOTAL	¢0 554 600	7

# Assumptions, Notes, Clarifications, etc.:

This Q Line Tower Section estimate is based on the definitive estimate for the SB and I Line Rail Trail Section of the H&SB Rebuild. The SB estimate was used as a direct correlation for the Q Line portion, while the X portion was similarly based on the I component. Structure size, style and loading for the SB&I is assumed to be comparable for the Q/X. However, for the SB&I the span lengths are limited by the distribution underbuild, which results in a higher density of transmission structures per mile of line. To account for this, the SB & I costs were extrapolated for the Q & X (respectfully), on a per structure rather than per miles basis. Nearly the entire estimate is based on this assumption, with the only differences being:

- Removed the transferred preconstruction costs, since these are accounted for in the separate Q Line 115kV Rebuild Pole Section estimate.
- Allowance for additional removal costs for the existing lattice towers on the Q & X that are not present on the SB & I.
- 10% contingency. Greater than SB&I contingency (5%) because the costs are just a similar example and not specific to the Q & X project, but lower than the Q Line Pole Section (20%) because this is based on the definitive estimate for a comparable project.

This estimate does not account for any modification, replacement or reconductor of the tower section between the East Park Tap and the Inwood Avenue Substation.

I -> X

2.857

I Line

14

X Line

40

Structures Structures Factor



Project Name: X-Line Partial Rebuild w/ Q Line

Manhours Monthly Payroll

Manhours Weekly Payroll

Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

12/5/2022 WO #: TBD Prepared By: Sam Pozorski (factored C. Rottkamp I Line estimate) Revision(s):

Cost Estimate Level: Conceptual Estimate  $\pm$  +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

	* All unit and total cost figures should be "raw costs", without any overhead markups. Markups are  Costs Incurred To-Date*  * All unit and total cost figures should be "raw costs", without any overhead markups. Markups are  Weekly Payroll*  Stock Materials* (A/P Taxable)  Contractors & Fees* (A/P Tax-Exempt)																	
			N	Monthly	/ Payroll'	r		Weekly	Payroll*		Stock Mate	erials*					Notes	
# Work Breakdown Structure (WBS)	Quantity	Units	through 9/12/2022	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
A PLANNING & ENGINEERING																		
A.1 Raw Costs Accrued To-Date in Work Order	1	Isum	155,760	0.0	0		0	0.0	0		0	0.00	0	0.00	0	0.00		Per PowerPlan 9/12/2022
A.2 Transmission Engineer - Construction	74	weeks	0	13.5	1,003		71,203	0.0	0		0	0.00	0	0.00	0	0.00		Per Kyle B. email 8/5/2022 (27 hrs/week split between SB-Line and I-Line)
A.3 Transmission Engineer - Administration	74	weeks	0	4.0	297		21,097	0.0	0		0	0.00	0	0.00	0	0.00		Per Kyle B. email 8/5/2022
A.4 Engineering - Survey for Sagging	9	days	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	750.00	6,429	Per Kyle B. email 8/5/2022 (\$1,500/day split between SB-Line and I-Line)
PROJECT MANAGEMENT, B ENVIRONMENTAL & SUPPORT SERVICES																		
.1 Project Manager - Preconstruction Phase	11	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all PM time being charged to SB-Line
2 Project Manager - Construction Phase	74	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all PM time being charged to SB-Line Rail Trail Section
3 Project Manager - Restoration/Closeout	17	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all PM time being charged to SB-Line Rail Trail Section
4 Env. Affairs - Preconstruction Phase	11	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all Env. Affairs time being charged to SB-Line Rail Trail Section
5 Env. Affairs - Construction Phase	74	weeks	0	0.0	0		0	0.0	0		0	0.00	0	0.00	0	0.00		Anticipate all Env. Affairs time being charged to SB-Line Rail Trail Section
6 Env. Affairs - Restoration/Closeout	17	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all Env. Affairs time being charged to SB-Line Rail Trail Section
7 Real Property Services Support	0	weeks	0	0.0	0	71.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00		Per discussions with Kate W. 9/8/22, we do not anticipate any further Real Property support on the V
8 Vegetation Manager	3	Isum	0	0.0	0		0	0.0	0		0	0.00	0	0.00	0	0.00	0	Little anticipated; Assume any veg. management will only be charged to SB-Line Rail Trail
Daily Environmental Monitor, Construction	409	days	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00		Anticipate all environmental monitor time to be charged to SB-Line Rail Trail Section
0 SWPPP Inpections Post-Construction	11	days	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Anticipate all SWPPP inspection work to be charged to SB-Line Rail Trail Section
1 Env. Consultant Support As-Needed	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Any consulting support work required would most likely be charged to SB-Line Rail Trail Section
GENERAL CONDITIONS																		
.1 Marshalling Yard Lease "Duke's Pit"	17	months	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	400.00	6,857	Distribution of \$1,000/month lease provided by Pat H. 9/8/22
2 CHG&E Trailer, Storage, Rent, Sanitary	31	weeks	0	0.0	0		0	0.0	0		0	0.00	0	0.00	0	170.00		Per Pat H. detailed construction cost estimate received 7-6-2022; Weeks = 26x39.2% per Pat H.
3 Marshalling Yard/Laydown Improvements	3	Isum	0	0.0	0		0	17.0	49		4,371	0.00	0	1.700.00	4,857	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor
4 Matting in laydown/marshalling yards	3	Isum	0	0.0	0		0	125.0	357		32,143	0.00	0	0.00	0	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor
5 Snow Removal Allowance	3	Isum	0	0.0	0		0		0		0	0.00	0	0.00	0	17,000.00		\$20,000 Allowance, split 85% A, 15% R
6 Security (lighting; signage; fencing, etc.)	3	Isum	0	0.0	0		0		114		10,286	0.00	0	2,000.00	5,714	0.00	0	
7 Surveying Offsets & Remarking as needed	3	Isum	0	0.0	0		0	0.0	0		0	0.00	0	0.00	0	4.000.00	11,429	Initial survey markouts already in costs incurred to-date
Miscellaneous Expenses	3	Isum	0	0.0	0		0	0.0	0		0	500.00	1,429	1,000.00	2,857	1,000.00	2,857	initial survey marketis directly in costs mounted to date
MAJOR EQUIPMENT &  MATERIALS																		
1 BILL OF MATERIALS Estimate	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	7,489.00	21,397	189,251.00	540,717	0.00	0	See spreadsheet by Kyle B. 8/5/22; Reduced Stock Material by \$35,403 already charged to WO
CONSTRUCTION																		
Construction Bid / Contract Award	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	1.048.152.00	2.994.720	Per Pat H. detailed construction cost estimate received 7-6-2022
2 Line Clearance; Tree Trimming; Mowing	3	Isum	n	0.0	0		n	67.0	191	90.00	17,229	0.00	0	0.00	n	0.00	n	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor
3. 3.	3		0	0.0	0	0.00	0				2,571	-	0	0.00	0	0.00	0	· · · · · · · · · · · · · · · · · · ·
Flagging  Flagging		Isum	0				0	10.0	29	90.00		0.00	0		0			Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
4 Foremen (Field Supervision)	74	weeks	0	0.0	0		0				247,371	0.00	0	0.00		0.00		(85%/15% A/R Split)
5 Operations Services Foreman	3	day	0	0.0	0		0			90.00	1,800	0.00	0	0.00		0.00		(85%/15% A/R Split)
6 T&D Field Clerk	6	day	0	0.0	0		0			71.00		0.00	0	0.00		0.00		Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
7 Operations Services Electricians Switching	3	Isum	0	0.0	0		0			71.00		0.00	0	0.00		0.00		Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
8 T&D General Supervision	74	weeks	0	7.0		71.00	36,920			0.00	0	0.00	0	0.00		0.00		Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
.9 T&D Engineer	74	weeks	0	8.5	631		44,831	0.0		0.00	0	0.00	0	0.00		0.00		Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
10 T&D Planner	74	weeks		1.7	126	71.00	8,966	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022; *Edited labor rate
			155,760			<u> </u>	183,018	<u> </u>			332,000	ļ <del> </del>	22,826		554,146	1	3,076,206	

Costs Incurred To-Date*	Monthly Payroli* Weekly Payroli*	Stock Materials*	Non-Stock Materials* (A/P Taxable)	Contractors & Fees* (A/P Tax-Exempt)	Notes
# Work Breakdown Structure (WBS) Quantity Units through 9/12/2022 MH/Unit	on MH Cost/MH Cost Production MH/Unit MH Cost/MH Cost	Cost/Unit Cost	Cost/Unit Cost	Cost/Unit Cost	

Part 2: Removals									*	All unit ar	nd total cost	figures should	be "raw co	sts", <u>without</u> an	y overhead	l markups. All	markups ar	re generated at the end of the estimate.
			Costs Incurred To-Date*	N	/lonthly	y Payroll <sup>i</sup>	<b>k</b>		Weekly	Payroll*		Stock Mat	erials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
# Work Breakdown Structure (WBS)	Quantity	Units	through 9/12/22	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
R.1 Raw Costs Accrued To-Date in Work Order	1	Isum	6,571	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	Per PowerPlan 9/12/2022
R.2 Construction Bid / Contract Award	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	184,968.00	528,480	Per Pat H. detailed construction cost estimate received 7-6-2022
R.3 Marshalling Yard Lease "Duke's Pit"	17	months	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	100.00	1,714	Distribution of \$1,000/month lease provided by Pat H. 9/8/22
R.4 CHG&E Trailer, Storage, Rent, Sanitary	31	weeks	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	30.00	943	Per Pat H. detailed construction cost estimate received 7-6-2022; Weeks = 26x39.2% per Pat H.
R.5 30 CY Dumpsters	9	each	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	1,200.00	10,286	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022
R.6 Marshalling Yard/Laydown Improvements	3	Isum	0	0.0	0	0.00	0	3.0	9	90.00	771	0.00	0	300.00	857	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
R.7 Line Clearance; Tree Trimming; Mowing	3	Isum	0	0.0	0	0.00	0	12.0	34	90.00	3,086	0.00	0	0.00	0	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
R.8 Matting in laydown/marshalling yards	3	Isum	0	0.0	0	0.00	0	22.0	63	90.00	5,657	0.00	0	0.00	0	0.00	0	Per Pat H. detailed construction cost estimate received 7-6-2022 (85%/15% A/R Split) *Edited labor rate
R.9 Foremen (Field Supervision)	74	weeks	0	0.0	0	0.00	0	6.5	483	90.00	43,457	0.00	0	0.00	0	0.00	0	(85%/15% A/R Split)
R.10 Operations Services Foreman	3	day	0	0.0	0	0.00	0	1.0	3	90.00	257	0.00	0	0.00	0	0.00	0	(85%/15% A/R Split)
R.11 Snow Removal Allowance	3	Isum	0	0.0	0	0.00	0	0.0	0	0.00	0	0.00	0	0.00	0	3,000.00	8,571	\$20,000 Allowance, split 85% A, 15% R
R.12 Additional Allowance for Tower Removal	40	str		5.0	200	60.00	12,000	8.0	320	60.00	19,200		0		0	5,000.00	200,000	
					0		0		0		0		0		0		0	
		•	6,571		200	<u> </u>	12,000	Ī	011	1	72,429		0		11,143		739,709	

Manhours Weekly Payroll

# Part 3: Cost Estimate Summary

	•	
ADDITIONS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$155,760	
Overhead Costs Incurred To-Date:	\$82,134	This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$237,894	
Estimated Future Raw Costs:	\$4,168,195	
Estimated Future Overheads:	\$705,031	
Estimated Future AFUDC:	\$243,556	!
Subtotal Future Costs:	\$5,116,782	-
		Contingency factor from Overheads & AFUDC Calculator (optional).
Contingency Applied:	\$535,468	10.0% Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$5,890,143	]
REMOVALS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$6,571	
Overhead Costs Incurred To-Date:	\$66	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$6,637	<b>=</b>
Estimated Future Raw Costs:	\$835,280	
Estimated Future Overheads:	\$122,403	
Subtotal Future Costs:	\$957,683	=
Contingency Applied:	\$96,432	10.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$1,060,752	
GRAND TOTAL ADDITIONS + REMOVALS:	\$6,950,896	

Manhours Monthly Payroll

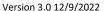
### Assumptions, Notes, Clarifications, etc.:

This X Line Tower Section estimate is based on the definitive estimate for the SB and I Line Rail Trail Section of the H&SB Rebuild. The SB estimate was used as a direct correlation for the Q Line portion, while the X portion was similarly based on the I component. Structure size, style and loading for the SB&I is assumed to be comparable for the Q/X. However, for the SB&I the span lengths are limited by the distribution underbuild, which results in a higher density of transmission structures per mile of line. To account for this, the SB & I costs were extrapolated for the Q & X (respectfully), on a per structure rather than per miles basis. Nearly the entire estimate is based on this assumption, with the only differences being:

- Removed the transferred preconstruction costs, since these are accounted for in the separate Q Line 115kV Rebuild Pole Section estimate.
- Allowance for additional removal costs for the existing lattice towers on the Q & X that are not present on the SB & I.
- 10% contingency. Greater than SB&I contingency (5%) because the costs are just a similar example and not specific to the Q & X project, but lower than the Q Line Pole Section (20%) because this is based on the definitive estimate for a comparable project.

This estimate does not account for any modification, replacement or reconductor of the tower section between the East Park Tap and the Inwood Avenue Substation.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

### A. GENERAL

Project/Program Name: Removal of SD/SJ and WM Tap Lines

Work Order #:

**Budget Group:** Electric **Budget Category:** 12 **Funding Project Number:** 

**PEND** 

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 6/1/2023

In-Service: 12/31/3025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

N/A

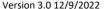
#### Describe the project objective and scope of work:

These lines were constructed in the early 1900's as a tie between Central Hudson and neighboring New Jersey Power & Light and Orange & Rockland Utilities. These lines are currently used to reserve New Jersey load post-contingency and for maintenance conditions and provide no benefit to Central Hudson's transmission system. Given their age these lines are scheduled to be decommissioned and retired.

### Describe specific scope exclusions, assumptions and constraints:

Conceptual Project assumptions do not assume special provisions for access, matting, environmental controls or permitting.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure; Reliability; Risk Reduction; Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is needed to remove existing assets that are no longer in use and have reached the end of their useful life.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Planned retirement of the aged assets will eliminate the potential for unplanned repairs due to failures which can be time consuming and costly.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipalities (>1); Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

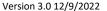
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Central Hudson is currently in the process of creating an RFP of Sale for the SD & SJ Lines. Once finalized, these line will then be either sold or retired. Central Hudson is also in discussion with Orange & Rockland Utilities regarding the timeline for retirement of the WM Line Tap pending completion of system improvements at the Blooming Grove Substation. Exact schedule will be determined as part of those discussions.

### Why was the proposed project scope chosen over other alternatives?

Retirement or sale of the lines is based on current and/or future need and discussions with the neighboring interconnected utility that they serve. As these lines serve no benefit to Central Hudson Customers rebuilding them would be based mostly on the needs of the interconnected utility.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Compelting the project in the requested timeframe will reduce the risk of an aged asset failing unexpectedly and potentially causing damage to private property and/or requiring a costly unplanned repair.

What are the risks and consequences of not completing this project?

The longer the old assets remain in place, the more elevated risk of failure

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu				cost estimates sl adjustments for			
	\$2,874,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	0	0	0	0	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	279,000	28,900	129,500	120,600				
T	Contractors (A/P tax exempt)	2,511,000	260,100	1,165,500	1,085,400				
R	Overheads	84,000		30,000	54,000				
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	2,874,000	289,000	1,325,000	1,260,000	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	3,122,000	3,122,000	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Specific project details relevant to the removal of the structures is still unknown such as environmental and access constraints and local permitting. Basis for estimate: Historical Unit Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Base estimate for the removal of the towers in 2023-2025 is based on the removal of 155 structures (88 on the SD/SJ and 67 on the WM Tap) at a per structure Pro-Forma removal cost of \$18K which includes provisions for internal labor, permitting approvals, etc....

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Estimates assumes a 90/10 split for AP and internal labor charges.



Version 3.0 12/9/2022

Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: 69kV GM Line: Retirement of Clinton Avenue Tap Section Work Order #:

Budget Group: Electric Budget Category: 12 Funding Project Number: PEND

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/31/2025

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

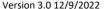
There will potentially be other Cat#13 and Cat#15 Work Orders required to re-route the exisiting distribution circuits being fed from Clinton Avenue and to retire the Substation. This would also include upgrades to the Greenfield Road Substation.

### Describe the project objective and scope of work:

Central Hudson's 69kV GM Line currently runs between the Honk Falls and Greenfield Road Substations with a 1.75 mile long tap section that provides service to the Clinton Avenue Substation. The Clinton Avenue Substation was constructed in the late 1950's and has reached the end of it's useful life. Planning is evaluating a project to retire the Clinton Avenue Substation and transfer the relevant load to other local distribution circuits. This project will cover the removal of the transmission tap section.

### Describe specific scope exclusions, assumptions and constraints:

Conceptual Project assumptions do not assume special provisions for access, matting, environmental controls or permitting.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure; Reliability; Risk Reduction; Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The project is needed to remove existing assets that are no longer in use and have reached the end of their useful life. Please reference Planning Memo "EP-2019-006" for more details.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Please reference EP Memo above. Removal of the aged GM Line Tap Section to Clinton Avenue will help to reduce any operational costs associated with unplanned outages as a result of an in-service failure.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1); Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

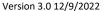
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Please see Planning memo for alternatives considered.

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Completing the project in the requested timeframe will reduce the risk of an aged asset failing unexpectedly and causing damage to private property.

What are the risks and consequences of not completing this project?

The longer the old assets remain in place, there is an elevated risk of failure.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates she adjustments for			
	\$650,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	5,700			5,700				
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	14,250			14,250				
Ī	Contractors (A/P tax exempt)	37,050			37,050				
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	57,000	0	0	57,000	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	59,300			59,300				
	Contractors (A/P tax exempt)	533,700			533,700				
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	593,000	0	0	593,000	0	0	0	0
	* AFUDC may require adjustment after Finance Depa	rtment review.							
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	650,000	0	650,000					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): Medium Confidence **Cost Estimate Confidence:** Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates: Formulas give standard ranges ← per estimate level, but may be **Cost Estimate Range:** Minimum (\$): Maximum (\$): overwritten if desired. Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Specific project details relevant to the removal of the structures is still unknown such as environmental and access constraints and local permitting. Basis for estimate: Historical Data + Job Specific Adjustments; Historical Proforma Pricing

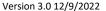
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Conceptual Project Cost Estimate assumes a proforma of approximately \$300K per mile for the removal of the tap line and in the installation of (1) new structure at the connection of the tap with the remaining portion of the 69kV GM Line.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): Estimates assumes a 90/10 split for AP and internal labor charges related to the removal of the line. For the installation of the new structure, an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively was used.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Kyle Bragg Current Life-Cycle Phase: 1 Planning

### A. GENERAL

**Budget Group:** 

Project/Program Name: 115kV SK Line Rebuild

Budget Category: 12 Funding Project Number: 10400

Work Order #:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2022 In-Service: 12/31/2029

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

There may be other supporting Cat#13 work orders related to connection work at both the Knapp's Corners and Spackenkill Substations associated with the rebuild of the transmission line.

#### Describe the project objective and scope of work:

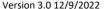
Electric

Field inspection findings on the 2.4 mile 115kV "SK" Line (Knapp's Corners Substation - Spackenkill Road Substation) showed that over 75% of the existing structure plant would require replacement due to component defects with an additional 5% of structures exhibiting significant defects. Recent Right-of-Way deficiency surveys have also indicated that the line is currently offset within the existing 100ft-wide easement corridor creating a deficiency to one side. Given the level of replacement needed to repair the identified component defects, as well as the need to address the identified deficiencies, it has been proposed to rebuild all 2.4 miles of the existing 115kV "SK" Line. This would include replacement of all structures, conductor and overhead ground wire while allowing the re-alignment of the centerline to the middle of the existing R.O.W to correct the identified deficiencies without the need to pursue additional easement rights from private landowners.

### Describe specific scope exclusions, assumptions and constraints:

Detailed design and permitting work has not been completed. Estimates to date do not account for specific conditions related to matting, access, permitting, outage constraints, etc...







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance; Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project is needed to mitigate the conditions found on the line in order to maintain reliability. Please reference EP Memo "EP#2020-001".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of the line will reduce the risk of an in-service failure and resulting unplanned emergency repair work at a premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

PSL Part 102 with municipal approval(s); Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

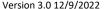
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Direct replacement of the existing structures showing actionable conditions was considered initially. However, the results of a ROW deficiency study showed a general lack of easement on one side of the line and a surplus on the other. In an attempt to solve both issues, rebuilding the line in the center of the existing corridor was chosen as the prefered option to mitigate both the infrastructure and ROW related deficiencies.

### Why was the proposed project scope chosen over other alternatives?

The rebuild was chosen as it was unlikely without the use of condemnation to acquire the level of ROW required along the entire length of the line. When also considering the overall vintage of the line along with the ROW issues, the rebuild option proved to be a better option.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

Given the conditions identified as part fo the inspection process, it is important to complete the project to reduce the risk of an in-service failure.

### What are the risks and consequences of not completing this project?

Delaying the project would increase the risk of an unplanned outage and subsequent repair.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for i			
	\$6,022,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	548,400	2,000			10,000	20,000	20,000	496,400
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,366,000				25,000	50,000	50,000	1,241,000
ī	Contractors (A/P tax exempt)	3,551,600				65,000	130,000	130,000	3,226,600
Т	Overheads	0							
1	AFUDC*	61,000				9,000	21,000	31,000	
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,527,000	2,000	0	0	109,000	221,000	231,000	4,964,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	49,500							49,500
	Contractors (A/P tax exempt)	445,500							445,500
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	495,000	0	0	0	0	0	0	495,000
	* AFUDC may require adjustment after Finance Depart			-					
	Expense \$ (if applicable):	0							

Prior years funding; not actuals.

2021-2023

158,000

271,000

113,000

2024



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 4,215,400 Maximum (\$): 7,828,600 Formulas give standard ranges overwritten if desired.

Permitting, material and construction costs may vary causing a potential variance in the pro-forma estimate. A more accurate estimate will be created upon completion of preliminary design work.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see provided estimate for details on assumptions. Cost figures were based on historical costs for projects of similar construction and permitting requirements.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals were split based on a 90%/10% split of Contractor (AP) and Monthly Labor respectively.



Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Project Name: SK Line Rebuild - Part 102 115kV

<u>Date:</u> 01/03/2023 <u>Revision(s):</u> 0 <u>WO #:</u> 1491-K

Rebuild Length 2.3 miles

Prepared By: John Dittmann

<u>Cost Estimate Level:</u> Preliminary Estimate +/-20% accuracy... design underway but not yet complete. Still lacking some significant details.

			Costs Incurred To-Date*		Montl	hly Payroll			Weekly	/ Payroll*		Stock Ma	terials*	Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes
Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit		Cost/MH	Cost	Production MH/Unit		Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
PLANNING & ENGINEERING			700700701	THE WORK				1411 17 01 111										
Engineering Design -121	2	miles		348.4	4 801	71.00	56,895		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
Engineering Supervision; Project Sponsor -310	2	miles		6.5	5 15	71.00	1,069		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
B Drafting - 132	2	miles			(	1	0	49.	7 11/	71.00	8,110		0		n		n	Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
ESP - 125	2	miles		7.8	,	,	1,274	47.	0		0,110		0		0			Avg of Part 102s (G/EF/HF/CL/TV/KM) x1.5 for 115kV upgrade
Planning - 126	2	miles		25.1		3 71.00	4,091		0		0		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV/KM) x1.5 for 115kV upgrade
Misc Internal Support	2	miles		4.7			772		0		0		0		0			Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
LIDAR	2	miles			C	-	0		0		0		0		0	2,400.00		pre/post project LIDAR flights
Engineering and Related Contractors	2	miles			(	)	0		0		0		0		0	22,512.60	51,//9	Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
						,	U		0		U		U		U		U	
PROJECT MANAGEMENT, ENVIRONMENTAL & SUPPORT SERVICES																		
Environmental Consultant	2	miles			C	)	0		0		0		0		0	40,409.60		Avg of G, CL, TV, KM. EF, HF ignored due to short length and high cost. H&SB and A&C ignored due to Article VII. +10%
Legal Consultant	2	miles		000	0		0		0		0		0		0	57,532.20		Avg of G, TV, KM. +10% CL, EF, HF ignored due to lack of signficant legal costs. Varies signficantly with PMO approach and municipalities
Project Manager - 110	2	miles miles		202.3 55.5			33,031		0		0		0		0			Avg of G, EF, HF, CL, TV, KM \$/mile to hrs/mile +10%  Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
Environmental - 726 Real Property Services - 124	2	miles		48.2	_		9,059 7,877		0		0		0		0			Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%  Avg of Part 102s (G/EF/HF/CL/TV/KM) +10%
System Ops - 330	2	miles		13.6			2,227	18.6		71.00	3,035		0		0			Avg of G, EF, HF, CL, TV. +10%
					C		0		0		0		0		0		0	
GENERAL CONDITIONS																		
Surveying/Staking	2	miles			C	-	0		0		0		0		0	22,647.90		Avg of G, EF, HF, CL, TV. +10%
Easements/Access Right/Laydown Yards	2	miles				)	0		0		0		0		0	21,116.70		Avg of G, EF, HF, CL, TV, KM, H&SB, A&C. +10%
Filing Fees Misc AP (ecluding material)	2	miles miles				)	0		0		0		0	+	0	6,279.90 9,227.90		Avg of G, EF, HF, CL, TV, KM. +10%  Avg of G, EF, HF, CL, TV. +10%
Wisc Air (eclading material)	2	IIIIICS				,	U		U		U		0		U	7,221.70	21,224	NY 01 0, E1, 111, 0E, 111. TIO.00
					C	)	0		0		0		0		0		0	
MAJOR EQUIPMENT & MATERIALS																		
Conductor 1033.5 Ortolan ACSR (30-50-164)	38,254	FT			C	-	0		0		0	4.55			0			CME Quote 11/21/22. \$/FT for 1033.5 Ortloan.
OPGW (30-50-205) Direct Embed Poles	13,116	34 Poles			(	)	0		0		0	3.34	43,839	611,196.40	0 611,196			MMS price as of 12/5/22 SB PO#91505: 85' H4 Tangent Davit Item #5, 85' H4 for 2-Pole Item #19 +10% for additional 5' (no example)
Moderate Engineered Structures	1	Str			0	<b>^</b>	0		0		0		0	42,500.00	42.500		0	35 FC#71300: 65 TH Tangent Davit tient #5, 65 TH for 2-Fore item #17 +1076 for additional 5 (for example)
115kV Tangent Braced Post Structure	30	Str				)	0		0		0	2,000.00	60,000		0		0	Estimated, HF-\$1,600
115kV Swing Angle Structure	2	Str			C	)	0		0		0	3,262.87	6,526		0		0	SS Cost as of 11/4/22
115kV Deadend Structure	3	Str			C	)	0		0		0	9,155.63	27,467		0			SS Cost as of 11/4/22
Crossarms and X-Braces for 2-poles	2	Str			C	_	0		0		0	1,238.00	2,476	1,850.00	3,700		0	34-79-006,008,009 MMS \$ as of 117/22
Misc Material	36	str			0	J	0	1	0		0	500.00	18,000	250.00	9,000		0	
CONSTRUCTION						1			+									
Line Construction	2	miles			0	)	0		0		0		0	†	0	414,439.30	953.210	Avg of recent Part 102s (EF/HF/CL/TV). +15% for 115kV Upgrade
Moderate Drilled Pier Foundations	1	Str			0		n		0		0		n	1	n	187,500.00	187,500	
Drilling / Site Work / Matting / Access / Trimming /		0.1			+		_	1	1 -				_				•	
Restoration / etc.	2	miles			(	J	0		0		0		0		0	518,171.60		Avg of Part 102s (G/EF/HF/CL/TV). Combined all associated costs because of overlap between contractors. +15% for 115kV Upgrade
Equipment Moves/Rentals	2	miles			0	,	0		0		0		0		0	6,747.40		Avg of Part 102s (G/EF/HF/CL/TV). +10%
T&D Foreman - 215	2	miles		100		·	0	485.0		71.00	79,202		0		0			Avg of recent Part 102s (CL/TV) with foreman more soley dedicated to project. +10%
T&D Engineer, Planner, Director - 215	2	miles		130.5			21,307	1.0	0		1 105		0	<del> </del>	0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
OS Foreman - 221 Storekeepers - 223	2	miles miles				)	0	6.8		71.00 71.00	1,105 335		0	+	0			Avg of Part 102s (G/EF/HF/CL/TV). +10% Avg of Part 102s (G/EF/HF/CL/TV). +10%
Mechanics - 224	2	miles				)	0	29.8		71.00	4,865		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
0 Electricians - 225	2	miles				)	0	40.1		71.00	6,554		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
1 Substation Technicians - 226	2	miles			C	)	0	90.5	_	71.00	14,778		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
2 District Line Crews	2	miles				)	0	19.8	45	71.00	3,230		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
3 Misc WP	2	miles			C	)	0	1.6	4	71.00	254		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
							137,602	<u> </u>			121,468		332,361	<u> </u>	666,396			

Manhours Monthly Payroll

Manhours Weekly Payroll

			Costs Incurred To-Date*		hly Payroll*			ekly Payroll		Stock Mat		Non-Stock N	able)	(A/P Tax-l	Exempt)	Notes
#	Work Breakdown Structure (WBS)	Quantity Units	through xx/xx/xx	Production MH/Unit MH	Cost/MH	Cost	Production MH/Unit	1H Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

				Costs Incurred To-Date*	ľ	Monthly Payr	oll*		Weekl	y Payrol	*	Stock Ma	aterials*	Non-Stock N (A/P Tax		Contractors & (A/P Tax-Exe		Notes
	Work Breakdown Structure (WBS)	Quantity	Units	through Produ		MH Cost/N	1H Cost	Production MH/Unit		Cost/MF	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	ne Construction	2	miles			0		0	(	)	0		0		0	98,726.10	227,070	Avg of Part 102s (EF/HF/CL/TV). +10%
	rilling / Site Work / Matting / Access / Trimming / estoration / etc.	2	miles			0		0	(	)	0		0		0	73,480.00	169,004	Avg of Part 102s (G/EF/HF/CL/TV). Combined all associated costs because of overlap between contractors. +10%
Е	quipment Moves/Rentals	2	miles			0		0	(	)	0		0		0	1,276.00	2,935	Avg of Part 102s (G/EF/HF/CL/TV). +10%
N	isc AP (Including Dumpsters)	2	miles			0		0	(	)	0		0		0	4,041.40	9,295	Avg of Part 102s (G/EF/HF/CL/TV). +10%
	ransmission Foreman - 215	2	miles			0		0 36.	7 84	71.00	5,991		0		0		C	Avg of Part 102s (G/EF/HF/CL/TV). +10%
N	echanics - 224	2	miles			0		0 2.	1 5	71.00	344		0		0		C	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E	lectricians - 225	2	miles			0		0 3.	6 8	71.00	581		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
	istrict Line Crews	2	miles			0		0 0.	,	71.00			0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
	isc WP	2	miles			0		0 0.	8 2	71.00	135		0		0			Avg of Part 102s (G/EF/HF/CL/TV). +10%
P	roject Management - 110	2	miles		21.7	50 71	.00 3,5	39	(	)	0		0		0		C	Avg of Part 102s (G/EF/HF/CL/TV/KM). +10%
						0		0	(	)	0		0		0		C	
						0		0	(	)	0		0		0		C	
						0		0	(	)	0		0		0		C	
						0		0	(	)	0		0		0		C	
						0		0	(	)	0	1	0	<u>l</u> .	0		C	<u> </u>

# Part 3: Cost Estimate Summary

	-	
ADDITIONS SUMMARY: Incurred To-Date:		
Raw Costs Incurred To-Date: Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	=
Estimated Future Raw Costs:	\$4,024,743	
Estimated Future Overheads:	\$640,424	
Estimated Future AFUDC:	\$303,456	_
Subtotal Future Costs:	\$4,968,623	_
Contingency Applied:	\$496,862	Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$5,465,486	]
REMOVALS SUMMARY:		
Incurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$419,037	
Estimated Future Overheads:	\$31,213	
Subtotal Future Costs:	\$450,250	=
Contingency Applied:	\$45,025	Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$495,275	
GRAND TOTAL ADDITIONS + REMOVALS:	\$5,960,760	

Assumptions, Notes, Clarifications, etc.:	

Copy to: Mr. B Arteta Mr. K. D. Bragg

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Mr. P. Harpolis
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Mr. B. Fuoco
Mr. C. Hay
Mr. B. DuBois
E. P. #2020-001

Mr. M. Campagna

February 21, 2020

Mr. H. W. Turner

#### 115 kV SK Line Rebuild

#### Recommendations

For the reasons discussed in the body of this memo, Electric Transmission Planning recommends the following:

- The 115 kV SK line be rebuilt with 1033.5 ACSR Ortolan conductor.
- For communication, OPGW should be installed on the SK line with 144 single mode fiber.
- The SK line rebuild should be completed and in-service by December 2023.
- Replace the 795 ACSR and 1272 AAC station connections at Spackenkill with a larger size station connections such that the connections do not limit the line conductor.
- For the Knapps Corners substation rebuild, use 1590 ACSR or 1590 AAC for the substation station connections as well as the connections to the SK line breakers and switches.

### **Background**

The 115 kV Knapps Corners to Spackenkill line, was built in 1965 with 795 ACSR Tern, totaling approximately 2.4 miles of circuit length. There are 37 structures on the SK Line. Of the 32 wood structures, 14 have severity 5 defeats (requiring mitigation within one year of discovery), 14 have severity 4 defects (requiring mitigation within three years of discovery). Replacements or repairs are required for over 75% of the line's structures with an additional 5% containing significant defects, justifying a complete line rebuild.

### **Conductor Consideration**

Two ACSR conductor sizes were considered for the SK Line rebuild, the existing 795 ACSR Tern and 1033.5 ACSR Ortolan. Factors such as thermal performance, net present value (NPV) of conductor losses and material cost of each conductor was reviewed to determine which conductor size would be most beneficial.

This rebuild will replace all existing wooden poles with steel poles and replace existing conductors with either new 795 ACSR Tern or 1033.5 ACSR Ortolan.

#### **Thermal Performance**

The following table shows the thermal ratings of the existing and proposed SK line conductors. While the 1033.5 ACSR Ortolan would increase the SK line conductor ratings by more than 15%, other limiting elements exist in the SK line path. The existing station connections and bushing CTs at Knapps Corners, as well as, the station connections at Spackenkill currently limit the facility ratings as shown in Attachment 1. The oil circuit breaker at Knapps Corners Substation and 1272 AAC station connections at Spackenkill also would limit the 1033.5 ACSR "Ortolan" conductor.

Overhead (	Conductor	Sumi	mer (MV	′A)	Winter (MVA)		
Overneau	Conductor	Normal	LTE	STE	Normal	LTE	STE
Existing	795 ACSR (45/7) "Tern"	217	250	279	265	290	315
	795 ACSR (45/7) "Tern"	217	250	279	265	290	315
Proposed	1033.5 ACSR (45/7)	255	294	333	310	341	375
	"Ortolan"						

#### **Losses Analysis**

The I<sup>2</sup>R losses associated with the proposed conductors vary based on their resistance. Larger conductors allow more capacity of current flow as a result of lower resistance, reducing the amount of line losses for the same current. An hourly loss analysis was performed for each proposed conductor. Future "Location Based Marginal Prices" (LBMP) for Zone G were obtained from Energy Resources and are shown in Attachment 2. Energy Resources took the average of the off peak and on peak pricing forecast to compute the average LBMP.

As shown in Attachment 2, price forecast was limited to a six year outlook. For the purpose of Transmission Planning, a 55 year price forecast of NYISO Zone G was drawn from a linear extrapolation based off the six year outlook. The estimated cost of losses calculated for proposed conductors over a 55 year period are shown below.

Conductor Losses (NPV)						
795 ACSR Tern	\$137,635					
1033.5 ACSR Ortolan	\$120,813					

<sup>1</sup> 

<sup>&</sup>lt;sup>1</sup> The limitations at Knapps Corners Substation will be addressed as part of the rebuild, which is planned to be complete by June 2021.

The 1033.5 ACSR conductor would have approximately \$17,000 less NPV in losses than the 795 ACSR conductor over a 55 year period. The Net Present Value calculations are shown in Attachment 3 for 795 and 1033.5 ACSR conductors.

#### **Cost Estimates**

Transmission Design developed cost estimated for construction with the proposed 795 and 1033.5 ACSR conductors as shown in Attachment 4 and 5 respectively. A comparison of estimated project costs including addition/removal cost of the rebuild and net present value (NPV) of losses is shown in the following table.

	795 ACSR Tern	1033.5 ACSR Ortolan
Additions Cost	\$3,489,151	\$3,520,191
Removals Cost	\$255,366	\$255,366
Contingency	\$1,123,355	\$1,132,667
NPV Losses	\$137,635	\$120,813
Total Cost	\$5,005,507	\$5,029,037

Based on the estimated cost of the HF Line rebuild and estimated losses of the proposed conductor, the cost difference between the 795 ACSR Tern and 1033.5 ACSR Ortolan is \$23,530, which is a minimal difference and within the accuracy of the estimates.

### System Load Serving Capability (LSC)

With the planned rebuild of the HF line (East Fishkill to Fishkill Plains) to 1033.5 ACSR Q1 2020, the System Load Serving Capability will be 1660 MW, limited by the HF line following the loss of the EF line (East Fishkill – Shenandoah). The next limiting element is the M line (Pleasant Valley - Manchester), also following the loss of the EF line at a system load level of approximately 1760 MW. The 2019 summer peak is 1,109 MW. The rebuilt with 1033.5 ACSR SK line would limit the system LSC at approximately 3700 MW. No further consideration based on the system LSC is needed at this time.

#### Conclusion

Inspection reports indicate the SK Line is in poor condition with 75% of its structures requiring replacements or repairs with an additional 5% containing significant defects. To address these issues, a complete rebuild is warranted. Based on the above analysis, 1033.5 ACSR is the recommended conductor. In addition, the 795 ACSR and 1272 AAC station connections at Spackenkill Substation would limit the facility ratings and should be replaced.

Ruby Chan
Ruby Chan
Ruby Chan

# **CHGE Tie Line Ratings**

Linename SK Voltage (kV): 115 Route: Spackenkill - Knapps Corners

				Name-	S	ummer			Winter	r
Miles	Symbol	<b>Description:</b>	<b>Equipment</b>	Plate	NORM	LTE	STE	NORM	LTE	STE
	Spacken	kill								
	+		Bus-Terminal	!				  -		
	[G]	MC-200-SK	Breaker-SF6	3000A	3120	3480	3990	3660	4020	4470
	E-+	2000/5	CT-Bushing	2000A	4000	4000	4000	4000	4000	4000
ļ	E-+	2000/5	CT-Bushing	2000A	4000	4000	4000	4000	4000	4000
	1	1272 AAC 61STR	STA Connection		1167	1292	1525	1463	1557	1753
ļ	/a	SK-902	Switch (30C rise)	1200A	1296	1836	2400	1692	2136	2400
ļ	1	3.50" AL (IPS)	Bus Tube	!	2626	2938	3615	3406	3634	4199
	<-+	To Tr #2	<sup>!</sup> Tap Left	!				!		
	1	3.50" AL (IPS)	Bus Tube	!	2626	2938	3615	3406	3634	4199
	į	1272 AAC 61STR	STA Connection		1167	1292	1525	1463	1557	1753
	 /a	SK-702	Switch (30C rise)	1200A	1296	1836	2400	1692	2136	2400
į		795 ACSR (45/7)	STA Connection	i	995	1153 *	1303	1218 *	1338 *	1470 *
2.36	i	795 ACSR (45/7)	O/H Line	!	1091	1257	1400	1330	1458	1582
	į	795 ACSR (45/7)	STA Connection	!	995	1153 *	1303	1218 *	1338 *	1470 *
	 /a	SK-1604	Switch (30C rise)	1200A	1296	1836	2400	1692	2136	2400
į		795 ACSR (45/7)	STA Connection	i i	995	1153 *	1303	1218 *	1338 *	1470 *
	<-+	To TR#1	Tap Left	!				<u> </u>		
	1	795 ACSR (45/7)	STA Connection	!	995	1153 *	1303	1218 *	1338 *	1470 *
	/a	SK-1557	Switch (30C rise)	1200A	1296	1836	2400	l 1692	2136	2400
į		795 ACSR (45/7)	STA Connection	į	995	1153 *	1303	1218 *	1338 *	1470 *
	E-+	1200/5	CT-Bushing	1200A	1248	1392	1596	1464	1608	1788
	[O]	KB-1558-SK	Breaker-Oil	1200A	1248	1392	1596	1464	1608	1788
ļ	E-+	1200-800/5	CT-Bushing	980A	1019 *	<u>1137</u>	1303 *	<u>1196</u>	<u>1313</u>	1460
ļ		795 ACSR (45/7)	STA Connection	!	995	1153 *	1303	1218 *	1338 *	1470 *
ļ	/a	KB-1559	Switch (30C rise)	1200A	1296	1836	2400	1692	2136	2400
		795 ACSR (45/7)	STA Connection	!	995	1153 *	1303	1218 *	1338 *	1470 *
	+		Bus-Terminal	!				<u>.</u>		
-	Knapps	Corners	1	1 1				1		
2.36	: Total Mile	es	Minimum Amp	s:	995	1137	1303	1196	1313	1460
			Minimum MVA		198	226	260	238	262	291

<sup>\*</sup> Indicates the Thermal Rating for the next most limiting equipment

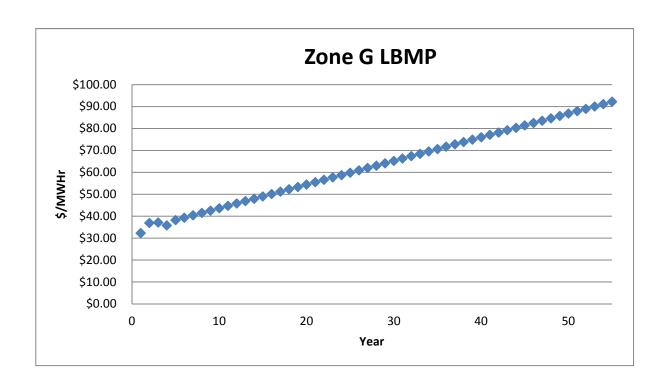
#### **Comments:**

20130919: Bus tube rating updated. 20101129: Added Spackenkill Substation

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From Energy Resources

	<i>51</i>
Year	Forecasted NYISO Zone G Price
2020	\$30.75/MWH
2021	\$30.87/MWH
2022	\$32.32/MWH
2023	\$36.88/MWH
2024	\$37.11/MWH
2025	\$35.84/MWH



Savings \$949.88 \$1,083.90 \$1,090.66 \$1,053.33 \$1,123.72 \$1,155.43 \$1,187.14 \$1,218.85 \$1,250.57 \$1,282.28 \$1,313.99 \$1,345.70 \$1,377.41 \$1,409.12 \$1,440.84 \$1,472.55 \$1,504.26 \$1,535.97 \$1,567.68 \$1,599.39 \$1,631.11 \$1,662.82 \$1,694.53 \$1,726.24 \$1,757.95 \$1,789.66 \$1,821.38 \$1,853.09 \$1,884.80 \$1,916.51 \$1,948.22 \$1,979.93 \$2,011.65 \$2,043.36 \$2,075.07 \$2,106.78 \$2,138.49 \$2,170.20 \$2,201.91 \$2,233.63 \$2,265.34 \$2,297.05 \$2,328.76 \$2,360.47 \$2,392.18 \$2,423.90 \$2,455.61 \$2,487.32 \$2,519.03 \$2,550.74 \$2,582.45 \$2,614.17 \$2,645.88 \$2,677.59 \$2,709.30

795 ACSR 1033 ACSR

		ı	5 ACSR	
Year		Zone G LBMP	Sum Loss MWhr	Losses (\$)
2022	1	\$32.32	240.46	\$7,771.74
2023	2	\$36.88	240.46	\$8,868.24
2024	3	\$37.11	240.46	\$8,923.55
2025	4	\$35.84	240.46	\$8,618.16
2026	5	\$38.24	240.46	\$9,194.07
2027	6	\$39.31	240.46	\$9,453.53
2028	7	\$40.39	240.46	\$9,712.99
2029	8	\$41.47	240.46	\$9,972.45
2030	9	\$42.55	240.46	\$10,231.91
2031	10	\$43.63	240.46	\$10,491.36
2032	11	\$44.71	240.46	\$10,750.82
2033	12	\$45.79	240.46	\$11,010.28
2034	13	\$46.87	240.46	\$11,269.74
2035	14	\$47.95	240.46	\$11,529.20
2036	15	\$49.03	240.46	\$11,788.66
2037	16	\$50.10	240.46	\$12,048.12
2037				\$12,048.12
	17	\$51.18	240.46	
2039	18	\$52.26	240.46	\$12,567.03
2040	19	\$53.34	240.46	\$12,826.49
2041	20	\$54.42	240.46	\$13,085.95
2042	21	\$55.50	240.46	\$13,345.41
2043	22	\$56.58	240.46	\$13,604.87
2044	23	\$57.66	240.46	\$13,864.33
2045	24	\$58.74	240.46	\$14,123.79
2046	25	\$59.82	240.46	\$14,383.24
2047	26	\$60.89	240.46	\$14,642.70
2048	27	\$61.97	240.46	\$14,902.16
2049	28	\$63.05	240.46	\$15,161.62
2050	29	\$64.13	240.46	\$15,421.08
2051	30	\$65.21	240.46	\$15,680.54
2052	31	\$66.29	240.46	\$15,940.00
2053	32	\$67.37	240.46	\$16,199.46
2054	33	\$68.45	240.46	\$16,458.91
2055	34	\$69.53	240.46	\$16,718.37
2056	35	\$70.61	240.46	\$16,977.83
2057	36	\$71.68	240.46	\$17,237.29
2058	37	\$72.76	240.46	\$17,496.75
2059	38	\$73.84	240.46	\$17,756.21
2060	39	\$74.92	240.46	\$18,015.67
2061	40	\$76.00	240.46	\$18,275.13
2062	41	\$77.08	240.46	\$18,534.58
2063	42	\$78.16	240.46	\$18,794.04
2064	43	\$79.24	240.46	\$19,053.50
2065	44	\$80.32	240.46	\$19,312.96
2066	45	\$81.40	240.46	\$19,572.42
2067	46		240.46	
_	47	\$82.47 \$83.55		\$19,831.88
2068			240.46	\$20,091.34
2069	48	\$84.63	240.46	\$20,350.79
2070	49	\$85.71	240.46	\$20,610.25
2071	50	\$86.79	240.46	\$20,869.71
2072	51	\$87.87	240.46	\$21,129.17
2073	52	\$88.95	240.46	\$21,388.63
2074	53	\$90.03	240.46	\$21,648.09
2075	54	\$91.11	240.46	\$21,907.55
2076	55	\$92.19	240.46	\$22,167.01

NPV Rate

NPV

V-			3 ACSR	1 (6)
Year	_	Zone G LBMP	Sum Loss MWhr	Losses (\$)
2022	1	\$32.32	211.07	\$6,821.86
2023	2	\$36.88	211.07	\$7,784.35
2024	3	\$37.11	211.07	\$7,832.90
2025	4	\$35.84	211.07	\$7,564.83
2026	5	\$38.24	211.07	\$8,070.35
2027	6	\$39.31	211.07	\$8,298.10
2028	7	\$40.39	211.07	\$8,525.85
2029	8	\$41.47	211.07	\$8,753.59
2030	9	\$42.55	211.07	\$8,981.34
2031	10	\$43.63	211.07	\$9,209.09
2032	11	\$44.71	211.07	\$9,436.83
2033	12	\$45.79	211.07	\$9,664.58
2034	13	\$46.87	211.07	\$9,892.33
2035	14	\$47.95	211.07	\$10,120.08
2036	15	\$49.03	211.07	\$10,347.82
2037	16	\$50.10	211.07	\$10,575.57
2038	17	\$51.18	211.07	\$10,803.32
2039	18	\$52.26	211.07	\$11,031.06
2040	19	\$53.34	211.07	\$11,258.81
2041	20	\$54.42	211.07	\$11,486.56
2042	21	\$55.50	211.07	\$11,714.30
2043	22	\$56.58	211.07	\$11,942.05
2044	23	\$57.66	211.07	\$12,169.80
2045	24	\$58.74	211.07	\$12,397.55
2046	25	\$59.82	211.07	\$12,625.29
2047	26	\$60.89	211.07	\$12,853.04
2048	27	\$61.97	211.07	\$13,080.79
2049	28	\$63.05	211.07	\$13,308.53
2050	29	\$64.13	211.07	\$13,536.28
2051	30	\$65.21	211.07	\$13,764.03
2052	31	\$66.29	211.07	\$13,991.78
2053	32	\$67.37	211.07	\$14,219.52
2054	33	\$68.45	211.07	\$14,447.27
2055	34	\$69.53	211.07	\$14,675.02
2056	35	\$70.61	211.07	\$14,902.76
2057	36	\$71.68	211.07	\$15,130.51
2058	37	\$72.76	211.07	\$15,358.26
2059	38	\$73.84	211.07	\$15,586.00
2060	39	\$74.92	211.07	\$15,813.75
2061	40	\$76.00	211.07	\$16,041.50
2062	41	\$77.08	211.07	\$16,269.25
2063	42	\$78.16	211.07	\$16,496.99
2064	43	\$79.24	211.07	\$16,724.74
2065	44	\$80.32	211.07	\$16,952.49
2066	45	\$81.40	211.07	\$17,180.23
2067	46	\$82.47	211.07	\$17,407.98
2068	47	\$83.55	211.07	\$17,635.73
2069	48	\$84.63	211.07	\$17,863.48
2070	49	\$85.71	211.07	\$18,091.22
2071	50	\$86.79	211.07	\$18,318.97
2071	51	\$80.79	211.07	\$18,546.72
2072	52	\$88.95	211.07	\$18,774.46
2073	53	\$90.03	211.07	\$19,002.21
2074	54	\$90.03	211.07	\$19,002.21
2076	55	\$92.19	211.07	\$19,457.70
20/0	JJ	<i>↓3</i> ∠.13	211.0/	¥13,437.70

8.01% NPV Rate 8.01% \$137,635.53 NPV \$120,813.41

NPV Savings \$16,822.12 \$16,822.12



# **Project Cost Estimate**

Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the password "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Project Name: SK Line Rebuild Conceptual Estimate 795 ACSR Date: 11/13/2019 Wo #: Attachment #4

Prepared By: Bo DuBois Revision(s):

Cost Estimate Level: Conceptual Estimate +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Part <sup>*</sup>	1: Additions							* All ur	nit and total	cost figu	res should	be "raw c	osts", <u>without</u> a	any overhea	ad markups. M	arkups are	generated at the	he end of	he estimate.
				Costs Incurred To-Date*	I	Monthly	/ Payroll	*		Weekly	Payroll*		Stock Ma	terials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	ANNING & ENGINEERING																		
	Insmission Design	900	Hours		1.0	900	60.00	54,000		0		0		0		0		0	
	afting	200	Hours			0		0		200		10,000		0		0		0	
	nning Time	2	Hours			0		0		0		0		0		0	1 200 00	0	
A.4 LiD	PAR	3	Mile			0		0		0		0		0		0	1,200.00	3,240	Closeout
A.6						0		0		0		0		0		0		0	
A.7						0		0		0		0		0		0		0	
A.8						0		0		0		0		0		0		0	
A.9						0		0		0		0		0		0		0	
A.10						0		0		0		0		0		0		0	
71.10						0				U		- 0		U		0			
B EN	ROJECT MANAGEMENT, IVIRONMENTAL & SUPPORT ERVICES																		
	oject Management	900	Hour		1.0	900	60.00	54,000		0		0		0		0		0	
	vironmental	250	Hour		1.0	250	60.00	15,000		0		0		0		0		0	
	al Property	300	Hour		1.0	300	60.00	18,000		0		0		0		0		0	
	vironmental Consultant/Part 102c	1	Contract			0		0		0		0		0		0	125,000.00	125,000	
	gal Consultant	1	Contract			0		0		0		0		0		0	50,000.00	50,000	
B.6						0		0		0		0		0		0		0	
B.7						0		0		0		0		0		0		0	
B.8						0		0		0		0		0		0		0	
B.9						0		0		0		0		0		0		0	
B.10						0		0		0		0		0		0		0	
0 05	THERAL CONDITIONS																		
	ENERAL CONDITIONS																		
	nstruction Staking	2.7	Miles			0		0		0		0		0		0	20,000.00		Based off of WH1&2 Costs
	nstruction Trailers	5.0	Months			0		0		0		0		0		0	1,000.00	5,000	
	mporary Toilet Facilities	5.0	Months			0		0		0		0		0		0	250.00	1,250	
C.4 Sta	iging Area	7.0	Months			0		0		0		0		0		0	3,000.00	21,000	Contract
0.4			0 "						0000	000	50.00	10.000							
	ee Clearing	4.0	Section			0		0	200.0	800		40,000		0		0	18.750.00	75.000	Based off of WH1&2 Costs
C./ SW	/PP Inspections	4.0	Months			0		0		0	$\longrightarrow$	0		0		0	18,/50.00	75,000	Based oil Of WHT&2 COSIS
C.9				<b> </b>		0		0		0	++	0		0	<del>                                     </del>	0		0	
C.10						0		0	1	0		0		0		0		0	
C. IU						U		U		U	+	U		U		U		U	1
D MA	AJOR EQUIPMENT & MATERIALS																		
	ht Duty Steel Poles	37.0	Each			0		0		0		0		0		308,802			CL Line Quote for 70' H3
	gineered Steel Poles	1.0	Each			0		0		0		0		0	20,000.00	20,000			Based off of G-Line Structure G2
	gineered Foundations	1.0	Each			0		0		0		0		0	50,000.00	50,000			Estimated (Structure G2)
	nductor (795 ACSR TERN)	38,000.0	Feet			0		0		0		0		75,913		0			MMS Stock Avg Cost
	atic (OPGW)	13,000.0	Feet			0		0		0		0		43,469		0			MMS Stock Avg Cost
	indard Stock Material- Tangent	32.0	Structure			0		0		0		0		8,000		0			MMS Stock Avg Cost
	indard stock material - Dead End	2.0	Structure			0		0		0		0	2,000.00	4,000		0			MMS Stock Avg Cost
	n-Stock Insulators	32.0	Structure			0		0		0		0	953.00	30,496	,	0			Quoted Price
	ane Service	1.0	Location	<b> </b>		0		0		0		0		0	4,000.00	4,000			Estimated
D.10 Equ	uipment Moves	2.7	Mile			0		0		0	$\longrightarrow$	0		0	12,000.00	32,400		0	Estimated
	ANOTE LIGHT OF										<b></b>								-
E CC	DNSTRUCTION																		<u> </u>

				Costs Incurred To-Date*	٨	Monthly	/ Payroll	*		Weekly	Payroll*	•	Stock Ma	terials*	Non-Stock M (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.1	Environmental/Restoration Contractor	2.7	Mile			0		0		0		0		0		0	97,852.40	264,201	Based on HF Line Estimate R.O.W. Improvements - Access (Building / Upgrading Roads, Culverts, etc) Erosion/Sediment Control Installation
E.2	Install R.O.W. Access Controls (Gates, etc)	2.7	Mile			0		0		0		0		0		0	5,000.00	13,500	
E.4	R.O.W. Improvements - Matting	1,500.0	Feet			0		0		0		0		0		0	60.00	90,000	
E.5	R.O.W. Improvements - Trimming	0.0	Mile			0		0		0		0		0		0		0	
E.6	Drill Pole Holes - Soil ( Contract )	18.0	Line			0		0		0		0		0		0	3,000.00		Soil Hole and Grounding
	Drill Pole Holes - Rock (Contract)	19.0	Line			0		0		0		0		0		0	6,000.00	114,000	Rock Hole and Grounding
	Off Load Pole Delivery	4.0	Per Truck			0		0	16.0	64	55.00	3,520		0		0		0	
	Line Construction (Contract)	2.7	Mile			0		0		0		0		0		0	489,262.00	1,321,007	Based off of HF Line Bid
	Supervision - Foreman	4.0	Month			0		0	160.0	640	65.00	41,600		0		0		0	
E.11	Install OPGW Splice Locations	3.0	Per Site			0		0						0	1,000.00	3,000	1,000.00	3,000	
				0	Man-hours	2,350	•	141,000		1,704	Daywall	95,120		161,878		418,202		2,194,199	

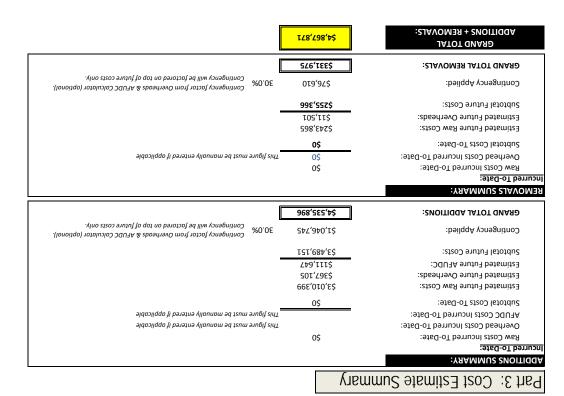
Part 2: Removals \* All unit and total cost figures should be "raw costs", without any overhead markups. All markups are generated at the end of the estimate. Costs Non-Stock Materials\* Contractors & Fees\* Incurred Monthly Payroll\* Weekly Payroll\* Stock Materials\* (A/P Taxable) (A/P Tax-Exempt) Notes To-Date\* through Production Production Work Breakdown Structure (WBS) Quantity Units МН Cost/MH Cost МН Cost/MH Cost Cost/Unit Cost Cost/Unit Cost Cost/Unit MH/Unit MH/Unit Pole Removals 2.7 Mile 0 66,717.50 180,137 Based off of HF Line Bid Based on HF Line Estimate Environmental/Restoration Contractor 2.7 Mile 0 13,343.50 36,027 R.O.W. Restoration rosion/Sediment Control Removal R.O.W. Improvements - Matting 1,500.0 15.00 22,500 Feet 0 0 Supervision - Foreman 4.0 Month 5,200 20.0 80 0 0 0 5,200 238,665

Man-hours Weekly Payroll

Man-hours Monthly Payroll

	Cost	Cost/Unit	Cost	Cost/Unit	tsoO	Cost/Unit	Cost	Cost/MH	HW	Production MH/Unit	Cost	Cost/MH	HW	Production MH/Unit	through	stinU	Quantity	Work Breakdown Structure (WBS)	#
səfoN		contractors (A/P Tax-E		Mon-Stock M xsT q/A)	*erials*	Stock Wa		*Payroll*	<b>Λ</b> еєκιλ	۸		*Payroll	lonthly	N	Costs Incurred To-Date*				

# Assumptions, Notes, Clarifications, etc.: Estimated 3 months to complete Estimate represents cost to construct & assumed Part 102c filing only permitting. Assume local site plan approval. 30% contingency applied.





# **Project Cost Estimate**

Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the password "Estimate" may be used to unlock the spreadsheet. Caution should be used in order to keep the integrity of the spreadsheet.

Project Name: Prepared By: Bo DuBois
Cost Estimate Level: Conceptual Estimate 1033 ACSR

Project Name: Bo DuBois
Cost Estimate Level: Conceptual Estimate 11/13/2019 WO #: Attachment #5

Revision(s):

+/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet.

Process	Part 1: Additions								* A	II unit and to	otal cost	figures sh	ould be "raw	v costs", <u>withou</u>	<u>ıt</u> any overh	ead markups.	Markups ar	e generated at	the end of	the estimate.
## PLANING EXPONENTION SHOULD VISION Works A COUNTY USE					Incurred		Month	ly Payrol	l*		Weekly	Payroll*		Stock Ma	terials*					Notes
A PLANNING & EXCURERING  A T Transmission probagy  900 Hours  10 900 5000 5000 0 0 0 0 0 0 0 0 0 0 0 0	# Work Breakdown Structure (WBS)	Quantity	Quantity	Units			MH	Cost/MH	Cost		MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
1.00   1.00	A PLANNING & ENGINEERING																			
A3   Permy Time						1.0							U				,			
A4 LUDR		200							-	1.0			10,000							
A5		2							_				0				ò	1 200 00		Classout
A6		3	J	WIIIC									U					1,200.00		
A7													Ü							
A3									0				0							
PROJECT MANGEMENT,   PROJECT SERVICES   PROJECT S							(	)	0		0		0		0		0		0	
PROJECT MANAGEMENT,   SERVICONMENTAL & SUPPORT   SERVICOS   SERV									0				0		0		0			
B   EVIRONMENTAL & SUPPORT   SERVICES   SUPPORT   SUPP	A.10						(	)	0		0		0		0		0		0	
B   EVIRONMENTAL & SUPPORT   SERVICES   SUPPORT   SUPP																				
81   Project Management   900   Hour   10   900   50.00   54.000   0   0   0   0   0   0   0   0   0	B ENVIRONMENTAL & SUPPORT																			
Real Personantial   250   Hour   10   250   60.00   15.000   0   0   0   0   0   0   0   0   0		900	900	Hour		1.0	900	60.00	54 000		0		0		0		0		0	
Ball Read Property   Store   Hours   Store   Hours   Store   Household   Store   Sto													0							
Section   1	B.3 Real Property	300	300	Hour		1.0			18,000		0		0		0		0			
B.6		1	1	Contract					0				0		-		0			Based on HF Line EDR Bid
ST   ST   ST   ST   ST   ST   ST   ST		1	1	Contract					Ü				U		Ü		ò	50,000.00		
8.8									- v								-			
Section   Sect									_				Ü							
Section   Control   Cont									Ü				U				0			
C   C   C   C   C   C   C   C   C   C									- v				Ü				-			
Construction Staking	B.10						(	)	0		0		0		0		0		0	
C.1 Construction Staking 2.7 Miles 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C CENERAL CONDITIONS																			
C.2 Construction Trailers		0.7	0.7	A PT			<b>—</b>											20.000.00	E 4 000	December of Military Contra
C.3   Temporary Tollet Facilities   5.0   Months   0   0   0   0   0   0   0   0   250.00   1,250									-				U		_		,			Based off of WH1&2 Costs
C.A.   Staging Área   7.0   Months   0   0   0   0   0   0   0   0   3,000.00   21,000   Contract									Ü											
C.6 Tree Clearing													Ü				-			Contract
C.7 SWPP Inspections 4.0 Months 0 0 0 0 0 0 0 18,750.00 75,000 Based off of WH182 Costs  C.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C.4 Staging Area	7.0	7.0	WOTHIS	1		_	,	U		- 0		U		0		0	3,000.00	21,000	Contract
C.7 SWPP Inspections 4.0 Months 0 0 0 0 0 0 0 18,750.00 75,000 Based off of WH182 Costs  C.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C.6 Tree Clearing	4.0	4.0	Section			(	)	0	200.0	800	50.00	40.000		0		0		0	
C.9									0									18,750.00		
D MAJOR EQUIPMENT & MATERIALS	1,																			
D MAJOR EQUIPMENT & MATERIALS  D1 Light Duty Steel Poles D2 Engineered Steel Poles D3 Engineered Foundations D4 Conductor (1033 ACSR Ortolan) D5 Static (OPGW) D6 Standard Stock Material - Tangent D7 Standard Stock Material - Data End D8 Non-Stock insulators D8 Non-Stock insulators D9 Crane Service D9 O O O O O O O O O O O O O O O O O O O									0				0		0		ò			
Display   Disp	C.10						(	)	0		0		0		0		0		0	
Display   Disp					1		1	1												
D.2   Engineered Steel Poles   1.0   Each   0   0   0   0   0   0   20,000.00   20,000   0   Based off of G-Line Structure   D.3   Engineered Foundations   1.0   Each   0   0   0   0   0   0   50,000.00   50,000   0   Estimated (Structure G2)		27.0	27.0	Park.												0.00/.00	222.402			HE I SO O SEE SO ZOLIE
D.3   Engineered Foundations   1.0   Each   0   0   0   0   0   0   0   50,000.00   50,000   0   Estimated (Structure G2)					1	1							U					-		
D.4   Conductor (1033 ACSR Ortolan)   38,000.0   Feet   0   0   0   0   0   2.08   79,040   0   0   0   MMS Stock Avg Cost					1	1			- v				Ü					-		
D.5         Static (OPGW)         13,000.0         Feet         0         0         0         3.34         43,469         0         0 MMS Stock Avg Cost           D.6         Standard Stock Material-Tangent         32.0         Structure         0         0         0         250.00         8,000         0         0 MMS Stock Avg Cost           D.7         Standard stock material - Dead End         2.0         Structure         0         0         0         2,000.00         4,000         0         0 MMS Stock Avg Cost           D.8         Non-Stock Insulators         32.0         Structure         0         0         0         953.00         30,496         0         0         Quoted Price           D.9         Crane Service         1.0         Location         0         0         0         0         4,000.00         4,000         0         Estimated           D.10         Equipment Moves         2.7         Mile         0         0         0         0         12,000.00         32,400         0         Estimated					1	1			-				Ü	2 08		50,000.00				
D.6   Standard Stock Material - Tangent   32.0   Structure   0   0   0   0   250.00   8,000   0   0   MMS Stock Avg Cost					1	1			-				_				ò			
D.7   Standard stock material - Deal End   2.0   Structure   0   0   0   0   2,000.00   4,000   0   0   MMS Stock Avg Cost									Ü				0			1				
D.8     Non-Stock Insulators     32.0     Structure     0     0     0     953.00     30,496     0     0     Quoted Price       D.9     Crane Service     1.0     Location     0     0     0     0     4,000.00     4,000.00     4,000     0     Estimated       D.10     Equipment Moves     2.7     Mile     0     0     0     0     0     12,000.00     32,400     0     Estimated							(	)	0				0	2,000.00	4,000					
D.10 Equipment Moves 2.7 Mile 0 0 0 0 0 0 12,000.00 32,400 0 Estimated	D.8 Non-Stock Insulators	32.0							0				0	953.00	30,496				0	Quoted Price
									- v				U							
F CONSTRUCTION	D.10 Equipment Moves	2.7	2.7	Mile			(	)	0		0		0		0	12,000.00	32,400		0	Estimated
E CONSTRUCTION					1		1	1												
	E CONSTRUCTION						1													
E.1 Environmental/Restoration Contractor 2.7 Mile 0 0 0 0 0 0 0 0 97,852.40 264,201 R.O.W. Improvements - Ac Upgrading Roads, Culverts	E.1 Environmental/Restoration Contractor	2.7	2.7	Mile			(		0		0		0		0		0	97,852.40	264,201	Based on HF Line Estimate R.O.W. Improvements - Access (Building / Upgrading Roads, Culverts, etc) Erosion/Sediment Control Installation

				Costs Incurred To-Date*	1	Monthly	y Payroll	•		Weekly	/ Payroll*		Stock Ma	terials*	Non-Stock N (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.2	Install R.O.W. Access Controls (Gates, etc)	2.7	Mile			0		0		0		0		0		0	5,000.00	13,500	
E.4	R.O.W. Improvements - Matting	1,500.0	Feet			0		0		0		0		0		0	60.00	90,000	
E.5	R.O.W. Improvements - Trimming	0.0	Mile			0		0		0		0		0		0		0	
E.6	Drill Pole Holes - Soil ( Contract )	18.0	Line			0		0		0		0		0		0	3,000.00	54,000	Soil Hole and Grounding
E.7	Drill Pole Holes - Rock ( Contract )	19.0	Line			0		0		0		0		0		0	6,000.00	114,000	Rock Hole and Grounding
E.8	Off Load Pole Delivery	4.0	Per Truck			0		0	16.0	64	55.00	3,520		0		0		0	
E.9	Line Construction (Contract)	2.7	Mile			0		0		0		0		0		0	489,262.00	1,321,007	Based off of HF Line Bid
E.10	Supervision - Foreman	4.0	Month			0		0	160.0	640	65.00	41,600		0		0		0	
E.11	Install OPGW Splice Locations	3.0	Per Site			0		0						0	1,000.00	3,000	1,000.00	3,000	
				0	Man-hour	2,350 s Monthly	L	141,000	Man-hou	1,704	-	95,120		165,005		441,882		2,194,199	

Pa	rt 2: Removals							* All	unit and tota	al cost	figures shoul	d be "raw	costs", <u>without</u>	any overhe	ad markups. A	ll markups a	are generated a	t the end of	the estimate.
				Costs Incurred To-Date*	1	Monthly	/ Payroll	•		Week	ly Payroll*		Stock Ma	terials*	Non-Stock I (A/P Tax		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
	Pole Removals	2.7	Mile			0		0		(	0	0		0		0	66,717.50		Based off of HF Line Bid
	Environmental/Restoration Contractor	2.7	Mile			0		0		(	0	0		0		0	13,343.50	36,027	Based on HF Line Estimate R.O.W. Restoration Erosion/Sediment Control Removal
	R.O.W. Improvements - Matting	1,500.0	Feet			0		0		(	0	0		0		0	15.00	22,500	
	Supervision - Foreman	4.0	Month			0		0	20.0	80	0 65.00	5,200		0		0		0	
						0		0		(	0	0		0		0		0	
						0		0		(	0	0		0		0		0	
						0		0		(	0	0		0		0		0	
				0				0	1			5,200		0		0		238,665	

80 Man-hours Weekly Payroll

Man-hours Monthly Payroll

				Costs Incurred To-Date*	N	Ionthl	y Payroll'		١	Weekly	/ Payroll*		Stock Mai	terials*	Non-Stock M		Contractors (A/P Tax-E		Notes
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

# Part 3: Cost Estimate Summary

ADDITIONS + REMOVALS:

ed To-Date: Raw Costs Incurred To-Date:	ćo	
	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$3,037,206	
Estimated Future Overheads:	\$370,336	
Estimated Future AFUDC:	\$112,649	<u> </u>
Subtotal Future Costs:	\$3,520,191	_
Contingency Applied:	\$1,056,057	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$4,576,249	$\neg$

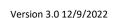
EMOVALS SUMMARY:		
ncurred To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$243,865	
Estimated Future Overheads:	\$11,501	<u> </u>
Subtotal Future Costs:	\$255,366	_
Contingency Applied:	\$76,610	30.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL REMOVALS:	\$331,975	
GRAND TOTAL	64,000,224	

\$4,908,224

# Assumptions, Notes, Clarifications, etc.:

Estimated 3 months to complete Estimate represents cost to construct & assumed Part 102c filing only permitting. Assume local site plan approval. 30% contingency applied. Although local permitting for installing 1033 instead of 795 could result in increased legal/environmental consultant fees due to public opposition to EMF, aesthetics, etc. the additional costs are difficult to estimate and therefore not included in this estimate. Cost estimate increase over 795 ACSR is based on incremental cost of wire and increasing pole class from H3 to H4 based on conceptual design for deflection criteria.







Submission Date: April 28, 2023 First Year of 5-Year Budget Period: 2024

Kyle Bragg **Current Life-Cycle Phase: 1 Planning Submitted By:** 

A. GENERAL

Project/Program Name: 115kV 5 Line Rebuild Work Order #:

**PEND** 

**Budget Group: Budget Category:** Electric 12 **Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Target Schedule - Start: 6/1/2023 In-Service: 3/1/2027 Specific

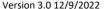
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The Rebuild of Central Hudson's 2.87-mile portion the 5 Line is intended to address significant infrastructure issues identified on the line as part of the company's routine inspection cycle. The line was originally constructed in the 1910's and runs to CHG&E's North Catskill Substation to an interconnection with the National Grid owned section of the line. Inspection results have shown that 57% of the structures on the line are in need of replacement with an additional 36% requiring some level of repair.

## Describe specific scope exclusions, assumptions and constraints:

Detailed design and permitting work has not been completed. Estimates to date do not account for specific conditions related to matting, access, permitting, outage constraints, etc...



Yes



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance; Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project is needed to mitigate the conditions found on the line in order to maintain reliability. Please reference ETD Memo "ETD2023-002" for a preliminary Engineering justification for the project. A Transmission Planning memo will be forethcoming to further detail the project.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of the line will reduce the risk of an in-service failure and resulting unplanned emergency repair work at a premium cost.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

PSL Part 102 with municipal approval(s); Miscellaneous (wetlands; highway; SWPPP)

## ESG (Environmental, Social and Governance) and Sustainability:

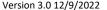
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Replacement in-kind of the existing structures showing actionable conditions was considered although given the high percentage of issues on the line overall and the use of a non-standard conductor which makes replacements in this manner more complex, a more comprehensive rebuild was decided upon.

## Why was the proposed project scope chosen over other alternatives?

The one-for-one replacement of structures on the 5 line is not an efficient approach given the number of dead-end structures. This combined with the need to install a standard conductor type makes rebuilding the line the most efficient option for mitigation.

## D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Given the conditions identified as part fo the inspection process, it is important to complete the project to reduce the risk of an in-service failure.

## What are the risks and consequences of not completing this project?

Delaying the project would increase the risk of an unplanned outage and subsequent repair.

## Was this project included in a prior 5-year forecast?

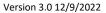
No

# If No, why should this project be completed instead of a planned project?

The 5 Line was an emergent project that was identified after the prior-year budget cycle. In the interest of reducing risk, this project was prioritized over others given the complex nature and potentially long duration associated with constructing spot replacements and/or repairs.

## What other factor were considered during the prioritization process?

This line is an interconnection to another utility.





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			cost estimates she adjustments for i			
	\$9,906,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	798,300		25,000	40,000	233,300	500,000		
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,995,750		62,500	100,000	583,250	1,250,000		
l	Contractors (A/P tax exempt)	5,188,950		162,500	260,000	1,516,450	3,250,000		
Т	Overheads	0							
I	AFUDC*	745,000			16,000	205,000	524,000		
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	8,728,000	0	250,000	416,000	2,538,000	5,524,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	108,700				18,700	90,000		
	Contractors (A/P tax exempt)	978,300				168,300	810,000		
R	Overheads	91,000				13,000	78,000		
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	1,178,000	0	0	0	200,000	978,000	0	0
	* AFUDC may require adjustment after Finance Depart	rtment review.							
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 6,934,200 Maximum (\$): 12,877,800 ← per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Permitting, material and construction costs may vary causing a potential variance in the pro-forma estimate. A more accurate estimate will be created upon completion of preliminary design work.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see provided estimate for details on assumptions. Cost figures were based on historical costs for projects of similar construction and permitting requirements.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): The cost breakdown provided is estimated based on an averaged historical percentage split per project of Materials Costs, Accounts Payable / AA and Internal Labor of 25%, 65% and 10% respectively. Removals were split based on a 90%/10% split of Contractor (AP) and Monthly Labor respectively.



E.2 Major Drilled Pier Foundations

E.6 T&D Foreman - 215

E.8 OS Foreman - 221

E.3 Moderate Drilled Pier Foundations

Trimming / Restoration / etc. E.5 Equipment Moves/Rentals

E.7 T&D Engineer, Planner, Director - 215

Drilling / Site Work / Matting / Access /

2

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Note: Except where data entries are permitted, this spreadsheet is locked in order to prevent users from accidentally deleting important formulas. If user needs to add/delete rows, or make other edits, the passwork "Estimate" may be used to unlock the spreadsheet. Caution should be used in

order to keep the integrity of the spreadsheet.

Project Name: 5 Line Rebuild - Part 102 115kV

Prepared By: Sam Pozorski

0

0

0

0

375

130.5

0

0

0

60.00

19 60.00

1,392

485.0

22,476

60.00

0

83,547

1,165

Date: 12/6/2022 Revision(s): 0

WO #:

Rebuild Length 2.87 miles

1,487,665 Avg of Part 102s (G/EF/HF/CL/TV). Combined all associated costs because of overlap between contractors. +15% for 115kV Upgrade

0 Avg of recent Part 102s (CL/TV) with foreman more soley dedicated to project. +10%

Cost Estimate Level: **Conceptual Estimate** +/-30% Accuracy... There is a general scope but few details available. Little or no design work completed yet. Part 1: Additions \* All unit and total cost figures should be "raw costs", without any overhead markups. Markups are generated at the end of the estimate. Costs Non-Stock Materials\* Contractors & Fees\* Monthly Payroll\* Weekly Payroll\* Stock Materials\* Incurred (A/P Taxable) (A/P Tax-Exempt) Notes To-Date\* Production through Production Work Breakdown Structure (WBS) MH Cost/MH MH Cost/MH Quantity Cost Cost Cost/Unit Cost Cost/Unit Cost Cost/Unit Cost Units MH/Unit MH/Unit A PLANNING & ENGINEERING A.1 Engineering Design -121 348.4 1,000 60.00 60,016 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% A.2 Engineering Supervision; Project Sponsor miles 6.5 19 60.00 1.127 0 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% A.3 Drafting - 132 miles 49.7 143 60.00 8,555 A.4 ESP - 125 985 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% miles 16 60.00 53 A.5 Planning - 126 miles 18.4 60.00 3.164 0 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% A.6 Misc Internal Support miles 4.7 14 60.00 815 0 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% 2,400.00 6,890 pre/post project LIDAR flights A.7 LIDAR miles 0 0 A.8 Engineering and Related Contractors 64,633 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% miles 22,512.60 A.9 Λ PROJECT MANAGEMENT, **B** ENVIRONMENTAL & SUPPORT SERVICES 116,016 Avg of G, CL, TV, KM. EF, HF ignored due to short length and high cost. H&SB and A&C ignored due to Article VII. +10% B.1 Environmental Consultant miles 0 0 40.409.60 165,174 Avg of G, TV, KM. +10%. CL, EF, HF ignored due to lack of signficant legal costs. Varies signficantly with PMO approach and municipalities. B.2 Legal Consultant 57,532.20 0 Avg of G, EF, HF, CL, TV, KM \$/mile to hrs/mile +10% miles 581 B.3 Project Manager - 110 202.3 60.00 34.843 0 B.4 Environmental - 726 miles 55.5 159 60.00 9,556 0 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% 0 Avg of Part 102s (G/EF/HF/CL/TV/KM) +10% B.5 Real Property Services - 124 48.2 138 8.309 miles 60.00 0 3,201 B.6 System Ops - 330 13.6 39 60.00 2,350 18.6 53 60.00 0 Avg of G, EF, HF, CL, TV. +10% miles B.7 0 C GENERAL CONDITIONS 0 22,647.90 65,022 Avg of G, EF, HF, CL, TV. +10% miles 0 C.1 Surveying/Staking C.2 Easements/Access Right/Laydown Yards 0 0 21,116.70 60,626 Avg of G, EF, HF, CL, TV, KM, H&SB, A&C. +10% C.3 0 0 18,030 Avg of G, EF, HF, CL, TV, KM. +10% C.4 Filing Fees 0 6,279.90 C.5 Misc AP (ecluding material) 26,493 Avg of G, EF, HF, CL, TV. +10% 9,227.90 0 0 **MAJOR EQUIPMENT &** MATERIALS D.1 Conductor 795 Drake ACSR (30-50-180) 47.750 0 0 4.55 217.264 O Adjusted CME Quote 11/21/22, \$/FT for 1033,5 Ortloan D.2 OPGW (30-50-205) 16,372 FT 0 0 3.34 54,722 0 MMS price as of 12/5/22 D.3 Poles 543 082 0 SB PO#91505: 85' H4 Tangent Davit Item #5, 85' H4 for 2-Pole Item #19 +10% for additional 5' (no example) 1 33 Poles 0 0 543.082.10 170,000 D.4 Major Engineered Structures 85,000.00 42,500.00 D.5 Moderate Engineered Structures 0 0 42.500 D.6 115kV Tangent Davit Structure 22 Str 0 0 28,854 0 SS Cost as of 11/4/22 1.311.56 D.7 115kV Swing Angle Structure 4 0 0 3,262.87 13,051 0 SS Cost as of 11/4/22 D.8 115kV Deadend Structure 36 623 0 SS Cost as of 11/4/22 4 0 0 Crossarms and X-Braces for 2-poles 6,190 9,250 0 34-79-006,008,009 MMS \$ as of 117/22 1,238.00 1,850.00 30 500.00 250.00 7,500 D.10 Misc Material 0 15,000 D.10 0 0 E CONSTRUCTION 1,189,851 Avg of recent Part 102s (EF/HF/CL/TV). +15% for 115kV E.1 Line Construction miles 0 0 0 414,439.30

0

0

375,000.00

187,500,00

518,171.60

6,747.40

750,000

187,500

19,372 Avg of Part 102s (G/EF/HF/CL/TV). +10%

0 Avg of Part 102s (G/EF/HF/CL/TV). +10%

0 Avg of Part 102s (G/EF/HF/CL/TV). +10%

				Costs Incurred To-Date*	Monthly Payroll*		Weekly Payroll*			Stock Ma	terials*	Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes			
#	Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
E.9	Storekeepers - 223	3	miles			0		0	2.1	6	60.00	354		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.10	Mechanics - 224	3	miles			0		0	29.8	86	60.00	5,132		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.11	Electricians - 225	3	miles			0		0	40.1	115	60.00	6,913		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.12	Substation Technicians - 226	3	miles			0		0	90.5	260	60.00	15,588		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.13	District Line Crews	3	miles			0		0	19.8	57	60.00	3,408		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
E.14	Misc WP	3	miles			0		0	1.6	4	60.00	268		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%
					Manhours	2,394 s Monthly		143,643	Manhour	2,136 s Weekly	Payroll	128,132		371,704		772,332		4,157,272	

				Monthly Payroll*		,	Weekly Payroll*		Stock Mat	terials*	Non-Stock M		Contractor (A/P Tax-		Notes
#	Work Breakdown Structure (WBS)	Quantity Units	through xx/xx/xx	Production MH Cost/MH	Cost	Production MH/Unit	MH Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	

t 2: Removals						7 till drillt d	ila total oos	inguios	Silouid be	1411 00313	, without any o	voirioud iii	inaps. 7 iii mai	maps are ger	nerated at the e	114 01 1110 031	mato.	
	Costs Incurred Monthly Payroll* To-Date*  Out Break down Structure (MRS) Quantity Units through Production MH Cost/MH				Weekly Pay				Stock Materials*		Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes			
# Work Breakdown Structure (WBS)	Quantity	Units	_	uction /Unit MH	Cost/MH	Cost	Production MH/Unit	MH	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost		
Line Construction	3	miles		0		0		0		0		0		0	98,726.10	283,442	Avg of Part 102s (EF/HF/CL/TV). +10%	
Drilling / Site Work / Matting / Access / Trimming / Restoration / etc.	3	miles		C		0		0		0		0		0	73,480.00	210,960	Avg of Part 102s (G/EF/HF/CL/TV). Combined all associate	ed costs because of overlap between
Equipment Moves/Rentals	3	miles		C		0		0		0		0		0	1,276.00	3,663	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Misc AP (Including Dumpsters)	3	miles		C		0		0		0		0		0	4,041.40	11,603	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Transmission Foreman - 215	3	miles		C		0	36.7	105	60.00	6,319		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Mechanics - 224	3	miles		C		0	2.1	6	60.00	363		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Electricians - 225	3	miles		0		0	3.6	10	60.00	613		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
District Line Crews	3	miles		0		0	0.9	3	60.00	152		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Misc WP	3	miles		0		0	0.8	2	60.00	142		0		0		0	Avg of Part 102s (G/EF/HF/CL/TV). +10%	
Project Management - 110	3	miles		21.7 62		3,733		0		0		0		0			Avg of Part 102s (G/EF/HF/CL/TV/KM). +10%	
Additional Allowance for Tower Removal	26.5	str		10.0 265	60.00	15,900	16.0	424	60.00	25,440		0		0	10,000.00	265,000	-3 for pole structures, -0.5 for shared tower with 2 Line	
				C		0		0		0		0		0		0	1	
				C		0		0		0		0		0		0		
				C		0		0		0		0		0		0		
				C		0		0		0		0		0		0	1	

Manhours Monthly Payroll Manhours Weekly Payroll

# Part 3: Cost Estimate Summary

	<b>J</b>	
TIONS SUMMARY:		
ed To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:		This figure must be manually entered if applicable
AFUDC Costs Incurred To-Date:		This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	
Estimated Future Raw Costs:	\$5,573,083	
Estimated Future Overheads:	\$671,894	
Estimated Future AFUDC:	\$407,332	<u>_</u>
Subtotal Future Costs:	\$6,652,309	_
Contingency Applied:	\$1,330,462	20.0% Contingency factor from Overheads & AFUDC Calculator (optional). Contingency will be factored on top of future costs only.
GRAND TOTAL ADDITIONS:	\$7,982,770	
OVALS SUMMARY:		
ed To-Date:		
Raw Costs Incurred To-Date:	\$0	
Overhead Costs Incurred To-Date:	\$0	This figure must be manually entered if applicable
Subtotal Costs To-Date:	\$0	_
Estimated Future Raw Costs:	\$827,330	
Estimated Future Overheads:	\$78,593	_
Subtotal Future Costs:	\$905,923	_
Contingency Applied:	\$181,185	20.0% Contingency factor from Overheads & AFUDC Calculator (optional).  Contingency will be factored on top of future costs only.

Assumptions, Notes, Clarifications, etc.:

			Costs Incurred To-Date*	Monthly Payroll*			Weekly Payroll*			Stock Materials*		Non-Stock Materials* (A/P Taxable)		Contractors & Fees* (A/P Tax-Exempt)		Notes		
# Work Breakdown Structure (WBS)	Quantity	Units	through xx/xx/xx	Production MH/Unit	МН	Cost/MH	Cost	Production MH/Unit	МН	Cost/MH	Cost	Cost/Unit	Cost	Cost/Unit	Cost	Cost/Unit	Cost	
GRAND TOTAL ADDITIONS + REMOVALS:		\$9,06	9,878															



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Substation Minor Projects

Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1311-00-18
Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Minor Substation projects are completed throughout the year based on failures and equipment condition assessments. These are smaller scale projects and typically based on the need to update/replace substation equipment including:

Battery Chargers, Meters, Controls, Communications, Other Equipment that fails and is unrepairable.

## Describe specific scope exclusions, assumptions and constraints:

Install new and update existing equipment as required during the course of a year that is not specifically tied to a major project upgrade.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4 Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction; Replacement of equipment failures throughout the year.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc

**Checklist Fully Completed:** Yes **Environmental Component:** Maybe - Requires further scope development

Social Component: No Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Infrastructure Replacements

Why was the proposed project scope chosen over other alternatives?

N/A: Infrastructure Replacements

# D. PRIORITIZATION

Why do we need to complete this project in the period requested? Infrastructure Replacements as required.

What are the risks and consequences of not completing this project? Failed equipment would not be replaced possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



# E. COST ESTIMATE

	Capital Estimate Summary		t year of the Idget plan			cost estimates she adjustments for			
	\$8,674,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	627,000	87,000	56,000	56,000	58,000	60,000	60,000	250,000
	Labor (Monthly Payroll)	313,000	43,000	28,000	28,000	29,000	30,000	30,000	125,000
4	Stock Materials	313,000	43,000	28,000	28,000	29,000	30,000	30,000	125,000
	Non-Stock Material (A/P taxable)	1,250,000	173,000	112,000	112,000	115,000	119,000	119,000	500,000
Ī	Contractors (A/P tax exempt)	438,000	61,000	39,000	39,000	40,000	42,000	42,000	175,000
T	Overheads	3,123,000	433,000	280,000	280,000	287,000	297,000	296,000	1,250,000
I	AFUDC*	187,000	25,000	17,000	17,000	17,000	18,000	18,000	75,000
l V	Journal vouchers (JVS)	0							
S		0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,251,000	865,000	560,000	560,000	575,000	596,000	595,000	2,500,000
F	Labor (Weekly Payroll)	363,000	30,000	34,000	31,000	38,000	33,000	32,000	165,000
E	Labor (Monthly Payroll)	727,000	60,000	69,000	62,000	76,000	65,000	65,000	330,000
l¦	Contractors (A/P tax exempt)	122,000	10,000	11,000	10,000	14,000	11,000	11,000	55,000
F	Overheads	1,211,000	100,000	115,000	103,000	127,000	108,000	108,000	550,000
E	Journal Vouchers (JVs)	0							
N	Jaivage Citebri	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	2,423,000	200,000	229,000	206,000	255,000	217,000	216,000	1,100,000
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	2,194	1,595	599					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 6,071,800 Maximum (\$): 11,276,200 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

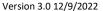
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: Greenfield Road Substation Upgrade Work Order #: 0 4 0 4 - H

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 6/1/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer. Based on this assessment, the existing 69-4.16kV Greenfield Road Substation transformers have reached the end of their useful life and require replacement.

## Describe specific scope exclusions, assumptions and constraints:

Retire all of the 4 kV equipment including Transformers #1 and #3 and all other associated equipment. Two existing 69-13.8kV three phase transformers will be utilized (current plans are to use the Modena Substation spare and the retired Kerhonkson Substation transformers). The MG Line from Modena to Galeville must be converted to 115 kV prior to the removal of the Transformer at Modena to be used at Greenfield Road.



N/A





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4 Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP2016-012 Spare 10 12MVA Transformer Relocations.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc

Checklist Fully Completed: Yes Environmental Component: Maybe - Requires further scope development

**Social Component:** No **Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

# D. PRIORITIZATION

Why do we need to complete this project in the period requested? To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project? Risk of power transformer failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	•			r cost estimates sl e adjustments for			
	\$1,942,000	TOTAL	Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	
	Ψ1,542,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	181,600	80,600	101,000	0	0	0	0	0
	Labor (Monthly Payroll)	90,300	40,300	50,000	0	0	0	0	0
A	Stock Materials	90,300	40,300	50,000	0	0	0	0	0
D	Non-Stock Material (A/P taxable)	363,200	161,200	202,000	0	0	0	0	0
ı	Contractors (A/P tax exempt)	128,420	56,420	72,000	0	0	0	0	0
Т	Overheads	907,000	403,000	504,000	0	0	0	0	0
1	AFUDC*	54,180	24,180	30,000	0	0	0	0	0
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,815,000	806,000	1,009,000	0	0	0	0	0
R	Labor (Weekly Payroll)	18,750	3,750	15,000	0	0	0	0	0
E	Labor (Monthly Payroll)	38,500	7,500	31,000	0	0	0	0	0
Hi	Contractors (A/P tax exempt)	6,250	1,250	5,000	0	0	0	0	0
R	Overheads	63,500	12,500	51,000	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	127,000	25,000	102,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
Cu	rrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023
Prior years funding;
not actuals.

2024



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Minimum (\$): 1,553,600 Maximum (\$): 2,330,400

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Copy to:	Mr. P. E. Haering	Mr. D. Dittmann	Mr. L. Saltis
	Mr. P. Harpolis	Mr. M. Sefcik	Mr. A. Onevelo
	Mr. K. Post	Mr. H. W. Turner	Mr. J. Kisch
	Ms. J. Caserto	Mr. D. L. DuBois	Mr. M. Englishby
	Mr. J. Ferrara	Ms. J. Paull	Mr. G. Yozzo
	Mr. R. Wright	Mr. N. Conza	

E.P. #2016-012

August 18, 2016

Ms. H. M. Adams

## **Spare 10/12MVA Transformer Relocations**

#### Overview

Due to recent and future substation upgrades at Saugerties, Modena, and Kerhonkson, three 10/12MVA transformers will be available for use. The three transformers from these locations each operate at 69/13.8kV, two are wye-delta-wye, one wye-wye and are 34, 6, and 14 years old, respectively. Because the transformers are still in good working condition, it is recommended they be relocated for future use.

#### **Location Recommendations**

The first transformer, T-10000-10, is the spare Saugerties Substation Transformer made available by the retirement of the old Saugerties Substation. As stated in the Draft Coxsackie/New Baltimore/Freehold Area Study, it was recommended that the spare Saugerties transformer replace the existing 1935 Freehold transformer. This replacement was completed in 2016.

The system spare transformer, T-10000-18, is currently located at the Modena Substation. The Modena Substation Upgrade Assessment (E.P. 2012-013) indicated that this transformer should be relocated following the update of the P and MK Lines and the retirement of the 69kV at Modena. Due to the timing of the P & MK line project, this transformer will not be available until 2020. Because the installation of a 10MVA transformer will be required at the Stanfordville Substation by 2019, Distribution Planning recommends a new 10/12MVA transformer be purchased for use at this location.

The third transformer, T-10000-17, is available from the recently retired Kerhonkson Substation. Currently, Operations Services is monitoring the existing 10MVA transformer at Greenfield Road due to its high DGA content. Because of this, it is recommended that the spare Kerhonkson 10MVA be held for use at the Greenfield Road Substation in the event of a transformer failure. Based on the Area Study completed for the Greenfield Road/Clinton Avenue Substations, it is also recommended that the system spare transformer, T-10000-18 located at Modena be used at Greenfield Road in 2020 as part of the 4kV to 13.2kV upgrade and the retirement of the aging 4kV infrastructure. A new 10/12MVA transformer should then be purchased for use as a system spare. The future use of the second spare transformer (old Kerhonkson Transformer # 2) made available by the retirement of the Kerhonkson Substation was also explored; however, this

transformer is 78 years old and in poor condition. Therefore, Operation Services recommends its retirement.

#### **Conclusion**

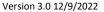
The following 10/12MVA transformers should be relocated or purchased for the substations listed below:

- •Spare Saugerties T-10000-10: Freehold Substation (2016)
- •Purchase New 10/12MVA: Stanfordville Substation (2019)
- •Spare Kerhonkson T-10000-17: Greenfield Road Substation (as needed or in 2020)
- •Spare Modena T-10000-18: Greenfield Road Substation (2020)
- •Purchase New 10/12MVA: System Spare (2020)

Stephanie Genesee Electric Distribution Planning

Stephonie Genesee







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: New Baltimore Substation Upgrade Work Order #: 2 1 6 7 - K

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 12/1/2024

## Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

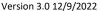
The New Baltimore (FKA Freehold) DEC Peaker Regulation Project will also be designed and constructed alongside the Substation Upgrade. The Peaker Project was established due to the retirements of the Coxsackie and South Cairo Gas Turbines.

#### Describe the project objective and scope of work:

Due to their proximity, the Coxackie and New Baltimore Substations provide reserve capability and operating flexibility between the two substations. The existing distribution infrastructure between the substations is aging, in poor condition and has access limitations due to CSX railroad expansion. To maintain reliability and operating flexibility in this area, the distribution infrastructure requires replacement. A review of the area determined that a more cost effective solution is to install a second transformer and associated circuit positions at the New Baltimore

## Describe specific scope exclusions, assumptions and constraints:

Add an additional 13.4 MVA,115x69/13.8 kV transformer and associated distribution feeders to the New Baltimore Substation. The cross rated transformer is due to future plans to upgrade the transmission feeds to the substation from 69 kV to 115 kV.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP2016-012 Spare 10 12MVA Transformer Relocations.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

# D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to improve operating flexibility in the New Baltimore/Coxsackie area and to provide reserve capability in the event of a transformer failure at the New Baltimore Substation.

What are the risks and consequences of not completing this project?

Risk of power transformer failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	•			r cost estimates sl e adjustments for			
	\$5 144 000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	
	\$5,141,000	TOTAL	Actuals +	2024	2025	2026	2027	2028	Future Years
		100.000	Projections						
	Labor (Weekly Payroll)	496,000	191,000	305,000	0	0	0	0	0
	Labor (Monthly Payroll)	248,500	95,500	153,000	0	0	0	0	0
A	Stock Materials	248,500	95,500	153,000	0	0	0	0	0
D	Non-Stock Material (A/P taxable)	992,000	382,000	610,000	0	0	0	0	0
Ιĭ	Contractors (A/P tax exempt)	347,700	133,700	214,000	0	0	0	0	0
T	Overheads	2,480,000	955,000	1,525,000	0	0	0	0	0
I	AFUDC*	148,300	57,300	91,000	0	0	0	0	0
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,961,000	1,910,000	3,051,000	0	0	0	0	0
R	Labor (Weekly Payroll)	26,900	3,900	23,000	0	0	0	0	0
E	Labor (Monthly Payroll)	53,800	7,800	46,000	0	0	0	0	0
H	Contractors (A/P tax exempt)	9,300	1,300	8,000	0	0	0	0	0
R	Overheads	90,000	13,000	77,000	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	180,000	26,000	154,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Dep							_	
	Expense \$ (if applicable):	0							
Cu	rrent Approved Rate Case Funding (\$):	1,553	1,553	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 4,112,800 Maximum (\$): 6,169,200 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

## A. GENERAL

Project/Program Name: Coxsackie DEC Peaker Regulation Project

Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 12/31/2024

## Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

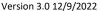
The New Baltimore and South Cairo DEC Peaker Regulation Projects will also be designed and constructed parallel with the Coxsackie DEC Peaker Project in order to ensure the South Cairo and Coxsackie Gas Turbines can be reitred by 2025.

#### Describe the project objective and scope of work:

New York State DEC has passed a stricter emissions standard over the next few years. In preparation for this standard, Central Hudson has determined to retire the Gas Turbines at Coxsackie and South Cairo Substations while adding necessary equipment to compensate for the Gas turbine retirements.

## Describe specific scope exclusions, assumptions and constraints:

A second transformer will be added to both South Cairo and Coxsackie Substations in order to make them half breaker stations. Dynamic Volt-Amp Reactive (D-VAR) Compensation Solutions will also be installed at South Cairo and New Baltimore Substations to provide stability and regulate voltage and power factor by injecting leading or lagging reactive power at opportune times.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component?Yes Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP2022-001 Local Transmission Plan for Replacement of Westerlo Loop Combustion Turbines.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Retirement of the South Cairo and Coxsackie Gas Turbines in order to meet enhanced emissions regulations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

### ESG (Environmental, Social and Governance) and Sustainability:

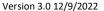
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Required retirements of the South Cairo and Coxsackie Gas Turbines by 2025.

What are the risks and consequences of not completing this project?

There would be no system stability and voltage regulation on the system due to the retirement of the South Cairo and Coxsackie Gas Turbines.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary	stimate Summary  Year 1 = 1s 5-year by				All future year cost estimates should include applicable adjustments for inflation.			
	\$3,926,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	382,000	180,000	202,000	0	0	0	0	0
	Labor (Monthly Payroll)	191,000	90,000	101,000	0	0	0	0	0
<i>A</i>	Stock Materials	191,000	90,000	101,000	0	0	0	0	0
]	Non-Stock Material (A/P taxable)	765,000	360,000	405,000	0	0	0	0	0
١	Contractors (A/P tax exempt)	267,000	125,000	142,000	0	0	0	0	0
1	Overheads	1,912,000	900,000	1,012,000	0	0	0	0	0
	AFUDC*	116,000	55,000	61,000	0	0	0	0	0
	Journal vouchers (JVS)	0							
5		0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,824,000	1,800,000	2,024,000	0	0	0	0	0
F	Labor (Weekly Payroll)	15,000	0	15,000	0	0	0	0	0
E	Labor (Monthly Payroll)	31,000	0	31,000	0	0	0	0	0
	Contractors (A/P tax exempt)	5,000	0	5,000	0	0	0	0	0
F	Overheads	51,000	0	51,000	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
N	Salvage CINEDII	0							
E	1 1/1 Daymonte ( DEI II )	0							
1	Joint Utility Payments CREDIT	0							
8	TOTAL REMOVALS:	102,000	0	102,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	7,604	4,017	3,587					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 3,140,800 Maximum (\$): 4,711,200 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: South Cairo DEC Peaker Regulation Project Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 12/31/2024

### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

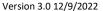
The New Baltimore and Coxsackie DEC Peaker Regulation Projects will also be designed and constructed parallel with the South Cairo DEC Peaker Project in order to ensure the South Cairo and Coxsackie Gas Turbines can be reitred by 2025.

#### Describe the project objective and scope of work:

New York State DEC has passed a stricter emissions standard over the next few years. In preparation for this standard, Central Hudson has determined to retire the Gas Turbines at Coxsackie and South Cairo Substations while adding necessary equipment to compensate for the Gas turbine retirements.

### Describe specific scope exclusions, assumptions and constraints:

A second transformer will be added to both South Cairo and Coxsackie Substations in order to make them half breaker stations. Dynamic Volt-Amp Reactive (D-VAR) Compensation Solutions will also be installed at South Cairo and New Baltimore Substations to provide stability and regulate voltage and power factor by injecting leading or lagging reactive power at opportune times.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component?Yes Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP2022-001 Local Transmission Plan for Replacement of Westerlo Loop Combustion Turbines.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Retirement of the South Cairo and Coxsackie Gas Turbines in order to meet enhanced emissions regulations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

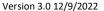
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Required retirements of the South Cairo and Coxsackie Gas Turbines by 2025.

What are the risks and consequences of not completing this project?

There would be no system stability and voltage regulation on the system due to the retirement of the South Cairo and Coxsackie Gas Turbines.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary	Capital Estimate Summary  Year 1 = 1st y 5-year budg			•					
	\$8,210,000	TOTAL	Prior Years Actuals +	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
			Projections							
	Labor (Weekly Payroll)	811,000	100,000	711,000	0	0	0	0	0	
	Labor (Monthly Payroll)	405,000	50,000	355,000	0	0	0	0	0	
A D	Stock Materials	405,000	50,000	355,000	0	0	0	0	0	
D	Non-Stock Material (A/P taxable)	1,622,000	200,000	1,422,000	0	0	0	0	0	
ī	Contractors (A/P tax exempt)	568,000	70,000	498,000	0	0	0	0	0	
Т	Overheads	4,054,000	500,000	3,554,000	0	0	0	0	0	
1	AFUDC*	243,000	30,000	213,000	0	0	0	0	0	
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	8,108,000	1,000,000	7,108,000	0	0	0	0	0	
R	Labor (Weekly Payroll)	15,000	0	15,000	0	0	0	0	0	
E	Labor (Monthly Payroll)	31,000	0	31,000	0	0	0	0	0	
H	Contractors (A/P tax exempt)	5,000	0	5,000	0	0	0	0	0	
R	Overheads	51,000	0	51,000	0	0	0	0	0	
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	102,000	0	102,000	0	0	0	0	0	
	* AFUDC may require adjustment after Finance Dep			-						
	Expense \$ (if applicable):	0								
Cu	rrent Approved Rate Case Funding (\$):	7,928	1,004	6,924						

Prior years funding; not actuals.

2021-2023

2024



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

6.568.000

No further estimate range is required.

Formulas give standard ranges

← per estimate level, but may be overwritten if desired.

9,852,000

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: New Baltimore DEC Peaker Regulation Project Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

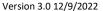
The New Baltimore Upgrade will also be designed and constructed alongside the DEC Peaker Project.

#### Describe the project objective and scope of work:

New York State DEC has passed a stricter emissions standard over the next few years. In preparation for this standard, Central Hudson has determined to retire the Gas Turbines at Coxsackie and South Cairo Substations while adding necessary equipment to compensate for the Gas turbine retirements.

### Describe specific scope exclusions, assumptions and constraints:

A second transformer will be added to both South Cairo and Coxsackie Substations in order to make them half breaker stations. Dynamic Volt-Amp Reactive (D-VAR) Compensation Solutions will also be installed at South Cairo and New Baltimore Substations to provide stability and regulate voltage and power factor by injecting leading or lagging reactive power at opportune times.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component?Yes Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP2022-001 Local Transmission Plan for Replacement of Westerlo Loop Combustion Turbines.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Retirement of the South Cairo and Coxsackie Gas Turbines in order to meet enhanced emissions regulations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Required retirements of the South Cairo and Coxsackie Gas Turbines by 2025.

What are the risks and consequences of not completing this project?

There would be no system stability and voltage regulation on the system due to the retirement of the South Cairo and Coxsackie Gas Turbines.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the All future year cost estimates should include 5-year budget plan applicable adjustments for inflation.						
	\$3,769,000	TOTAL	Prior Years Actuals +	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	367,000	Projections 155,000	212,000	0	0	0	0	0
	Labor (Monthly Payroll)	183,500	77,500	106,000	0	0	0	0	0
Α	Stock Materials	183,500	77,500	106,000	0	0	0	0	0
D	Non-Stock Material (A/P taxable)	733,000	310,000	423,000	0	0	0	0	0
D	Contractors (A/P tax exempt)	256,500	108,500	148,000	0	0	0	0	0
I I	Overheads	1,833,000	775,000	1,058,000	0	0	0	0	0
ľ	AFUDC*	110,500	46,500	64,000	0	0	0	0	0
0	Journal Vouchers (JVs)	0	40,500						
N S	CIAC Payments CREDIT	0							
S	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,667,000	1,550,000	2,117,000	0	0	0	0	0
R		15,000	0	15,000	0	0	0	0	0
E	Labor (Monthly Payroll)	31,000	0	31,000	0	0	0	0	0
Т	Contractors (A/P tax exempt)	5,000	0	5,000	0	0	0	0	0
l R	Overheads	51,000	0	51,000	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
N	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	102,000	0	102,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Dep	,	_	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
	Expense \$ (if applicable):	0							
Cu	rrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 3,015,200 Maximum (\$): 4,522,800 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Grid Modernization Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2023 In-Service: 12/1/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

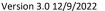
The Central Hudson Grid Modernization Program is comprised of six critical projects: Distribution Automation, Distribution Management System, Distribution System Operations, Geographic Information System (GIS) Model, Network Strategy, and Substation Metering Infrastructure.

#### Describe the project objective and scope of work:

Installation of substation feeder metering upgrades for per phase metering and fault data reporting. This includes electric and gas customer metering upgrades to provide remote monitoring and control. These infrastructures will be leveraged for remote metering, outage reporting, and energy savings. Installations include upgraded transformer LTC controllers and distribution circuit relaying upgrades at multiple substations.

### Describe specific scope exclusions, assumptions and constraints:

A systematic approach installing Grid Modernization equipment within substations has taken place. The Poughkeepsie and Fishkill Districts will be completed first, followed by Newburgh, Kingston, and Catskill Districts, respectively.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component?Yes Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

**Needs Assessment:** Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Grid Modernization Charter Final Signed.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

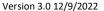
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> Social Component: No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Grid Modernization projects are a key Central Hudson initiative that will help create a smarter grid that will meet the changing energy landscape and prepare for the operating needs of the future.

What are the risks and consequences of not completing this project?

Risk of decreased reliability possibly increasing SAIFI or CAIDI due to decreased automated restoration.

Was this project included in a prior 5-year forecast?

No
If No, why should this project be completed instead of a planned project?

Grid Modernization aligns with our Corporate Goals by improving customer reliability.

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the  5-year budget plan  All future year cost estimates should include applicable adjustments for inflation.						
	\$3,876,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	328,100	147,100	165,000	0	16,000	0	0	0
	Labor (Monthly Payroll)	163,550	73,550	82,000	0	8,000	0	0	0
A	Stock Materials	163,550	73,550	82,000	0	8,000	0	0	0
D	Non-Stock Material (A/P taxable)	655,200	294,200	330,000	0	31,000	0	0	0
l	Contractors (A/P tax exempt)	228,970	102,970	115,000	0	11,000	0	0	0
Т	Overheads	1,638,500	735,500	825,000	0	78,000	0	0	0
1	AFUDC*	98,130	44,130	49,000	0	5,000	0	0	0
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,276,000	1,471,000	1,648,000	0	157,000	0	0	0
R	Labor (Weekly Payroll)	89,750	3,750	78,000	0	8,000	0	0	0
E	Labor (Monthly Payroll)	180,500	7,500	157,000	0	16,000	0	0	0
H	Contractors (A/P tax exempt)	30,250	1,250	26,000	0	3,000	0	0	0
R	Overheads	299,500	12,500	261,000	0	26,000	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	600,000	25,000	522,000	0	53,000	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
Cu	rrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 3,100,800 Maximum (\$): 4,651,200 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Maybrook Transformer Upgrades Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

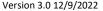
#### Describe the project objective and scope of work:

Replace existing Maybrook transformers with 22.4/29.8/37.4 MVA transformers with high side circuit switchers, bus work, and connections.

### Describe specific scope exclusions, assumptions and constraints:

Property must be obtained adjacent to the Maybrook Substation to allow for future expansion of additional circuits which may require a Power Control Center (PCC) if loading on the Maybrook Substation surpasses 30 MVA.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP#2022-007 Maybrook-Montgomery Spot Load Review.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc

**Checklist Fully Completed: Yes Environmental Component:** Maybe - Requires further scope development

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project? Risk of power transformer failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,		All future year cost estimates should include applicable adjustments for inflation.				
	\$6,357,000	TOTAL	Prior Years Actuals +	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	608,000	<b>Projections</b> 0	100,000	508,000	0	0	0	0
	Labor (Weekly Fayroll)	304,000	0	50,000	254,000	0	0	0	0
Α	Stock Materials	304,000	0	50,000	254,000	0	0	0	0
D	Non-Stock Material (A/P taxable)	1,215,000	0	200,000	1,015,000	0	0	0	0
D	Contractors (A/P tax exempt)	425,000	0	70,000	355,000	0	0	0	0
l'	Overheads	3,039,000	0	500,000	2,539,000	0	0	0	0
i	AFUDC*	182,000	0	30,000	152,000	0	0	0	0
0	Journal Vouchers (JVs)	0							
N	CIAC Payments CREDIT	0							
٥	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,077,000	0	1,000,000	5,077,000	0	0	0	0
R	Labor (Weekly Payroll)	42,000	0	15,000	27,000	0	0	0	0
E	Labor (Monthly Payroll)	84,000	0	31,000	53,000	0	0	0	0
H	Contractors (A/P tax exempt)	14,000	0	5,000	9,000	0	0	0	0
R	Overheads	140,000	0	51,000	89,000	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	280,000	0	102,000	178,000	0	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):								
Cu	rrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 5,085,600 Maximum (\$): 7,628,400 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: East Kingston PLC Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2025

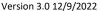
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The first and second generation Programmable Logic Controllers (PLC's) require more extensive maintenance due to age-related component failures. Many of these PLC's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

### Describe specific scope exclusions, assumptions and constraints:

Planned replacement of PLC located at East Kingston Substation.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

Needs Assessment: Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable: Replacing obsolete PLC equipment in order to optimize control and communications in Electric Substations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

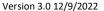
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Replacement of obsolete PLC equipment.

Why was the proposed project scope chosen over other alternatives?

N/A: Replacement of obsolete PLC equipment.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project?

Lack of Supervisory control and information in the substation possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary		t year of the dget plan						
	\$2,292,000	TOTAL	Prior Years Actuals +	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
			Projections						
	Labor (Weekly Payroll)	203,000	0	10,000	193,000	0	0	0	0
	Labor (Monthly Payroll)	101,000	0	5,000	96,000	0	0	0	0
1	Stock Materials	101,000	0	5,000	96,000	0	0	0	0
	Non-Stock Material (A/P taxable)	407,000	0	21,000	386,000	0	0	0	0
	Contractors (A/P tax exempt)	143,000	0	8,000	135,000	0	0	0	0
1	Overheads	1,016,000	0	51,000	965,000	0	0	0	0
	AFUDC*	61,000	0	3,000	58,000	0	0	0	0
	Journal vouchers (JVS)	0							
9	1	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,032,000	0	103,000	1,929,000	0	0	0	0
F	Laber (Treetay Layren)	39,000	0	8,000	31,000	0	0	0	0
E	Labor (Monthly Payroll)	78,000	0	15,000	63,000	0	0	0	0
	Contractors (A/P tax exempt)	14,000	0	3,000	11,000	0	0	0	0
F	Overheads	129,000	0	25,000	104,000	0	0	0	0
E	Journal Vouchers (JVs)	0							
N	Salvage CILDII	0							
E		0							
'	Laint Hillity Dayma anta CDEDIT	0							
5	TOTAL REMOVALS:	260,000	0	51,000	209,000	0	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 1,604,400 Maximum (\$): 2,979,600 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This project was part of the original RTU and PLC Replacement Program that has been separated out by project.



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Mobile Switchgear Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/31/2025

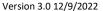
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

With all of the switchgear replacements along with long term maintenance of existing switchgears, a new mobile switchgear will be purchased to offload existing circuits in order to provide reliable work practices.

### Describe specific scope exclusions, assumptions and constraints:

New Mobile Switchgear will need to be available for maintenance or new construction for every substation.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** 

**Investment Type: Discretion Level:** Maintain System Standards Infrastructure

Is there an Innovation Component?Yes Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4

**Needs Assessment:** Infrastructure: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A: Infrastructure Replacements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 4

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estinN/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approval No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown belc \*Sustainability status is **Checklist Fully Completed: Yes Environmental Component:** No

> Social Component: No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? N/A: Infrastructure Replacements

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan				r cost estimates sl e adjustments for			
	\$1,015,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	102,000	0	0	102,000	0	0	0	0
	Labor (Monthly Payroll)	51,000	0	0	51,000	0	0	0	0
A	Stock Materials	51,000	0	0	51,000	0	0	0	0
D	Non-Stock Material (A/P taxable)	203,000	0	0	203,000	0	0	0	0
ı	Contractors (A/P tax exempt)	70,000	0	0	70,000	0	0	0	0
Т	Overheads	508,000	0	0	508,000	0	0	0	0
1	AFUDC*	30,000	0	0	30,000	0	0	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,015,000	0	0	1,015,000	0	0	0	0
R	Labor (Weekly Payroll)	0	0	0	0	0	0	0	0
E	Labor (Monthly Payroll)	0	0	0	0	0	0	0	0
H	Contractors (A/P tax exempt)	0	0	0	0	0	0	0	0
R	Overheads	0	0	0	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
Cu	rrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 710,500 Maximum (\$): 1,319,500 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Montgomery Street Switchgear Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/31/2026

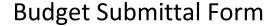
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The existing internal switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. Maintenance issues have been experienced with racking the vintage breakers in the internal switchgear. Replacement parts for the racking mechanisms are no longer available.

### Describe specific scope exclusions, assumptions and constraints:

It is recommended that the internal switchgear be replaced with a new switchgear. The switchgear will contain three bus's with normally closed tie breakers, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Part of the original Breaker Replacement Program and removal of cables to old Balmville Substation.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

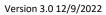
What are the risks and consequences of not completing this project?

N/A: Infrastructure Replacements

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•			cost estimates sh adjustments for ii			
	\$3,660,000	Prior Years Year 1		Year 2	Year 3	Year 4	Year 5		
	ψ3,000,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	334,000	0	0	20,000	314,000	0	0	0
	Labor (Monthly Payroll)	167,000	0	0	10,000	157,000	0	0	0
A	Stock Materials	167,000	0	0	10,000	157,000	0	0	0
D	Non-Stock Material (A/P taxable)	668,000	0	0	41,000	627,000	0	0	0
l	Contractors (A/P tax exempt)	234,000	0	0	14,000	220,000	0	0	0
Т	Overheads	1,671,000	0	0	102,000	1,569,000	0	0	0
I	AFUDC*	99,000	0	0	6,000	93,000	0	0	0
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,340,000	0	0	203,000	3,137,000	0	0	0
R	Labor (Weekly Payroll)	48,000	0	0	0	48,000	0	0	0
E	Labor (Monthly Payroll)	96,000	0	0	0	96,000	0	0	0
1;	Contractors (A/P tax exempt)	16,000	0	0	0	16,000	0	0	0
R	Overheads	160,000	0	0	0	160,000	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	320,000	0	0	0	320,000	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

Cost Estimate Range: Minimum (\$): 2,562,000 Maximum (\$): 4,758,000

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



# **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Wiccopee Relay Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

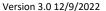
#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

### Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All electromechanical relays at Wiccopee Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

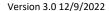
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	•		•	cost estimates sho adjustments for in			
	\$1,279,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	123,000	0	123,000	0	0	0	0	0
	Labor (Monthly Payroll)	61,000	0	61,000	0	0	0	0	0
A	Stock Materials	61,000	0	61,000	0	0	0	0	0
D	Non-Stock Material (A/P taxable)	245,000	0	245,000	0	0	0	0	0
Ī	Contractors (A/P tax exempt)	86,000	0	86,000	0	0	0	0	0
Т	Overheads	613,000	0	613,000	0	0	0	0	0
1	AFUDC*	37,000	0	37,000	0	0	0	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,226,000	0	1,226,000	0	0	0	0	0
R	Labor (Weekly Payroll)	8,000	0	0	0	8,000	0	0	0
E	Labor (Monthly Payroll)	16,000	0	0	0	16,000	0	0	0
1;	Contractors (A/P tax exempt)	3,000	0	0	0	3,000	0	0	0
R	Overheads	26,000	0	0	0	26,000	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	53,000	0	0	0	53,000	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Minimum (\$): 895,300 Maximum (\$): 1,662,700

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Copy to:	Mr. B. Arteta	Mr. N. Conza	Mr. P. Kothe	Mr. G. Depoala	E. Fortier
	Mr. E. Kearney	Mr. M. James	Mr. E. Loeven	Mr. K. Palen	E.P. #2022-015
	Mr. T. Burns	Mr. R Hawthorne	Mr. K. Pratt	Mr. H. Turner	
	Mr. A. Salemo	Mr. J. Kisch	Mr. V. Narkaj	Mr. R. Wright	

January 27, 2023

To: Ms. S. Palmer:

#### EP# 2022-015: East Fishkill Area Review

#### Recommendation

For the reasons discussed in this memo it is recommended that Option 3 in the below with the following projects be budgeted and completed as follows to address the area loading and operational concerns:

#### Year 2026

- Re-configure the Wiccopee Substation to operate similar to a standard highside half-breaker / two transformer substation (normally open 13.8kV bus tie with the ability to automatically transfer load for loss of a transformer). Complete the required controls and relay upgrades to support the new configuration and Grid Mod. Upgrade relays and control on the 8031, 8032, 8033 and 8034 circuits, the majority of this work is already budgeted to support the Grid Mod program. \$1 Million
- Extend the 8032 circuit from the first manhole to Rt. 52. Install new 8033 circuit from the breaker to Rt. 52. Circuits should be designed with a 9/14 MVA rating. **\$750,000**
- Polyphase 0.44 miles of the 8094 to Hopewell Glen. \$200,000

#### Year 2025-2026

- Double circuit west along Rt. 52 towards 82 for the 8032 circuit 0.73 miles. \$330,000
- Add pole plant for the 8072 circuit east along Rt. 52 to off load the 8093 2.21 miles. \$1 Million

#### **Area and Load Serve Capability**

The Southeast Fishkill Area being reviewed is depicted in Figure 1 below. This area straddles Route 52 and begins just to the east of the Merritt Park Substation, south of the East Fishkill Substation and heads

south and east to the edge of the service. The area is being reviewed due to circuit loading and proposed spot load growth near the Shenandoah Substation area and iPark 84 formerly the IBM complex.



Figure 1 Southeast Fishkill Area

The area is supplied by the following circuitry: Shenandoah 8071 and 8072; Fishkill Plains 8093, 8094 and 8095; and the Merritt Park 8065. Table 1 Area Load below is a listing of the Substations and circuits supplying the area along with their design ratings and non-coincident peak loads.

Substations & Circuits	Rating	2021
	(MVA)	(MVA)
Shenandoah	18	13.8
8071	9/12	8.1
8072	9/12	7.4
Fishkill Plains	48	46.6
8093	9/12	8.7
8094	9/12	8.4
8095	9/12	11.0
Merritt Park	51	32.7
8065	6/9	5.7

Table 1 Area Load

Many of the circuits supplying the area load are approaching their design limits. Although the loading is currently within thermal limits, there are concerns regarding operational flexibility during peak period switching, which is further limited as new spot load requests materialize. It should be noted that the ratings for Merritt Park and Fishkill Plains substations are firm ratings and Shenandoah is not since it is a single transformer substation, therefore for any substation related outage at Shenandoah the load would need to be transferred to neighboring circuits.

The East Fishkill/Shenandoah area was identified as a candidate for a Non-Wires Alternative (NWA) in 2014/2015 to address the ratings of the area substations and to defer the Phillips Road Substation. The NWA was launched in 2015 to reduce the area loading by 5 MW in order to defer the need for the Phillips Road Substation to 2025. Table 2 NWA Fishkill/Shenandoah below shows the achieved NWA for

Fishkill/Shenandoah which was reduced by 1.6 MW to 3.4 MW during the last avoided T&D cost study. The targeted energy efficiency program reduces the area load by 259 kW and the Peak Perks program can further reduce the area loading by 2.8 MW including avoided line losses when triggered. Based on the NWA, the total area rating can be increased by approximately 2.8 MW for analysis; however, this is spread amongst all the Fishkill Plains and the Shenandoah circuits which only addresses the area's total firm rating but will not support the immediate need to supply the recent spot loads in the Shenandoah area along Route 52 and iPark 84. In addition, the NWA does not address the need to reduce the distribution circuit loading to within their design ratings which currently limits the ability to serve the newly developed spot loads as well as provide the needed operational flexibility during abnormal and contingency conditions. With the recommended upgrades to supply the emergent spot loads and increase operation flexibility, it is recommended to review the current NWA for the East Fishkill Area to determine if it is recommended to extend the timeframe beyond the original deferment period (2025).

Load Zone	Peak Perks: Residential & Small Commercial (kW)	Peak Perks: Large C&I (kW)	Targeted Efficiency (kW)	Avoided Line Losses (kW)	Total kW Available
Fishkill/Shenandoah	2,664	0**	259	144	3,063

Table 2 - NWA Fishkill/Shenandoah

#### **Area Spot Loads**

The recent addition of an Amazon distribution center as well as the Frito Lay distribution center and planned vehicle charging stations are expected to add approximately 9 MVA of load to the area. The Amazon distribution center's 6 MVA was added to the former IBM Wiccopee Substation. The Amazon Distribution center is located near the Wiccopee Substation. This area was formerly part of the IBM complex load supplied by Wiccopee Substation. This location was a better fit to be supplied by Wiccopee instead of our Shenandoah distribution station due to the size and proximity of the load. Wiccopee is a "non-traditional" distribution substation with a closed bus tie which was designed for the former IBM complex and has higher fault currents than current distribution station design levels. This aligned with the operation of the former IBM closed bus medium voltage gear at the time. When completed, the Frito Lay distribution center will be added to the Shenandoah Substation on the 8071 circuit which will push this feeder above its normal design rating of 9MVA. There are three additional proposed distribution centers in the iPark 84 complex. Blue water group is a 530,000 square foot warehouse and Ashley Furniture has a proposed 260,000 furniture repair and warehouse facility both which have not yet provided load letters. Additionally, LIDL has a proposed grocery warehouse with refrigeration and a proposed load of 4 MW also pending a formal load letter. Based on the 2020 DSIP, the Shenandoah and Fishkill Plains Substations show a 1.4% and 1.2% growth rate, respectively without any spot loads being accounted for.

#### **Operational Concerns**

Loading near design ratings poses a concern for operating during peak periods which limits the flexibility for switching, connecting larger spot loads and distribution automation. As mentioned earlier the

Shenandoah Substation is a single transformer source and the loss of transformer #7 or the low side bus would cause a permanent interruption for the customers on the 8071 and 8072 circuits. These customers would need to be transferred to neighboring circuits which would require lengthy switching. Although there is some reserve capability on the neighboring circuits there would likely be some unreserved load as well as potential voltage concerns during peak periods. Circuit ties are also limited since these circuits are effectively radial to the eastern border of the territory.

The Wiccopee Substation was recently utilized to supply the Amazon Distribution center. During the planning stages to supply this distribution center it was recommended that a second feeder be added from the alternate 13.8kV bus at Wiccopee to support substation maintenance requirements and to limit customer interruption in the future for the 8031 circuit which feeds Amazon. This second feeder will also allow for a future distribution circuit in the area to support any future spot loads simply by extending this feeder from the manhole outside the station to Route 52. To utilize the Wiccopee circuitry as distribution feeders, the bus tie would need to be opened to reduce the circuit fault currents.

#### **Options**

The below options will address the area spot loads as well as addressing the operational flexibility needs and circuit loading in the Southern East Fishkill area. Each option supports both existing and planned Distributed Energy Resources (DERs) and has the potential to increase hosting capacity along the distribution feeders as well as at the substation level.

#### **Option 1 Phillips Road Substation**

This option was a previously identified project to construct a single transformer 12/16/20 MVA substation where Phillips Road intersects the FP line crossing. This would establish a source to the north of Route 216 on the east end of the Town of East Fishkill. This project was posed to add distribution circuits to off load the Fishkill Plains and Shenandoah eastern circuits. Although this option addresses the loading of some of the local rural circuits as well as the firm rating of the Fishkill Plains Substation, it does not support the load requirements near the Shenandoah Rt. 52 corridor. A budgetary estimate for the substation and distribution tie-ins is estimated to cost \$8 million.

#### Option 2 New circuit out of Shenandoah

A new circuit emanating from the Shenandoah Substation could provide load relief to the area. This option will not be further pursued since it is a single transformer source and the inability to provide automatic load transfers for loss of transformer, bus or transmission feed exists. The opportunity to expand this station is also limited due to space constraints.

#### Option 3 Reconfigure the Wiccopee Substation as a Distribution Substation (Recommended)

The Wiccopee Substation currently has two distribution circuits that were recently added. The 8031 supplies the Amazon Distribution Center and the 8032 circuit provides a second circuit to support

substation breaker maintenance and a potential future distribution circuit. The station currently operates with a closed bus which contributes to higher than desired fault currents for our distribution overhead facilities. To utilize this substation, it is recommended that the substation be reconfigured to operate with a normally open bus tie along with the necessary relay and controls upgrades to support the new configuration and Grid Modernization. Opening the bus tie will reduce the fault currents from approximately 18,000 A for a 3 phase and 17,000 A for a single-phase fault to 9,400 A for a 3 phase fault and 9,000 A for a single phase fault. It is estimated that the fault current will be within the design limits of the overhead facilities prior to load being tapped. The cost estimate to complete the substation work along with extending the 8032 and adding a third distribution feeder is estimated to cost \$1 million for the substation work and \$750K for the circuit exits for a total of \$1.75 million.

To fully integrate the Wiccopee Substation circuits and address the spot loads as well as the area circuits over design rating, there were several options reviewed with the Fishkill Electric Operations Engineer. Figure 2 below illustrates the East Fishkill load relief plan including the recommended circuit reconfiguration and integration to address the area loading and operational needs.

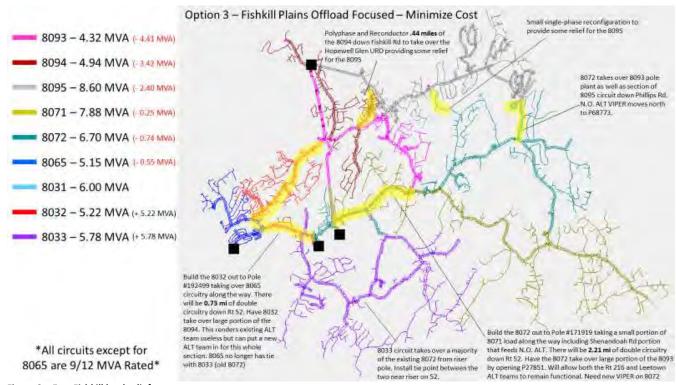


Figure 2 – East Fishkill load relief

There are three distribution projects that need to be incorporated within the capital budget in addition to the Wiccopee circuit exits to balance the circuit loading and increase operational flexibility. The following projects are recommended at a total cost of **\$1.53 million**:

- Polyphase 0.44 miles of the 8094 to Hopewell Glen. \$200,000.
- Double circuit west along Rt. 52 towards 82 for the 8032 circuit 0.73 miles \$330,000.
- Install a second circuit for the 8072 to the east along Rt. 52 to off load the 8093 2.21 miles \$1M.

Juno lingate

Mr. J. M. May Mr. D. J. **D**ittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nue 54' 5011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

## L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. Various departments rely on information from these devices in order to perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact, 2) Customer Services (Line Forces) to sid in fault locating and thereby limiting patrol time and area; 3) ©perations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability. Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### **Discussion:**

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is previded with them.
- o Basier BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- o Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

o Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basier provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

#### C. Additional Considerations:

- O Data Concentrator (SEL-2032): This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- O Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- ◆ They provide oscillegraphy, targets, and phasor data that can be accessed from a remote location through a modern. This capability assists in timely and accurate fault analysis.
- They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

<sup>&</sup>lt;sup>1</sup> Full integration requires a DNP compatible Remote Terminal Unit described in the "RTU Review" memo.

#### **Attachment 2**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### Discussion:

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

# Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti (Manl	Cost	
A	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

		Tin	ne		Cost			İ	
Retrofit Options		Manh	ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL	
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9 9
Grid Sense Meter	W / VAr	•	Hours are for the EOE and the Linemen.						\$5,700
Data Concentrator	1 for every 4 ckts.	takes	Per installation, each meter takes the lineman and the			\$2,272			\$2,700
POT Line		2.0	15 minu n data c			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tin	ne and	15			\$430	\$430
Site Registration	per D/C	20	utes of el to ea			-waived-			
TOTAL GS Installation	ā	been assumed to be 1 hour.						\$9,000	
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

#### **Attachment 3**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### Re: Remote Terminal Unit Review

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

• Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

#### **Attachment 4**

Copy to:

Mr. P.E. Haering Mr. H.W.Turner

Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

#### Discussion:

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering: Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### **Conclusions:**

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

Editor and a factor	C		
Retrofit Options	Parts	TOTAL	
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2
R-Mag Breaker	\$25,000	\$90,000	

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

			Electric Sub	station Upgra	OE MEEGS WS	26221116111		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment  Retired as part of P/MK Upgrade
		264 624	Charts - kW		EM	NONE		Only has a 13.8 Voltage Regulator
Accord	4	361 Ckl.			EM	NONE		Only has a 13.8 Voltage Regulator
Ancram	13.8	7085 Ckt.	Grid Sense			NONE		
Balmville					EM			
Balmville	4	411 Ckt.	MV-90		EM			
Balmville	4	412 CKt.	MV-90			C-300		
					,			Metering source?
Barnegat	115	KB Line	Amps	EM				
Barnegat Barnegat	115	KC Line	None	EM				
Barnegat	115	KB-749-KC BKR		EM				
Barnegat	115/13.8	T1	SCADA	EM				IBM Feeds
Barnegat	115/13.8	Т2	SCADA	EM				
Barnegat	13.8	S1	SCADA		EM			IBM Feeds
Barnegat	13.8	52	SCADA		EM			
Barnegat	13.8	\$1-706 BKR	SCADA		EM		****	IBM Feeds
	13.8	S2-734 BKR	SCADA		EM			
Barnegat	13.8	OZ-754 ONN				D-20		
Beacon	12.0	BOOC Che	SCADA		EM			
Beacon	13.8	8006 Ckt.			· _ · · · · · · · · · · · · · · · · · ·		<del></del>	Deviewely 2027 A 2
Beacon	13.8	. 8015 Ckt.	SCADA		EM			Previously 8087A?
Beacon	4	801 Ckt.	SCADA		EM			· · · · · · · · · · · · · · · · · · ·
Beacon	4	802 Ckt.	SCADA		EM			
Beacon	4	803 Ckt.	SCADA		EM	****	*****	i
	4	W-414 BKR	SCADA	<u> </u>	EM			<del>                                     </del>
Beacon	4						<del></del>	<u> </u>
Beacon		W-463 BKR	SCADA		EM			
Beacon	4	Bus 1	SCADA					
Beacon	4	Bus 2	SCADA					
Beacon	13.8/4	T1	SCADA		EM			INDE:
Beacon	13.8/4	T2	SCADA		EM			MDB has an entry with T1+T2 calculate
Beacon	13.8	BF Cable	SCADA	****	EM			<del> </del>
Beacon	13.8	NM Cable	SCADA		EM			<del></del>
Beacon	13.8	CM Cable	SCADA				*****	<u> </u>
Beacon	13.8	Bus 1			EM			
Beacon	13.8		SCADA		EM			
Bethlehem Rd.	73.0	] Bus 2	SCADA		ÉM			
Bethlehem Rd.	420	7				2400		~ <del></del>
	13.8	4091 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4093 Ckt.	MV-96		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4094 Ckt.	MV-90		EM/uP			
Bethlehem Rd.	13.8	4095 Ckt.	MV-90			<del></del>		BE1-851H as BU and 79
Betnlehem Rd.	13.8			*	EM			<u></u>
		4096 Ckt.	MV-90		EM			
Bethlehem Rd.	13.8	4097 Ckt.	MV-90		EM EM			
Bethlehem Rd.	13.8	4098 Ckt.	MV-90		EM	N-4-4		
Bethlehem Rd.	13.8	Bus 1	EMS		EM			
Bethlehem Rd.	13.8	Bus 2	EMS		EM			
Bethlehem Rd.	115	RD Line	None	EM				<del></del>
Bethlehem Rd.	115	UB Line	None	EM				<del></del>
Bethlehem Rd.	115	RD-604-UB BKR	Tone	EM				<del> </del>
Bethlehem Rd.	115/13.8		<del></del>					
			EMS	EM EM				Metering combined
Bethlehem Rd.	115/13.8		EMS	EM	*****			matering compared
Bethlehem Rd.	13.8	W-613 BKR			EM			
Bethlehem Rd.	13.8	W-619 BKR			EM			
Bethlehem Rd.	13.8	W-804 BKR			EM			
Bordman Rd.					·······	NONE	<del></del>	<del></del>
Bordman Rd.	13.8	6081A Ckt.			EM			
··			<del></del>		EM			
Bordman Rd.	13.8	6082A Ckt.					*	
Bordman Rd.	13.8	Z-203 Ckt.			EM			
Bordman Rd.	13.8	Z-204 Ckt.			EM			
					E₩			
Bordman Rd.	13.8	Z-205 Ckt.			EM			
Bordman Rd.	13.8	Z-206 Ckt.						
Bordman Rd.		Z-207 Ckt.		****	EM			
···			-t	,	EM			
Bordman Rd.	. 13.8				EM			
	. 13.8	Z-209 Ckt.	,	****				

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Coxsackie

	<del></del>		Electric Substa			1		C
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
	<del> </del>					2100		
Boulevard	69	OB Line	SCADA	UP				
Boulevard	69	N Line	SCADA	υP				
Boulevard		1 Line	SCADA	uP				Line Amps & W/VAr
Boulevard	69	KO Line	SCADA		uP			
Boulevard	13.8	KK Line	SCADA		υP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1012	SCADA		EM/uP			
Boulevard	13.8	CKI, 1013	SCADA		UP	*****		
Boulevard Boulevard	13.8	Ckt. 1014	SCADA		EM/uP			
Bonievard	13.8	Bus 1	SCADA		EM			
Boulevard	13.8	Bus 2	SCADA		EM			
	69	Bus 1	SCADA	EM				<del>                                     </del>
Boulevard		Bus 2	SCADA	E₩		*****		
Boulevard	69		3020	EM				
Boulevard	69	Overall		EM				Metering combined
Boulevard	69/13.8		SCADA	EM				inetering contoured
Boulevard	69/13.8	Т3	SCADA		<del></del>		*****	
Boulevard	69/13.8	T2	SCADA	EM		M-4000		
Clinton Ave.						19124000		1
Clinton Ave.	4	395 Ckt.	MV-90		EM		<del></del> -	<del>                                     </del>
Clinton Ave.	4	396 Ckt.	MV-90		EM			<del></del>
Clinton Ave.	4	397 Ckt.	MV-90		EM			<del>. </del>
Clinton Ave.	4	Bus	SCADA		***	<u> </u>		
Clinton Ave.	13.8/4	T1	MV-90		Fuse			
Cold Spring	10.074					NONE		
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two (
Cold Spring	4	872 Ckt.	Charts - kW		EM			circuits.
Coldenham	<del></del>	0,4,33				D-20		
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
	13.8	4022 Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
Coldenham					uP-200/ uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		<del></del>	+	<del></del>	
Coldenham	13.8	4024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4927 Ckt.	SCADA		υP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM			
Coldenham	13.8	Bus 2	SCADA		EM		*****	
Coldenham	13.8	B1-B2 Tie			EM			
Coldenham	115	J Line	SCADA	Gen 1			*****	95P is DLP; 95BU is REL-301; part of
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
	115/13.8	T1	SCADA	EM				
Coldenham		T2	SCADA	EM				
Coldenham	115/13.8			SS				
Coldenham	115	J-19-CW BKR				NONE	1	
Converse St.	+ -	121 Ckt.	MV-90	*****	EM			1
Converse St.	4	121 Ckt.	MV-90		EM			
Converse St.	4		MV-90		EM			
Converse St.		123 Ckt.	MIA-20			NONE		
Conway Place						MOME		
Conway Place		881 Ckt.	MV-90	*****	EM			
Conway Place	4	882 Ckt.	MV-90		EM:			
Coxsackie			<u></u>			8890		
Coxsackie	13.8	1071 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
	13.8	1072 Ckt.	SCADA/ Charts - kW		EM			BE1-851H as BU and 79
Coxsackie	13.8	1074 Ckt.	Charts - Amps		EM/uP			Bitronics for the SCADA portion
Coxsackie			SCADA/ Charts - kW		EM			Stocked for the Contract Soliton.
Coxsackie		4070.064		<del></del>	EM			
	13.8	1076 Ckt.		*****				•
Coxsackie Coxsackie	13.8	1076 Ckt. Bus 1 (T1+G1)	SCADA					
Coxsackie Coxsackie Coxsackie	13.8 13.8	Bus 1 (T1+G1)			EM			Metering data available through relay, b
Coxsackie Coxsackie	13.8 13.8		SCADA		EM			
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	Bus 1 (T1+G1) Bus 2	SCADA ???					Metering data available through relay, b configured.
Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	Bus 1 (T1+G1)	SCADA	uP	EM			
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 69	Bus 1 (T1+G1) Bus 2 CN Line	SCADA ??? None		EM			
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 69	Bus 1 (T1+G1) Bus 2 CN Line NC Line	SCADA ???	uP	EM			

·			Electric Sub	station Upgra	<u>de Needs As</u>	sessment 	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU	Recloser	Comment
	5.655 (,					2100		Siemens meters 485 to RTU Al
Danskammer	i			EM				Siemens meters 485 to RTU Al
Danskammer	115	AC Line	SCADA - Amps	EM			~	Siemens meters 465 to RTU AL
Danskammer	115	DC Line	SCADA - Amps	UP UP				Siemens meters 485 to RTU Al
Danskammer	115	DB Line	SCADA - Amps					Siemens meters 485 to RTU Al
Danskammer	115	DR Line	SCADA - Amps	UP				Siemens meters 485 to RTU Al
	115	DW Line	SCADA - Amps	uР				Siemens meters 485 to RTU Al
Danskammer	115	RS Line .	SCADA - Amps	EM				
Danskammer	115	W - 323 8KR		SS				
Danskammer Danskammer	115	North Bus	SCADA - Volts	EM			****	
Danskammer	115	Middle Bus	SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA - Volts	EM				
Danskammer	115	DB-1171 BKR		υP				
Danskammer	115	DR-1421 BKR		υP				<u> </u>
Danskammer	115	DW-1061 BKR	****	υP			*****	ļ
Danskammer	115	T5&T6	SCADA	EM			***-*	<u> </u>
Dashville	1.13	1				2300		
	4	345 Ckt.	-MV-90		EM		V4L	Single Phase; Vac; Hydr
Dashville	6.6	Bus	- 144 Y - 30		EM			
Dashville	6.6			EM				Fused Transformer w/ CR 67 relay
Dashville		T1						1 daed fransionner wild to teldy
Dashville		G1-G2	SCADA					<u> </u>
East Fishkill 345kV								
East Fishkill 345kV	345	C9751 Breaker A1 BR	·	EM				
East Fishkill 345kV	345	C9751 Breaker A2 BR		EM			*****	
East Fishkill 345kV	115	Transformer #1 Alt. 1		EM				
East Fishkill 345kV		Transformer #1 Alt. 2	SCADA	EM			*****	
East Fishkill		1				8890	<u> </u>	
East Fishkill	115	EF Line	SCADA	υ <b>Ρ</b> *				95P is MDAR; 95BU is Optimho - Replacin
East Fishkill	115	HF Line			<del></del>	<del></del>		with 311C & D60.
East Fishkill	115	EF-672 BKR	SCADA	u₽*				95BU is Optimho - Replacing with D60.
East Fishkill				EM				
	115	EF-679 BKR		EM				
East Fishkill	115	W-640 BKR		ĖM	*****			
East Fishkill	115	T1	SCADA	see EFB				
East Kingston						Orion		
East Kingston	13.8	Đus 1	SCADA		UP		****	
East Kingston	13.8	Bus 2	SCADA	N	υP			
East Kingston	13.8	1021 Ckt.	SCADA		чp		·	
East Kingston	13.8	1022 Ckt.	SCADA		υP			
East Kingston	13.8	1023 Ckt.	SCADA		uP			
East Kingston	13.8	1024 Ckt.	SCADA		UP			~ <del></del>
East Kingston	13.8	1025 Ckt.	SCADA		uP			<del>-  </del>
East Kingston	13.8	1026 Ckt.	SCADA		υP			-
East Kingston	13.8	1026 Ckt.			UP			
			SCADA					
East Kingston	13.8	1028 Ckt.	SCADA		uP			
East Kingston	115	ER Line	SCADA	∪P				
East Kingston	115	LR Line	SCADA	υP				
	115	LR-201-ER Breaker	****	uP				
East Kingston		Com Equipment		,				Com
			SCADA	υP			*****	
East Kingston	115/13.8		SCADA	UP				
East Kingston East Kingston	115/13.8	172		1 01		8890		
East Kingston East Kingston East Kingston	115/13.8 115/13.8	T2	J GCADA					
East Kingston East Kingston East Kingston East Park	115/13.8		· · · · · · · · · · · · · · · · · · ·		EMILID			RE1-851M as RI1 and 70
East Kingston East Kingston East Kingston East Park East Park	115/13.8	6073 Ckt.	SCADA		EM/uP			BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Kingston East Park East Park East Park	115/13.8 13.8 13.8	6073 Ckt.	SCADA SCADA		EM/uP			BE1-851H as BU and 79 BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Park East Park	115/13.8	6073 Ckt. 6074 Ckt. 6075 Ckt.	SCADA SCADA SCADA		EM/uP EM	*****		
East Kingston East Kingston East Kingston East Kingston East Park East Park East Park	115/13.8 13.8 13.8	6073 Ckt.	SCADA SCADA		EM/uP			

Substation								
	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)					2400		3 phase; oil; electronic; GS not working
ast Walden					EM/uP		ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5041 Ckt.	Grid Sense		EM/uP		ES	GS not working
East Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
East Walden	13.8	5043 Ckt.	Grid Sense					
ast Walden	13.8	Com Equipment			uP			95P is DLP; part of replacement program
	13.8	81	SCADA					already.
East Walden			None	Gen1/uP			<u></u>	aireauy.
East Walden	115	CW Line		EM				
East Walden	115	CW -712		EM				
East Walden	115	D Line	None	EM			<u></u>	
East Walden	115	D-722 BKR	SCADA	UP	****			
East Walden	115	DW Line	SCADA	UP				
East Walden	115	DW-1071 BKR		UP				
East Walden	115	EM Line	SCADA	uP				Amps & Volts
East Walden	115	EM-642 BKR	SCADA	UP				Anips a voits
East Walden	69	WM Line	SCADA	EM				
East Walden	115	W-644		EM				Combine Bus Volts to one point
East Walden	115	B1	SCADA	EM				
East Walden	115	82					2/	95P is SEL-587
East Walden	69/13.8	T1	SCADA	uP/EM				95BU is SEL-587
East Walden	69/13.8	T3	SCADA	EM/uP	J	D-20		
Fishkill Plains					EM/uP			BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM			
Fishkill Plains	13.8	8092 Ckt.	MV-90	V				SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	SCADA		บค- 200		<del></del>	SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.	SCADA	****	uP- 200	<u> </u>		322-201 (Kelly), 300 0 13 322 0 1
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA		υP			
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1			84471	95BU is Optimho; part of replacement program.
Fishkill Plains	115	HF-703 BKR		EM				
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	υP		****		
Fishkill Plains	115	A-1036-FP	y-+	uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498	- papers	uP- 200				279/2BFR relays
Fishkill Plains	115	Com Equipment						Com
Fishkill Plains	115	FP Line	SCADA	uP/Gen 1				95P is DLP; part of replacement programmed already; 95BU is SEL-321
Fishkill Plains	115	81	SCADA	EM			*****	
	13.8	B1			EM			Combine Bus Volts to one point
Fishkill Plains	13.8	82	SCADA		EM			- Commence and the comm
Fishkill Plains		T1		EM/uP				95BU is SEL-587; metering is combine
Fishkill Plains	115/13.8	T2	SCADA	EM/uP			*****	3555 % 525 531, 315631 13 15 00 115
Fishkill Plains	115/13.8	12				2300		
Forgebrook		D.10 #4			EM			
Forgebrook	13.8	Bus #1 Bus #2	Charts - kW/kVAr		EM			
Forgebrook	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8011 Ckt.			EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - Amps Charts - kW		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8014 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8015 Ckt.			EM			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW					Com
Forgebrook	115	Com Equipment	Nana	EM				
Forgebrook	115	FO Line	None	EM				
Forgebrook	115	FO-1430-FT		EM				
Forgebrook	115	FT Line	None					
	445	FT-1432		EM				
Forgebrook				EM				
Forgebrook	115		SCADA	uР				
Forgebrook	( 115				EM			Amne
Forgebrook		CM Line	None		EM			Amps
	<del> </del>		SCADA		EM			
Forgebroo	- 1							
Forgebroo			_		EM	*****		
Forgebroo	ok 13	8 W-994	2000					Metering combined
Forgebroo		·	SCADA	EM				

200-2

120

w	
75	
9	

Substation   Voltage   Line(Ckt.   Metering   T. Relaying   D. Relaying   RTU   Recloser   Comment				Electric Subs	station Upgra	de Needs As	sessment		
Freehold   13.5   2061 CNL   Grid Sense   EM/UP     PR-960M   3-phase; oil electronic; ISSU IS 981-957   GS orgovering	Substation		Line/Ckt.	Metering	T. Relaying	D. Relaying		Recloser	Comment
Freshold   13.8   2061 Cht.   Grid Sense   EMUP	Maria de Maria	<del> </del>					M-4000		3 phase oil: electronic; 95BU is BE1-851H;
Freehold   13.8   2091 CH.   Orth String   College   C	Freehold	<del>                                     </del>		0.44.5		EM/uP		PR-560M	GS not working
Freshold   13.8   2071 CPL   Grid Sense	Freehold	13.8	2061 Ckt.			EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H;
Freehold   13.8   W.152 BPK	Freehold	13.8			<u> </u>			PR-560M	
Freehold   13.8   T1	Freehold	13.8					****		
Galeville   13.8   5.0	Freehold				<del></del>				
13.8   6.9   S.CADA		13.8	81	SCADA	<u> </u>		Orion .		······································
Galeville   13.8   52   50.00   13.8   50.00   13		42.0	B1	SCADA		uP			
Galeville   13.8   5031 CRL   SCADA									
Galeville   13.8   5931 CM;   SCADA   UP						up			
Galeville   13.8   5932 Ckt   SCADA						υP		****	
Galeville						uP			
Galeville   13.8   59.35 Cit   SCADA   UP						υP			
Selective   13.8   53.5 Cet.   SCADA									
Com   Com									
SCADA   UP					<del></del>	<del></del>			Com
Galeville   69						<u> </u>	<u> </u>		
Galeville   691 Mit Line   SCADA   UP					<del></del>	-	<del></del>		
Galeville							· · · · · · · · · · · · · · · · · · ·		
Galeville   G9f13.8   T2   SCADA   UP							ļ		
Greenfield Rd.   13.8   3076 Ckt.   Grid Sense   EMiuP   ES   3 phase; oit; electronic; 956U is BE1-8   Creenfield Rd.   13.8   3078 Ckt.   Grid Sense   EMiuP   ES   3 phase; oit; electronic; 956U is BE1-8   Creenfield Rd.   4   375-376 Ckt.   Charts - kW   EM									
Greenfield Rd.   13.8   3076 Ckt.   Grid Sense   EMul		69/13.8	T2	SCADA	ŲΡ	<u> </u>	· <del>- ·</del>		
Greenfeld Rd.   13.8   3078 Ckt   Grid Sense   EMIUP   ES   3 phase; oil; electronic; 958U is BE1-5		<u> </u>					M-4000		
Greenfield Rd.   13.8   3078 Ckt   Grid Sense   EMIUP   ES   3 phase; oil; electronic; 958U is BE1-8				Grid Sense		EMJup		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.				Grid Sense		EM/uP		ES	
Streenfield Rd.   13.8   W-1608   EM				. Charts - kW		EM		T	
School   13.8/4   72				Charts - kW		EM			
Greenfield Rd.   13,84   72   Charts - kW   EM						EM		ES	3 phase; oil: electronic
SCADA   SCAD				Charts - kW		EM		<u> </u>	o phase, on, electronic
Scenfield Rd.   4   B1   SCADA			B1	SCADA		*****	<del></del>	<del></del>	~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Grienfeld Rd.   4   B3   SCADA			81	SCADA				<del> </del>	
NONE-Scon to have DMP RTU	Greenfield Rd.	4	<b>B</b> 3	SCADA			<del></del>	<del> </del>	
Grimley Rd.   4   385 Ckt.   Grid Sense   EM   Kyle L   Single Phase; Oil; Electronic Grimley Rd.   4   386 Ckt.   Grid Sense   EM   Micro 1C   No DATA	Grimley Rd.						NONE-Soon to		Volts
Grimley Rd.   4   386 Ckt.   Grid Sense   EM	Grimley Rd	4	385 Ckt	Grid Sanso		E44	Have DIAL KIL		0 1 5
Hibernia   13.8					· · · · · · · · · · · · · · · · · · ·		+		
Hibernia   13.8   7011 Ckt.   SCADA   UP-200/ UP   95P is SEL-251; 95BU is SEL-501				Ond delise		Ciai		····	No DATA
Hibernia   13.8   7012 Ckt.   SCADA   UP-200/ UP     SSP is SEL-251; SSBU is SEL-501   Hibernia   13.8   B1   SCADA     EM/UP     95BU is DFP-100		128	7011 541	90404					<del></del>
Hibernia   13.8   B1   SCADA   EM/UP     95BU is DFP-100     Hibernia   69/13.8   T1   SCADA   EM/UP       95BU is DFP-100     High Falls   13.8   3021 Ckt   SCADA     UP-200/UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3022 Ckt   SCADA     UP-200/UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3023 Ckt   SCADA     UP-200/UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3024 Ckt   SCADA     UP-200/UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3025 Ckt   SCADA     UP-200/UP     95P is SEL-251; 95BU is SEL-501     High Falls   69	<del></del>							<del></del>	
Hibernia   69/13.8   T1   SCADA   EM/UP									
Hibernia   13.8   Com Equipment									
High Falls   13.8   3021 Ckt   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501								<del></del>	
High Falls   13.8   3021 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3022 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3023 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3024 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3025 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   69	***************************************	13.0	Com Equipment	V					Com
High Falls   13.8   3022 Ckt.   SCADA     UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3023 Ckt.   SCADA     UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3024 Ckt.   SCADA     UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3025 Ckt.   SCADA     UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   69		120	2024 01-4				<del></del>	<del></del>	
High Falls   13.8   3023 Ckt.   SCADA   UP-200/ UP   SSEL-251; 958U is SEL-501     High Falls   13.8   3024 Ckt.   SCADA   UP-200/ UP   SSEL-251; 958U is SEL-501     High Falls   13.8   3025 Ckt.   SCADA   UP-200/ UP   SSEL-251; 958U is SEL-501     High Falls   69									
High Falls   13.8   3024 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   13.8   3025 Ckt.   SCADA   UP-200/ UP     95P is SEL-251; 95BU is SEL-501     High Falls   69					<del></del>				
High Falls 13.8 3025 Ckt. SCADA UP-200/ UP 95P is SEL-251; 95BU is SEL-501 High Falls 69 HK Line SCADA UP 95P is DLP 95P is DLP UP-200 SEL-279 UP-200 SEL-279 UP-200 95P is DLP 95P is DLP 95P is DLP UP-200 95P is DLP 95P is DLP UP-200 95P is SEL-251; 95BU is SEL-501 UP 95P is SEL-251; 95BU is SEL-501 UP-200 95P is SEL-251; 95BU is SEL-501 UP-200 95P is SEL-251; 95BU is SEL-501 UP-200 95BU is SEL-251 UP-200 95BU is SEL-251 UP-200 95BU is SEL-251 UP-200 95BU is SEL-251 UP-200 95BU is SEL-251 UP-200 95P is SR-745 & 95BU is SEL-251 UP-200 95P is SR-745 & 95BU is SEL-251 UP-200 95P is SR-745 & 95BU is SEL-387; UP-200 95P is								<del></del>	
High Falls 69 HK Line SCADA UP 95P is DLP High Falls 69 HK-696-P BKR UP-200 SEL-279 High Falls 69 P Line SCADA UP 95P is DLP High Falls 13.8 W-998 BKR. SCADA UP-200/UP 95P is SEL-251; 95BU is SEL-251 High Falls 13.8 B1 SCADA UP/UP-200 95BU is SEL-251 High Falls 13.8 B2 SCADA UP/UP-200 95BU is SEL-251 High Falls 13.8 Com Equipment									
High Falls   69							<del></del>		
High Falls   69					<del></del>				
High Falls         13.8         W-998 BKR.         SCADA         UP: 200/ UP         95P is SEL-251; 95BU is SEL-50*           High Falls         13.8         B1         SCADA         UP/ UP: 200         95BU is SEL-251           High Falls         13.8         B2         SCADA         UP/ UP: 200         95BU is SEL-251           High Falls         13.8         Com Equipment         Com         Com           High Falls         13.8         Com Equipment         95P is SR:745 & 95BU is SEL-587;           High Falls         69/13.8         T1         SCADA         UP         95P is SR:745 & 95BU is SEL-587;			****	<del></del>					
High Falls         13.8         B1         SCADA         UPT UP - 200							<del></del>		
High Falls     13.8     B2     SCADA     UP/ UP- 200     SSBU is SEL-251       High Falls     13.8     Com Equipment        95P is SR-745 & 95BU is SEL-587;       High Falls     69/13.8     T1     SCADA     UP       95P is SR-745 & 95BU is SEL-587;				<del> </del>					95P is SEL-251; 95BU is SEL-501
High Falls 13.8 Com Equipment	High Falls						<del> </del>	····	
High Falls 13.8 Com Equipment	High Falls	13.8	B2	SCADA					
High Falls 69/13.8 T1 SCADA UP 95P is SR-745 & 95BU is SEL-587.\			Com Fauinment						
High Falls   59/13.8   95P is SR-745 & 95BU is SEL-587; \					uР				
High Falls 69/13.8 T2 SCADA UP				SCADA	uP				95P is SR-745 & 95BU is SEL-587; Vo

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			Electric Subs	itation Up.	Needs As	sessment	1	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Ciass (KV)					2300	<del></del>	95BU is B£1-IPS-100
Highland			SCADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA		EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			3350 350 115
Highland	13.8	5083 Ckt. 5084 Ckt.	SCADA		uP			
Highland	13.8	5084 Ckt.	SCADA		uP			
Highland	13.8		SCADA	υP				
Highland	115	HR Line OR Line	SCADA	UP				
Highland	115	OR-761-HR BKR.		EM	EM			
Highland Highland	13.8	B1	SCADA		uP			
Highland	13.8	82	SCADA		ur			Com
Highland	13.8	Com Equipment						958U is SEL-587
Highland	115/13.8	T1	SCADA	υP/EM				
Highland	115/13.8	T2	SCADA	uP		D-20		······································
Honk Falls	<del>                                     </del>					D-20	WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA	<u> </u>	EW			J J Marie S Ma
Honk Falls	13.8	81	SCADA	EM				79 Relay is EM
Honk Falls	69	GM Line	SCADA	EM/uP		<del></del>		701(010) 10 011
Honk Falls	69	HG Line	SCADA	· uP				79 Relay is EM
Honk Falls	69	HK Line	SCADA	uP/EM	ļ		*****	15 Kelay is Em
Honk Falls	69	MK Line	SCADA	υP			*****	79 Relay is EM
Honk Falls	69	WH Line	SCADA	uP/EM			*****	73 Relay IS CIM
Honk Falls	69	overall diff B1+T1	SCADA	EM			*****	<del> </del>
Honk Falls	69/13.8	71		fuse	<u> </u>	25.4000		
Hunter		<u> </u>				NI-4000	VR-3S	3 phase; vac; hyd
Hunter	34.5	Z-666						3 phase; vac, nyu 3 phase; oil; hyd
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase, on, myd
Hunter	13.8	Cap Bank			EM			<del></del>
Hurtey Ave. 345kV		1				2400	<del>                                     </del>	
Hurley Ave. 345kV	345	30151 BKR.	****	EM	10000			79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		uP		*****	*****	<del></del>
Hurley Ave. 345kV	345	30152 A2 BF	*****	EM				
Hurley Ave. 345kV	345	301 Line A1	SCADA	uP		<u> </u>	<del></del>	
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				79 Relay is EM; In process replacement with
Hurley Ave. 345kV	345	30353 BKR.	*****	EM*				SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		up				
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement wit SEL-451
Hurley Ave. 345kV		30354 A1 BF		EM				1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Hurley Ave. 345kV		30354 A2 BF	***	EM*				In process replacement with GE C70
Hurley Ave. 345kV		303 Line A1	SCADA	uP				1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Hurley Ave. 345kV		303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV		Bus A1		EM				
Hurley Ave. 345kV		Bus A2		EM EM				
Hurley Ave. 345kV		A2451 BKR.		EM				
Hurley Ave. 345kV		A2451 A1 BF		EM EM		*****		
Hurley Ave. 345k\		A2451 A2 BF	*****	EM				<del></del>
Hurley Ave. 345k\		T1 A1 Out of Step	*****	EM				<del></del>
Hurley Ave. 345k		T1 A2 Out of Step						<del></del>
Hurley Ave. 345k		T1 A1		EM				<del></del>
Hurley Ave. 345k		T1 A2	40000	EM	*****			
Hurley Ave. 345k	V 115	T1 LS	SCADA	uP				Volts
		B1						

			Electric Subst	ation nhais	ine lacens ha	36331116116		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
			· · · · · · · · · · · · · · · · · · ·			2400		BE1-851H as BU and 79
Hurley Ave.		2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as 8U and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps	*****	EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		EM/UP			
Hurley Ave.	115	Cap Bank		EM				
Hurley Ave.		HP Line	SCADA	EM				Quadramho part of the package; metering
Hurley Ave.	115		SCADA	Gen1				Amp value only
Hurley Ave.	69	l line		EM				
Hurley Ave.	115	OR Line	SCADA					Quadramho part of the package; metering
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
	105	HP-1643 BKR.		EM				
Hurley Ave.	115	OR-1640 BKR.		EM				
Hurley Ave. Hurley Ave.	69	W-142 BKR.		uР				
Hurley Ave.	13.8	W-1575 BKR.			EM			
Hurley Ave.	115	W-389 BKR.		EM				
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM				Volts
Hurley Ave.	13.8	B1	SCADA		EM			Volts
Hurley Ave.	115/69	Т3	SCADA	EM				
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				
Inwood Ave.	T				· ·	3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	*****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Cktl.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
inwood Ave.	13.8	Com Equipment			**-**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115	IR-201-X BKR		υP				
Inwood Ave.	115	X Line	SCADA	· uP				
Inwood Ave.	13.8	B1 B2	SCADA		uP			<del></del>
			SCADA		υP			
Inwood Ave.	115/13.8	T1 T2	SCADA	υP	**			
Jansen Ave.	115/13.8	12	SCADA	υP		M-4000		
Jansen Ave.	13.8	1001 Ckt.	MV-90		υP	W-4000		
Jansen Ave.	13.8	1002 Ckt.	MV-90		EM			· · · · · · · · · · · · · · · · · · ·
Jansen Ave.	13.8	1002 Ckt.	MV-90		uP	<del>-  </del>		
Jansen Ave.	13.8	1003 Ckt.	MV-90		EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM		*	
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM			
Jansen Ave.	13.8	Com Equipment						Com
Jansen Ave.	13.8	T - Grounding	MV-90		uP			
Kerhonkson		· · · · · · · · · · · · · · · · · · ·				8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Da
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Da
Kerhonkson	69	MK-929 MOS		EM				
Kerhonkson	69	MK-930 MOS	*****	EM				
		T1		fuse				Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS	fuse				
Kerhonkson	69/13.8	T2	60404					Volts & Amps
Kerhonkson	69	HK	SCADA					Volts & Amps
	69	WK	SCADA					1 0013 01 701193

			Electric Substa	igion aba. a	7			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2100		Not sure if charts were removed
Knapps Corners		8021 Ckt.	Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners	13.8	8022 Ckt.	Charts - Amps		EM/uP			Not sure if charts were removed
Knapps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		uP/EM			BE1-851H as BU and 79
Knapps Corners	13.8 13.8	8024 Ckt.	Charts - kW		EM/uP			
Knapps Corners	13.8	8025 Ckt.	Charts - kW		EM			Com
Knapps Corners	13.8	Com Equipment						
Cnapps Corners  Knapps Corners	115	K8 Line	None	EM				SEL-279
Knapps Corners	115	KB-1558-MC BKR.		υΡ- 200 <b>υ</b> Ρ				
Knapps Corners	115	SK Line	SCADA	EM	† — — — ·			Amps
Knapps Corners	13.8	KN Line	SCADA*	EM				Amps
Knapps Corners	13.8	KR Line	SCADA*	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				
Knapps Corners	69	KM Line	SCADA	EM				
Knapps Corners	69	TR Line	SCADA	uΡ				
Knapps Corners	69	G Line			EM			
Knapps Corners	13.8	W-1215 BKR.		υP				
Knapps Corners	69	W-1409 BKR.			EM			
Knapps Corners	13.8	W-1462 BKR.			EM			
Knapps Corners	13.8	B1	50,454		EM			Combine Bus Volts to one point
Knapps Corners	13.8	82	SCADA		EM			_
Knapps Corners	13.8	B3		EM		<del></del>		Volts
Knapps Corners	69	69k Bus	SCADA	EM				Combine land value
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		uP				
Knapps Corners	115/69	T2	SCADA	Ur		M-4000		
Lawrenceville		2205 014	Grid Sense	EM/uP		1	CXE-400A	3 phase; oil; hyd
Lawrenceville	34.5	2385 Ckt. B1	SCADA*	2,711,01				Volts
Lawrenceville Lawrenceville	34.5 69/34.5	T1	MV90/Grid Sense/SCADA	EM				Amps.
Lincoln Park	05/34.5	<del></del>	IN TOUR OF ISEROOMS			2300	<del>                                     </del>	
Lincoln Park	13.8	Com Equipment			,			Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps		EM			
Lincoln Park	13.8	2012 Ckt.	Charts - kW		E₩		*****	
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt	Charts - kW		EM			
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM		****	
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1			EM			<u> </u>
Lincoln Park.	13.8	Cap Bank 2			EM		****	
Lincoln Park	115	HP Line	None	EM.				Relay Replacement Progam in proc
Lincoln Park	115	HP-1318 BKR.		EM	*****			
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	υP				<u> </u>
Lincoln Park	13.8	W -1321 BKR.	2-12-		EM			<u> </u>
Lincoln Park	13.8	W-45 BKR.			EM			
Lincoln Park	13.8	W-534 BKR.			EM			<u> </u>
Lincoln Park	13.8	W-554 BKR.			EW			<del>-  </del>
Lincoln Park	13.8	WT-206 BKR.			EM			
Lincoln Park	13.8	WT-207 BKR.	44-1-		EM			
Lincoln Park	13.8	WT-525 BKR.	*****		EM_			
Lincoln Park	13.8	WT-528 BKR.			EM			
Lincoln Park	13.8	B1	SCADA		EM			Combine Bus Volts to one poi
	13.8	B2	JCADA		EM			Volts
Lincoln Park		B3	SCADA		EM			¥ UKS
Lincoln Park	13.8		None		EM			V-N-
		84		EM				Volts
Lincoln Park		1 115k bus	SCADA					Cambino Inadivatua
Lincoln Park Lincoln Park	115	1130,003		) E80				
Lincoln Park	110100		4000	EM				Combine load value
	115/13	3.8 T1	SCADA	EM			****	COMBINE IQAO VAIDE

			Electric Subs	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
·	Class (KV)					2400		BE1-851H as BU and 79
Manchester				· · · · · ·	EM/uP			8E1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-B51H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP		*****	BE1-851H as BU and 79
Manchester	13.8	6094 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90	·	EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	υP				Amps
Manchester	13.8	MS Line	SCADA*		EM.			
Manchester	13.8	W-1458 BKR.			EM		*****	
Manchester	13.8	W-650 BKR.			EW .			
Manchester	13.8	B1	SCADA		EM		,	Combine Bus Volts to one point
Manchester	13.8	82	30,70,		EM	ļ		<u> </u>
Manchester	115/13.8	T1	SCADA	EM				Combine load value
Manchester	115/13.8	т2	SCADA	€M				<u></u> _
Mariboro	1.0.1010	·				8890		, : ????
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			BE1-IP\$100 as 80 and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
	13.8	5004 Ckt.	SCADA		UP	·		021110100000000000
Mariboro			30404					~
Marlboro	13.8	Com Equipment			UP	+	· · · · · · · · · · · · · · · · · · ·	Com
Mariboro	13.8	81 T1	SCADA		<del></del>			Volts
Mariboro	115/13.8	T2	SCADA	uP/EM*	****	<del></del>		95P is SEL-587
Martboro Maryland Ave.	115/13.8	141	SCADA	υP				J
	<del> </del>				<del></del>	M-4000		
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			
Maryland Ave.	4	622 Ckt.	Charts - kW		ÉM	****		
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Çkt.	Charts - kW		EM			
Maryland Ave.	13.8	MS Line		****	EM			
Maryland Ave.	13.8	PH-284 BKR.			EM			
Maryland Ave.	13.8	PH-286 BKR.		4	EM			
Maryland Ave.	4	W-1032 BKR.			EM	****		
Maryland Ave.	4	W-1033 BKR.			EM			
Maryland Ave.	4	W-1034 BKR.			EM			
Maryland Ave.	13.8	B1	SCADA		EM			Volts
Maryland Ave.	13.8	82	SCADA		EM			Volts
Maryland Ave.	4	81		*****	EM			<del></del>
Maryland Ave.	4	B2	SCADA		EM	**-*-		Volts
Maryland Ave.	13.8/4	T1			EM			
Maryland Ave.	13.8/4	T2			EM	***		
Maybrook		······				M-4000		
Maybrook	13.8	5051 Ckt.	MV-90		EM		RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	. MV-90		υP			Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90		EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Maybrook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None					* * * * * * * * * * * * * * * * * * * *
Maybrook	69/13.8	T2	None					·
	05/13.6	1 12	140116			NONE		
McKinley St.		5/5 0/:	141/ 00		EM	140145		
McKinley St.	4	845 Ckt.	MV-90		- L			

			Electric Subs	ration obdis	8 14CCM2 142			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
<u> </u>	0.033 (7)					BM		
Aerritt Park			SCADA		uР			
Rerritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA		uP			· · · · · · · · · · · · · · · · · · ·
Werritt Park	13.8	8063 Ckt.	SCADA	ļ	uP		+	
Aerritt Park	13.8	8064 Ckt.			υP		+	
Aerritt Park	13.8	8065 Ckt.	SCADA		uΡ			
Aerritt Park	13.8	8066 Ckt.	SCADA SCADA		uP		_ —	
Werritt Park	13.8	8067 Ckt.	SCADA		uP			Com
Vierritt Park	13.8	8068 Ckt.						
Merritt Park	13.8	Com Equipment WF Line	SCADA	υP				
Merritt Park	115		SCADA	uP				SEL-279
Merritt Park	115	WP Line	35707	uP-200				3,2,2,13
Merritt Park	115	WF-439-WP BKR.	SCADA		uP			
Merritt Park	13.8	B1	SCADA		uP			
Merritt Park	13.8	B2	SCADA	uP				
Merritt Park	115/13.8	T1		UP				
Merritt Park	115/13.8	T2	SCADA	J. UF	<del></del>	BM		
Milan				т	uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA		- Ur		*****	Com
Milan	13.8	Com Equipment			<u> </u>			
Milan	115	B-4561 Ckt Sw		uP				
Milan	115	MR Line	SCADA	uP				
Milan	115	MR-501 BKR.	SCADA	υP		<del></del>		-
Milan	115	RT-7 BKR.		υP				
Milan	115	R-10 BKR.		υP				
Milan	115	T-7 Line	SCADA	υP				
Milan	115	10 Line	SCADA		υP			
Milan	115	B1	SCADA	υP				
Milan	13.8	B1	SCADA		uP			
Milan	115/13.8	T1	SCADA	υP				<u></u>
Millerton						L&N		
Millerton	13.8	7081 Ckt.	SCADA		EM		****	<u> </u>
Millerton	69	GE-823 MOS		EM				
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; T1 = 7081 load
Millerton	69	Line to SMI	SCADA					Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV						BM		
Modena 115kV	13.8	B1	SCADA		υP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			υP			
Modena 115kV	13.8	5011 Ckt.	ŞÇADA		υP			<u> </u>
Modena 115kV	13.8	5012 Ckt.	SCADA		υP			<u> </u>
Modena 115kV	13.8	5013 Ckt.	SCADA		uР			
Modena 115kV	13.8	Com Equipment				*****		Com
Modena 115kV	115	EM Line	SCADA	UP				<u> </u>
Modena 115kV	115	EM-201-PX BKR.		υP				
Modena 115kV	115	PX Line	SCADA	υP				
Modena 115kV	115/13.8		SCADA	UΡ				Only has one 13.8 bus; T3 = Bus k
Modena 69kV	110/133	:_ <del>-</del>				8890		
Modena 69kV	69	B1	SCADA	EM				volts
Modena 69kV	69	MG Line	SCADA	υP				
Modena 69kV	69	W-941 BKR.		EM			*****	
Modena 69kV	69	MG-380 BKR.	1	EM				
			SCADA	EM/uP				
Modena 69kV	115/69		None	Fuse/uP				GE F35 is installed
Modena 69kV	69/13.	8 T2	NOTE			NONE		
16 4			Charts - kW		EM		V4L	Single phase; Vac; Hyd Single phase; Vac; Hyd
Montgomery	4	571 Ckt.					V4L	

			Electric Subs	tation Upgra	de Needs As	sessment	_ <del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						NI-4000		volts
Montgomery St.	120	B1	SCADA		EM			Volts
Montgomery St.	13.8	B2	SCADA	****	EM			volts
Montgomery St.	13.8	B3	SCADA		EM			
Montgomery St.	13.8	B Line	None	*****	EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8		Charts - kW/kVAr		EM	****		
Montgomery St.	13.8	4002 Ckt.	Charts - kW/kVAr		EM*			
Montgomery St.	13.8	4003 Ckt	Charts - kW demand		EM			
Montgomery St.	4	402-3 Ckt.	Charts - kW demand		EM	·		
Montgomery St.  Montgomery St.	4	404 Ckt.	Charts - kW demand	·	EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand		EM		•	
Montgomery St.	4	410A/B Ckt.	Charts - kW demand		EM			\tag{2}
Montgomery St.	4	81	SCADA		EM			Volts
Montgomery St.	4	B2	SCADA		EM		*****	volts
Montgomery St.	13.8	F Line	None		EW			
Montgomery St.	13.8	NB Line	None		EM		*****	
Montgomery St.	13.8	NM Line	None		EM			
Montgomery St.	13.8	R Line	None		EM			
		W-507 BKR.	140776		EM			
Montgomery St.	13.8			<del></del>	EM			
Montgomery St.	13.8	W-508 BKR.	<del></del>	1	EM	<del> </del>	<del></del>	
Montgomery St.	13.8	W-509 BKR.		*****				· · · · · · · · · · · · · · · · · · ·
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	T2			EM			
Myers Corners	<del>                                     </del>				- <del></del>	44-550	<del></del>	
Myers Corners	13.8	8041 Ckt.	Charts - kW		uP uP		*****	
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM	****		
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM	****		
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM	*****		
Myers Corners	13.8	8046 Ckt.	SCADA		υΡ			
Myers Corners	69	KM Line	None	EM	*****			
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.		EM				
Myers Corners	13.8	W-63 BKR.	4444		EM			
Myers Corners	13.8	W-66 BKR.			EM			
Myers Corners	13.8	Feeder M1-75		****	EM			
Myers Corners	13.8	Feeder M2-76			EM			
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1	SCADA		EM			Cambias Bus Valleda and Co
Myers Corners	13.8	B2	JUADA		EM			Combine Bus Volts to one point
Myers Corners	69/13.8	T1	SCADA	EM				Combine lead solve
Myers Corners	69/13.8	T2	1	EM				Combine load value
Neversink						2200		
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	****	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM			to by updated	Amps
Neversink	69	WH Line	\$CADA*	EM				Amps
Neversink	4	W-1128 BKR.			EM EM		*****	
Neversink	69	69k Bus	SCADA	uP/EM				Volts
New Baltimore						2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	SCADA*		EM			kW
New Baltimore	13.8	1083 Ckt.	SCADA*		EM			kW
		Cap Bank	337.5.	EM/uP				
New Baltimore	69	<del></del>	<u> </u>					Com
New Baltimore		Com Equipment						
New Battimore	69	CN Line	None	uP			_+	
		NW Line	None	υP				17.86
New Baltimore		B1	SCADA	*****	EM			Volts
New Baltimore			<del></del>		-			95P is SEL-587
New Baltimor	e 69/13.8	71	SCADA	EW/,,o				

					Needs As	socemon?		
			Electric Subs	station Ups	Neeus As	<u> </u>		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)			<u> </u>		NONE		N- DATA
New Windsor					EM	•		No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	463 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	464 Ckt.	Grid Sense		υP			
New Windsor	13.8	UN & UW ATC	None		υP			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kVAr		UP			
New Windsor	13.8/4	Т2			1	D-20		
North Catskill					uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA		uP-200/ uP	•		95P is SEL-251
North Catskill	13.8	2003A Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA		uP-200/ uP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA	*****	uP-200/ uP			95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA		+			Com
North Catskill	13.8	Com Equipment				<del> </del>		
North Catskill	115	2 Line	SCADA	EM				
North Catskill	115	R-2 BKR	-10-5	EM				
North Catskill	115	RT-7 BKR.		EM			•	
	115	T-7 Line	SCADA*	EM				Amps
North Catskill	69	Cap Bank		EM				
North Catskill		<del></del>	SCADA	uР				
North Catskill	69	CL Line H Line	SCADA	uP				
North Catskill	69		SCADA	ыP	*****			
North Catskill	69	NC Line W-1107 BKR.	SCADA	EM/uP*	<del> </del>			` check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*			†	check on TD-5
North Catskill	69		,	uP- 200		<del></del>		SEL-2BFR
North Catskill	115	W-791 BKR.			EM			IJS
North Catskill	69	W-269 & W-1107 BKR			<del></del>	<del></del>		
North Catskill	115	B1	SCADA	EM	****	ļ		Volts
North Catskill	69	B1	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP	*****			Volts
North Catskill	13.8	B1	SCADA		EM/uP			Volts; 95BU is DFP-100
North Catskill	13.8	B2	SCADA	4	EM/uP			Volts; 95BU is DFP-100
North Catskill	115/69	T4	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	77	SCADA	EM/uP				95BU is DFP-100

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			Electric Subs	tation Upgrad	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del></del>							
North Chelsea	42.0	8051 Ckt.	SCADA		٩υ			
North Chelsea	13.8	8052 Ckt.	SCADA		υP			· · · · · · · · · · · · · · · · · · ·
North Chelsea	13.8	8053 Ckt.	SCADA		υP			<u> </u>
North Chelsea	13.8	8054 Ckt.	SCADA		uP )			
North Chelsea	13.8		SCADA	.,	UP			
North Chelsea	13.8	8055 Ckt.	SCADA		υP			
North Chelsea	13.8	8056 Ckt. 8057 Ckt.	SCADA		uP			
North Cheisea	13.8	8058 Ckt.	SCADA		uP			Com
North Chelses	13.8	Com Equipment						
North Chelsea North Chelsea	115	AC Line	SCADA	υP				
North Chelses	115	AC-1086 BKR.		UP	****			
North Chelsea	115	DC Line	SCADA	υP				
North Chelsea	115	DC-1414 BKR.	*****	υP				
North Chelsea	115	FO-1482 BKR.		uP.				
North Chelsea	115	FO Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.		υP			+	
	115	SC Line	SCADA	UP			*****	
North Chelsea			SCADA	uP	****		<u> </u>	
North Chelsea	115	SC-1566 BKR.		υP			<del></del>	
North Chelsea	69	TV Line	SCADA			<del></del>	<del></del>	
North Chelsea	115	B-2651 BKR.	****	UP		*****		
North Chelsea	115	B-2652 BKR	*****	υP	**			
North Chelsea	115	B-2653 BKR.	4222	uP			ļ	
North Chelsea	115	W-1572 BKR.		υP				
North Chelsea	115	B1	SCADA	uΡ		*****		•
North Chelses	13.8	<b>B</b> 1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP			
North Chelsea	115/69	T1	SCADA	υP				
North Cheisea	115/13.8	T2	SCADA	υP				<del></del>
North Chelsea	115/13.8	T3	SCADA	υP				Volts
Ohioville					*	2100	<del></del>	1003
Ohioville	13.8	5021 Ckt.	Charts - Amps	T	EM/uP	****	1	BE1-851H as BU and 79
Ohioville	13.8	5022 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA		uP			0C1-03117 45 00 810 79
Ohioville	13.8	Com Equipment	- GCADA			-		Com
Ohioville	115	Cap Bank		EM	<del></del>			Com
Ohioville	69	O Line	None	UP				
Ohioville	69	OB Line	None	υP			*****	<del></del>
Ohioville	115	OR Line		EM				
Ohioville		<del></del>	None	EM	<del></del>		*****	
	115	OR-1075 BKR.						
Ohioville	115	PX Line	SCADA	EM/UP			*****	
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				
Ohiovitte	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM				Volts
Ohioville	69	69k Bus	SCADA	EM				Volts
Ohioville	13.8	81	None	****	EM			
Ohioville	13.8	B2	None		EM			
Ohioville	115/13.8	T1	50.50	EM				Combine load value
			- SCADA	F-10				Combine load value
Ohioville	115/13.	8 T2	1	EM				95BU is SEL-251

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<u> </u>	Electric Substation Upgrade Needs Assessment										
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment			
	Class (kV)					2300		Grid owns Line			
Pleasant Valley				uP uP				Grid Ownio Control			
Pleasant Valley	115	8 Line	SCADA***	UP				Grid owns Line			
Pleasant Valley	115	10 Line	SCADA**	UP				Grid owns Line			
Pleasant Valley	115	12 Line	SCADA**	up up				95BU is Optimho; in replacement plan			
Pleasant Valley	115	13 Line		EM/Gen-1				32BO IS Obditito, 111 (32-32-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			
Pleasant Valley	115	C Line	SCADA	EM							
Pleasant Valley	115	M Line	SCADA SCADA	UP				Com			
Pleasant Valley	115	X Line	SCAOA					SEL-279			
Pleasant Valley	115	Com Equipment		u₱- 200		*****		SEL-279			
Pleasant Valley	115	R-12 BKR.		UP- 200				SEL-279			
Pleasant Valley	115	R-13 BKR.		uP- 200							
Pleasant Valley	115	R-8 BKR.		EM							
Pleasant Valley	115	RC-6 BKR.		EM	****						
Pleasant Valley	115	RM BKR.		l uP							
Pleasant Valley	115	RX-4 BKR.		EM				Con Ed owns the Bkr			
Pleasant Valley	115	R-61 BKR.	\$CADA**	EM .			*****	Con Ed owns the Bkr			
Pleasant Valley	115	R-62 BKR.	SCADA**	EM	·						
Pleasant Valley	115	R-643 BKR.				<del>                                     </del>					
Pleasant Valley	115	R-81 BKR.		EM			1-7	Volts			
Pleasant Valley	115	81	SCADA	EM		<del></del>		Volts			
Pleasant Valley	115	82	SCADA	EM		-+		kW			
Pleasant Valley	69	E Line	SCADA*	υP		<u> </u>		kW			
Pleasant Valley	69	GLine	SCADA*	υP				kW			
Pleasant Valley	69	Q Line	SCADA*	UP				Volts			
Pleasant Valley	69	81	SCADA	uP				voits			
Pleasant Valley	13.8	W-387	-4	<u> </u>	EM			O . Ed bank and pretention			
Pleasant Valley	345/115	S1	SCADA		****			Con Ed owns bank and protection			
Pleasant Valley	115/69	T10	SCADA	EM			<del></del>	<u> </u>			
Pulvers Corners						D-20					
Pulvers Corners	13.8	7091 Ckt.	SCADA	*	EM		V4L	single phase; vac; hyd			
Pulvers Corners	13.8	7092 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd			
Pulvers Corners	34.5	7395 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd			
Pulvers Corners	13.8	Com Equipment						Com			
	69	Cap Bank	*****	EM							
Pulvers Corners		B1	SCADA					Voits			
Pulvers Corners		B1	SCADA				****	Volts			
Pulvers Corners		B1	SCADA					Volts			
Pulvers Corners		71	SCADA	Fuse							
Pulvers Corners Pulvers Corners		T2	None	EM/uP				95P is SR-745			

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			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (KV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del> </del>					2100		
Reynolds Hill	<del></del>	5554 653	Charts - kW		EM			
Reynolds Hill	13.8	6001 Ckt.	SCADA	4774-	UP .			
Reynolds Hill	13.8	6004 Ckt.	Charls - kW		EM			
Reynolds Hill	13.8	6005 Ckt.	SCADA		υP			
Reynolds Hill	13.8	6008 Ckt.	30,40,4					Com
Reynolds Hill		Com Equipment		uP				
Reynolds Hill	115	DR-1418 BKR. DR Line	SCADA	uP				
Reynolds Hill	115	HR-1285 BKR.	30804	EM			*****	
Reynolds Hill Reynolds Hill	115	HR Line	SCADA	υP			*****	
Reynolds Hill	115	IR Line	SCADA	υP				
Reynolds Hill	13.8	B Cable	SCADA		uP			
Reynolds Hill	13.8	W Cable	SCADA		uP			
Reynolds Hill	13.8	PD Cable	SCADA		uP			
Reynolds Hill	13.8	PH Line	SCADA		υP	++		
Reynolds Hill	13.8	PK Line	SCADA	****	uP			
Reynolds Hill	13.8	PO Line	SCADA		υP			
Reynolds Hill	13.8	PQ Line	SCADA		υP			
Reynolds Hill	13.8	PS Line	SCADA		υP			
Reynolds Hill	13.8	PU Cable	SCADA		₩P			
Reynolds Hill	115	T-31 BKR.		EM		*****	· · · · · · · · · · · · · · · · · · ·	
Reynolds Hill	115	B1	SCADA	EM			<del></del>	
Reynolds Hill	115	B2	SCADA	EM EM		†		Volts
Reynolds Hill	13.8	81	SCADA				****	Volts
Reynolds Hill	13.8	B2	SCADA		EM/uP			958U is SEL-501
Reynolds Hill	13.8	83	SCADA		υP			Volts
Reynolds Hill	115	W-1543 BKR.	SCADA	EM	uP		****	Volts
Reynolds Hill	115/13.8	T3	SCADA	EM/uP				
Reynolds Hill	115/13.8	T4	SCADA	EM/uP			2227	95P is SEL-351A
Rhinebeck		L. 1	3CADA	I EM/UP				95P is SEL-351A
Rhinebeck	13.8	7051 Ckt.	Charts - kW/SCADA	<del></del>	T	2300		
Rhinebeck	13.8	7052 Ckt.			uP- 200/ טP			95P is SEL-251; 95BU is SEL-501
Rhinebeck	13.8	7053 Ckt.	Charts - Amps		EM		*****	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Rhinebeck	13.8		Charts - Amps		EM			
		7054 Ckt.	Charts - Amps		EM			
Rhinebeck	13.8	7055 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Rhinebeck Rhinebeck	13.8	7056 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
		Com Equipment						
Rhinebeck	69	Cap Bank	*****	EM				
Rhinebeck	115	ER Line	SCADA*	uP				Amps
Rhinebeck	1,15	LR-830-MR BKR.		UP				, 01, 50
Rhinebeck	115	MR Line	None	ijΡ				
Rhinebeck	69	Q-1471 BKR.		EM				
Rhinebeck	13.8	W-1017 BKR.	2-0-0		EM			
Rhinebeck	13.8	W-1238 BKR.			EM			
Rhinebeck	69	W-258 BKR.		EM				
Rhinebeck	13.8	W-367 BKR.			EM EM			
Rhinebeck	69	Q Line	SCADA*					Volts
Rhinebeck	13.8	B1	SCADA		EM			T
Rhinebeck	13.8	B2	none	*****	EM			Combine Bus Volts to one point
Rhinebeck	69	69kV Bus	SCADA				*****	Volts
Rhinebeck	69/13.8	T1	SCADA*	EM	****			Amps & Volts
Rhinebeck	69/13.8	₹2	SCADA*	EM				Amps & Volts
Rhinebeck	115/13.8	T4	SCADA	EM				
Rhinebeck	115/69	T3	SCADA	EM				

			Electric Substa	ition Ups	ر Nee <u>ds Ass</u>	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
5 . 1. 7 24EW								
Rock Tavern 345kV	345	311 Line A1	SCADA	UP				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV	345	3456 BKR.		EM				
Rock Tavern 345kV	345	3456 BF A1		uP				
Rock Tavern 345kV	345	3456 BF A2		up l				
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345kV	345	Cap Bank 1 A2	SCADA*	EM				Combined in the
Rock Tavern 345kV	345	Cap Bank 2 A1	<u> </u>	EM EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP EM				
Rock Tavern 345kV	345	34 Line A1	SCADA	UP UP				
Rock Tavern 345kV	345	34 Line A2						
Rock Tavern 345kV	345	37751 BKR.		EM				
Rock Tavern 345kV	345	37751 BF A1		uP EM				
Rock Tavern 345kV	345	37751 BF A2						
Rock Tavern 345kV	345	37752 BKR.		EM			*****	
Rock Tavern 345kV	345	37752 BF A1		υP				
Rock Tavern 345kV	345	37752 BF A2		EM				
Rock Tavern 345kV	345	377 Line A1	SCADA	uP		<del></del>		
Rock Tavern 345kV	345	377 Line A2	30,70	EM				
Rock Tavern 345kV	345	4255 BKR.		EM			*****	
Rock Tavern 345kV	345	4255 BF A1		EM				
Rock Tavern 345kV	345	4255 BF A2		EM				
Rock Tavern 345kV	345	42 Line A1		\$\$				<del></del>
Rock Tavern 345kV	345	42 Line A2		EM				<del> </del>
Rock Tavern 345kV	345	C3351 BKR.		EM				<u> </u>
Rock Tavern 345kV	345	C3351 BF A1		EM				
Rock Tavern 345kV	345	C3351 BF A2		EM EM		****		ļ
Rock Tavern 345kV	345	C3352 BKR.		EM	****			
Rock Tavern 345kV	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM			****	
Rock Tavern 345kV	345	C3353 BKR.		uP- 200	**			<u> </u>
Rock Tavern 345kV	345	C3353 BF A1		υP				
Rock Tavern 345kV	345	C3353 BF A2		uР		1	*****	
Rock Tavern 345kV	345	31153 BKR.		EM				1
Rock Tavern 345kV	345	31153 BF A1		υP				
Rock Tavern 345kV	345	31153 BF A2		υP				
Rock Tavern 345kV	345	31154 BKR.		EW.				
Rock Tavern 345kV	345	31154 BF A1		EM				
Rock Tavern 345kV	345	31154 BF A2	****	EM	·			
Rock Tavern 345kV	345	Com Equipment						Com
Rock Tavern 345kV	345	B1 A1		EM				<u> </u>
Rock Tavern 345kV	345	B1 A2	wasen.	EM				
Rock Tavern 345kV	345	B2 A1		EM		*****		<u> </u>
Rock Tavern 345kV	345	B2 A2		EM				
Rock Tavern 345kV	345/115	T1 A1	SCADA	EM				
Rock Tavern 345kV	345/115	T1 A2	GCADA	ΕM				
Rock Tavern 345kV	345/115	T3 A1	SCADA	uP				
Rock Tavern 345kV	345/115	T3 A2	] SCADA	υP				

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			Electric Sub	station Up.	Needs As	sessment	· · · · · · · · · · · · · · · · · · ·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KT)				1	2400	L	
Sand Dock	1		Charts - kW		. EM			
Sand Dock	13.8	6011 Ckt.	Cusite - K44		EM	*****		
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM			
Sand Dock	13.8	GB Line	SCAUA	EM				
Sand Dock	115	KC-1447-SC BKR. KC Line	None	EM				
Sand Dock	115	SC Line	None	UP				
Sand Dock	115	SH-886 BKR			EM		ļ	
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-902 BKR.			EM			
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8	TW-910 BKR.			EM		*****	
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM			
Sand Dock	13.8	W-1453 BKR.	*****		EM			
Sand Dock	13.8	W-1467 BKR.				<del></del>		
Sand Dock	115	B1	SCADA				<del></del>	Combine Bus Volts to one point
Sand Dock	115	B4						
Sand Dock	13.8	81			EM		<u> </u>	Combine Bus Volts to one point
Sand Dock	13.8	B2	SCADA		€M			Combine Bus voits to one point
Sand Dock	13.8	B3			EM	*****		
Sand Dock	13.8	B4	SCADA		EM			
Sand Dock	13.8	T1	SCADA	EM			*****	Combine load value
Sand Dock	13.8	T3	SCADA	EM				Combine load value
Sand Dock	13.8	T4	SCADA	EM				
Saucortice						Orion	1	

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			Electric Subs	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Shenandoah	<del> </del>	,				2400		
	115	East Bus	22.224	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	SCADA	EM				<u></u>
Shenandoah	13.8	B1	00101		EM		,	Combine Bus Volts to one point
Shenandoah	13.8	B2	SCADA		EM			
Shenandoah	13.8	B3			EM		*****	Combine Bus Volts to one point
Shenandoah	13.8	B4	SCADA		EM			
Shenandoah Shenandoah	13.8	B5	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	96	SCADA		EM			
Shenandoah	13.8	B7	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	€8			EM			
Shenandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2	****		EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM EM			
Shenandoah	13.8	Cap Bank 5				<del></del>		
Shenandoah	13.8	Cap Bank 6			EM		P	
Shenandoah	13.8	B-4451 BKR. (CB1)	<u>.</u>		uР			
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			
Shenandoah	13.8	8072 Ckt.	Charts - kW		EM	*****		
Shenandoah	115	EF Line	None	uP/Gen-1				95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM		*****		
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah	115	FS-892-EF BKR.		EM				· · · · · · · · · · · · · · · · · · ·
Shenandoah	115	FS-959 BKR.		EM				
Shenandoah	13.8	Feeder S1	None		EM	<del></del>		
Shenandoah	13.8	Feeder S2	None	*****	ÉM		<del>                                     </del>	<del></del>
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None		EM	<del></del>		
Shenandoah	13.8	Feeder S5	None		EM	/		
Shenandoah	13.8	Feeder \$6	None		EM			
Shenandoah	13.8	Feeder S7	None		EM			
Shenandoah	13.8	Feeder S8	None		EM	*****		
Shenandoah	13.8	Feeder S9	None		EM			<del></del>
Shenandoah	13.8	Feeder S10	None		EM			
Shenandoah	13.8	Feeder S11	None	****	EM	<del></del>	*****	
Shenandoah	13,8	Feeder S12	None	<del></del>	EM	*****		
Shenandoah	13.8	Feeder \$13	None		EM			<u></u>
Shenandoah	13.8	Feeder S14	None		EM	<del></del>		
Shenandoah	13.8	Feeder S15	None	· <del>                                      </del>				
Shenandoah	115/13.8	T1		EM	EM			
Shenandoah	115/13.8	T2	SCADA	EM		<del></del>		Combine load value
Shenandoah	115/13.8	T3		EM		<del></del>		
Shenandoah	115/13.8	T4	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5		EW	<del></del>			
Shenandoah	115/13.8	T6	SCADA	EM		*****	/	Combine load value
Shenandoah	115/13.8	T7	SCADA	EM				
Shenandoah	13.8	W-1266 BKR.	SCADA		EM			+
Shenandoah	13.8	W-1279 BKR.		<del></del>				<u> </u>
Shenandoah	13.8	W-1450 BKR.	****		EM			
Shenandoah	13.8	W-1593 BKR.			EM			****
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	<del>~</del>	· · <del> </del>				<del></del>
		_	y***-		EM		*****	
Shenandoah	13.8	W-802 BKR.			EM			
Shenandoah	13.8	W-803 BKR.			EM			
Shenandoah	13.8	W-805 BKR.			EM			<del></del>
U	13.8	W-807 BKR.			EM			

			Electric Sub	station Upgra	ne ideenz wa	26221116111	ı	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						44-550		
Rock Tavern 115kV				EM				
Rock Tavern 115kV	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV	115	115-0.48kV SST					****	Com
Rock Tavern 115kV	115	Com Equipment		E.M				Amps
Rock Tavern 115kV	115	D Line	SCADA*	EM	****			
Rock Tavern 115kV	115	D-448 BKR.	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
Rock Tavern 115kV	L			EM	*****			
Rock Tavern 115kV	115	J-788 BKR.	SCADA*	EM			****	Amps
Rock Tavern 115kV	115	RD Line RD-809 BKR.	SCADA	EM				
Rock Tavern 115kV Rock Tavern 115kV	115	RD-809 BKK.	SCADA*	EM				Amps
Rock Tavern 115kV	115	RJ-818 BKR.		EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM	*****			
Rock Tavern 115kV	115	SL-684 BKR.	30707	EM				
Rock Tavern 115kV	115	W-467 BKR.		υP			****	
						1	<del>-</del>	<del> </del>
Rock Tavern 115kV	115	W-681 BKR.	*****	EM			****-	
Rock Tavern 115kV	115	W-814 BKR.	****	EM/uP				\$EL-351
Rock Tavern 115kV	115	WM Line	none	uP			·	ļ
Rock Tavern 115kV	115/69	T2	SCADA	EM	<u> </u>			
Roseton Switchyard	ļ <del></del>					2100		
Roseton Switchyard	345	30356 (B6) BKR	2011	EM				
Roseton Switchyard	345	30356 (B6) BF A1		EM				
Roseton Switchyard	345	30356 (B6) BF A2		EM				
Roseton Switchyard	345	303 Line A1	SCADA	uP			****	<del></del>
Roseton Switchyard	345	303 Line A2	30,404	EM				<del></del>
Roseton Switchyard	345	30551 (B7) BKR		EM			·	<del></del>
Roseton Switchyard		30551 (B7) BF A1		€M			****	
Roseton Switchyard		30551 (B7) BF A2		E₩	*****	†	<del></del>	<u> </u>
Roseton Switchyard		30553 (B3) BKR		EM	****			
Roseton Switchyard		30553 (B3) BF A1		υP		<del></del>		
Roseton Switchyard		30553 (B3) BF A2		EM	1			<u> </u>
Roseton Switchyard		305 Line A1	65.54	υP				<u> </u>
Roseton Switchyard	345	305 Line A2	SCADA	EM/uP				
Roseton Switchyard	345	31151 (B1) BKR		EM				SEL-501 for DBC
Roseton Switchyard	345	31152 (B1) BF A1		EM			*****	
Roseton Switchyard	345	31152 (B1) BF A2		EM			<del></del>	
Roseton Switchyard		31152 (B4) BKR		EM			*****	
Roseton Switchyard		31152 (B4) BF A1		EM				
Roseton Switchyard		31152 (B4) BF A2	****	EM				
Roseton Switchyard		311 Line A1		UP				
Roseton Switchyard		311 Line A2	SCADA					
Roseton Switchyard		B1	<u> </u>	EM			*****	
Roseton Switchyard		B2		υP				
Roseton Switchyard				uP				
Roseton Switchyard		U1 U1	SCADA	EM				
- COSELOG SWITCHYSE	d 345	U2	SCADA	EM EM				

0.100014

			Electric Subs	tation Ups	Needs As	Sessineiii	<del></del>	
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)			_,	<u> </u>	2300		Radio to INW
Smith Street			Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			······································
Smith Street	4	632 Ckt.	Charts - KW		EM			
Smith Street	4	634 Ckt	Charts - kW		EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street Smith Street	13.8	PQ Line	None		EM			
Smith Street	13.8	PS Line	None		EM			
Smith Street	13.8	W Line	None SCADA		EM			Volts
Smith Street	13.8	B1 B2	SCADA		EM			Volts
Smith Street	13.8	B1	SCADA		υP			Volts
Smith Street Smith Street	4	B2	SCADA		uP			
Smith Street	13.8/4		None	***	EM			
Smith Street	13.8/4	Т2	None		EM	8890		·
Smithfield				<del></del>		<del></del>		
Smithfield	13.8	7095 Ckt.	SCADA		uP			Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	EM				Amps
Smithfield	69	GE Line	SCADA* SCADA*	EM			<b></b>	Amps
Smithfield	69	S Line SA Line	SCADA*	EM				Volts & Amps
Smithfield	69	B2	SCADA					Volts
Smithfield Smithfield	69	B3	SCADA					Volts
Smithfield	69/13.8	T1	None*					Only one feeder; T1 = 7095 load
South Cairo	1 03/13/0 [					8890	1	
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps		EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			*****	Com
South Cairo	69	CF Line	None	EM/uP				79 done with NLR
South Cairo	69	CL Line	None	uP				
South Cairo	13.8	B1+G1	Charts - kW/SCADA		EM			SCADA Volts 95P is SEL-587
South Cairo	69/13.8	T1	Charts - Amps	EM/uP		None		33F IS 3EL-367
South Wall St. South Wall St.	4	111 Ckt.	Grid Sense		EM	HOITE	Kyle L	Single Phase; Oil; Hyd
South Wall St.	4	112 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd; missing GS of
South Wall St.	13.8/4	71	Charts - kW/kVAr		EM		*****	
Spackenkill						Orion		
Spackenkill	13.8	6041 Ckt.	SCADA		uР		****	
Spackenkill	13.8	6042 Ckt.	SCADA		υP			
Spackenkill	13.8	6043 Ckt.	SCADA		uР		*****	
Spackenkill	13.8	6044 Ckt.	\$CADA	*****	uP uP			
Spackenkill	13.8	6045 Ckt.	SCADA	*****	υP			
Spackenkill	13.8	6046 Ckt.	SCADA		υP			
Spackenkill	13.8	6047 Ckt. 6048 Ckt.	SCADA SCADA		UP UP			
Spackenkill Spackenkill	13.8	Com Equipment	JOADA			*****		~ 1
Spackenkill	13.8	KR Line	\$CADA		uP			
Spackenkili	13.8	KS Line	SCADA	****	υP			
Spackenkill	13.8	MC Line	SCADA		uP			
Spackenkill	13.8	MC-200-SK BKR.	ŞCADA		υP			
Spackenkill	13.8	B1	SCADA		uP			
Spackenkill	13.8	B2			uP			
	115/13.8		SCADA	u₽			<del></del>	
Spackenkill	115/13.8			υP				
Spackenkill	113/13.0					BM		
Staatsburg		70.44 Cb+	SCADA		uР			
Staatsburg	13.8	7041 Ckt.			uР			
Staatsburg	13.8	7042 Ckt.	SCADA		uP			
Staatsburg	13.8	7043 Ckt.	SCADA					
		Com Equipment		*****				
Staatshirn	1 13.8	Out Edablina						
Staatsburg Staatsburg	13.8	B1	SCADA		qu			

Standfordville	1:1014						
Standfordville   Standfordville   13.8	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Standfordville					M-4000		
Standfordville		MV-90		EM		V4L	Single phase; vac; hyd
Standfordville	7071 Ckt.	MV-90		EM			
Standfordville   69/13.8     Sturgeon Pool   5     Sturgeon Pool   4   Co     Sturgeon Pool   69     Sugarloaf   115     Sugarloaf   1	7072 Ckt.	SCADA					Volts
Sturgeon Pool   Sturgeon Pool   4   Sturgeon Pool   4   Sturgeon Pool   4   Sturgeon Pool   4   Sturgeon Pool   69   50   50   50   50   50   50   50   5	B1	MV-90	Fuse				
Sturgeon Pool   4	T1	WV-30			2100		
Sturgeon Pool   4   Co				EM		Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   50   Sturgeon Pool   50   Sugarloaf   115   50   50   50   50   50   50   5	341 Ckt	Grid Sense					Com
Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   69   Sturgeon Pool   Sugarloaf   115	Com Equipment N Line	SCADA	uΡ	****			
Sturgeon Pool   69	O Line	SCADA	υP				
Sturgeon Pool   Sturgeon Pool	P Line	SCADA	υP				
Sturgeon Pool	69k Bus	SCADA	EM				Volts
Sugarloaf   Sugarloaf   Sugarloaf   Sugarloaf   Sugarloaf   Sugarloaf   115   Suga	T5	None	Fuse				
Sugarloaf   115					44-500		
Sugarloaf	SD Line	SCAPA	EM	<b></b>	+25.53	*****	Combine load value
Sugarloaf	SJ Line	SCADA	EM				000000000000000000000000000000000000000
Sugarloaf	SL Line	None	EM				
Sugarloaf	B1	SCADA	EM				Volts
Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinkertown Tinrenda Tioronda Tio	& R Transformer	SCADA	EM				<del></del>
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda 13.8 Ti	<u> </u>	00,00,0	<u> </u>	· · · · · · · · · · · · · · · · · · ·	2300	<del>                                     </del>	Radio to PVL
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda 13.8 Todd Hill 13.8	7022 Ckt.	SCADA	****	υP			
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 13.8 Tinronda 13.8 Tioronda 13.8 Todd Hill 13.8	7023 Ckt.	SCADA	*****	UP UP	7		
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda 13.8 Todd Hill 13.8	7023 Ckt.	SCADA		uP		<del> </del>	
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 13.8 Tioronda 13.8 Todd Hill 13.8	7025 Ckt.	SCADA		UP UP			
Tinkertown 13.8 Tinkertown 13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 115/13.8 Tod Hill 13.8 Todd Hill 13.8	81	SCADA		UP UP			
Tinkertown 13.8 C Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115 Tioronda 115 Tioronda 13.8 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Todd Hill 13.8	B2	SCADA		UP	<del>+</del>		Volts
Tinkertown 69/13.8 Tinkertown 69/13.8 Tinkertown 69/13.8 Tioronda Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115 Tioronda 115 Tioronda 13.8 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Todd Hill 13.8	Com Equipment		*****	+			Volts
Tinkertown 69/13.8 Tioronda Tioronda Tioronda Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Todd Hill 13.8	T1	SCADA	<del></del>				Com
Tioronda Tio	T2	SCADA	Fuse		*****		
Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 11.5 Tioronda 11.5 Tioronda 13.8 Tioronda 115/13.8 Todd Hill 13.8	12	SCADA	Fuse	*****			
Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Todd Hill 13.8	8085 Ckt.	Charles Amora	T		M-4000		
Tioronda 13.8 Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 13.8 Tioronda 115/13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115	8085 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda 115 Tioronda 13.8 Tioronda 13.8 Tioronda 115/13.8 Tioronda 115/13.8 Todd Hill 13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda 13.8 Tioronda 115/13.8 Todd Hill Todd Hill 13.8	W-566 Ckt. Sw	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda 115/13.8 Todd Hill Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115 Todd Hill 115			EM				Agastat
Todd Hill Todd Hill Todd Hill Todd Hill 13.8	B1	SCADA		EM			Volts
Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115 Todd Hill 115	T1	Charts - kW/kVAr	EM				
Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 115  Todd Hill 115  Todd Hill 115			.,	·	2200		
Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115 Todd Hill 115 Todd Hill 115	6051 Ckt.	SCADA		υP			
Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 115  Todd Hill 115  Todd Hill 115  Todd Hill 115  Todd Hill 115	6052 Ckt.	SCADA		υÞ	be 144	****	
Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 13.8  Todd Hill 115  Todd Hill 115  Todd Hill 115  Todd Hill 115  Todd Hill 115	6053 Ckt.	SCADA		uP			1
Todd Hill 13.8 Todd Hill 13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115 Todd Hill 115 Todd Hill 115 Todd Hill 115	6054 Ckt.	SCADA	<u> </u>	υP			
Todd Hill 13.8 Todd Hill 13.8 Todd Hill 115 Todd Hill 115 Todd Hill 115 Todd Hill 115 Todd Hill 115	6055 Ckt.	SCADA		EM			
Todd Hill 13.8  Todd Hill 115  Todd Hill 115  Todd Hill 115  Todd Hill 115	6056 Ckt.	SCADA		EM			
Todd Hill 115 Todd Hill 115 Todd Hill 115	6057 Ckt.	SCADA		EM	*****		
Todd Hill 115 Todd Hill 115	Com Equipment	****		*****			Com
Todd Hill 115	A Line	None	EM/Gen-1				95BU is Optimho; in replacement pla
	A-520-C BKR.		EM				
Todd Hill 1 13.8	C Line	None	EM/Gen-1				95BU is Optimho; in replacement pla
	W - 524 BKR.			E₩			
Todd Hill 115	B1	SCADA					Volts
Todd Hill 13.8	81	SCADA		EM/uP			95BU is SEL-351A; Volts
Todd Hill 13.8	B2	SCADA		UP			Volts
Todd Hill 115/13.8 Todd Hill 115/13.8	T1	SCADA	EM/uP				95P is SEL-587

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``			Electric Subs	tation Ut	Needs Assessment					
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment		
	<u> </u>					2200		Volts		
Union Ave	115	B1	SCADA	υP						
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF		
Union Ave	115	RJ-52 BKR.		EM/uP						
Union Ave	115	UB Line	SCADA	up	, <u></u>					
Union Ave	115	UB-51 BKR.		uP				Amps		
Union Ave	115	UN Line	SCADA*	EM				Amps		
Union Ave	115	UW Line	SCADA*	EM.						
Union Ave	115	W-1095 BKR.		EM	UP					
Union Ave	13.8	81			UP UP					
Union Ave	13.8	B2			υP			Volts		
Union Ave	13.8	B3	SCADA		υp			Volts		
Union Ave	13.8	84	SCADA	<del></del>	uP	****		··············		
Union Ave	13.8	B3-B2			uP					
Union Ave	13.8	B4-B1	101.00		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4042 Ckt.	MV-90					BE1-851H as BU and 79		
Union Ave	13.8	4043 Ckt.	MV-90		EM/uP	L	<del></del>	BE1-851H as BU and 79		
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP					
Union Ave	13.8	4045 Ckt.	MV-90	279112	EM/uP		*****	BE1-851H as BU and 79		
Union Ave	13.8	4046 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4047 Ckt.	SCADA		υP					
Union Ave	13.8	4051 Ckt.	SCADA	*****	uP		*****			
Union Ave	13.8	4052 Ckt.	SCADA		υP					
Union Ave	13.8	4053 Ckt.	SCADA		uP					
Union Ave	13.8	4054 Ckt.	SCADA		υP					
Union Ave	13.8	4055 Ckt	SCADA	****	uP			<u> </u>		
Union Ave	13.8	Com Equipment		****		*****		Com		
Union Ave	115/13.8	T1	SCADA	EM/uP				95BU is SEL-387E		
Union Ave	115/13.8	T2	SCADA	EM/uP				95BU is SEL-387E		
Union Ave	115/13.8	T3	SCADA	uP						
Van Wagner						NONE				
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd		
Van Wagner	4	732 Ckt.	Charts - kW/GS		_l	*****	Kyle L	Single phase; oil; hyd		
Vinegar Hill		·				M-4000				
Vinegar Hill	34.5	2389 Ckt.	MV-90	-A	uΡ	*	RVE	3 phase; oil; hyd		
West Balmville						2300				
West Balmville	115	B2	SCADA	EW				Volts		
West Balmville	13.8	B1	SCADA		υP			Combine Bus Volts to one point		
West Balmville	13.8	B2			υP			Domestic State of the point		
West Balmville	115	B Line	SCADA	υP		<u> </u>	*****			
West Balmville	13.8	4011 Ckt.	MV-90	****	EM			<u> </u>		
West Balmville	13.8	4012 Ckt.	SCADA		uP			MV-90 still?		
West Balmville	13,8	4013 Ckt.	SCADA		υP			MV-90 still?		
West Balmville	13.8	4014 Ckt.	SCADA		uP			MV-90 still?		
West Balmville	13.8	4015 Ckt.	MV-90		EW					
West Balmville	13.8	Com Equipment	*****				*****	Com		
West Balmville	115	DB Line	SCADA	uP						
West Balmville	115	DB-875 BKR.		UP.			*****			
West Balmville	115	DW Line	SCADA	υP						
West Balmville	115	DW-662 BKR.		uP						
West Balmville	115	F Line	SCADA	UP_			*****	<u> </u>		
LATE OF THE STATE	115	R Line	SCADA	υP						
West Balmville	445	W-478 BKR.	*****	υP				1		
West Balmville	115		<del></del>							
West Balmville West Balmville	115	W-855 BKR.		υP						
West Balmville			SCADA	uР						
West Balmville West Balmville	115	W-855 BKR.	<del></del>					Combine load value		

			Electric Sut	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Westerlo	<del> </del>					DWI		
	13.8	1091 Ckt.	SCADA		<u>uP</u>			
Westerlo	13.8	1092 Ckt.	SCADA		UP			
Westerlo	13.8	1093 Ckt.	SCADA		uP			
Westerlo	13.8	B1	SCADA		υP			
Westerlo	13.0	Com Equipment				*****		Only has one 13.8 bus; T1 = Bus load
Westerlo		T1	SCADA	uP		V		Othy has one 15.5 cbs, 11
Westerlo	69/13.8	Cap Bank		υP				
Westerlo	69	FW Line	SCADA	UP				
Westerlo Westerlo	69	NW Line	SCADA	υP				
Westerio	69	FW-1500-NW BKR		uP				
Wiccopee	+					L&N		
Wiccopee	115	FS Line	None	EM				
Wiccopee	115	WP Line	None	uP				
Wiccopee	115	FS - 1652- WP BKR.		EM				
Wiccopee	13.8	F1-292 BKR.			EM			
Wiccopee	13.8	F2-280 BKR			E₩			
Wiccopee	13.8	W-368 BKR.			EM			
Wiccopee	13.8	W-378 BKR.			EM			
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.	1000		EM			
Wiccopee	13.8	Future (Unit #3)	****	4	EM			<del></del>
	13.8				EM	<del>†</del>	<del></del>	
Wiccopee	13.8	Future (Unit #9)					·	
Wiccopee		, B1			EM			·
Wiccopee	13.8				EM	*****		
Wiccopee	13.8	Com Equipment			*****		*****	Com
Wiccopee	115/13.8	T1	SCADA	EM				
Wiccopee	115/13.8	T2	SCADA	EM				
Woodstock						M-4000		
Woodstock	13.8	3011 Ckt.	MV-90		EM			1
Woodstock	13.8	3012 Ckt.	MV-90		EM			<del></del>
Woodstock	13.8	3013 Ckt.	MV-90		EM			<del></del>
Woodstock	13.8	3014 Ckt.	MV-90		EM			<del>                                     </del>
Woodstock	13.8	B1	SCADA		EM		\	Volts
Woodstock	13.8	B2	SCADA		EM	<del> </del>		Volts
Woodstock	69/13.8	T2+SR Line	*****	EM				V Ons
Woodstock	69/13.8	T2 + B2	****	EM				
Woodstock	69/13.8	T1	MV-90	*****	<del>                                     </del>	<del></del>		<del> </del>
Woodstock	69/13.8	T2	MV-90			1		<del></del>

# Attachment 6

	Cost	
Dashville	\$190,000	
East Walden	\$610,000	
Tioronda	\$200,000	
Coxsackie	\$130,000	
South Cairo	\$160,000	
East Park	\$200,000	
Pleasant Valley	\$360,000	
Todd Hill	\$160,000	
Sand Dock	\$510,000	
Fishkill Plains	\$480,000	
South Wall St.	\$84,000	
Manchester	\$340,000	
Forgebrook	\$730,000	
Rock Tavern	\$1,060,000	
	East Walden Tioronda Coxsackie South Cairo East Park Pleasant Valley Todd Hill Sand Dock Fishkill Plains South Wall St. Manchester Forgebrook	





Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Pulvers Corners Transformer #1 Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

As part of the original Transformer Condition-Based Replacement Program that has been broken out into individual projects, several existing power transformers have been identified for potential replacement due to condition and are on the above 55 years of age listing. These transformers include: Pulvers Corners Transformer #1 (69/13.8 kV), Forgebrook Transformers #1 & #2 (115/13.8 kV),

Ancram
Transformer #1 (1 Phase 34.5/13.8 kV), Woodstock Transformers #1 & #2 (69/13.8 kV).

#### Describe specific scope exclusions, assumptions and constraints:

Replace Transformer #1 at Pulvers Corners Substation and any associated relaying as appropriate.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP 2022-013 Pulvers Ancram Area Review.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

## ESG (Environmental, Social and Governance) and Sustainability:

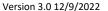
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project? Risk of power transformer failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	cost estimates sh adjustments for ii			
	\$2,969,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	
	\$2,909,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	275,000	0	0	20,000	255,000	0	0	0
	Labor (Monthly Payroll)	138,000	0	0	10,000	128,000	0	0	0
Α	Stock Materials	138,000	0	0	10,000	128,000	0	0	0
D	Non-Stock Material (A/P taxable)	552,000	0	0	41,000	511,000	0	0	0
	Contractors (A/P tax exempt)	193,000	0	0	14,000	179,000	0	0	0
T	Overheads	1,379,000	0	0	102,000	1,277,000	0	0	0
I	AFUDC*	81,000	0	0	6,000	75,000	0	0	0
	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,756,000	0	0	203,000	2,553,000	0	0	0
R	Labor (Weekly Payroll)	32,000	0	0	0	32,000	0	0	0
E	Labor (Monthly Payroll)	64,000	0	0	0	64,000	0	0	0
1:	Contractors (A/P tax exempt)	11,000	0	0	0	11,000	0	0	0
R	Overheads	106,000	0	0	0	106,000	0	0	0
E	Journal Vouchers (JVs)	0							
IM	Daivage ONEDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	1017(21(20)	213,000	0	0	0	213,000	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

Minimum (\$): 2,078,300

**Maximum (\$):** 3,859,700

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

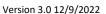
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Myers Corners Switchgear Upgrade & 69 kV Breaker TV-399-KM Replace Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

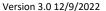
#### Describe the project objective and scope of work:

The existing external switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. The switchgear roof has been repaired over the years but water ingress has damaged much of the inner ceiling.

#### Describe specific scope exclusions, assumptions and constraints:

It is recommended that the external switchgear be replaced with a new switchgear. The switchgear will contain two bus's with a normally closed tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion. This project will include the replacement of the 69 kV TV-399-KM circuit breaker as part of the original 69 kV Breaker Replacement program that has also been broken out into individual projects.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A: Infrastructure Replacements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

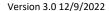
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

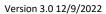
Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu			All future year cost estimates should include applicable adjustments for inflation.					
	\$3,559,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	324,000	0	0	10,000	314,000	0	0	0	
	Labor (Monthly Payroll)	162,000	0	0	5,000	157,000	0	0	0	
A	Stock Materials	162,000	0	0	5,000	157,000	0	0	0	
D	Non-Stock Material (A/P taxable)	647,000	0	0	20,000	627,000	0	0	0	
ī	Contractors (A/P tax exempt)	228,000	0	0	8,000	220,000	0	0	0	
Т	Overheads	1,620,000	0	0	51,000	1,569,000	0	0	0	
	AFUDC*	96,000	0	0	3,000	93,000	0	0	0	
N N	Journal Vouchers (JVs)	0								
s	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	3,239,000	0	0	102,000	3,137,000	0	0	0	
R	Labor (Weekly Payroll)	48,000	0	0	0	48,000	0	0	0	
E	Labor (Monthly Payroll)	96,000	0	0	0	96,000	0	0	0	
l:	Contractors (A/P tax exempt)	16,000	0	0	0	16,000	0	0	0	
R	Overheads	160,000	0	0	0	160,000	0	0	0	
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	320,000	0	0	0	320,000	0	0	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								

2021-2023 2024

1,808

Prior years funding; not actuals.

1,808

0



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

2,491,300

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 4,626,700

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Smithfield Relay Modernization Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

#### Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All electromechanical relays at Smithfield Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

## ESG (Environmental, Social and Governance) and Sustainability:

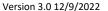
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

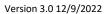
Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		All future year cost estimates should include applicable adjustments for inflation.					
	\$2,244,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	208,000	0	0	0	10,000	198,000	0	0	
	Labor (Monthly Payroll)	104,000	0	0	0	5,000	99,000	0	0	
A	Stock Materials	104,000	0	0	0	5,000	99,000	0	0	
D	Non-Stock Material (A/P taxable)	416,000	0	0	0	21,000	395,000	0	0	
ī	Contractors (A/P tax exempt)	145,000	0	0	0	7,000	138,000	0	0	
Т	Overheads	1,040,000	0	0	0	52,000	988,000	0	0	
I	AFUDC*	64,000	0	0	0	5,000	59,000	0	0	
N N	Journal Vouchers (JVs)	0								
s	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	2,081,000	0	0	0	105,000	1,976,000	0	0	
R	Labor (Weekly Payroll)	24,000	0	0	0	0	24,000	0	0	
E	Labor (Monthly Payroll)	49,000	0	0	0	0	49,000	0	0	
H	Contractors (A/P tax exempt)	8,000	0	0	0	0	8,000	0	0	
R	Overheads	82,000	0	0	0	0	82,000	0	0	
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	163,000	0	0	0	0	163,000	0	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								

724 2021-2023 2024

Prior years funding; not actuals.

724

0



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

Minimum (\$): 1,570,800 Maximum (\$):

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

2.917.200

Historical Proforma Pricing

**Cost Estimate Range:** 

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nue 54' 5011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

# L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact; 2) Customer Services (Line Forces) to aid in fault locating and thereby limiting patrol time and area; 3) penalions Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (e.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability. Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### **Discussion:**

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

# C. Additional Considerations:

- Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- ♦ They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

<sup>&</sup>lt;sup>1</sup> Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

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Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### Discussion:

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

## Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti: (Manl	Cost	
	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

		Time				Cost			
Retrofit Options	Retrofit Options			ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9 9
Grid Sense Meter	W / VAr	Hours are for the EOE and the Linemen.				\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	Per installation, each meter takes the lineman and the			\$2,272			\$2,700	
POT Line		2.0	15 minu n data c			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tin	ne and	15			\$430	\$430
Site Registration	per D/C	20	utes of el to ea			-waived-			
TOTAL GS Installation	ā	been assumed to be 1 hour.						\$9,000	
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

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Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### Re: Remote Terminal Unit Review

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

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Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

#### Discussion:

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### **Conclusions:**

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

	Cost				
Retrofit Options	Parts	TOTAL			
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1		
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1		
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2		
R-Mag Breaker	\$25,000	\$90,000			

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

<del> </del>			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment  Retired as part of P/MK Upgrade
			Charts - kW		EM	NONE		
Accord	4	361 Ckl.	Grid Sense		EM	NONE		Only has a 13.8 Voltage Regulator
Ancram	13.8	7085 Ckt.	Grid Serise			NONE		
Balmville					EM			
Balmville	4	411 Ckt.	MV-90 MV-90		EM			
Balmville	4	412 CKt.	WIV-90			C-300		
Barnegat				EM				Metering source?
Barnegat	115	KB Line	Amps	EM				
Barnegat	115	KC Line	None	EM				
Barnegat	115	KB-749-KC BKR		EM				IBM Feeds
Barnegat	115/13.8	<u>T1</u>	SCADA	EM				
Barnegat	115/13.8	T2	SCADA SCADA		EM			IBM Feeds
Barnegat	13.8	S1	SCADA		EM			101111 2203
Barnegat	13.8	S2	SCADA		EM		*****	IOM Foods
Barnegat	13.8	\$1-706 BKR	SCADA		EM			IBM Feeds
Barnegat	13.8	S2-734 BKR	SCADA			D-20		
Beacon					EM			1
Beacon	13.8	8006 Ckt.	SCADA					
Beacon	13.8	8015 Ckt.	SCADA		EM			Previously 8087A?
Beacon	4	801 Ckt.	SCADA		EM			
Beacon	4	802 Ckt.	SCADA		EM			
Beacon	4	803 Ckt.	SCADA		EM	***		
Beacon	4	W-414 BKR	SCADA		EM			
Beacon	4	W-463 BKR	SCADA		EM			<del>                                     </del>
Beacon	4	Bus 1	SCADA				+	
Beacon	4	Bus 2	SCADA					<del> </del>
Beacon	13.8/4	T1		<del></del>	<del></del>			
Beacon	13.8/4	T2	SCADA		EM	*****		MDB has an entry with T1+T2 calculated
			SCADA	<u> </u>	EM		1	The state and that The Concolletes
Beacon	13.8	BF Cable	SCADA	****	EM			
Beacon	13.8	NM Cable	SCADA		EM		*****	
Beacon	13.8	CM Cable	SCADA		EM			†···
Beacon	13.8	Bus 1	SCADA		EM			·
Beacon	13.8	Bus 2	SCADA		EM			<del> </del>
Bethlehem Rd.						2400	· <del></del>	-t
Bethlehem Rd.	13.8	4091 Ckt.	MV-90	*****	EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4092 Gkt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4093 Ckt.	MV-96		EM/uP			
Bethlehem Rd.	13.8	4094 Ckt.	MV-90		EM/uP	-		BE1-851H as BU and 79
Bethlehem Rd.	13.8	4095 Ckt.	MV-90			<del></del>		BE1-851H as BU and 79
Bethlehem Rd.	13.8	4096 Ckt.		*	EM			<u> </u>
Bethlehem Rd.			MV-90		EM			
Bethlehem Rd.	13.8	4097 Ckt.	MV-90		EM		***** '	
	13.8	4098 Ckt.	MV-90		EM	4	*****	
Bethlehem Rd.	13.8	Bus 1	EMS		EM			
Bethlehem Rd.	13.8	Bus 2	EMS		EM			
Bethlehem Rd.	115	RD Line	None	EM				
Bethlehem Rd.	115	UB Line	None	EM				
Bethlehem Rd.	115	RD-604-UB BKR		EM				
Bethlehem Rd.	115/13.8	T1	EMS	EM				
Bethlehem Rd.	115/13.8		EMS	EM				Metering combined '
Bethlehem Rd.	13.8	W-613 BKR			EM			
Bethlehem Rd.	13.8	W-619 BKR			EM			
Bethlehem Rd.	13.8	W-804 BKR			EM	-		<del>-  </del>
Bordman Rd.	13.0				Z IVI	NONE		<del></del>
Bordman Rd.	13.8	60814 Ckt			===			<del>-                                    </del>
<del></del>	13.8	6081A Ckt.			EM			
Bordman Rd.	13.8	6082A Ckt.			EM EM			<del></del>
Bordman Rd.	13.8	Z-203 Ckt.			EM			
Bordman Rd.		Z-204 Ckt.			EM			
					E₩			
Bordman Rd.					EM			
Bordman Rd	. 13.8	Z-206 Ckt.						
Bordman Rd				****	EM		<del></del>	
Bordman Rd	~				EM			
	յ, լ 1.5.0	2-200 CAL.			F14	7		
Bordman Ro		Z-209 Ckt.			EM	1	]	1

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Coxsackie

	T		Electric Substa					0
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del> </del>					2100		
Boulevard	69	OB Line	SCADA	<u>uP</u>				
Boulevard	69	N Line	SCADA	uP				
Boulevard	69	1 Line	SCADA	<u> </u>	uP			Line Amps & W/VAr
Boulevard	13.8	KO Line	SCADA					
Boulevard	13.8	KK Line	SCADA		uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1012	SCADA		EM/uP uP			
Boulevard Boulevard	13.8	Ckt. 1013	SCADA		EM/uP	*****		
Boulevard	13.8	Ckt. 1014	SCADA	***	EM			
Boulevard	13.8	Bus 1	SCADA		EM			
Boulevard	13.8	Bus 2	SCADA				<del> </del>	
Boulevard	69	Bus 1	SCADA	EM				
	69	Bus 2	SCADA	EM				
Boulevard		Overall		EM				
Boulevard	69		SCADA	EM				Metering combined
Boulevard	69/13.8	<u>T1</u>	SCADA	EM				1
Boulevard	69/13.8	Т3		EM			****	
Boulevard	69/13.8	T2	SCADA	EWI	L	M-4000		
Clinton Ave.					EM	10,4000		
Clinton Ave.	4	395 Ckt.	MV-90		EM			
Clinton Ave.	4	396 Ckt.	MV-90					<del></del>
Clinton Ave.	4	397 Ckt.	MV-90		EM	<u> </u>	<del></del>	<del></del>
Clinton Ave.	4	Bus	SCADA		***			
Clinton Ave.	13.8/4	T1	MV-90		Fuse			
Cold Spring						NONE		1 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two (
Cold Spring	4	872 Ckt.	Charts - kW		EM			eireuits.
Coldenham						D-20		· · · · · · · · · · · · · · · · · · ·
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP - 200/ uP			95P is SEL-251
Coldenham	13.8	4024 Ckt.	SCADA		uP- 200/ ∪P		<b></b>	95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
		4026 Ckt.	SCADA		uP-200/ uP	·		95P is SEL-251
Coldenham	13.8	4027 Ckt.	SCADA		uP- 200/ uP	·		95P is SEL-251
Coldenham	13.8		SCADA		EM			33.33.33.33
Coldenham	13.8	Bus 1			EM		*****	
Coldenham	13.8	Bus 2	SCADA		EM			<del></del>
Coldenham	13.8	B1-B2 Tie		<del></del>				95P is DLP; 95BU is REL-301; part of
Coldenham	115	J Line	SCADA	Gen 1		<u> </u>	****	_
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
Coldenham	115/13.8	T1	SCADA	EM				
Coldenham	115/13.8	T2	SCADA	EM			*****	
Coldenham	115	J-19-CW BKR		SS				<u>_   _  </u>
Converse St.						NONE		
Converse St.	4	121 Ckt.	MV-90		EM			
Converse St.	4	122 Ckt.	MV-90		EM			
Converse St.	4	123 Ckt.	MV-90		EM			
Conway Place						NONE		
Conway Place	4	881 Ckt.	MV-90	*****	EM			
		882 Ckt.	MV-90		EM			
Conway Place	<del></del>					8890		
Conway Place Coxsackie	1	1071 Ckt.	Charts - Amps		EM			
Coxsackie	13.9	1011000			EM			Bitronics for the SCADA portion
Coxsackie Coxsackie	13.8		SCADA/Charte-kW					BE1-851H as BU and 79
Coxsackie Coxsackie Coxsackie	13.8	1072 Ckt.	SCADA/ Charts - kW		EM/uP			BE1-631H as 80 and 70
Coxsackie Coxsackie	13.8	1072 Ckt. 1074 Ckt.	Charts - Amps					Bitronics for the SCADA portion
Coxsackie Coxsackie Coxsackie Coxsackie	13.8	1072 Ckt. 1074 Ckt. 1076 Ckt.	Charts - Amps SCADA/ Charts - kW		EM			Bitronics for the SCADA portion
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	1072 Ckt. 1074 Ckt. 1076 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8	1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1)	Charts - Amps SCADA/ Charts - kW SCADA		EM			Bitronics for the SCADA portion
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8	1072 Ckt. 1074 Ckt. 1076 Ckt.	Charts - Amps SCADA/ Charts - kW		EM			Bitronics for the SCADA portion  Metering data available through relay, t
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8	1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1) Bus 2	Charts - Amps SCADA/ Charts - kW SCADA ???		EM			Bitronics for the SCADA portion  Metering data available through relay, b
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8	1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1)	Charts - Amps SCADA/ Charts - kW SCADA		EM EM			Bitronics for the SCADA portion
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8 69	1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1) Bus 2 CN Line	Charts - Amps SCADA/ Charts - kW SCADA ??? None		EM EM			Metering data available through relay, to
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8 69	1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1) Bus 2	Charts - Amps SCADA/ Charts - kW SCADA ???	   uP	EM EM			Bitronics for the SCADA portion  Metering data available through relay, t

· <u></u>			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU	Recloser	Comment
	Class (XV)					2100		Siemens meters 485 to RTU Al
Danskammer				EM				Siemens meters 485 to RTU Al
Danskammer	115	AC Line	SCADA - Amps	EM			~	Siemens meters 485 to RTU AI
Danskammer	115	DC Line	SCADA - Amps	UP				Siemens meters 485 to RTU Al
Danskammer	115	DB Line	SCADA - Amps	UP				Siemens meters 485 to RTU Al
Danskammer	115	DR Line	SCADA - Amps	uP				Siemens meters 485 to RTU AI
Danskammer	115	DW Line	SCADA - Amps					Siemens meters 485 to RTU Al
Danskammer	115	RS Line	SCADA - Amps	EM SS				
Danskammer	115	W - 323 8KR		EM				
Danskammer	115	North Bus	SCADA - Volts	EM				
Danskammer	115	Middle Bus	SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA - Volts	uP uP				<u> </u>
Danskammer	115	DB-1171 BKR		UP				
Danskammer	115	DR-1421 BKR		UP			*****	
Danskammer	115	DW-1061 BKR	50464	EM			****	T
Danskammer	115	T5&T6	SCADA	EW.	.1	2300		<u> </u>
Dashville	J	<del>,                                      </del>			EM	2300	V4L	Single Phase; Vac; Hydr
Dashville	4	345 Ckt.	MV-90				<del></del>	Single i nase, Fac, ciyor
Dashville	6.6	Bus			EM			- 1T
Dashville		T1		EM				Fused Transformer w/ CR 67 relay
Dashville		G1-G2	SCADA					
East Fishkill 345kV								
East Fishkill 345kV	345	C9751 Breaker A1 BR		EM .		<b>*</b>		
East Fishkill 345kV	345	C9751 Breaker A2 BR		EM			*****	
East Fishkill 345kV	115	Transformer #1 Alt. 1		EM				<u> </u>
East Fishkill 345kV		Transformer #1 Alt. Z	SCADA	EM	1		*****	
East Fishkill	1	111011310111111111111111111111111111111		<u> </u>	-1	8890		<u> </u>
East Fishkill	115	EF Line	SCADA	υP*				95P is MDAR; 95BU is Optimho - Replacing with 311C & D60.
East Fishkill	115	HF Line	SCADA	up*	<del></del>	<del>\</del>		
East Fishkill	115	EF-672 BKR	SCADA	EM				95BU is Optimho - Replacing with D60.
East Fishkill	115	EF-679 BKR		EM		+		<del></del>
East Fishkill	115	W-640 BKR		ÉM		<del> </del>		
East Fishkill	115	T1	SCADA	See EFB				
	+ ,,,,	<u> </u>	SCADA	7 256 51.0		0:4-		_,1,,
East Kingston	<del></del>	2 . 4				Orion	<del></del>	
East Kingston	13.8	Bus 1	SCADA		UP	<del></del>	*****	<u> </u>
East Kingston	13.8	Bus 2	SCADA	N	uP			
East Kingston	13.8	1021 Ckt.	SCADA		uP		/	
East Kingston	13.8	1022 Ckt.	SCADA		uP			
East Kingston	13.8	1023 Ckt.	SCADA		uP			
East Kingston	13.8	1024 Ckt.	SCADA		uP			
East Kingston	13.8	1025 Ckt.	SCADA		uP			
East Kingston	13.8	1026 Ckt.	SCADA		υP			
East Kingston	13.8	1027 Ckt.	SCADA		uP			
East Kingston	13.8	1028 Ckt.	SCADA		uP			
East Kingston	115	ER Line	SCADA	U₽				
East Kingston	115	LR Line	SCADA	υP				
East Kingston	115	LR-201-ER Breaker		uP				
East Kingston		Com Equipment		,				Com
East Kingston	115/13.1		SCADA	υP			*****	
East Kingston	115/13.		SCADA	UP				
East Park	1.5713.	· · · · · · · · · · · · · · · · · · ·	,			8890		
East Park	13.8	6073 Ckt.	SCADA		EM/uP			BE1-851H as BU and 79
East Park	13.8	6074 Ckt.	SCADA		EM/uP	*****		BE1-851H as BU and 79
			SCADA		EM			
East Park	13.8	6075 Ckt.		EM				
East Park	69	Q Line	None	UP/EM				95P is SEL-587
East Park	69/13	8 71	SCADA	UP/EW				

			Electric Subs	Latton opt	veeds As:			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (K*)					2400	ES	3 phase; oil; electronic; GS not working
ast Walden					EM/uP		ES	3 phase; oil; electronic; G\$ not working
ast Walden	13.8	5041 Ckt.	Grid Sense		EM/uP			GS not working
East Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
East Walden	13.8	5043 Ckt.	Grid Sense					
East Walden	13.8	Com Equipment	SCADA		uP			95P is DLP; part of replacement program
ast Walden	13.8	81	SCADA					already.
	115	CW Line	None	Gen1/uP				
East Walden		CW -712		EM				
East Walden	115	D Line	None	EM				
East Walden	115	D-722 BKR		EM				
East Walden	115 115	DW Line	ŞCADA	UP				
East Walden	115	DW-1071 BKR		UP		I		
East Walden	115	EM Line	SCADA	UP				
East Walden	115	EM-642 BKR		UP				Amps & Volts
East Walden East Walden	69	WM Line	SCADA	uP				
East Walden	115	W-644		EM				Combine Bus Volts to one point
East Walden	115	B1	SCADA	EM				Combine Bus voits to one point
East Walden	115	82	SCAUA	EM	<del></del>	<del></del>	37	95P is SEL-587
East Walden	69/13.8	T1	SCADA	uP/EM				95BU is SEL-587
East Walden	69/13.8	T3	SCADA	EM/uP		D 30		<u></u>
Fishkill Plains	1 00.10.0	<u> </u>				D-20		BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM/uP			BE1-00111 43 5 5 4 14 15
Fishkill Plains	13.8	8092 Ckt.	WV-90		EM			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	SCADA		uP- 200	<del> </del>		SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.	SCADA	****	uP- 200			SEL-251 Relay, 5360 IS SEE-501
Fishkill Plains	13.8	8095 Ckt.	SCADA	****	υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA		υP			OCRUS - Outlinhar and of contagomoral
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1				95BU is Optimho; part of replacement program.
Fishkill Plains	115	HF-703 BKR		EM				
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	υP		***		
Fishkill Plains	115	A-1036-FP	VA	uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498		uP- 200				279/2BFR relays Com
Fishkill Plains	115	Com Equipment					<del></del>	95P is DLP; part of replacement progra
Fishkill Plains	115	FP Line	SCADA	uP/Gen 1				already; 95BU is SEL-321
Fishkill Plains	115	81	SCADA	EM				
Fishkill Plains	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Fishkill Plains	13.8	82	SCADA		EM			
Fishkill Plains	115/13.8		SCADA	EM/uP				95BU is SEL-587; metering is combin
Fishkill Plains	115/13.8		30,40,4	EM/uP		2200	*****	
Forgebrook						2300_		
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM		*****	
Forgebrook	13.8	Bus #2			EM			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8013 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8014 Ckt.	Charts - kW		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM/uP			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW		EM	<del></del>		Com
Forgebrook	115	Com Equipmen		EM				
Forgebrook	115	FO Line	None	EM			-	
Forgebrook	115	FO-1430-FT		EM				
Forgebrook	115	FT Line	None					
	115			EM				
Forgebrook	115			EM				
Forgebrook			SCADA	uР				
Forgebrook	115		None		EM			Amps
Forgebrook					EM			74,150
Forgebrook		8 BF Line	SCADA		EM			
Forgebroo			200-		EM	*****		Ni
Forgebroo	k 13	.8 W-994		EM				Metering combined
L CALIMETY (1/2)		13.8						

200-2

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		·	Electric Subs	station Upgra	de Needs As:	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	0.000 (4.17)					M-4000		3 phase; oil; electronic; 958U is BE1-851H;
Freehold			Grid Sense		EM/uP		PR-560M	GS not working
Freehold	13.8	2061 Ckt.	Gno Sense	<u></u>	EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H;
Freehold	13.8	2071 Ckt.	Grid Sense		EM/UP		PR-560M	GS not working 3 phase; oil; electronic
Freehold	13.8	W-1155 BKR						
Freehold	13.8	T1	Charts - kW/kVAr	fuse	EM			
Freehold	13.8	81	SCADA	<u></u>		Orion .		
Galeville			SCADA		UP			
Galeville	13.8	B1 B2	SCADA		uP		*****	
Galeville	13.8	5030 Ckt.	SCADA		uР			
Galeville Galeville	13.8	5031 Ckt.	SCADA		uP		***	
Galeville	13.8	5032 Ckt.	SCADA		up			
Galeville	13.8	5033 Ckt.	SCADA		υP			
Galeville	13.8	5034 Ckt.	SCADA		uP			
Galeville	13.8	5035 Ckt.	SCADA		υP			
Galeville		Com Equipment						Com
Galeville	69	MG Line	SCADA	UP			*****	
Galeville	69	MG-200-MK BKR		υP				
Galeville	69	MK Line	SCADA	UP				
Galeville	69/13.8	T1	SCADA	υΡ				
Galeville	69/13.8	72	SCADA	UP				
Greenfield Rd.		1 -2		<u> </u>	_ <u> </u>	M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP	161-4000	ES	2 whose oil states in OSBU in DEA OSA
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	4	375-376 Ckt.	Charts - kW		EM			3 phase; oil; electronic; 958U is BE1-851
Greenfield Rd.	4	377-378 Ckt.	Charts - kW		EM	+		<del>-  </del>
Greenfield Rd.	13.8	W-1608	3710.13 7.77		EM		ES	
Greenfield Rd.	13.8/4	ΤŻ	Charts - kW		EM		~	3 phase; oil; electronic
Greenfield Rd.	13.8	B1	SCADA		500-4	<del></del>	*****	
Greenfield Rd.	4	81	SCADA			*****	*****	Volts
Greenfield Rd.	4	B3	SCADA					Volts
Grimley Rd.				<del>!</del>		NONE-Soon to have DNP RTU		Volts
Grimley Rd.	4	385 Ckt.	Grid Sense		EM	*****	Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4	386 Ckt.	Grid Sense	V	EM		1,916 2	No DATA
Hibernia			,			Micro 1C	<u> </u>	
Hibernia	13.8	7011 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	7012 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	B1	SCADA		EM/uP			95BU is DFP-100
Hibernia	69/13.8	T1	SCADA	EM/vP			****	95BU is DFP-100
Hibernia			1					Com
	13.8	Com Equipment						
High Falls						D-20	<u> </u>	
High Falls High Falls	13.8	3021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls High Falls High Falls	13,8	3021 Ckt. 3022 Ckt.	SCADA SCADA		นP- 200/ บP บP- 200/ บP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
High Falls High Falls High Falls High Falls	13.8 13.8 13.8	3021 Ckt. 3022 Ckt. 3023 Ckt.	SCADA SCADA SCADA		uP- 200/ uP uP- 200/ uP uP- 200/ uP	D-20	<del></del>	
High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt.	SCADA SCADA SCADA SCADA SCADA		uP- 200/ uP uP- 200/ uP uP- 200/ uP uP- 200/ uP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
High Falis High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt.	SCADA SCADA SCADA SCADA SCADA		uP- 200/ uP uP- 200/ uP uP- 200/ uP uP- 200/ uP uP- 200/ uP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line	SCADA SCADA SCADA SCADA SCADA SCADA		UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP	D-20		95P is SEL-251; 95BU is SEL-501 95P is DLP
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR.	SCADA SCADA SCADA SCADA SCADA SCADA		UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK-696-P BKR. P Line	SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP	D-20		95P is SEL-251; 95BU is SEL-501 95P is DLP
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200/ UP UP-200 UP UP-200	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is DLP 95P is DLP
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3023 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR. B1	SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP-200/ UP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is DLP 95P is SEL-251; 95BU is SEL-501
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69 69	3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200 UP- 200 UP UP- 200 UP UP- 200/ UP UP- 200 UP/ UP- 200 UP/ UP- 200	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is DLP 95P is SEL-251; 95BU is SEL-501 95BU is SEL-251
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69 69 13.8	3021 Ckt. 3022 Ckt. 3023 Ckt. 3023 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR. B1	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200 UP UP- 200 UP UP- 200/ UP UP- 200/ UP	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is SEL-251; 95BU is SEL-501 95BU is SEL-251 95BU is SEL-251
High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 69 69 69 13.8 13.8	3021 Ckt. 3022 Ckt. 3023 Ckt. 3023 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR. B1 B2 Com Equipment	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200 UP- 200 UP UP- 200 UP UP- 200/ UP UP- 200 UP/ UP- 200 UP/ UP- 200	D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is DLP 95P is SEL-251; 95BU is SEL-501 95BU is SEL-251

			Electric Subs	tation Up	Needs Assessment				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment	
	Ciass (KV)		<u></u>			2300		95BU is BE1-IPS-100	
Highland			SCADA		EM/uP			95BU is BE1-IPS-100	
Highland	13.8	5081 Ckt.	SCADA		EM/uP			95BU is BE1-IPS-100	
Highland	13.8	5082 Ckt.	SCADA		EM/uP				
Highland	13.8	5084 Ckt.	SCADA		uP				
Highland	13.8 13.8	5085 Ckt.	SCADA		UP				
Highland	115	HR Line	SCADA	υP					
Highland Highland	115	OR Line	SCADA	UP					
Highland	115	OR-761-HR BKR.		EM	EM			<u> </u>	
Highland	13.8	B1	SCADA		υP				
Highland	13.8	B2	SCADA					Com	
Highland	13.8	Com Equipment	SCADA	υP/EM				95BU is SEL-587	
Highland	115/13.8	T1	SCADA	uP				<u></u>	
Highland	115/13.8	T2	SCADA	_1		D-20			
Honk Falls			SCADA	1	EM		WE	3 phase; oil; electronic	
Honk Falls	13.8	3071 Ckt.			EM		WE	3 phase; oil; electronic	
Honk Falls	13.8	3072 Ckt.	SCADA	EM	4				
Honk Falls	13.8	B1	SCADA SCADA	EM/uP				79 Relay is EM	
Honk Falls	69	GM Line	SCADA	uP					
Honk Falls	69	HG Line HK Line	SCADA	uP/EM				79 Relay is EM	
Honk Falls	69	MK Line	SCADA	uP			****		
Honk Falls	69	WH Line	SCADA	uP/EM			*****	79 Relay is EM	
Honk Falls Honk Falls	69	overall diff B1+T1	SCADA	EM			****		
Honk Falls	69/13.8	71		fuse					
Hunter	- 00/10/0	1		<del></del>		M-4000			
Hunter	34.5	Z-666					VR-3S	3 phase; vac; hyd	
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase; oil; hyd	
Hunter	13.8	Cap Bank			EM				
Hurley Ave. 345kV						2400			
Hurley Ave. 345kV	345	30151 BKR.	****	EM	****			79 Relay is EM	
Hurley Ave. 345kV	345	30151 A1 BF		υP		*****	*****	<u> </u>	
Hurley Ave. 345kV	345	30152 A2 BF	4	EM					
Hurley Ave. 345kV	345	301 Line A1	SCADA	uΡ					
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				<del></del>	
Hurley Ave. 345kV	345	30353 BKR.	*****	EM*				79 Relay is EM; In process replacement wi SEL-451	
Hurley Ave. 345kV	345	30353 A1 BF		up			*****		
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70	
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement wi SEL-451	
Hurley Ave. 345kV	345	30354 A1 BF		EM				la pracons routes most with GE C70	
		30354 A2 BF	*****	EM*				In process replacement with GE C70	
Hurley Ave. 345kV	345								
Hurley Ave. 345kV Hurley Ave. 345kV	345	303 Line A1	SCADA			i i	L		
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	345 345	303 Line A2	SCADA	EM*				In process replacement with GE D90	
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345	303 Line A2 Bus A1	SCADA	EM*				In process replacement with GE D90	
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345	303 Line A2 Bus A1 Bus A2	SCADA 	EM* EM EM				In process replacement with GE U90	
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115	303 Line A2 Bus A1 Bus A2 A2451 BKR.	SCADA 	EM* EM EM				In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115	303 Line A2 Bus A1 Bus A2 A2451 BKR. A2451 A1 BF	SCADA	EM* EM EM EM				In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115 115	303 Line A2  Bus A1  Bus A2  A2451 BKR.  A2451 A1 BF  A2451 A2 BF	SCADA 	EM* EM EM EM EM EM EM				In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115 115 115 345	303 Line A2 Bus A1 Bus A2 A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step	SCADA	EM* EM EM EM				In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115 115 115 345	303 Line A2 Bus A1 Bus A2 A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step	SCADA	EM* EM EM EM EM EM EM				In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115 115 115 345 345 345	303 Line A2 Bus A1 Bus A2 A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step T1 A1	SCADA	EM* EM EM EM EM EM EM EM EM	Land			In process replacement with GE 090	
Hurley Ave. 345kV Hurley Ave. 345kV	345 345 345 345 115 115 115 345 345 345 345 345	303 Line A2 Bus A1 Bus A2 A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step	SCADA	EM* EM EM EM EM EM EM EM EM EM				Volts	

			Electric Subst	anni ahaio	OC NOONO NO			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Marie Area	,,,,,					2400		BE1-851H as BU and 79
Hurley Ave.	13.8	2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps	*****	EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Hurley Ave. Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		CMITOF			
Hurley Ave.	115	Cap Bank		EM		*****		
Hurley Ave.	115	HP Line	SCADA	EM	<u> </u>			Quadramho part of the package; metering
	69	l line	SCADA	Gen1				Amp value only
Hurley Ave.			SCADA	EM				a destate and the package; metering
Hurley Ave.	115	OR Line						Quadramho part of the package; metering  Amp value only
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
	115	HP-1643 BKR.		EM				
Hurley Ave. Hurley Ave.	115	OR-1640 BKR.		EM				
Hurley Ave.	69	W-142 BKR.		uP			ļ	
Hurley Ave.	13.8	W-1575 BKR.			EM	****	ļ	<del> </del>
Hurley Ave.	115	W-389 BKR.		EM				<u> </u>
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM	Auta			Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	Т3	SCADA	€M			Ţ	
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				
inwood Ave.		·				3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	*****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/oP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
inwood Ave.	13.8	Com Equipment			**-**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115	IR-201-X BKR		υP				
Inwood Ave.	115	X Line	SCADA	· uP				
	13.8	B1	SCADA		uP			<del></del>
Inwood Ave.	13.8	82	SCADA		υP			
Inwood Ave.	115/13.8	T1	SCADA	υP	**			
Inwood Ave.	115/13.8	Τ2	SCADA	υP		10.4000		
Jansen Ave. Jansen Ave.	130	1001 011	807 00		] · · · · · · · · · · · · · · · · · · ·	M-4000		
Jansen Ave. Jansen Ave.	13.8	1001 Ckt. 1002 Ckt.	MV-90 MV-90		UP EM			· · · · · · · · · · · · · · · · · · ·
				*****				
Jansen Ave. Jansen Ave.	13.8	1003 Ckt. 1004 Ckt.	MV-90 MV-90		uP EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM			<u> </u>
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM		- 10-410-5	
Jansen Ave.	13.8	Com Equipment	SCADA	<del></del>				Com
Jansen Ave.	13.8	T - Grounding	MV-90		υP			, , , , , , , , , , , , , , , , , , , ,
Kerhonkson		, c. ounding	10.4.00	· · · · · · · · · · · · · · · · · · ·		8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense	-1	EM		Kyle D	Single phase; oil; hyd; No GS Dat:
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat
	69	MK-929 MOS		EM				
Kerhonkson		MK-930 MOS	*****	EM				
Kerhonkson	69		1	fuse				Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS					701100 101 00011 1701013
Kerhonkson	69/13.8			fuse				Volts & Amps
Kerhonkson	69	HK	SCADA					
(Common)	69	MK	SCADA					Volts & Amps

		<del></del>	Electric Substa	ition Upy.	Meeds AS	>6221116111	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2100		Not sure if charts were removed
Knapps Corners	100	8021 Ckt.	Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners	13.8	8022 Ckt.	Charts - Amps		EM/uP up/EM			Not sure if charts were removed
Knapps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		EM/uP			BE1-851H as BU and 79
Knapps Corners Knapps Corners	13.8	8024 Ckt.	Charts - kW		EM			
Chapps Corners	13.8	8025 Ckt.	Charts - kW					Com
Chapps Corners	13.8	Com Equipment		EM-				SEL-279
Knapps Corners	115	K8 Line	None	uP- 200				SEC-279
Knapps Corners	115	KB-1558-MC BKR. SK Line	SCADA	цP				Amps
Knapps Corners	115	KN Line	SCADA*	EM				Amps
Knapps Corners Knapps Corners	13.8	KR Line	SCADA*	EM	<del> </del>			Amps
Knapps Corners	13.8	K\$ Line	SCADA*	EM	ļ			
Knapps Corners	69	KM Line	SCADA	uP				·
Knapps Corners	69	TR Line	SCADA	EM		·		
Knapps Corners	69	G Line	SCADA	uP			<del> </del>	
Knapps Corners	13.8	W-1215 BKR.			EM EM			
Knapps Corners	69	W-1409 BKR.		υP				
Knapps Corners	13.8	W-1462 BKR.			EM	ļ		
Knapps Corners	13.8	B1			EM		*****	Combine Bug Volta to and paint
Knapps Corners	13.8	82	SCADA		EM			Combine Bus Volts to one point
Knapps Corners	13.8	B3	Γ		EM			
Knapps Corners	69	69k Bus	SCADA	EM		<u> </u>		Volts
Knapps Corners	115/13.8	T1	ECADA	EM				Combine load value
Knapps Corners	115/13.8	Т3	SCADA	EM				
Knapps Corners	115/69	Т2	SCADA	υP				
Lawrenceville	113,00					M-4000		
Lawrenceville	34.5	2385 Ckt.	Grid Sense	EM/uP			CXE-400A	3 phase; oil; hyd
Lawrenceville	34.5	81	SCADA*					Volts
Lawrenceville	69/34.5	T1	MV90/Grid Sense/SCADA	EM				Amps.
Lincoln Park						2300		<u></u>
Lincoln Park	13.8	Com Equipment			,6-4-6-6-		*****	Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps	****	EM		\$-4P4	
Lincoln Park	13.8	2012 Ckt.	Charts - kW	*****	EM			
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM		, , , , , , , , , , , , , , , , , , ,	<u> </u>
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			<del>                                     </del>
Lincoln Park	13.8	Cap Bank 1			EM			1
Lincoln Park.	13.8	Cap Bank 2			EM			D. L. D. Leve and December 12 areas
Lincoln Park	115	HP Line	None	EM				Relay Replacement Progam in proci
Lincoln Park	115	HP-1318 BKR.		EM				<del>                                     </del>
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	υP				<del>                                     </del>
Lincoln Park	13.8	W -1321 BKR.	2-327		EM			<del>                                     </del>
Lincoln Park	13.8	W-45 BKR.		ļ	EM			
Lincoln Park	13.8	W-534 BKR.		· · · · · · · · · · · · · · · · · · ·	EM			<del> </del>
Lincoln Park	13.8	W-554 BKR.			EM			
Lincoln Park	13.8	WT-206 BKR.			EM			
Lincoln Park	13.8		*****		EM			
Lincoln Park	13.8		*****		EM			
Lincoln Park	13.8	WT-528 BKR.			EM			O
Lincoln Park	13.8	B1	SCADA		EM			Combine Bus Volts to one poin
Lincoln Park			3020		EM			Volts
Lincoln Park			SCADA		EM			
i incoin Park			None		EM			Malla
			SCADA	EM				Volts
Lincoln Park		5 1 115kbus	SCAUA					Combine load value
Lincoln Park	1101		SCADA	EM	<del></del>			30000000
Lincoln Park	k 115/	13.8 T1	SCADA	EM				33,7,0,7,0

	<u> </u>		Electric Subs	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
· · · · · · · · · · · · · · · · · · ·	Class (K*)					2400		BE1-851H as BU and 79
Manchester	T		201/ 00	1	EM/uP			BE1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90 MV-90		EM/uP			
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP		*****	BE1-851H as BU and 79
Manchester	13.8	6094 Ckt.			EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	υP	EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EM			
Manchester	13.8	W-650 BKR.		<del></del>	EM			S. I.i. S.: Walte to any anish
Manchester	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Manchester	13.8	82			<del></del>			
Manchester	115/13.8	T1	SCADA	EM		<del></del>		Combine load value
Manchester	115/13.8	Т2		EM				????
Marlboro						8890		
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			8E1-IP\$100 as 80 and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/UP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP			Volts
Mariboro	115/13.8	T1	SCADA	uP/EM*	****	i		95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP			<del> </del>	301.13.022.031
Maryland Ave.		·		<del></del>		M-4000		-,1
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			T
Maryland Ave.	4	622 Ckt.	Charts - kW		EM	****		
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Ckt.	Charts - kW		EM			<del></del>
Maryland Ave.	13.8	MS Line			EM			
Maryland Ave.	13.8	PH-284 BKR.			EM			·
Maryland Ave.	13.8	PH-286 BKR.			EM			
Maryland Ave.	4	W-1032 BKR.			EM			
Maryland Ave.	4	W-1033 BKR.		*	EM		<del>                                     </del>	<del></del>
Maryland Ave.	4	W-1034 BKR.			EM			-
Maryland Ave.	13.8	B1	SCADA		EM	+		Volts
Maryland Ave.	13.8	82	SCADA	· · · · · · · · · · · · · · · · · · ·	EM			
Maryland Ave.	4	81			EM			Volts
Maryland Ave.	4	82	SCADA		EM		<del>-  </del>	Volts
Maryland Ave.	13.8/4	T1	+		EM			<del></del>
		T2	*****		EM		*	+
Maryland Ave. Maybrook	13.8/4	12		*	E3M	M-4000		
Maybrook	13.8	5051 Ckt.	MV-90	- T	EM	W-4000	RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	MV-90		UP			Previously 5081-83?
					EM	<del></del>	RXE	
Maybrook	13.8	5053 Ckt.	MV-90	*****	<del></del>	+	<del></del>	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Mayorook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None					
Maybrook	69/13.8	T2	None					
McKinley St.						NONE		T
McKinley St.	4	845 Ckt.	MV-90		EM			

			Electric Subs	tation Upgi's	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T, Relaying	D. Relaying	RTU BM	Recloser	Comment
Merritt Park	<del>                                     </del>				uP			
Merritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA	<del></del>	uP			
Merritt Park	13.8	8063 Ckt.	SCADA		υP			
Merritt Park	13.8	8064 Ckt.	SCADA		υP			
Merritt Park	13.8	8065 Ckt.	SCADA		uP			
Merritt Park	13.8	8066 Ckt.	SCADA		uP uP			
Merritt Park	13.8	8067 Ckt.	SCADA SCADA	<u> </u>	uP		+	Com
Merritt Park	13.8	8068 Ckt.	SCADA					
Merritt Park	13.8	Com Equipment	SCADA	uP				
Merritt Park	115	WF Line	SCADA	uP				SEL-279
Merritt Park	115	WP Line	3000	uP-200				366-213
Merritt Park	115	WF-439-WP BKR.	SCADA		uP			
Merritt Park	13.8	B1	SCADA		uP			
Merritt Park	13.8	B2	SCADA	uP				
Merritt Park	115/13.8	<u>T1</u>	SCADA	UP				
Merritt Park	115/13.8	T2	SCAUA	<u></u>	<del></del>	BM		
Milan					uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA	<del></del>			*****	Com
Milan	13.8	Com Equipment						
Milan	115	B-4561 Ckt Sw	.,	uP uP				
Milan	115	MR Line	SCADA			<del></del>		
Milan	115	MR-501 BKR	SCADA	υP				-
Milan	115	RT-7 BKR.		uP		1		
Milan	115	R-10 BKR.		UP O				
Milan	115	T-7 Line	SCADA	υP		·		
Milan	115	10 Line	SCADA		uP			
Milan	115	B1	SCADA	uP				
Milan	13.8	B1	SCADA		. UP			
Milan	115/13.8	T1	SCADA	υP			<u> </u>	<u> </u>
Millerton						L&N	<del>- </del>	}
Millerton	13.8	7081 Ckt.	SCADA		EM		*****	1
Millerton	69	GE-823 MOS		EM				O-1: fooder: 71 - 7091 lood
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; T1 = 7081 load
Millerton	69	Line to SMI	SCADA					Volts Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV					<u>-</u>	ВМ		· · · · · · · · · · · · · · · · · · ·
Modena 115kV	13.8	B1	SCADA		uP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			υP			
Modena 115kV	13.8	5011 Ckt.	\$CADA	4	UP			·
Modena 115kV	13.8	5012 Ckt.	SCADA		uP			<del>                                     </del>
Modena 115kV	13.8	5013 Ckt.	SCADA		uP			
Modena 115kV	13.8	Com Equipment						Com
Modena 115kV	115	EM Line	SCADA	υP				
Modena 115kV	115	EW-201-PX BKR.		UP				<del>                                     </del>
Modena 115kV	115	PX Line	SCADA	υP				Only has one 13.8 bus; T3 = Bus lo.
Modena 115kV	115/13.8	T3	SCADA	UP		9990		Umy has one 15.0 005, 15 - 005 to
Modena 69kV						8890		volts
Modena 69kV	69	B1	SCADA	EM				40/13
Modena 69kV	69	MG Line	SCADA	uP				
Modena 69kV	69	W-941 BKR.		EM				<del> </del>
Modena 69kV	69	MG-380 BKR.		EM				<del>-  </del>
Modena 69kV	115/69	T1	SCADA	EM/uP				GE F35 is installed
Modena 69kV			None	Fuse/uP		NONE		
	05, 13.					NONE	V4L	Single phase; Vac; Hyd
Montgomery		571 Ckt.	Charts - kW		EM			Single phase; Vac; Hyd
Montgomery	4	1 3/ F URG	Charts - kW		EM.	1	V4L	Single priase, vac, riye

			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU M-4000	Recloser	Comment
						141-24000		volts
Montgomery St.	13.8	B1	SCADA		EM .			Volts
Montgomery St.	13.8	B2	SCADA	****	EM			volts
Montgomery St.	13.8	B3	\$CADA		EM			
Montgomery St.  Montgomery St.	13.8	B Line	None		EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr					
	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.   Montgomery St.	13.8	4003 Ckt.	Charts - kW/kVAr		EM EM			
Montgomery St.	4	401 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	402-3 Ckt.	Charts - kW demand	****	EM			
Montgomery St.	4	404 Ckt.	Charts - kW demand Charts - kW demand		EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	410A/8 Ckt.	SCADA		EM			Volts
Montgomery St.	4	<u>81</u>	SCADA		EM		*****	volts
Montgomery St.	4	B2			EM			
Montgomery St.	13.8	F Line	None		EM			
Montgomery St.	13.8	NB Line	None	<del></del>	EM	<del></del>	<del></del>	
Montgomery St.	13.8	NM Line	None	*****	EM			
Montgomery St.	13.8	R Line	None			· · · · · · · · · · · · · · · · · · ·	1	
Montgomery St.	13.8	W-507 BKR.			EM			
Montgomery St.	13.8	W-508 BKR.			EM		<del> </del>	
Montgomery St.	13.8	W-509 BKR.		*****	EM			
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	72			EM			
Myers Corners	<u> </u>					44-550		
Myers Corners	13.8	8041 Ckt.	Charts - kW		uP			
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM	*****		
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM	*****		
Myers Corners	13.8	8046 Ckt.	SCADA		υP			
Myers Corners	69	KM Line	None	EM	*****			
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.		EM:				
Myers Corners	13.8	W-63 BKR.	*****		EM			
Myers Corners	13.8	W-66 BKR.			EM			
Myers Corners	13.8	Feeder M1-75		****	EM			
Myers Corners	13.8	Feeder M2-76			EM			
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1	SCADA		EM			0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Myers Corners	13.8	B2	SCADA		EM			Combine Bus Volts to one point
Myers Corners	69/13.8	T1	SCADA	EM				B
Myers Corners	69/13.8	T2	30,402	EM				Combine load value
Neversink			· · · · · · · · · · · · · · · · · · ·			2200		
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	*****	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM				Amps
Neversink	69	WH Line	\$CADA*	EM	*****		**	Amps
Neversink	4	W-1128 BKR.			EM EM		*****	
Neversink	69	69k Bus	SCADA	uP/EM		*****		Volts
New Baltimore						2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	\$CADA*		EM			kW MW
New Baltimore	13.8	1083 Ckt.	SCADA*		EM			KW
	69	Cap Bank		EM/uP				<del> </del>
New Baltimore		<del></del>					****	Com
New Baltimore	13.8	Com Equipment		UP				]
New Baltimore	69	CN Line	None					
New Baltimore	69	NW Line	None	υP				Vates
		B1	SCADA		EM			Volts
New Baltimore				EM/+D	-			95P is SEL-587
New Baltimore	69/13.1	8 71	SCADA	) LIMINAU	*****	*****	1	001 10 000

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( ,			Electric Sub	station Up	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)		·	<u> </u>		NONE		
New Windsor					EM			No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA No DATA
New Windsor	4	463 Ckt.	Grid Sense Grid Sense		EM			NODATA
New Windsor	4	464 Ckt.			υP			
New Windsor	13.8	UN & UW ATC	None		uΡ			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kV Ar		υP			
New Windsor	13.8/4	T2				D-20	L	95P is SEL-251
North Catskill	<del> </del>	2001A Ckt.	SCADA		นP- 200/ บP			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA		uP- 200/ uP	****		
North Catskill	13.8		SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA	****	υP-200/ υP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA		นค- 200/ นค	****		95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA				·	Com
North Catskill	13.8	Com Equipment		EM				
North Catskill	115	2 Line	SCADA					
North Catskill	115	R-2 BKR.		EM		<del></del>		···
North Catskill	115	RT-7 BKR.		EM			2000	Amps
North Catskill	115	T-7 Line	SCADA*	EM		\		7,103
North Catskill	69	Cap Bank		EM		*****		
North Catskill	69	CL Line	SCADA	υP				
North Catskill	69	H Line	SCADA	uP				
North Catskill	69	NC Line	SCADA	धP	****	****	*****	<del></del>
North Catskill	69	W-1107 BKR		EM/uP*			V	check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*				check on TD-5
North Catskill	115	W-791 BKR.		uP- 200				SEL-2BFR
North Catskill	69	W-269 & W-1107 BKR			EM			us
North Catskill	115	B1	SCADA	EM	****			Volts
North Catskill	69	B1	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP				Volts
North Catskill	13.8	B1	SCADA		EM/uP			Volts: 95BU is DFP-100
North Catskill	13.8	B2	SCADA	4====	EM/uP			Volts: 95BU is DFP-100
North Catskill	115/69	74	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	17	SCADA	EM/uP				95BU is DFP-100

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Substation	E1	lectric Subst	ation Upgrad	de Needs As	sessment		
North Chelsea		Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
North Chelsea							
North Chelsea		SCADA		٩υ			
North Chelsea		SCADA		uP			
North Chelsea   13.8   8054 Ckt.		SCADA		υP			
North Chelsea   13.8   8055 Ckt.		SCADA		υP			
North Chelsea   13.8   8056 Ckt.		SCADA		uP			
North Chelsea		SCADA		υP			
North Chelses		SCADA		uP			
North Chelses		SCADA		υP			Com
North Chelsea	nent						
North Chelsea		SCADA	uP				
North Chelsea			UP	****			
North Chelsea         115         FO-1482 BM           North Chelsea         115         FO Line           North Chelsea         115         NF Line           North Chelsea         115         NF-1116 BM           North Chelsea         115         NF-1116 BM           North Chelsea         115         SC-1566 BM           North Chelsea         69         TV Line           North Chelsea         115         B-2651 BM           North Chelsea         115         B-2651 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-1           North Chelsea         115         B-1           North Chelsea         115/9         T1           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2		SCADA	UP O				
North Chelsea         115         FO Line           North Chelsea         115         NF Line           North Chelsea         115         NF-1116 BH           North Chelsea         115         SC Line           North Chelsea         115         SC-1566 BH           North Chelsea         115         B-2651 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115/9         T1           North Chelsea         115/69         T1           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2		****	υP				
North Chelsea	KR.		UP.		<del></del>		95P is LCB-1I
North Chelsea	,	SCADA	UP				
North Chelsea         115         SC Line           North Chelsea         115         SC-1566 Br           North Chelsea         69         TV Line           North Chelsea         115         B-2651 Br           North Chelsea         115         B-2651 Br           North Chelsea         115         B-2653 Br           North Chelsea         115         B-2653 Br           North Chelsea         115         B1           North Chelsea         115         B1           North Chelsea         13.8         B2           North Chelsea         115/69         T1           North Chelsea         115/13.8         T2           Ohioville         13.8         5022 Ck           Ohioville		SCADA	υP				95P is LCB-II
North Chelsea         115         SC Line           North Chelsea         115         SC-1566 Br           North Chelsea         69         TV Line           North Chelsea         115         B-2651 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         13.8         B1           North Chelsea         13.8         B2           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/43.8         T2           North Chelsea         115/49         T1           Ohioville         13.8         5021 Ck           Ohiovill	KR.		υP			**	
North Chelsea	e	SCADA	υP			*****	
North Chelsea   69	KR.		uΡ	****			
North Chelsea	e	SCADA	υP				
North Chelsea	KR.	****	uP				
North Chelsea			υP	****	*-***		
North Chelsea		*****	υP				
North Chelsea   115			υP				····
North Chelsea   13.8   B1		SCADA	υP		*****		
North Chelsea		SCADA		υP			
North Chelsea		SCADA		UP			<del></del>
North Chelsea		SCADA	υP				
North Chelsea		SCADA	uP				<del></del>
Ohioville         13.8         5021 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         13.8         Com Equip           Ohioville         69         O Line           Ohioville         69         O B Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         PX Line           Ohioville         115         PX Line           Ohioville         115         PX Line           Ohioville         69         W - 1537           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA	UP			<del></del>	
Ohioville         13.8         5021 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5024 Ck           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Lin           Ohioville         115         OR Lin           Ohioville         115         OR-1075           Ohioville         115         PX Lin           Ohioville         115         PX - 1659           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2				I	2100	<del></del>	Volls
Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5024 Cf           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         69         O Line           Ohioville         69         O B Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         PX Line           Ohioville         115         PX Line           Ohioville         69         W - 1517           Ohioville         13.8         W - 1527           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2	ket (	Charts - Amps		EM/uP	2100	·	BE1-851H as BU and 79
Ohioville         13.8         5023 Ch           Ohioville         13.8         5024 Cc           Ohioville         13.8         5025 Cc           Ohioville         13.8         Com Equip           Ohioville         113.8         Com Equip           Ohioville         69         O Lin           Ohioville         69         OB Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         PX Lin           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohiovitte         13.8         5024 Cf           Ohiovitle         13.8         5025 Cf           Ohiovitle         13.8         Com Equip           Ohiovitle         115         Cap Ba           Ohiovitle         69         O Line           Ohiovitle         115         OR Line           Ohiovitle         115         OR Line           Ohiovitle         115         OR Line           Ohiovitle         115         PX Line           Ohiovitle         115         PX Line           Ohiovitle         69         W - 1511           Ohiovitle         13.8         W - 1600           Ohiovitle         13.8         W - 1600           Ohiovitle         69         69k B           Ohiovitle         13.8         B1           Ohiovitle         13.8         B1           Ohiovitle         13.8         B2		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville         13.8         5025 Cl           Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Lin           Ohioville         69         OB Lir           Ohioville         115         OR Lir           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		Charts - kW		EM/uP			8E1-851H as BU and 79
Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR-1075           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA		uP	*****		8E1-831M as 80 and 79
Ohioville         11S         Cap Ba           Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		00707					Com
Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR.1075(           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1637           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2			EM	<del></del>		<del></del>	Com
Ohioville         69         OB Lir           Ohioville         115         OR Lir           Ohioville         115         OR-10751           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	uP				
Ohioville         115         OR Lir           Ohioville         115         OR-10751           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	UP				
Ohioville         115         OR-10751           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1637           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	EM				
Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		140116	EM				
Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B 1           Ohioville         69         69k B           Ohioville         13.8         B 1           Ohioville         13.8         B 2		SCADA	EM/uP				
Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W · 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		SCAUA	UP				1
Ohioville         13.8         W - 1537           Ohioville         13.8         W · 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2			EM	<del></del>			<del> </del>
Ohiovitle         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		*****	+		!		<del></del>
Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2				EM			
Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		00454	EM	EM			<del>                                     </del>
Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA		ļ			Volts
Ohiovitle 13.8 B2		SCADA	EM				Volts
		None		EM			- <del></del>
	<del></del>	None		EM		******	
Ohioville 115/13.8 T1		ACADA	EM				Combine load value
Ohioville 115/13.8 T2		SCADA	EM/UP-200				95BU is SEL-251

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<u> </u>			Electric Sub	station Upgra	ue Needs As	<u>sessment</u>		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2300		Grid owns Line
Pleasant Valley				T UP		*****		0110 01110 2110
Pleasant Valley	115	8 Line	SCADA**	UP				Grid owns Line
Pleasant Valley	115	10 Line	SCADA	UP UP				Grid owns Line
Pleasant Valley	115	12 Line		uP				95BU is Optimho; in replacement plan
Pleasant Valley	115	13 Line	SCADA**	EM/Gen-1		7		95BO IS OBUILITO, IN TEDICOCITICA DE
Pleasant Valley	115	C Line	SCADA	EM				
Pleasant Valley	115	M Line	SCADA	UP				Com
Pleasant Valley	115	X Line	SCADA					SEL-279
Pleasant Valley	115	Com Equipment		u₱- 200		*****		SEL-279
Pleasant Valley	115	R-12 BKR.		uP- 200				SEL-279
Pleasant Valley	115	R-13 BKR.		UP- 200				3EL-2/3
Pleasant Valley	115	R-8 BKR.		EM		- <del></del>		
Pleasant Valley	115	RC-6 BKR.		EM				
Pleasant Valley	115	RM BKR.		uP				
Pleasant Valley	115	RX-4 BKR.						Con Ed owns the Bkr
Pleasant Valley	115	R-61 BKR.	\$CADA**	EM		<del> </del>		Con Ed owns the Bkr
Pleasant Valley	115	R-62 BKR.	SCADA**	EM	<del>`</del>			
Pleasant Valley	115	R-643 BKR.		EM		<del>                                      </del>	<del>                                     </del>	
Pleasant Valley	115	R-81 BKR.		EM			<del></del>	Volts
Pleasant Valley	115	81	SCADA	ΕM				Volts
	115	B2	SCADA	EM				kW
Pleasant Valley	69	E Line	SCADA*	υP				
Pleasant Valley	69	GLine	SCADA*	υP				kW
Pleasant Valley	69	Q Line	SCADA*	υP				kW
Pleasant Valley	69	81	SCADA	uP				Volts
Pleasant Valley	13.8	W-387			E₩			
Pleasant Valley	345/115	S1	SCADA					Con Ed owns bank and protection
Pleasant Valley		T10	SCADA	EM	****			
Pleasant Valley	115/69	110	- SCADA			D-20		······································
Pulvers Corners				<del></del>	EM		V4L	single phase; vac; hyd
Pulvers Corners	13.8	7091 Ckt.	SCADA	*****	EM		Kyle L	single phase; oil; hyd
Pulvers Corners	13.8	7092 Ckt.	SCADA	EM	Eisi		RVE	3 phase; oil; hyd
Pulvers Corners	34.5	7395 Ckt.	SCADA					Com
Pulvers Comers	13.8	Com Equipment						
Pulvers Corners	69	Cap Bank	*****	EM				Volts
Pulvers Corners	69	B1	SCADA		*****		****	Volts
Pulvers Corners	34.5	B1	SCADA					Volts
Pulvers Corners		B1	SCADA					1010
Pulvers Corners	69/13.8	31	SCADA	Fuse		*****		050 in 50 745
Pulvers Corners		T2	None	EM/uP		,		95P is SR-745

Comment				Electric Subs	tation Upgra	ide Needs As	sessment		
Reynolds Hill	Substation		Line/Ckt.				RTU		Comment
Reynolds Hill   13.8   6001 CH   Charts - KW   P   P   P   P   P   P   P   P   P		<del></del>					2100		
Reynolds Hill		<del></del>	5554 OU	Charle WW		EM			
19.5   6000 CRL   Charts - WY						υP			
Reynolds Hill						EM			
Permidde Hill		<del></del>				υP			
Reynolds Hill					****				Com
Remotes Hill   115									
Reymolds Hill 115 NR.1255 BYR.						<del></del>			
Symples Hill									
Reynolds Hill   13.8   R Line   SCADA   UP				SCADA	υP			!	
Reynolds Hill   13.8   8 Cable   SCADA				SCADA	υP	J	****		
Reynolds Hill   13.8   PC Gable   SCADA   UP		13.8	B Cable	SCADA				<del></del>	
Reynolds Hill   13.8   PD Cable   SCADA     UP			W Cable	SCADA				<del> </del>	
Reynolds Hill   13.8			PD Cable	SCADA		<u> </u>			
Reynolds Hill   13.8			PH Line	SCADA		υP	***		
Reynolds Hill   13.8		13.8	PK Line	SCADA	*****	uP			
Reynolds Hill   13.8						uP			
Reynolds Hill   13.8   PU Cable   SCADA			PQ Line	SCADA		υP			
Reynolds Hill   13.8   PU Cable   SCADA						υP			
Reynolds Hill		13.8	PU Cable	SCADA		υĖ			
Reynolds Hill				<del> · · · · · · · · ·</del>	EM			1	<del></del>
Reynolds Hill   115   B2   SCADA   EM				SCADA				<del></del>	
Reynolds Hill   13.8   81   958U is SEL-501					<del></del>	†	+		
Reynolds Hill   13.8   B2   SCADA   UP	··							<del></del>	
Reynolds Hill   13.8   B3   SCADA				SCADA			<del> </del>		
Reynolds Hill				SCADA		<del></del>	<del></del>	<del></del>	
Reynolds Hill							·	<del></del>	Volts
Reynolds Hill	Reynolds Hill			·····			·	<del></del>	
Rhinebeck	Reynolds Hill	115/13.8				-	<del></del>	+	
Rhinebeck   13.8   7051 Ckt.   Charts - Amps     EM	Rhinebeck			33,25	<u> </u>		+ <del></del>		95P is SEL-351A
Rhinebeck	Rhinebeck	13.8	7051 Ckt.	Charte , kW/SCADA	T	0001 5	<del></del>		
Rhinebeck	Rhinebeck	13.8							95P is SEL-251, 95BU is SEL-501
Rhinebeck   13.8   7054 Ckt.   Charts - Amps	Rhinebeck				<del> </del>		<del></del>	10	
Rhinebeck   13.8   7055 Ckt   Charts - kW					<del></del>				
Rhinebeck   13.8   7056 Ckt   SCADA   UP-200/ UP   SPP is SEL-251; 958U is SEL-501					· · · · · · · · · · · · · · · · · · ·		*****		
Rhinebeck   G9									BE1-851H as BU and 79
Rhinebeck   69					<del></del>				95P is SEL-251; 95BU is SEL-501
Rhinebeck			<u></u>		<del></del>				
Rhinebeck   115	<del></del>					<u> </u>			
Rhinebeck									Amps
Rhinebeck   69   Q-1471 BKR.     EM									
Rhinebeck   13.8   W-1017 BKR.								-44.14	
Rhinebeck   13.8   W-1238 BKR     EM     Volts   EM     EM     EM     Volts   EM       EM     EM     EM     EM     EM     EM									
Rhinebeck   69   W-258 BKR     EM     Combine Bus Volts to one point Rhinebeck   13.8   B2   none     EM     EM     Combine Bus Volts to one point Rhinebeck   69   69kV Bus   SCADA     EM     Volts     Volts     EM     Amps & Volts   Rhinebeck   69/13.8   T1   SCADA   EM       Amps & Volts     Amps & Volts     Amps & Volts     Amps & Volts     EM       Amps & Volts       Amps & Volts     EM       Amps & Volts								* <b>-</b>	
Rhinebeck   13.8   W.367 BKR.   EM						EM			
Rhinebeck   69									
Rhinebeck									
Rhinebeck				····	<del></del>				Volts
Rhinebeck         69         69kV Bus         SCADA									·, · · · · · · · · · · · · · · · · · ·
Rhinebeck         69/13.8         T1         SCADA*         EM									Comoine ous voits to one point
Rhinebeck         69/13.8         T2         SCADA?         EM          Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM								*****	Volts
Rhinebeck         69/13.8         T2         SCADA*         EM           Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM						**			
Rninebeck 115/3.8 14 SCADA EM									
Rhinebeck 115/69 T3 SCADA EM									
	Rhinebeck	115/69	T3	) SCADA	EM				

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			Electric Subs	station Ups	Needs As کر	<u> </u>	T	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
Rock Tavern 345kV						2100		
Rock Tavern 345kV	345	311 Line A1	SCADA	uP				
Rock Tavern 345kV	345	311 Line A2		EM EM				
Rock Tavern 345kV	345	3456 BKR.		uP				
Rock Tayern 345kV	345	3456 BF A1						
Rock Tavern 345kV	345	3456 BF A2		UP EM		**		
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345kV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345kV	345	Cap Bank 2 A1		EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	UP				
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.		uP			·	
Rock Tavern 345kV	345	37751 BF A1		EM		*****		
Rock Tavern 345kV	345	37751 BF A2		EM				
Rock Tavern 345kV	345	37752 BKR.	·	UP			*****	
Rock Tavern 345kV	345	37752 BF A1		EM	,			
Rock Tavern 345kV	345	37752 BF A2		uP				
Rock Tavern 345kV	345	377 Line A1	SCADA	EM				
Rock Tavern 345kV	345	377 Line A2		EM				
Rock Tavern 345kV	345	4255 BKR.		EW.				
Rock Tavern 345kV	345	4255 BF A1		EM				
Rock Tavern 345kV	345	4255 BF A2		SS				
Rock Tavern 345kV	345	42 Line A1		EM				
Rock Tavern 345kV	345	42 Line A2		EM			<u></u>	
Rock Tavern 345kV	345 345	C3351 BKR.	10444	EM				
Rock Tavern 345kV	345	C3351 BF A2		EM				
Rock Tavern 345kV Rock Tavern 345kV	345	C3351 BF A2		EM		<del></del>		<del></del>
	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM	<del> </del>			
Rock Tavern 345kV	345	C3352 BF AZ C3353 BKR.		υP- 200				
Rock Tavern 345kV	345	C3353 BF A1		UP - 200			<del></del>	<del> </del>
Rock Tavern 345kV	<del></del>			uP			*****	
Rock Tavern 345kV	345	C3353 BF A2		EM				
Rock Tavern 345kV	345	31153 BKR. 31153 BF A1		UP EM	<u> </u>			<u> </u>
Rock Tavern 345kV	345	31153 BF A1		UP UP				<del>                                     </del>
Rock Tavern 345kV	345	31153 BF AZ 31154 BKR.		EM				
Rock Tavern 345kV	345	31154 BF A1		EM				
Rock Tavern 345kV	345	31154 BF A2		EM				
Rock Tavern 345kV	345	Com Equipment						Com
Rock Tavern 345kV	345	B1 A1		EM			******	
Rock Tavern 345kV	345	B1 A2	*****	EM				<del>                                     </del>
Rock Tavern 345kV	345	B2 A1	*****	EM	<del> </del>		2000	<del>                                     </del>
Rock Tavern 345kV	345	B2 A2		EM				<del></del>
Rock Tavern 345kV	345/115	T1 A1		EM EM				
Rock Tavern 345kV	345/115	T1 A2	SCADA	EM				
Rock Tavern 345kV	345/115	T3 A1		uP				<del></del>
AMCAC HIBARI WOOM	1 3-13/113		- SCADA					<u> </u>

`					Alexade Acc	cacemoné		
			Electric Sub	station Up.	Needs As	<u> </u>		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1835 (KT)					2400	L	
Sand Dock			Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.			EW	*****		
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM		<u> </u>	
Sand Dock	13.8	GB Line	SCAUA	EM				
Sand Dock	115	KC-1447-SC BKR. KC Line	None	EM				
Sand Dock	115	SC Line	None	UP				
Sand Dock	115	SH-886 BKR.			EM		ļ	
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock	13.8	TW-902 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8	TW-910 BKR.			EM	****		
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM			
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.					<del></del>	
Sand Dock	115	B1	SCADA			<del></del>		Combine Bus Volts to one point
Sand Dock	115	B4					<del></del>	
Sand Dock	13.8	81			EM			Combine Bus Volts to one point
Sand Dock	13.8	B2 ·	SCADA		EM			Combine ous voits to one point
Sand Dock	13.8	B3	<u> </u>	·	EN	*****		
Sand Dock	13.8	B4	SCADA		EM		*****	
Sand Dock	13.8	Τ1	SCADA	EM				Combine load value
Sand Dock	13.8	T3	GCADA	EM		****		
Sand Dock	13.8	T4	SCADA	EM			-,	
Saunerties						Orion	1	

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			Electric Sub	station Upgra	de Needs As	sessment		· · · · · · · · · · · · · · · · · · ·
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Shenandoah	<del></del>					2400		D = V= t= t= === ====
Shenandoah	115	East Bus	SCADA	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	SCADA	EM	EM			
Shenandoah	13.8	B1	SCADA		EM EM			Combine Bus Volts to one point
Shenandoah	13.8	B2			EM			C. Lin D Volta ta pop point
Shenandoah	13.8	<b>B</b> 3	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	B4			EM EM			Combine Bus Volts to one point
Shenandoah	13.8	B5	SCADA		EM			Combine 603 Tokis to one point
Shenandoah	13.8	96 B7		T	EM.			Combine Bus Volts to one point
Shenandoah Shenandoah	13.8	B8	SCADA		EM			
Shenandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2			EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5	*****		ĒM_			
Shenandoah	13.8	Cap Bank 6			EM		*****	<del>                                     </del>
Shenandoah	13.8	B-4451 BKR. (CB1)	*****		UP			
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			
Shenandoah	13.8	8072 Ckt.	Charts - KW		EM	*		
Shenandoah	115	EF Line	None	υP/Gen-1				95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM				
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah Shenandoah	115	FS-892-EF BKR.		- EM				
Shenandoah	13.8	FS-959 BKR. Feeder S1		EM				
Shenandoah	13.8	Feeder S2	None		EM			
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None None		EM			
Shenandoah	13.8	Feeder S5	None		EM			
Shenandoah	13.8	Feeder \$6	None		EM			
Shenandoah	13.8	Feeder S7	None		EM			
Shenandoah	13.8	Feeder S8	None		EM	*****		<del> </del>
Shenandoah	13.8	Feeder S9	None		EM			· <del> </del>
Shenandoah	13.8	Feeder \$10	None		EN			
Shenandoah	13.8	Feeder S11	None		EM	*****		<del> </del>
Shenandoah	13.8	Feeder S12	None		EM			<del>                                     </del>
Shenandoah	13.8	Feeder \$13	None		EM			<u> </u>
Shenandoah	13.8	Feeder S14	None		EM			
Shenandoah	13.8	Feeder S15	None		EM			
Shenandoah	115/13.8	T1	SCADA	EM				C
Shenandoah Shenandoah	115/13.8	T2		EM				Combine load value
Shenandoah	115/13.8	T3	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5		EM				Comonie vad vaide
Shenandoah	115/13.8	T6	SCADA	EM		*****	/	Combine toad value
Shenandoah	115/13.8	T7	SCADA	EM				25
Shenandoah	13.8	W-1266 BKR.	SCADA	EM				· <del> </del>
Shenandoah	13.8	W-1279 BKR.			EM EM			<del>-  </del>
Shenandoah	13.8	W-1450 BKR.			EM			
Shenandoah	13.8	W-1593 BKR.			EW			
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	y-4		EM			· · · · · · · · · · · · · · · · · · ·
Shenandoah	13.8	W-802 BKR.			EM			
Shenandoah	13.8	W-803 BKR.			EM			
		W-805 BKR.			EM			
Shenandoah	13.8				EM			
Shenandoah	13.8	W-807 BKR.						

			Electric Sub	station Upgra	de Meeds W2	sessment	i•··• · — ·-——	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Rock Tavern 115kV						44-550	<u> </u>	
	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV		115-0,48kV SST		EM				
Rock Tavern 115kV	115	Com Equipment					****	Com
Rock Tavern 115kV	+	D Line	\$CADA*	EM				Amps
Rock Tavern 115kV	115	D-448 BKR.		EM	****			
Rock Tavern 115kV	115	J Line	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
	115	J-788 BKR.		EM				
Rock Tavern 115kV Rock Tavern 115kV	115	RD Line	SCADA*	EM				Amps
Rock Tavern 115kV	115	RD-809 BKR.		EM				
Rock Tavern 115kV	115	RJ Line	SCADA*	EM			***-*	Amps
Rock Tavern 115kV	115	RJ-818 8KR.		EM				
Rock Tavern 115kV	115	St Line	SCADA	EM	*			
Rock Tavern 115kV	115	SL-684 BKR.		EM				
Rock Tavern 115kV	115	W-467 BKR.		υP			*****	
Rock Tavern 115kV	115	W-681 BKR.	*****	EM		<u> </u>	****	<del> </del>
Rock Tavern 115kV	115	W-814 BKR.	****	EM/oP		21277		OF1 254
Rock Tavern 115kV	115	WM Line	none	uP				\$EL-351
Rock Tavern 115kV	115/69	T2	SCADA	EM	<del></del>	··		<u> </u>
Roseton Switchyard	113/63	12	SCADA	EN		2400	<del></del>	
Roseton Switchyard	345	30356 (B6) BKR	<del></del>		<del> </del>	2100	ļ	
Roseton Switchyard	345	30356 (B6) BF A1	****	EM				
Roseton Switchyard	345	30356 (B6) BF A2		EM	ļ			
Roseton Switchyard	345	303 Line A1		EM			*****	
Roseton Switchyard	345		SCADA	υP				
Roseton Switchyard	345	303 Line A2		EM				
Roseton Switchyard		30551 (B7) BKR		EM EM				
Roseton Switchyard	345	30551 (B7) BF A1		Ė₩			****	1
Roseton Switchyard	345 345	30551 (B7) BF A2		E₩	*****			
Roseton Switchyard		30553 (B3) BKR		EM	****			
Roseton Switchyard	345	30553 (B3) BF A1		UP		*****		<del> </del>
Roseton Switchyard	345 345	30553 (B3) BF A2	****	EM				<del>                                     </del>
	<del></del>	305 Line A1	SCADA	υP				
Roseton Switchyard	345	305 Line A2		EM/uP				SEL-501 for DBC
Roseton Switchyard	345	31151 (B1) BKR		EM				0E2-301 IOI DBC
Roseton Switchyard		31152 (B1) BF A1		EM				
Roseton Switchyard		31152 (B1) BF A2		EM			<del>                                     </del>	<del> </del>
Roseton Switchyard		31152 (B4) BKR		EM				<del></del>
Roseton Switchyard		31152 (B4) BF A1		EM	*****			<del> </del>
Roseton Switchyard		31152 (B4) BF A2	***	EM				<del></del>
Roseton Switchyard		311 Line A1	50.404	υP	*			<del>- </del>
Roseton Switchyard		311 Line A2	SCADA	EM			<del></del>	<del> </del>
Roseton Switchyard	345	B1	*****	uP				<del> </del>
Roseton Switchyard		B2	****	uP	- <del></del>			
Roseton Switchyard		U1	SCADA	EM				
Roseton Switchyard		U2	00000			·		· · · · · · · · · · · · · · · · · · ·

			Electric Subs	ation Ups:	e recos as	26231116111		
	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment Radio to INW
	1000					2300		Radio to iiiii
Smith Street	<del></del>	004 014	Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			
Smith Street	4	632 Ckt.	Charts - kW		EM			
Smith Street	4	634 Ckt	Charts - kW		EW			
Smith Street	4		None		EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street	13.8	PQ Line PS Line	None		EM			
Smith Street	13.8	W Line	None		EM			Volts
Smith Street Smith Street	13.8	81	SCADA		EM EM			Volts
Smith Street	13.8	B2	SCADA		UP			Volts
Smith Street	4	B1	SCADA		uP			Volts
Smith Street	4	82	SCADA		EM			
Smith Street	13.8/4	T1	None		EM			
Smith Street	13.8/4	Т2	None		CIM	8890		<u> </u>
Smithfield					UP UP			
Smithfield	13.8	7095 Ckt.	SCADA					Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	uP- 200/uP				Amps
Smithfield	69	GE Line	SCADA*	EM		<del></del>	<del></del>	Amps
Smithfield	69	S Line	SCADA*	EM		****		Volts & Amps
Smithfield	69	SA Line	SCADA*	EM			<del></del>	Volts
Smithfield	69	B2	SCADA	ļ <u></u>			*****	
Smithfield	69	B3	SCADA	ļ			<del></del>	Volts Toos I and
Smithfield	69/13.8	T1	None*					Only one feeder; T1 = 7095 load
South Cairo					<del></del>	8890		
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP		ļ <del></del>	BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps	ļ <u></u>	EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM EM			
South Cairo	13.8	Com Equipment	*****				*****	Com
South Cairo	69	CF Line	None	EM/uP			*****	79 done with NLR
South Cairo	69	CL Line	None	υP				<u> </u>
South Cairo	13.8	B1+G1	Charts - kW/SCADA	*****	EM			SCADA Volts
South Cairo	69/13.8	T1	Charts - Amps	EM/uP				95P is SEL-587
South Wall St.						None	Yerla i	Single Phase; Oil; Hyd
South Wall St.	4	111 Ckt.	Grid Sense	*****	EM EM		Kyle L Kyle L	Single Phase; Oil; Hyd; missing GS d
South Wall St.	13.8/4	112 Ckt. 71	Grid Sense Charts - kW/kVAr		EM		10/16 2	Shigle Friase, Oil, Hyu, missing 00 0
South Wall St.	13.8/4		Charts - KVV/KV AS	L		Orion	<del></del>	
Spackenkill	43.0	6041 Ckt.	SCADA		uР		*****	
Spackenkill	13.8				up	<del></del>		<del></del>
Spackenkill	13.8	6042 Ckt.	SCADA		up			
Spackenkill	13.8	6043 Ckt.	SCADA		uP			
Spackenkill	13.8	6044 Ckt.	SCADA		uP	<del></del>		<del>-  </del>
Spackenkill	13.8	6045 Ckt.	SCADA		UP UP			
Spackenkill Spackenkill	13.8	6046 Ckt. 6047 Ckt.	SCADA SCADA		υP			
Spackenkill	13.8	6048 Ckt.	SCADA		uP uP			
Spackenkill	13.8	Com Equipment	JOADA					
Spackenkill	13.8	KR Line	SCADA		uP			
Spackenkili	13.8	KS Line	SCADA	*****	uP			
~ <del></del>	13.8	MC Line	SCADA		uP			
Spackenkill		MC-200-SK BKR.	SCADA		υP			
Spackenkill	13.8	**	SCADA		up up			
Spackenkill	13.8	B1	3CADA		UP			
Spackenkill	13.8	B2	00454	uP				
Spackenkill	115/13.8		SCADA	UP UP		*****		
Spackenkill	115/13.8	T2		UP UP	1	BM		
Staatsburg								
	13.8	7041 Ckt.	SCADA		υP			<del></del>
			SCADA		uР			
Staatsburg	13.8	7042 Ckt.	SCADA		uP			
Staatsburg			ALADA	<u> </u>				1
	13.8	7043 Ckt.	<del></del>					
Staatsburg Staatsburg		Com Equipment		****				
Staatsburg	13.8		<del></del>		uP			

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			Electric Subs	tation Upgra	de Needs As	sessment	<del></del> -	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Oten diametrilla	<del></del>					M~4000	V4L	Single phase; vac; hyd
Standfordville	13.8	7071 Ckt.	MV-90		EM			Single priode, your sys
Standfordville	13.8	7072 Ckt.	MV-90	**-**	EM			Volts
Standfordville	13.8	B1	SCADA					
Standfordville	69/13.8	T1	MV-90	Fuse				
Standfordville	69/13.6					2100		n had a single data
Sturgeon Pool	<del>Д</del> т	341 Ckt.	Grid Sense		EM		Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	Com Equipment	3,76 00,100					Com
Sturgeon Pool	69	N Line	SCADA	υP				
Sturgeon Pool Sturgeon Pool	69	O Line	SCADA	uP				
Sturgeon Pool	69	P Line	SCADA	up				Volts
Sturgeon Pool	69	69k Bus	SCADA	EM				AOUS
Sturgeon Pool		Ť5	None	Fuse				
Sugarloaf	<del>                                     </del>					44-500		
Sugarloaf	115	SD Line	00.151	EM		+	*****	Combine load value
Sugarloaf	115	SJ Line	SCADA	EM				35/15/12/1000 10/00
Sugarloaf	115	SL Line	None	EM		****		
Sugarloaf	115	B1	SCADA	EM				Volts
Sugarloaf	115/69	O & R Transformer	SCADA	EM			<del></del>	
Tinkertown	113/63	O & R Transformer	- SCADA			2300	<del>                                     </del>	Radio to PVL
	43.0	7022 Ckt.	SCADA		UP		<del> </del>	Radio to FVE
Tinkertown	13.8	7022 CRt.					**-**	
Tinkertown	13.8		SCADA	*****	uP	7		
Tinkertown	13.8	7024 Ckt.	SCADA		uP			
Tinkertown	13.8	7025 Ckt.	SCADA		uP			
Tinkertown	13.8	81	SCADA		uP	*****	<u> </u>	Volts
Tinkertown	13.8	B2	SCADA		υP	*****		Volts
Tinkertown	13.8	Com Equipment		*****				Com
Tinkertown	69/13.8	T1	SCADA	Fuse				
Tinkertown	69/13.8	T2	SCADA	Fuse	*****			
Tioronda						M-4000		·
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/uP			8E1-851H as 8U and 79
Tioronda	13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	W-566 Ckt. Sw	*****	EM				Agastat
Tioronda	13.8	B1	SCADA		EM			
Tioronda	115/13.8	T1	Charts - kW/kVAr	EM				Volts
Todd Hill				<del></del>		2200	<del> </del>	.i
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
Todd Hill	13.8	6052 Ckt	SCADA		uP			<del> </del>
Todd Hill	13.8	6053 Ckt.	SCADA	*****	uP		<del></del>	<u> </u>
Todd Hill	13.8	6054 Ckt.	SCADA		υP		<del></del>	<del> </del>
Todd Hill	13.8	6055 Ckt.	SCADA	<del></del>	EM			1
Todd Hill	13.8	6056 Ckt.	SCADA	<del></del>				<u> </u>
Todd Hill	13.8	6057 Ckt.			EM			<u> </u>
Todd Hill	13.8		SCADA		EM			
Todd Hill	115	Com Equipment						Com
		A Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill Todd Hill	115	A-520-C BKR.		EM				
		C Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	13.8	W - 524 BKR.			EM			
Todd Hill	115	B1	SCADA			****		Volts
Todd Hill	13.8	81	SCADA		EM/uP			95BU is SEL-351A; Volts
Todd Hill	13.8	B2	SCADA		uP			Volts
Todd Hill	115/13.8		SCADA	EM/uP				95P is SEL-587
Todd Hill	115/13.8	T2	SCADA	υP				

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			Electric Subs	tation Ut	Needs Assessment				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment	
	5.005 (/					2200		Volts	
Union Ave	115	81	SCADA	υP				7010	
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF	
Union Ave	115	RJ-52 BKR.		EM/uP					
Union Ave	115	UB Line	SCADA	up					
Union Ave	115	UB-51 BKR		<u>uP</u>				Amps	
Union Ave	115	UN Line	SCADA*	EM EM				Amps	
Union Ave	115	UW Line	SCADA*	EM			****		
Union Ave	115	W-1095 BKR. 81		*****	UP				
Union Ave Union Ave	13.8	B2			υP			Volts	
Union Ave	13.8	B3	SCADA		uP			Volts	
Union Ave	13.8	84	SCADA		υP			¥ OrtS	
Union Ave	13.8	B3-B2			uP	*****			
Union Ave	13.8	B4-B1	4-4		UP CM/-D			BE1-851H as BU and 79	
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4042 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4043 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4044 Ckt.	WV-90		EM/uP				
Union Ave	13.8	4045 Ckt.	MV-90		EM/uP		~	BE1-851H as BU and 79 BE1-851H as BU and 79	
Union Ave	13.8	4046 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4047 Ckt.	SCADA		uP				
Union Ave	13.8	4051 Ckt.	SCADA	breke	uP		*****		
Union Ave	13.8	4052 Ckt.	SCADA		UP				
Union Ave	13.8	4053 Ckt.	SCADA		uP υP				
Union Ave	13.8	4054 Ckt.	SCADA SCADA		uP				
Union Ave Union Ave	13.8	4055 Ckt. Com Equipment	SCADA			<del></del>		Com	
Union Ave	115/13.8	T1	SCADA	EM/uP				Com 958U is SEL-387E	
Union Ave	115/13.8	T2	SCADA	EM/uP			*****	95BU is SEL-387E	
Union Ave	115/13.8	T3	SCADA	uP				3080 ts 322-3672	
Van Wagner						NONE			
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd	
Van Wagner	4	732 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd	
Vinegar Hill						W-4000			
Vinegar Hill	34.5	2389 Ckt.	MV-90	-A	uΡ		RVE	3 phase; oil; hyd	
West Balmville						2300			
West Balmville	115	B2	SCADA	EM			*****	Volts	
West Balmville	13.8	B1	SCADA		uP			Combine Bus Volts to one point	
West Balmville	13.8	B2			υP				
West Balmville	115	B Line	SCADA	uP		<del> </del>	*****		
West Balmville	13.8	4011 Ckt.	MV-90	****	EM			10/100	
West Balmville West Balmville	13.8 13.8	4012 Ckt. 4013 Ckt.	SCADA		uP uP			MV-90 still?	
West Balmville	13.8	4013 CRt. 4014 Ckt.	SCADA SCADA		uP uP			MV-90 still? MV-90 still?	
West Balmville	13.8	4014 Ckt.	MV-90		EM	<del> </del>		MA-20 Still (	
West Balmville	13.8	Com Equipment						Com	
West Balmville	115	DB Line	SCADA	uP					
West Balmville	115	DB-875 BKR.		ψP			<del></del>		
West Balmville	115	DW Line	SCADA	υP					
West Balmville	115	DW-662 BKR.		υP					
West Balmville	115	F Line	SCADA	υP			* 1 6114		
West Balmville	115	R Line	SCADA	υP					
West Balmville	115	W-478 BKR.		υP					
West Balmville	115	W-855 BKR.		UP_				<u> </u>	
West Balmville	115	WN Line	SCADA	uP			<del></del>		
West Balmville		T1	SCADA	EM			<del></del>	Combine load value	
West Balmville		T2	3020	EM		•			
Livest Damitthe									

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			Electric Sub	station Upgra	ide Negos as			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Refaying	RTU	Recloser	Comment
181 4 1	<del> </del>							
Westerlo	13.8	1091 Ckt.	SCADA		uP .			
Westerlo	13.8	1092 Ckt.	SCADA		UP			
Westerlo		1093 Ckt.	SCADA		uP		22-2-	
Westerlo	13.8	B1	SCADA		υP			
Westerlo	13.8					*****		Only has one 13.8 bus; T1 = Bus load
Westerlo		Com Equipment	SCADA	uP		****		Only has one 13.8 dds, 11 = 883 load
Westerlo	69/13.8	T1 Cap Bank	JOADA	υP				
Westerlo	69	FW Line	SCADA	υP				
Westerlo	69	NW Line	SCADA	υP		*****		
Westerlo Westerlo	69	FW-1500-NW BKR	,	uP				
Wiccopee		1 11 12 12				L&N		
Wiccopee	115	FS Line	None	EM	*****			
Wiccopee	115	WP Line	None	uP				
Wiccopee	115	FS - 1652- WP BKR.		EM				<u> </u>
Wiccopee.	13.8	F1-292 BKR			EM			
Wiccopee	13.8	F2-280 BKR			E₩			
Wiccopee	13.8	W-368 BKR.			EM			
Wiccopee	13.8	W-378 BKR.	*****		EM			
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.			EM			<del> </del>
					EM	<del>}</del>	<del>                                     </del>	
Wiccopee	13.8	Future (Unit #3)						
Wiccopee	13.8	Future (Unit #9)			EM			
Wiccopee	13.8	, B1		-114	EM			·
Wiccopee	13.8	B2			EM			<del> </del>
Wiccopee	13.8	Com Equipment			*****		*****	Com
Wiccopee	115/13.8	T1	SCADA	EM				
Wiccopee	115/13.8		SCADA	EM				
Woodstock	45.5				<u> </u>	M-4000	1	
Woodstock	13.8	3011 Ckt.	MV-90		EM			
Woodstock	13.8	3012 Ckt.	MV-90		EM			
Woodstock	13.8	3013 Ckt.	MV-90		EM			<del> </del>
Woodstock	13.8	3014 Ckt.	MV-90		ĒM.		*****	<del></del>
Woodstock	13.8	B1	SCADA		EM		4==4	Volts
Woodstock	13.8	B2	SCADA		EM			Volts
Woodstock	69/13.8	T2+SR Line	*****	EM				1
Woodstock	69/13.8	T2 + B2		EM				<del></del>
Woodstock	69/13.8	T1	MV-90			*****		
Woodstock	69/13.8	T2	MV-90			<del> </del>		<del></del>

	<del></del>
Station	Cost
Dashville	\$190,000
East Walden	\$610,000
Tioronda	\$200,000
Coxsackie	\$130,000
South Cairo	\$160,000
East Park	\$200,000
Pleasant ∀alley	\$360,000
Todd Hill	\$160,000
Sand Dock	\$510,000
Fishkill Plains	\$480,000
South Wall St.	\$84,000
Manchester	\$340,000
Forgebrook	\$730,000
Rock Tavern	\$1,060,000
	Dashville East Walden Tioronda Coxsackie South Cairo East Park Pleasant Valley Todd Hill Sand Dock Fishkill Plains South Wall St. Manchester Forgebrook





# **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Sand Dock Relay Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

#### Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All electromechanical relays at Sand Dock Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

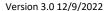
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

## **Budget Submittal Form**





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

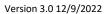
Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? None





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	r cost estimates sh e adjustments for i			
	\$1,133,000	TOTAL	Prior Years Actuals +	Year 1	Year 2	Year 3	Year 4	Year 5	Future Years
			Projections	2024	2025	2026	2027	2028	
	Labor (Weekly Payroll)	107,000	0	0	0	10,000	97,000	0	0
	Labor (Monthly Payroll)	54,000	0	0	0	5,000	49,000	0	0
A	Stock Materials	54,000	0	0	0	5,000	49,000	0	0
D	Non-Stock Material (A/P taxable)	216,000	0	0	0	21,000	195,000	0	0
ı	Contractors (A/P tax exempt)	77,000	0	0	0	9,000	68,000	0	0
Т	Overheads	539,000	0	0	0	52,000	487,000	0	0
I	AFUDC*	32,000	0	0	0	3,000	29,000	0	0
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,079,000	0	0	0	105,000	974,000	0	0
R	Labor (Weekly Payroll)	8,000	0	0	0	0	8,000	0	0
E	Labor (Monthly Payroll)	16,000	0	0	0	0	16,000	0	0
H	Contractors (A/P tax exempt)	3,000	0	0	0	0	3,000	0	0
R	Overheads	27,000	0	0	0	0	27,000	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		54,000	0	0	0	0	54,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



## **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

 Cost Estimate Range:
 Minimum (\$):
 793,100
 Maximum (\$):
 1,472,900

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

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Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

## L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact; 2) Customer Services (Line Forces) to sid in fault locating and thereby limiting patrol time and area; 3) perations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### Introduction:

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability. Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### Discussion:

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

## C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

#### Attachment 2

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### Discussion:

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

## Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti: (Manl	Cost	
	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

			Tin	ne			Cost		
Retrofit Options			Manh	ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9
Grid Sense Meter	W / VAr	•	are for the Line		E and	\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	takes	the line	man an	d the	\$2,272			\$2,700
POT Line		10 m	15 minu n data co			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tim	ne and	15			\$430	\$430
Site Registration	per D/C	Trav	utes of el to ea	ch site l	has	-waived-			1
TOTAL GS Installation	) 	been assumed to be 1 hour.						\$9,000	
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

#### **Attachment 3**

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### Re: Remote Terminal Unit Review

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### **Discussion:**

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

#### **Attachment 4**

Copy to:

Mr. P.E. Haering Mr. H.W.Turner

Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

#### Discussion:

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### Conclusions:

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control -

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

## Appendix 1: Estimated Costs of Retrofit Options

Editor and a factor	C	ost	
Retrofit Options	Parts	TOTAL	
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2
R-Mag Breaker	\$25,000	\$90,000	

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

Voltage Voltage T Relaying D. Relaying RTU Recloser Comment				Electric Sub	station Upgra	ide Meeds Wa	Sessment		
Second   A	Substation	1	Line/Ckt.				į	Recloser	
Accord 4 RF CVI Company		0.000		C2		EM	NONE		
Ancertain   13.8   7965 CH   W1920   SADA   Accord	4					NONE		Only has a 13.8 Voltage Regulator	
Spring	Ancram	13.8	7085 Ckt.	Grid Sense			NONE		
Samproville   4   411 CM   W. O.     EM   C.580   Matering Source?		T				EM			
Barringst		4							
Sampage		4	412 Ckt.	MV-90			C-300		
Berneget   115   CFD Line   ARTS   EM									Metering source?
Barriegal   115		115							
Barringst   115									
Emringat   11511.8   T.   SCADA   EM		115	KB-749-KC BKR						IPM Foods
Barringst   11971-8   72		115/13.8				+			IBM reeds
Barregal   13.8   51   SCADA   EM		115/13.8							
Barnegat   13.8   S   S   S   S   S   S   S   S   S		· 13.8							IBM Feeds
Barrel   19   \$2,734 GR   \$CADA		13.8					Ļ		
D-20		13.8							IBM Feeds
Beacon   13.8   909.6 Cht   SCADA   EM			S2-734 BKR	SCADA		EM	<del></del>		
Seacon   13.8   8005 CM.   SCADA   EM							+		
Beacon   13.8   8015 Ckt   SCADA   EM		13.8	8006 Ckt.	SCADA		EM			
Beacon						EM			Previously 8087A?
Beacon									
Beacon   4   89.3 Ckt   SCADA   EM							+	<del>                                     </del>	<del> </del>
Beacon   4	Beacon							*****	ļ
Bescon	Beacon	4	803 Ckt.	SCADA			****	*****	
Beson	Beacon	4	W-414 BKR	SCADA		EM			
Bescon   4	Beacon	4	W-463 BKR	SCADA		EM			
Bescon   4	Beacon	4	Bus 1	SCADA					
Beacon   13.8/4   T1   SCADA   EM		4					<del></del>	<del></del>	
Bescon					<del></del>	<del></del>	+	<del>+</del>	<del>                                     </del>
Beson   13.8   BF Cable   SCADA   EM					<del></del>		<del> </del>	<del></del>	MDB has an entry with T1+T2 calculated
Beacon   13.8								*****	
Beacon   13.8   CM Cubis   SCADA   EM					****				
Bescon								*****	
Beston						EM			
Sethilehem Rd.   13.8				SCADA		EM			†
Sethiehem Rd   13.8		13.8	Bus 2	SCADA		EM		<del></del>	<del> </del>
Bethiehem Rd.   13.8							2400	<del></del>	_ <del></del>
Bethlehem Rd. 13.8 4092 Ckt. MV-90			( 4091 Ckt.	MV-90		EM/uP		·	851-851H as Bill and 79
Bethlehem Rd. 13.8	Bethlehem Rd.	13.8	4092 Gkt.	MV-90		EM/uP		<del></del>	
Bethiehem Rd. 13.8 4094 Ckt. MV-90	Bethlehem Rd.	13.8	4093 Ckt.	MV-96				<del></del>	
Bethiehem Rd.   13.8   4095 Ckt.   MV-90									
Bethiehem Rd.   13.8   4096 Ckt.   MV-90     EM							<del></del>		BE1-851H as BU and 79
Bethlehem Rd.   13.8   4097 Ckt   MV-90     EM									
Bethlehem Rd.         13.8         4098 Ckt.         MV-90         EM         EM           Bethlehem Rd.         13.8         Bus 1         EMS         EM            Bethlehem Rd.         113.8         Bus 2         EMS          EM            Bethlehem Rd.         115         RD Line         None         EM              Bethlehem Rd.         115         RD GO-00-UB BKR          EM  .									
Bethlehem Rd.   13.8   4098 Ckt.   MV-90     EM				MV-90		EM		*****	
Bethlehem Rd.         13.8         Bus 1         EMS         EM          EM           BM          BM           BM           BM		13.8	4098 Ckt.	MV-90	2.0	EM			
Bethlehem Rd.         13.8         Bus 2         EMS         —         EM         —         —         Bethlehem Rd         —	Bethlehem Rd.	13.8	Bus 1	EMS					
Bethlehem Rd.   115		13.8	Bus 2						
Bethlehem Rd.	Bethlehem Rd.			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				<del></del>
Bethlehem Rd.				·				·	<del></del>
Bethlehem Rd.   115/13.8   T2   EMS   EM						<del></del>	<del></del>		·-   ·····-
Bethlehem Rd.   115/13.8   T2   EMS   EM		<del></del>		<del></del>		<del></del>			
Bethlehem Rd.   13.8   W-613 BKR									Metering combined
Bethlehem Rd.   13.8   W-619 BKR     EM									motoring opinionies
Berthlehem Rd.   13.8   W-804 BKR     EM         EM									
Bordman Rd.   13.8   6081A Ckt.   EM       EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM						EM			
Bordman Rd.   13.8   6081A Ckt.   EM		13.8	W-804 BKR			EM			
Bordman Rd.         13.8         6082A Ckt.         —         EM         —         —         EM         —         —         EM         —         —         EM         —         —         —         EM         —	Bordman Rd.						NONE		
Bordman Rd.         13.8         6082A Ckt.         EM          EM           EM	Bordman Rd.	13.8	6081A Ckt.			EM			
Bordman Rd.         13.8         Z-203 Ckt.         EM           Bordman Rd.         13.8         Z-204 Ckt.         EM           Bordman Rd.         13.8         Z-205 Ckt.         EM           Bordman Rd.         13.8         Z-206 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-208 Ckt.         EM	Bordman Rd.	13.8	6082A Ckt.						
Bordman Rd.   13.8   Z-204 Ckt.   EM									
Bordman Rd.         13.8         Z-204 Ckt.         EM	Boroman Rd	13.8							
Bordman Rd.   13.8   Z-205 Ckt.     EM	Bordman Rd	13.8	Z-204 Ckt.						
Bordman Rd.   13.8   Z-206 Ckt.     EM       Bordman Rd.   13.8   Z-207 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM			Z-205 Ckt.						
Bordman Rd.         13.8         Z-206 Ckt.         EM            Bordman Rd.         13.8         Z-207 Ckt.          EM            Bordman Rd.         13.8         Z-208 Ckt.          EM						EM			
Bordman Rd.   13.8   Z-207 Ckt.   EM   EM   EM   EM   EM   EM   EM   E	Bordman Rd	i. 13.8							·
Bordman Rd. 13.8 Z-208 Ckt EM	Bordman Ro	13.8	Z-207 Ckt.					<del></del>	
FM						EM			
		J. 13.0				FM			

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Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2100		
Boulevard		OB Line	SCADA	UP	,			
Boulevard	69	N Line	SCADA	υP				
Boulevard	69	1 Line	SCADA	uP				Line Amps & W/VAr
Boulevard	13.8	KO Line	SCADA		uP			
Boulevard Boulevard	13.8	KK Line	SCADA		uP EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1012	SCADA		UP			
Boulevard	13.8	Ckt. 1013	SCADA		EM/uP	*****		
Boulevard	13.8	Ckt. 1014	SCADA		EM			
Boulevard	13.8	Bus 1	SCADA		EM			
Boulevard	13.8	Bus 2	SCADA	EM				
Boulevard	69	Bus 1	SCADA					
Boulevard	69	Bus 2	SCADA	EM	<del></del>			
Boulevard	69	Overall		EM				
Boulevard	69/13.8	T1	SCADA	EM				Metering combined
Boulevard	69/13.8	T3	SCADA	EM			<del></del>	<del> </del>
Boulevard	69/13.8	T2	SCADA	EM		11,400	*****	1
Clinton Ave.	00,.00					M-4000		
Clinton Ave.	4	395 Ckt.	MV-90		EM		*****	
Clinton Ave.	4	396 Ckt.	MV-90		EM			<del></del>
Clinton Ave.	4	397 Ckt.	MV-90		EM			4
Clinton Ave.	4	Bus	SCADA		***			·
Clinton Ave.	13.8/4	T1	MV-90		Fuse			
Cold Spring	10,07					NONE		
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two
Cold Spring	4	872 Ckt.	Charts - kW		EM			eircuits.
Coldenham						D-20		· · · · · · · · · · · · · · · · · · ·
Coldenham	13.8	4021 Ckt.	SCADA _		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	****	uP-200/uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP - 200/ uP			95P is SEL-251
Coldenham	13.8	4024 Ckt.	SCADA	*****	uP- 200/ ∪P			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		. uP- 200/ uP	****		95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
Coldenham	13.8	4027 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM		*****	
Coldenham	13.8	Bus 2	SCADA		EM		****	
Coldenham	13.8	B1-B2 Tie			EM			
Coldenham	115	J Line	SCADA	Gen 1				95P is DLP; 95BU is REL-301; part o
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
Coldenham	115/13.8	T1	SCADA	EM				
	115/13.8	T2	SCADA	EM				
Coldenham Coldenham	115/13.8	J-19-CW BKR	SCAUA	SS			<u> </u>	
Converse St.	110	1 0-19-044 DVW		<u> </u>		NONE	1	
Converse St.	4	121 Ckt.	M(V-90		E₩			
Converse St.	4	122 Ckt.	MV-90		EM			
Converse St.	4	123 Ckt.	MV-90		EM			
Conway Place	+	J1			<u> </u>	NONE		
Conway Place	4	881 Ckt.	MV-90		EM			
Conway Place	4	882 Ckt.	MV-90		EM			
	<del></del>	602 CKt.	187-30	·		8890		
Coxsackie	120	1074 Cb+	Charte - Amns	1	EM			
Coxsackie	13.8	1071 Ckt.	SCADA/ Charts - kW		EM			Bitronics for the SCADA portion
Coxsackie	13.8	1072 Ckt.			EM/uP			BE1-851H as BU and 79
Coxsackie	13.8	1074 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
Coxsackie	13.8	1076 Ckt.	SCADA/ Charts - kW	<del>_</del>	EM			
Coxsackie	13.8	Bus 1 (T1+G1)	SCADA					
		Bus 2	???		EM			Metering data available through relay,
Coxsackie	13.8	DUS 4	<del> </del>					
Coxsackie	69	CN Line	None	uP				configured.
0	69	NC Line	SCADA	uP		<del>_                                     </del>		95P is SEL-587
	1 03	110						301 13 0 4 2 4 37
Coxsackie Coxsackie	22122	8 T1	Charts - Amps	υP/EM	1			

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Coxsackie

			Electric Subs	itation opgia	GC 14000.0 1 11			
	Voltage	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU	Recloser	Comment
Substation	Class (kV)	Line/CKC				2100		Siemens meters 485 to RTU Al
				EM				Signate meters 485 to RTU A
Danskammer		AC Line	SCADA - Amps	EM				Sigmens meters 485 to RTU Al
Danskammer	115	DC Line	SCADA - Amps	uP uP				Siemens meters 485 to RTU AI
Danskammer	115	DB Line	SCADA - Amps	UP				Siemens meters 485 to RTU AI
Danskammer	115	DR Line	SCADA - Amps	uP				Siemens meters 485 to RTU Al
Danskammer	115	DW Line	SCADA - Amps	EM				Siemens meters de la
Danskammer	115	RS Line	SCADA - Amps	SS				
Danskammer	115	W - 323 8KR		EM		·		
Danskammer	115	North Bus	SCADA - Volts	EM				
Danskammer Danskammer	115	Middle Bus	SCADA - Volts SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA: VOIG	UP	****			
Danskammer	115	DB-1171 BKR DR-1421 BKR		υP				
Danskammer	115	DW-1061 BKR	****	υP				
Danskammer	115	T5&T6	SCADA	EM		2300	1	
Danskammer	115	15616					V4L	Single Phase; Vac; Hydr
Dashville		345 Ckt.	- MV-90		EM		746	
Dashville	4	Bus			EM			Fused Transformer w/ CR 67 relay
Dashville	6.6	T1		EM				Puses transferment
Dashville		G1-G2	SCADA					
Dashville	<del> </del>	31.02						
East Fishkill 345kV		C9751 Breaker A1 BF		EM		***		
East Fishkill 345kV	345	C9751 Breaker A2 BH		EM				
East Fishkill 345kV	345	Transformer #1 Alt. 1		EM				
East Fishkill 345kV		Transformer #1 Alt. 2	SCADA	EM			*****	
East Fishkill 345kV	115	Transformer #1 Aic. 2				8890		
East Fishkill East Fishkill	115	EF Line	ŞCADA	uP*				95P is MDAR; 95BU is Optimho - Replacing with 311C & D60.
	115	HF Line	SCADA	up*				95BU is Optimho - Replacing with D60.
East Fishkill East Fishkill	115	EF-672 BKR		E.M				
East Fishkill	115	EF-679 BKR		EM				
East Fishkill	115	W-640 BKR		ÉM	*****			
East Fishkill	115	T1	SCADA	see EFB				
East Kingston	- ,,,,					Orion		
	13.8	Bus 1	SCADA		υP			
			SCADA		υP			
East Kingston	13.8	Bus 2	Q0/10/-				/	
East Kingston East Kingston	13.8	8us 2 1021 Ckt.	SCADA		υP			
East Kingston East Kingston East Kingston	13.8				υP			
East Kingston East Kingston East Kingston East Kingston	13.8 13.8	1021 Ckt.	SCADA		uP uP		Na grafter as	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8	1021 Ckt. 1022 Ckt.	SCADA SCADA		บP บP บP	*****	1, 21, 12	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt.	SCADA SCADA SCADA SCADA SCADA		uP uP uP uP	4444	to get the se	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA		ชค ชค ชค ชค ชค		1, 21, 12	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA		υΡ υΡ υΡ υΡ υΡ υΡ		14 palate	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP		14 14 14 14 14 14 14 14 14 14 14 14 14 1	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP			
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1027 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP UP		Name of the second of the seco	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP UP		Name of the second of the seco	Com
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP		Lands Lands	Com
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP UP		Land and the second a	Com
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP		The second secon	
East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment 8 T1 8 T2	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA		UP UP UP UP UP UP UP		The second secon	BE1-851H as BU and 79
East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment .8 T1 .8 T2	SCADA		UP UP UP UP UP UP UP UP UP UP		10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.5 13.8 13.8 11.5 11.5 11.5 11.5	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment 18 T1 18 T2	SCADA SCADA	UP UP UP UP UP	UP UP UP UP UP UP UP UP UP UP UP UP UP U	8890	Table 1	BE1-851H as BU and 79
East Kingston East Kingston	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	1021 Ckt. 1022 Ckt. 1023 Ckt. 1024 Ckt. 1025 Ckt. 1026 Ckt. 1027 Ckt. 1028 Ckt. 1027 Ckt. 1028 Ckt. ER Line LR Line LR-201-ER Breaker Com Equipment .8 T1 .8 T2 .6073 Ckt. 6074 Ckt.	SCADA		UP UP UP UP UP UP UP UP UP UP		Table 1	BE1-851H as BU and 79

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Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)					2400	<u> </u>	3 phase; oil; electronic; GS not working
ast Walden					EM/uP		ES	3 phase; oil; electronic; GS not working
East Walden	13.8	5041 Ckt.	Grid Sense		EM/uP		ES	GS not working
East Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
East Walden	13.8	5043 Ckt.	Grid Sense					
East Walden	13.8	Com Equipment			uP			95P is DLP; part of replacement program
	13.8	81	SCADA					already.
East Walden			None	Gen1/uP				aireauy.
East Walden	115	CW Line		EM				
East Walden	115	CW -712	11-00	EM			<del></del>	
East Walden	115	D Line	None	EM				
East Walden	115	D-722 BKR	SCADA	υP				
East Walden	115	DW Line	SCADA	UP				
East Walden	115	DW-1071 BKR	SCADA	UP				
East Walden	115	EM Line	SCADA	uP				Amps & Volts
East Walden	115	EM-642 BKR	SCADA	UP				Aniha a voira
East Walden	69	WM Line		EM				
East Walden	115	W-644		EM				Combine Bus Volts to one point
East Walden	115	B1	SCADA	EM				
East Walden	115	82		uP/EM				95P is SEL-587
East Walden	69/13.8	T1	SCADA	EM/uP				95BU is SEL-587
East Walden	69/13.8	T3	SCADA	I EM/UP	<u> </u>	D-20		
Fishkill Plains	Т"				EM/uP			BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM			
Fishkill Plains	13.8	8092 Ckt.	MV-90		uP-200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	\$CADA					SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.	SCADA		uP-200			02220 1100
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA	<u> </u>	υP			95BU is Optimho; part of replacemen
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1			84494	program.
Fishkill Plains	115	HF-703 BKR		EM				
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	υP		*****		
Fishkill Plains	115	A-1036-FP		uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498		นค- 200				279/2BFR relays
Fishkill Plains	115	Com Equipment						Com
Fishkill Plains	115	FP Line	SCADA	uP/Gen 1				95P is DLP; part of replacement progr already; 95BU is SEL-321
Fishkill Plains	115	81	SCADA	EM				
Fishkill Plains	13.8	B1			EM			Combine Bus Volts to one point
Fishkill Plains	13.8	B2	SCADA		EM			
Fishkill Plains	115/13.8			EM/uP				95BU is SEL-587; metering is combin
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	
Forgebrook	1,3,13.6					2300		
Forgebrook	13.8	Bus #1	D1 -1- 112731		EM			
Forgebrook	13.8	Bus #2	Charts - kW/kVAr		EM			
	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP		*****	BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - kW		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook		8014 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8016 Ckt.	Charts - kW		EM			No Chart Data
Forgebrook	13.8	Com Equipment	Cilares - Kit					Com
Forgebrook		FO Line	None	EM				
Forgebrook	115		none	EM				
Forgebrook	115	FO-1430-FT		EM				
Forgebrook	115	FT Line	None	EM				
	446							
Forgebrook				EM				
Forgebrook			SCADA	uР				
Forgebrook			None		EM			Amps
Forgebrook	13.				EM			
Forgebroo		8 BF Line	SCADA		EM			
				*****			****	·
Forgebroo			<del>-  </del>		EM	*****		
Forgebroo	sk 13	.8 W-994	FA6-12	EM				Metering combined
Forgebioc								

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Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	0.000 ()			J		M-4000		The stranger 95011 is RE1-8518
Freehold	12.0	2061 Ckt.	Grid Sense		EM/uP		PR-560M	3 phase; oil; electronic; 958U is BE1-851H; GS not working
Freehold	13.8		Grid Sense		EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H; GS not working
Freehold	13.8	2071 Ckt.	GING SENSE				PR-560M	3 phase; oil; electronic
Freehold	13.8	W-1155 BKR	Charts - kW/kVAr	fuse				
Freehold	13.8	T1	SCADA _		EM			<u> </u>
Freehold	13.8		30,10,			Orion .		1
Galeville Galeville	13.8	B1	SCADA		υP			
Galeville	13.8	82	SCADA		uP			
Galeville	13.8	5030 Ckt.	SCADA		υP			
Galeville	13.8	5031 Ckt.	SCADA		υP		an in he work	
Galeville	13.8	5032 Ckt.	SCADA		up			
Galeville	13.8	5033 Ckt.	SCADA		υP			
Galeville	13.8	5034 Ckt.	SCADA		uP			
Galeville	13.8	5035 Ckt.	SCADA		υP			<u> </u>
Galeville		Com Equipment						Com
Galeville	69	MG Line	SCADA	UP				
Galeville	69	MG-200-MK BKR		υP				
Galeville	69	MK Line	SCADA	υP				<del>-  </del>
Galeville	69/13.8	T1	SCADA	υP				
Galeville	69/13.8	T2	SCADA	UP UP	<del>                                     </del>	<del></del>		
Greenfield Rd.	99/13.0	12	SCAUA	( UF	1	10.4000	****	
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense			M-4000		
Greenfield Rd.	13.8	3078 Ckt.			EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	4	375-376 Ckt.	Grid Sense		EM/uP	*****	ES	3 phase; oil; electronic; 958U is BE1-851
Greenfield Rd.	4		Charts - kW		EM			
Greenfield Rd.	13.8	377-378 Ckt. W-1608	Charts - kW		EM			
Greenfield Rd.	13.8/4	T2			EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8	B1	Charts - kW		EM		*****	
Greenfield Rd.	1 4		SCADA		****		*****	Volts
Greenfield Rd.		B1	SCADA		*****			Volts
Greenileio Au.	4	<b>B</b> 3	SCADA					Volts
Grimley Rd.						NONE-Soon to	,	
							1	
Grimley Rd.	4	385 Ckt.	Grid Sense		EM	have DNP RTU	Kyle	Single Phase: Oil: Electronic
	4 4	385 Ckt. 386 Ckt.	Grid Sense Grid Sense		EM EM	have DNP RTU	Kyle Ł	Single Phase; Oit; Electronic
Grimley Rd.				<del></del>		have DNP RTU		Single Phase; Oit: Electronic No DATA
Grimley Rd. Grimley Rd.				<del></del>	EM	have DNP RTU	· · · · · · · · · · · · · · · · · · ·	No DATA
Grimley Rd. Grimley Rd. Hibernia	4	386 Ckt. 7011 Ckt.	Grid Sense , SCADA		EM UP- 200/ UP	have DNP RTU		No DATA 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia	13.8	386 Ckt.	Grid Sense SCADA SCADA		uP- 200/ uP uP- 200/ uP	Micro 1C	#144p	95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia	13.8 13.8	386 Ckt. 7011 Ckt. 7012 Ckt.	Grid Sense SCADA SCADA SCADA SCADA		UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP	Micro 1C	#1000 #1000	No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8 69/13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1	Grid Sense SCADA SCADA SCADA SCADA	  EM/uP	UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP	Micro 1C	2114	No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1	Grid Sense SCADA SCADA SCADA SCADA		UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP	Micro 1C	#1000 #1000	No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8 13.8 69/13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1  Com Equipment	Grid Sense  SCADA  SCADA  SCADA  SCADA  SCADA	EM/ <sub>U</sub> P	EM  uP- 200/ uP  uP- 200/ uP  EM/uP	Micro 1C		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls	13.8 13.8 13.8 69/13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1  Com Equipment  3021 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/ <sub>V</sub> P	EM  uP- 200/ uP  uP- 200/ uP  EM/uP	Micro 1C	A	No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8 13.9 69/13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment  3021 Ckt. 3022 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/UP	EM  uP- 200/ uP  uP- 200/ uP  EM/uP   uP- 200/ uP	Micro 1C   Micro 1C   D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/uP	EM  uP- 200/ uP  uP- 200/ uP  EM/uP   uP- 200/ uP  uP- 200/ uP	Micro 1C  Micro 1C  D-20		No DATA  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM//P	UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP UP - 200/ UP	Micro 1C  Micro 1C  D-20		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment  3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt, 3025 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/UP	UP- 200/ UP UP- 200/ UP EM/UP UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment  3021 Ckt. 3022 Ckt. 3023 Ckt. 3025 Ckt. HK Line	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/UP	UP- 200/ UP  UP- 200/ UP  EM/UP  UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3025 Ckt. HK Line HK-696-P BKR.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/UP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C   Micro 1C   D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  Com  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line	Grid Sense  SCADA	EM//P	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C  Micro 1C  D-20    D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95F is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	Grid Sense  SCADA	EM/UP	### EM  ### 200/ UP  ### 200/ UP  ### EM/UP  ### 200/ UP  ### 200/ UP  ### 200/ UP  ### 200/ UP  ### UP- 200/ UP  ### UP- 200  ### UP- 200  ### UP- 200  ### UP- 200/ UP	Micro 1C   Micro 1C   D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-938 BKR. B1	SCADA SCADA	EM/UP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	Grid Sense  SCADA	EM/UP	UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP	have DNP RTU		No DATA  95P is SEL-251; 95BU is SEL-501  95F is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is SEL-251; 95BU is SEL-501  95BU is SEL-251
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-938 BKR. B1	Grid Sense  SCADA	EM/UP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C  Micro 1C  D-20   D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  95P is SEL-251; 95BU is SEL-501  95BU is SEL-251
Grimley Rd. Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR. B1 B2 Com Equipment	Grid Sense  SCADA	EM/UP	UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP  UP - 200/ UP	have DNP RTU		No DATA  95P is SEL-251; 95BU is SEL-501  95F is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is SEL-251; 95BU is SEL-501  95BU is SEL-251

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			Electric Subs	station obs	1,000,00			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Ciass (KV)		. <u></u>			2300	<u> </u>	95BU is B£1-IPS-100
Highland			SCADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA		EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			3080 13 82
Highland	13.8	5083 Ckt.	SCADA		uP			
Highland	13.8	5084 Ckt.	SCADA		uP			
Highland	13.8	5085 Ckt. HR Line	SCADA	υP				
Highland	115	OR Line	SCADA	υP			L.————	
Highland	115	OR-761-HR BKR.		EM	EM			
Highland Highland	13.8	B1	SCADA		UP UP			
Highland	13.8	82	SCADA		Ur			Com
Highland	13.8	Com Equipment		υP/EM	V			958U is SEL-587
Highland	115/13.8	T1	SCADA					
Highland	115/13.8	T2	SCADA	uP	1	D-20		
Honk Falls	T				EM	0-20	WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EW		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA	<u> </u>	EMI			
Honk Falls	13.8	B1	SCADA	EM				79 Relay is EM
Honk Falls	69	GM Line	SCADA	EM/uP				
Honk Falls	69	HG Line	SCADA	UP				79 Relay is EM
Honk Falls	69	HK Line	SCADA	uP/EM				
Honk Falls	69	MK Line	SCADA	UP P				79 Relay is EM
Honk Falls	69	WH Line	SCADA	uP/EM EM				70 1000 1000
Honk Falls	69	overall diff B1+T1	SCADA		<del></del>			100
Honk Falls	69/13.8	71		fuse	_1	M-4000	<del>                                     </del>	
Hunter				<del>_</del> ,		181-4000	VR-3S	3 phase; vac; hyd
Hunter	34.5	Z-666	MV-90			*****	Kyle W	3 phase; oil; hyd
Hunter	13.8	2081 Ckt.	WIV-90		EM	+	1131001	5 51,000, 011,334
Hunter	13.8	Cap Bank				2400	<del>                                     </del>	<del>-</del>
Hurley Ave. 345kV	345	30151 BKR.	****	EM				79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF	****	uP			*****	13 Kelay IS CIII
Hurley Ave. 345kV	345	30152 A2 BF		EM				<del> </del>
Hurley Ave. 345kV			SCADA	uP				<u> </u>
Hurley Ave. 345kV	345	301 Line A1		EM				
Hurley Ave. 345kV	345	301 Line A2	SCADA			<del> </del>		79 Relay is EM; In process replacement w
Hurley Ave. 345kV	345	30353 BKR.		EM*				SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		up				
Hurley Ave. 345kV	345	30353 AT BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV		30354 BKR.		EM*				79 Relay is EM; In process replacement w SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM				
Hurley Ave. 345kV		30354 A2 BF	*****	EM*				In process replacement with GE C70
Hurley Ave. 345kV		303 Line A1	SCADA	uP				
Hurley Ave. 345kV		303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV		Bus A1	30202	EM				
Hurley Ave. 345k		Bus A2		EM				
Hurley Ave. 345k		A2451 BKR.		EM		****		
Hurley Ave. 345k\		A2451 A1 BF		EM			**	
Hurley Ave. 345k		A2451 A2 BF	****	EM				
Hurley Ave. 345k		T1 A1 Out of Step	*****	EM				
Hurley Ave. 345k		T1 A2 Out of Step	*****	EM				
Hurley Ave. 345k		T1 A1		EM				
Hurley Ave. 345k		T1 A2	Works	M3				
Hurley Ave. 345k		TILS		uP				V-14-
HUNTEY AVE. 343A	V 115	B1	SCADA					Volts

			Electric Subst	anni ahaio	OC 110000 100			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Marie Area	,,,,,					2400		BE1-851H as BU and 79
Hurley Ave.	13.8	2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps	*****	EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Hurley Ave. Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		CMITOF			
Hurley Ave.	115	Cap Bank		EM		*****		
Hurley Ave.	115	HP Line	SCADA	EM	<u> </u>			Quadramho part of the package; metering
	69	l line	SCADA	Gen1				Amp value only
Hurley Ave.			SCADA	EM				a destate and the package; metering
Hurley Ave.	115	OR Line						Quadramho part of the package; metering  Amp value only
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
	115	HP-1643 BKR.		EM				
Hurley Ave. Hurley Ave.	115	OR-1640 BKR.		EM				
Hurley Ave.	69	W-142 BKR.		uP			ļ	
Hurley Ave.	13.8	W-1575 BKR.			EM	****	ļ	<del> </del>
Hurley Ave.	115	W-389 BKR.		EM				<u> </u>
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM	Auto			Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	Т3	SCADA	€M			Ţ	
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				
inwood Ave.		·				3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	*****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/oP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
inwood Ave.	13.8	Com Equipment			**-**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115	IR-201-X BKR		υP				
Inwood Ave.	115	X Line	SCADA	· uP				
	13.8	B1	SCADA		uP			<del></del>
Inwood Ave.	13.8	82	SCADA		υP			
Inwood Ave.	115/13.8	T1	SCADA	υP	**			
Inwood Ave.	115/13.8	Τ2	SCADA	υP		10.4000		
Jansen Ave. Jansen Ave.	130	1001 011	807 00		] · · · · · · · · · · · · · · · · · · ·	M-4000		
Jansen Ave. Jansen Ave.	13.8	1001 Ckt. 1002 Ckt.	MV-90 MV-90		UP EM			· · · · · · · · · · · · · · · · · · ·
				*****				
Jansen Ave. Jansen Ave.	13.8	1003 Ckt. 1004 Ckt.	MV-90 MV-90		uP EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM			<u> </u>
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM		- 10-410-5	
Jansen Ave.	13.8	Com Equipment	SCADA	<del></del>				Com
Jansen Ave.	13.8	T - Grounding	MV-90		υP			, , , , , , , , , , , , , , , , , , , ,
Kerhonkson		, c. ounding	10.4.00	· · · · · · · · · · · · · · · · · · ·		8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense	-1	EM		Kyle D	Single phase; oil; hyd; No GS Dat:
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat
	69	MK-929 MOS		EM				
Kerhonkson		MK-930 MOS	*****	EM				
Kerhonkson	69		1	fuse				Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS					701100 101 00011 1701013
Kerhonkson	69/13.8			fuse				Volts & Amps
Kerhonkson	69	HK	SCADA					
(Common)	69	MK	SCADA					Volts & Amps

			Electric Substa	mon upg. a	INCEUS PIS	111111111111111111111111111111111111111		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	1					2100		Not sure if charts were removed
Knapps Corners	<del> </del>	8021 Ckt.	Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners	13.8	8022 Ckt.	Charts - Amps		EM/uP			Not sure if charts were removed
Knapps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		UP/EM			BE1-851H as BU and 79
Knapps Corners	13.8	8024 Ckt.	Charts - kW		EM/uP			
Knapps Corners	13.8	8025 Ckt.	Charts - kW		EM			Com
Knapps Corners	13.8	Com Equipment						
Knapps Corners Knapps Corners	115	K8 Line	None	EM		*****		SEL-279
Knapps Corners	115	KB-1558-MC BKR.		υΡ- 200 <b>υ</b> Ρ				
Knapps Corners	115	SK Line	SCADA	EM	† — — — ·			Amps
Knapps Corners	13.8	KN Line	SCADA*	EM				Amps
Knapps Corners	13.8	KR Line	SCADA*	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				
Knapps Corners	69	KM Line	SCADA	EM				
Knapps Corners	69	TR Line		uР				
Knapps Corners	69	G Line	SCADA		EM			
Knapps Corners	13.8	W-1215 BKR.			L_F91			
Knapps Corners	69	W-1409 BKR.		<u>uP</u>	EM			
Knapps Corners	13.8	W-1462 BKR.			EM		****	
Knapps Corners	13.8	B1						Combine Bus Volts to one point
Knapps Corners	13.8	82	SCADA		EM			• • • • • • • • • • • • • • • • • • • •
Knapps Corners	13.8	B3			EM			Volts
Knapps Corners	69	69k Bus	SCADA	EM		+		
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		EM		Ļ		
Knapps Corners	115/69	T2	SCADA	υP		M-4000		<u> </u>
Lawrenceville		<del></del>		510/-5		WI-4000	CXE-400A	3 phase; oil; hyd
Lawrenceville	34,5	2385 Ckt.	Grid Sense	EM/uP		<del></del>	CAETOOA	Volts
Lawrenceville	34.5	<u>B1</u>	SCADA*					
Lawrenceville	69/34.5	T1	MV90/Grid Sense/SCADA	EM				Amps.
Lincoln Park						2300		Com
Lincoln Park	13.8	Com Equipment	Charles Assess		EM	+	1	Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps		EM		*****	1
Lincoln Park	13.8	2012 Ckt.	Charts - kW			+		BE1-851H as BU and 79
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP EM			BET-03TH as CO and 13
Lincoln Park	13.8	2014 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM		pa-a-	OCTOMISMING THE PROT
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1 Cap Bank 2			EM			
Lincoln Park.		HP Line	None	EM				Relay Replacement Progam in proc
Lincoln Park	115			EM				1000
Lincoln Park	115	HP-1318 BKR.						Amps to SCADA
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				74.100 to 00.101
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uP	EM			<del></del>
Lincoln Park	13.8	W -1321 BKR.	2-4-4		EW			
Lincoln Park	13.8	W-45 BKR. W-534 BKR.			EM			1
Lincoln Park	13.8	W-554 BKR.			EM			·
Lincoln Park	13.8	WT-206 BKR.			EM			
Lincoln Park			77-7-		EM			
Lincoln Park	13.8	WT-207 BKR.			EM			
Lincoln Park	13.8	WT-525 BKR.	*****		EM			
Lincoln Park	13.8	WT-528 BKR.			EM			Combine Bus Volts to one poi
Lincoln Park	13.8	B1	SCADA		EN			Combine Bos voits to one por
Lincoln Park	13.8	B2	<u> </u>					Volts
		B3	SCADA		EM			
			None		EM			Volts
Lincoln Park	13.0		SCADA	EM				- VOICO
Lincoln Park								Combine load value
Lincoln Park	( 115			\ EM				COMPINE 1080 14:00
Lincoln Park Lincoln Park	115	3.8 T1	SCADA	EM	<del></del>			Combine load 14.55
Lincoln Park Lincoln Park Lincoln Park	k 115/13	3.8 T1		EM EM			****	COMBINE 1000 1000

			Electric Subs	station Upgra	de Needs As	sessment ———		<u> </u>
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2400		BE1-851H as BU and 79
Manchester		<del></del>	MV-90		EM/uP			8E1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			8E1-851H as BU and 79
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP			
Manchester	13.8	6094 Ckt.			EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	- UF	EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EW			
Manchester	13.8	W-650 BKR.		<del></del>	EM			2 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Manchester	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Manchester	13.8	82						<u> </u>
Manchester	115/13.8	Τ1	SCADA	EM		<del></del>		Combine load value
Manchester	115/13.8	т2		EM		2000		7777
Mariboro	T					8890		
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			8E1-IP\$100 as 80 and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP		****	Volts
Marlboro	115/13.8	T1	SCADA	uP/EM*				95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP				
Maryland Ave.						M-4000		
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			1
Maryland Ave.	4	622 Ckt.	Charts - kW		EM			
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Ckt.	Charts - kW		EM		*	<del></del>
Maryland Ave.	13.8	MS Line			EM			<u> </u>
Maryland Ave.	13.8	PH-284 BKR.			EM	*****		·
Maryland Ave.	13.8	PH-286 BKR.			EM	+		
Maryland Ave.	4	W-1032 BKR.			EM			<del></del>
Maryland Ave.	4	W-1033 BKR.			EM			*
Maryland Ave.	4	W-1034 BKR.			EM			· · · · · · · · · · · · · · · · · · ·
Maryland Ave.	13.8	B1	SCADA		EM			Votts
Maryland Ave.	13.8	82	<del></del>	<del> </del>	EM			
Maryland Ave.	13.8	91	SCADA		EM			Volts
Maryland Ave.	4	82	SCADA	*****	EM	****	_	Volts
Maryland Ave.	13.8/4	T1			EM		<del></del>	· <del> </del>
		T2			EW			- +
Maryland Ave.	13.8/4	1 2	1	*	E3M	M-4000		
Maybrook Maybrook	13.8	5051 Ckt.	MV-90	· · · · · · · · · · · · · · · · · · ·	EM	WI-4000	RXE	3 phase; oil; electronic
	13.8	5051 Ckt.	MV-90		uP		- RAE	
Maybrook							<del></del>	Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90	*****	EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Mayorook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None					
Maybrook	69/13.8	τ2	None					
McKinley St.						NONE		
McKinley St.	4	845 Ckt.	MV-90		EM			

			Electric Subs	ration obdis	8 14CCM2 142			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
<u> </u>	0.033 (7)					BM		
Aerritt Park			SCADA		uР			
Rerritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA		uP			· · · · · · · · · · · · · · · · · · ·
Werritt Park	13.8	8063 Ckt.	SCADA	ļ	uP		+	
Aerritt Park	13.8	8064 Ckt.			υP		+	
Aerritt Park	13.8	8065 Ckt.	SCADA		uΡ			
Aerritt Park	13.8	8066 Ckt.	SCADA SCADA		uP		_ —	
Werritt Park	13.8	8067 Ckt.	SCADA		uP			Com
Vierritt Park	13.8	8068 Ckt.						
Merritt Park	13.8	Com Equipment WF Line	SCADA	υP				
Merritt Park	115		SCADA	uP				SEL-279
Merritt Park	115	WP Line	35707	uP-200				3,2,2,13
Merritt Park	115	WF-439-WP BKR.	SCADA		uP			
Merritt Park	13.8	B1	SCADA		uP			
Merritt Park	13.8	B2	SCADA	uP				
Merritt Park	115/13.8	T1		UP				
Merritt Park	115/13.8	T2	SCADA	J. UF	<del></del>	BM		
Milan				т	uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA		- Ur		*****	Com
Milan	13.8	Com Equipment			<u> </u>			
Milan	115	B-4561 Ckt Sw		uP				
Milan	115	MR Line	SCADA	uP				
Milan	115	MR-501 BKR.	SCADA	υP		<del></del>		-
Milan	115	RT-7 BKR.		υP				
Milan	115	R-10 BKR.		υP				
Milan	115	T-7 Line	SCADA	υP				
Milan	115	10 Line	SCADA		υP			
Milan	115	B1	SCADA	υP				
Milan	13.8	B1	SCADA		uP			
Milan	115/13.8	T1	SCADA	υP				<u></u>
Millerton						L&N		
Millerton	13.8	7081 Ckt.	SCADA		EM		****	<u> </u>
Millerton	69	GE-823 MOS		EM				
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; T1 = 7081 load
Millerton	69	Line to SMI	SCADA					Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV						BM		
Modena 115kV	13.8	B1	SCADA		υP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			υP			
Modena 115kV	13.8	5011 Ckt.	ŞÇADA		υP			<u> </u>
Modena 115kV	13.8	5012 Ckt.	SCADA		υP			<u> </u>
Modena 115kV	13.8	5013 Ckt.	SCADA		uР			
Modena 115kV	13.8	Com Equipment				*****		Com
Modena 115kV	115	EM Line	SCADA	UP				<u> </u>
Modena 115kV	115	EM-201-PX BKR.		υP				
Modena 115kV	115	PX Line	SCADA	υP				
Modena 115kV	115/13.8		SCADA	UP				Only has one 13.8 bus; T3 = Bus k
Modena 69kV	110/133	:_ <del>-</del>				8890		
Modena 69kV	69	B1	SCADA	EM				volts
Modena 69kV	69	MG Line	SCADA	uP				
Modena 69kV	69	W-941 BKR.		EM			*****	
Modena 69kV	69	MG-380 BKR.	1	EM				
			SCADA	EM/uP				
Modena 69kV	115/69		None	Fuse/uP				GE F35 is installed
Modena 69kV	69/13.	8 T2	NOTE			NONE		
16 4			Charts - kW		EM		V4L	Single phase; Vac; Hyd Single phase; Vac; Hyd
Montgomery	4	571 Ckt.					V4L	

			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						NI-4000		volts
Montgomery St.	13.8	B1	SCADA		EM			Volts
Montgomery St.	13.8	B2	SCADA	****	EM			volts
Montgomery St.	13.8	B3	SCADA		EM			
Montgomery St.	13.8	B Line	None		EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4003 Ckt.	Charts - kW/kVAr		EM			
Wortgomery St. Wontgomery St.	4	401 Ckt.	Charts - kW demand		EM	****		
Montgomery St.	4	402-3 Ckt.	Charts - kW demand		EM .			
Montgomery St.	4	404 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand Charts - kW demand		EM			
Montgomery St.	4	410A/B Ckt.			EM			Volts
Montgomery St.	4	81	SCADA SCADA		EM			volts
Montgomery St.	4	B2		7	EM			
Montgomery St.	13.8	F Line	None		EM		*****	
Montgomery St.	13.8	NB Line	None	<del> </del>	EM			
Montgomery St.	13.8	NM Line	None				<del></del>	
Montgomery St.	13.8	R Line	None		EM			
Montgomery St.	13.8	W-507 BKR.			EM			
Montgomery St.	13.8	W-508 BKR.		*****	EM			
Montgomery St.	13.8	W-509 BKR.	****	****	EM			
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	72			EM			Comonie load valde
Myers Corners	<u> </u>					44-550		
Myers Corners	13.8	8041 Ckt.	Charts - kW		uP			
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM			···
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8046 Ckt.	SCADA		UP			
Myers Corners	69	KM Line	None	EM	*****			<del></del>
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.		EM				
Myers Corners	13.8	W-63 BKR.	about		EM			
Myers Corners	13.8	W-66 BKR.		N No.	EM			
Myers Corners	13.8	Feeder M1-75		****	EM .			
Myers Corners	13.8	Feeder M2-76			EM			
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1	ECADA.		EM			
Myers Corners	13.8	B2	SCADA		EM	77***		Combine Bus Volts to one point
Myers Corners	69/13.8	T1	SCADA	EM				5 44 4 4 4
Myers Corners	69/13.8	T2	SCAUA	EM				Combine load value
Neversink						2200		······································
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	~~~~	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM			to the system of	Amps
Neversink	69	WH Line	SCADA*	EM				Amps
Neversink	4	W-1128 BKR.			EM		*****	
Neversink	69	69k Bus	SCADA	uP/EM		*****		Volts
New Baltimore						2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1083 Ckt.	SCADA*		EM			кW
	69	Cap Bank		EM/uP				<del></del>
New Baltimore		<del></del>					*	Com
New Baltimore		Com Equipment		υP				
New Battimore	69	CN Line	None					
		NW Line	None	υP				17.16.
New Baltimore			SCADA		EM			Volts
New Baltimore	e 13.8	B1		EM/AD				95P is SEL-587
		8 71	SCADA				,	301 13 VEE VVI

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( ,			Electric Subs	station Up.	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)			<u> </u>		NONE		No DATA
New Windsor			Grid Sense		EM			No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	463 Ckt.	Grid Sense		EM			RODALA
New Windsor	4	464 Ckt.	None		υP			
New Windsor	13.8	UN & UW ATC			υP			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kVAr		υP			
New Windsor	13.8/4	T2				D-20	<u> — — — т</u>	95P is SEL-251
North Catskill	120	2001A Ckt.	SCADA		นค- 200/ นค			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2003A Ckt.	SCADA		uP- 200/ uP	•		95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA	****	uP- 200/ uP			
North Catskill	13.8	2004 Ckt.	SCADA	****	uP - 200/ uP			95P is SEL-251
North Catskill		2005 Ckt.	SCADA		นค- 200/ นค			95P is SEL-251
North Catskill	13.8		- GCADA					Com
North Catskill	13.8	Com Equipment	SCADA	EM				
North Catskill	115	2 Line	SCADA	EM				
North Catskill	115	R-2 BKR.		EM		<del> </del>		<u> </u>
North Catskill	115	RT-7 BKR.		EM			2	Amps
North Catskill	115	T-7 Line	SCADA*		<u> </u>			
North Catskill	69	Cap Bank		EM				
North Catskill	69	CL Line	SCADA	υP				
North Catskill	69	H Line	SCADA	uP	ļ			
North Catskill	69	NC Line	SCADA	UP		*****		check on TD-5
North Catskill	69	W-1107 BKR.		EM/uP*				check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*				
North Catskill	115	W-791 BKR.		uP- 200				SEL-2BFR
North Catskill	69	W-269 & W-1107 BKR			EM			US -
North Catskill	115	B1	SCADA	EM	•			Volts
North Catskill	69	81	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP			*****	Volts
North Catskill	13.8	B1	SCADA		EM/uP			Volts; 95BU is DFP-100
North Catskill	13.8	B2	SCADA		EM/uP			Volts; 95BU is DFP-100
North Catskill	115/69	T4	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	1 77	SCADA	EM/uP				95BU is DFP-100

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			Electric Subs	tation Upgra	de Needs As	sessment		The state of the s
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
North Chelsea	<del> </del>							
	13.8	8051 Ckt.	SCADA		UP _			
North Chelsea	13.8	8052 Ckt.	SCADA		uP			
North Chelsea	13.8	8053 Ckt.	SCADA		υP			
North Chelsea		8054 Ckt.	SCADA		uP ,			
North Chelsea	13.8		SCADA		υP			
North Chelsea	13.8	8055 Ckt.	SCADA		υP			
North Chelsea	13.8	8056 Ckt. 8057 Ckt.	SCADA		uP			
North Cheisea	13.8	8057 Ckt.	SCADA		uP			Com
North Cheises	13.8	Com Equipment					<del></del>	
North Chelses	115	AC Line	SCADA	uP				
North Chelsea North Chelsea	115	AC-1086 BKR.		UP				
North Chelsea	115	DC Line	SCADA	υP		,		<u> </u>
North Chelsea	115	DC-1414 BKR.		υP		*****		
North Chelsea	115	FO-1482 BKR.		UP.				
	115	FO Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.	SCADA	υP				
North Chelsea				υP		<del></del>		
North Chelsea	115	SC Line	SCADA				<del>                                     </del>	
North Chelsea	115	SC-1566 BKR.		uP	<del>                                       </del>	<del> </del>	<del></del>	
North Chelsea	69	TV Line	SCADA	υP		<u> </u>	<u> </u>	
North Chelsea	115	B-2651 BKR.	****	uP		*****	*****	
North Chelsea	115	B-2652 BKR.	2.4.4	υP	**			
North Chelsea	115	B-2653 BKR.	44141	υP				
North Chelsea	115	W-1572 BKR.	*****	υP				
North Chelsea	115	B1	SCADA	υP				
North Chelses	13.8	B1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP		<del></del>	<del></del>
North Chelsea	115/69	71	SCADA	υP			<del></del>	<u></u>
North Chelsea	115/13.8	T2	SCADA	uP uP				<del></del>
North Chelsea	115/13.8	†3 †3	SCADA	UP				
Ohioville	775715.0	11	GCADA	<u> </u>		2400		Volls
Ohioville	42.0	5021 Ckt.	Ob. 4	<del></del>	ENTL-D	2100	<del>-</del>	
	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5022 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/qP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA	<u> </u>	υP			
Ohioville	13.8	Com Equipment						Com
Ohioville	115	Cap Bank		EM				
Ohioville	69	O Line	None	υP				
Ohioville	69	OB Line	None	υP				
Ohioville	115	QR Line	None	EM	*****			
Ohioville	115	OR-1075 BKR.		EM				
Ohioville	115	PX Line	SCADA	EM/uP			~~~~	
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				
Ohiovitte	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM				Volts
Ohioville	69	69k Bus	SCADA	EM				Volts
		B1		CAI	EM			VOIS
Ohioville	13.8		None				<del></del>	<del></del>
Ohioville	13.8	B2	None		EM			
	115/13.8	T1	50454	EM				Combine load value
Ohioville			- SCAUA					
Ohioville Ohioville	115/13.8		SCADA SCADA	EM/uP-200				95BU is SEL-251

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#### Electric Substation Upgrade Needs Assessment Comment Recloser RTU D. Relaying Voltage T. Relaying Metering Line/Ckt. Substation Class (kV) 2300 Grid owns Line --------Pleasant Valley υP \$CADA\*\* 8 Line 115 ----Pleasant Valley UΡ Grid owns Line SCADA 10 Line 115 ---Pleasant Valley υP Grid owns Line SCADA\*\* --------115 12 Line Pleasant Valley 95BU is Optimho; in replacement plan υP ----SCADA\*\* ----13 Line 115 Pleasant Valley EM/Gen-1 SCADA C Line --------115 Pleasant Valley EM SCADA 115 M Line ----Pleasant Valley υP Com SCADA X Line Pleasant Valley 115 ----SEL-279 Com Equipment ----\*\*\*--115 uP- 200 Pleasant Valley SEL-279 R-12 BKR. 115 Pleasant Valley UP- 200 SEL-279 R-13 BKR ----115 ----Pleasant Valley uP- 200 ----R-8 BKR. 115 Pleasant Valley ----ЕΜ RC-6 BKR. ----115 Pleasant Valley EM ----RM BKR. ----115 Pleasant Valley ---υP RX-4 BKR. -----Con Ed owns the Bkr 115 Pleasant Valley EM SCADA\*\* Con Ed owns the Bkr R-61 BKR Pleasant Valley 115 ..... EM ----SCADA\*\* R-62 BKR. 115 Pleasant Valley ----EM -----R-643 BKR. 115 Pleasant Valley .... ΕM ----R-81 BKR. Pleasant Valley 115 Volts -----SCADA ĘΜ 81 Pleasant Valley 115 Volts ----ĒΜ -----SCADA **B2** 115 Pleasant Valley kW υP SCADA\* Pleasant Valley 69 E Line kW ---υP G Line SCADA\* Pleasant Valley 69 kW ۲P ----SCADA\* 69 Q Line Pleasant Valley Volts ---υP SCADA 81 Pleasant Valley 69 E₩ --------13.8 W-387 Pleasant Valley Con Ed owns bank and protection .... ----SCADA 345/115 51 Pleasant Valley ΕM .... T10 SCADA Pleasant Valley 115/69 D-20 **Pulvers Corners** V4L single phase; vac; hyd EΜ 7091 Ckt. SCADA ----13.8 Pulvers Corners single phase; oil; hyd EM Kyle L 7092 Ckt. SCADA -----13.8 Pulvers Corners RVE 3 phase; oil; hyd EM SCADA Pulvers Corners 34.5 7395 Ckt. Com ----13.8 Com Equipment ----**Pulvers Comers** EM Cap Bank Pulvers Corners 69 Volts SCADA --------69 B1 **Pulvers Corners** Volts .-------SCADA 34.5 81 **Pulvers Corners** Volts ----SCADA ---------13.8 B1 Pulvers Corners Fuse <u>T1</u> SCADA 69/13.8 Pulvers Corners 95P is SR-745 -----EM/uP T2 None 69/34.5 Pulvers Corners

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			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (KV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del> </del>					2100		
Reynolds Hill	<del></del>	5554 653	Charts - kW		EM			
Reynolds Hill	13.8	6001 Ckt.	SCADA	4774-	UP .			
Reynolds Hill	13.8	6004 Ckt.	Charls - kW		EM			
Reynolds Hill	13.8	6005 Ckt.	SCADA		υP			
Reynolds Hill	13.8	6008 Ckt.	30,40,4					Com
Reynolds Hill		Com Equipment		uP				
Reynolds Hill	115	DR-1418 BKR. DR Line	SCADA	uP				
Reynolds Hill	115	HR-1285 BKR.	30804	EM			*****	
Reynolds Hill Reynolds Hill	115	HR Line	SCADA	υP			*****	
Reynolds Hill	115	IR Line	SCADA	υP				
Reynolds Hill	13.8	B Cable	SCADA		uP			
Reynolds Hill	13.8	W Cable	SCADA		uP			
Reynolds Hill	13.8	PD Cable	SCADA		uP			
Reynolds Hill	13.8	PH Line	SCADA		υP	++		
Reynolds Hill	13.8	PK Line	SCADA	****	uP			
Reynolds Hill	13.8	PO Line	SCADA		υP			
Reynolds Hill	13.8	PQ Line	SCADA		υP			
Reynolds Hill	13.8	PS Line	SCADA		υP			
Reynolds Hill	13.8	PU Cable	SCADA		₩P			
Reynolds Hill	115	T-31 BKR.		EM		*****	· · · · · · · · · · · · · · · · · · ·	
Reynolds Hill	115	B1	SCADA	EM			<del></del>	
Reynolds Hill	115	B2	SCADA	EM EM		†		Volts
Reynolds Hill	13.8	81	SCADA				****	Volts
Reynolds Hill	13.8	B2	SCADA		EM/uP			958U is SEL-501
Reynolds Hill	13.8	83	SCADA		υP			Volts
Reynolds Hill	115	W-1543 BKR.	SCADA	EM	uP		****	Volts
Reynolds Hill	115/13.8	T3	SCADA	EM/uP				
Reynolds Hill	115/13.8	T4	SCADA	EM/uP			2227	95P is SEL-351A
Rhinebeck		L. 1	3CADA	I EM/UP				95P is SEL-351A
Rhinebeck	13.8	7051 Ckt.	Charts - kW/SCADA	<del></del>	T	2300		
Rhinebeck	13.8	7052 Ckt.			uP- 200/ טP			95P is SEL-251; 95BU is SEL-501
Rhinebeck	13.8	7053 Ckt.	Charts - Amps		EM		*****	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Rhinebeck	13.8		Charts - Amps		EM			
		7054 Ckt.	Charts - Amps		EM			
Rhinebeck	13.8	7055 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Rhinebeck Rhinebeck	13.8	7056 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
		Com Equipment						
Rhinebeck	69	Cap Bank	*****	EM				
Rhinebeck	115	ER Line	SCADA*	uP				Amps
Rhinebeck	1,15	LR-830-MR BKR.		UP				, 01, 50
Rhinebeck	115	MR Line	None	ijΡ				
Rhinebeck	69	Q-1471 BKR.		EM				
Rhinebeck	13.8	W-1017 BKR.	2-0-0		EM			
Rhinebeck	13.8	W-1238 BKR.			EM			
Rhinebeck	69	W-258 BKR.		EM				
Rhinebeck	13.8	W-367 BKR.			EM EM			
Rhinebeck	69	Q Line	SCADA*					Volts
Rhinebeck	13.8	B1	SCADA		EM			T
Rhinebeck	13.8	B2	none	*****	EM			Combine Bus Volts to one point
Rhinebeck	69	69kV Bus	SCADA				*****	Volts
Rhinebeck	69/13.8	T1	SCADA*	EM	**			Amps & Volts
Rhinebeck	69/13.8	₹2	SCADA*	EM				Amps & Volts
Rhinebeck	115/13.8	T4	SCADA	EM				
Rhinebeck	115/69	T3	SCADA	EM				

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			Electric Subs	tation Ups	ِی Needs As:	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
24512/						2100		
Rock Tavern 345kV	345	311 Line A1	SCADA	uP				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV Rock Tavern 345kV	345	3456 BKR.		EM				
Rock Tavern 345kV	345	3456 BF A1		UP				
Rock Tavern 345kV	345	3456 BF A2		up l				
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345KV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345kV	345	Cap Bank 2 A1	1	EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	υP			****	
Rock Tavern 345kV	345	34 Line A2 37751 BKR.	4	EM				
Rock Tavern 345kV	345	37751 BKK.		υP	44			
Rock Tavern 345kV	345	37751 BF A2		EM				
Rock Tavern 345kV	345	37752 BKR.		EM				
Rock Tavern 345kV	345	37752 BF A1		υP			***	
Rock Tavern 345kV	345	37752 BF A2		EM				
Rock Tavern 345kV	345	377 Line A1	·	uP				
Rock Tavern 345kV	345	377 Line A2	SCADA	EM				
Rock Tavern 345kV	345	4255 BKR.		EM				
Rock Tavern 345kV	345 345	4255 BF A1	3555	EM				
Rock Tavern 345kV Rock Tavern 345kV	345	4255 BF A2		EM				
Rock Tavern 345kV	345	42 Line A1		SS				<u> </u>
Rock Tavern 345kV	345	42 Line A2		EM				<u> </u>
Rock Tavern 345kV	345	C3351 BKR.		EM				
Rock Tavern 345kV	345	C3351 BF A1		EM				
Rock Tavern 345kV	345	C3351 BF A2		EW		*		ļ
Rock Tavern 345kV	345	C3352 BKR.		EM			*****	<u> </u>
Rock Tavern 345kV	345	C3352 BF A1		EM .				
Rock Tavern 345kV	345	C3352 BF A2		EM				
Rock Tavern 345kV	345	C3353 BKR.		υP- 200	*****			
Rock Tavern 345kV	345	C3353 BF A1	*****	υP				
Rock Tavern 345kV	345	C3353 BF A2		uP			*****	
Rock Tavern 345kV	345	31153 BKR.		EM				
Rock Tavern 345kV		31153 BF A1		υP			****	
Rock Tavern 345kV	345	31153 BF A2		υP				<u> </u>
Rock Tavern 345kV		31154 BKR.		EM				
Rock Tavern 345kV		31154 BF A1		EM				
Rock Tavern 345kV		31154 BF A2	*****	EM	*****			
Rock Tavern 345kV		Com Equipment						Com
Rock Tavern 345kV		B1 A1		EM				<del> </del>
Rock Tavern 345kV		B1 A2	was to	EM	<u> </u>			
Rock Tavern 345kV		B2 A1	2000	EM		*****		<del></del>
Rock Tavern 345kV		B2 A2	<u> </u>	EM EM				
Rock Tavern 345k\		T1 A1	SCADA	EM				
Rock Tavern 345k\		T1 A2	<del> </del>	uP				<del></del>
Rock Tavern 345k\		T3 A1	SCADA	UP UP				+
Rock Tavern 345k	V 345/115	T3 A2	.1	_ UF				

( )			Flectric Sub	station Up.	Needs As	sessment		
	<del></del>		<u> </u>	1				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	01000 (4.1)					2400	L	
Sand Dock			Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.	Charts		EM	*****		
Sand Dock	13.8	BP-1296 BKR.			EM			<del></del>
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA	<del></del>	EM			
Sand Dock	13.8	GB Line KC-1447-SC BKR.	SCAUA	EM				
Sand Dock	115	KC-1447-SC BKK.	None	EM				
Sand Dock	115 115	SC Line	None	UP				
Sand Dock		SH-886 BKR.			EM			
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-902 BKR.			EM			<u> </u>
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8	TW-910 BKR.			EM			
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM			
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.					<del></del>	
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4						
Sand Dock	13.8	81	SCADA		EM			Combine Due Velte to and point
Sand Dock	13.8	B2			€M			Combine Bus Volts to one point
Sand Dock	13.8	B3			EM	*****		
Sand Dock	13.8	B4	SCADA		EM		****	
Sand Dock	13.8	Τ1	SCADA	EM				Combine load value
Sand Dock	13.8	T3	SCADA	EM		*		
Sand Dock	13.8	T4	SCADA	EM				
Saugerties						Orion		

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			Electric Sub	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Shenandoah	<del> </del>					2400		
	115	East Bus	42423	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	SCADA	EM				
Shenandoah	13.8	B1	20101		EM		1	Combine Bus Volts to one point
Shenandoah	13.8	B2	SCADA		EM			
Shenandoah	13.8	B3		*****	EM		*****	Combine Bus Volts to one point
Shenandoah	13.8	84	SCADA		EM			
Shenandoah Shenandoah	13.8	B5	SCADA		EM			Combine Bus Votts to one point
Shenandoah	13.8	86			EM			
Shenandoah	13.8	B7	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	88			EM EM			
Shenandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2	****		EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5			EM			
Shenandoah	13.8	Cap Bank 6			<del></del>	<del>                                     </del>	1	
Shenandoah	13.8	B-4451 BKR. (CB1)	· •		UP			
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM		<u> </u>	
Shenandoah	13.8	8072 Ckt.	Charts - k₩		EM	·		
Shenandoah	115	EF Line	None	uP/Gen-1				95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM				
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah	115	FS-892-EF BKR.		EM				······································
Shenandoah	115	FS-959 BKR.		EM				
Shenandoah	13.8	Feeder \$1	None		EM			
Shenandoah	13.8	Feeder S2	None		EM			·
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None		EM	7		<del></del>
Shenandoah	13.8	Feeder S5	None	****	EM			
Shenandoah	13.8	Feeder \$6	None		EM	*		<del></del>
Shenandoah	13.8	Feeder S7	None		EM	22122		<del></del>
Shenandoah	13.8	Feeder S8	None		EM:			
Shenandoah	13.8	Feeder S9	None		EM			<del></del>
Shenandoah	13.8	Feeder \$10	None		EM			
Shenandoah	13.8	Feeder S11	None		EM	*****		
Shenandoah	13.8	Feeder S12	None		EM			<del></del>
Shenandoah	13.8	Feeder \$13	None		EM			<u> </u>
Shenandoah	13.8	Feeder S14	None		EM			
Shenandoah	13.8	Feeder S15	None		EM			
Shenandoah	115/13.8	T1		EM				<u> </u>
Shenandoah	115/13.8	T2	SCADA	EM				Combine load value
Shenandoah	115/13.8	Т3	90404	EM				<del> </del>
Shenandoah	115/13.8	T4	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5		EM		1	/	
Shenandoah	115/13.8	T6	SCADA	EM				Combine load value
Shenandoah	115/13.8	T7	SCADA	EM				<del></del>
Shenandoah	13.8	W-1266 BKR.	*****		EM			<del>                                     </del>
Shenandoah	13.8	W-1279 BKR.			EM			+
Shenandoah	13.8	W-1450 BKR.			EM			
Shenandoah	13.8	W-1593 BKR.			EM			****
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	****		EM			<del>* </del>
Shenandoah	13.8	W-802 BKR.			EM			
	13.8	W-803 BKR.			EM			
Shenandoah					EM			
Shenandoah	13.8	W-805 BKR.			EM			
Shenandoah	13.8	W-807 BKR.			L EWI	****		

			Electric Sub	station Upgra	ne iarenz wz	26221116111	<u> </u>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						44-550		<u></u>
Rock Tavern 115kV				EM				
Rock Tavern 115kV	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV	115	115-0.48kV SST					****	Com
Rock Tavern 115kV	115	Com Equipment	SCADA*	EM				Amps
Rock Tavern 115kV	115	D Line		EM	****			
Rock Tavern 115kV	115	D-448 BKR.	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
Rock Tavern 115kV	·			EM				
Rock Tavern 115kV	115	J-788 BKR.	SCADA*	EM				Amps
Rock Tavern 115kV	115	RD Line	SCADA*	EM	****			
Rock Tavern 115kV	115	RD-809 BKR. RJ Line	SCADA*	EM				Amps
Rock Tavern 115kV	115	RJ-818 BKR.	SCADA	EM				
Rock Tavern 115kV Rock Tavern 115kV	115	SL Line	SCADA	EM				
Rock Tavern 115kV	115	SL-684 BKR.		EM				
	115	W-467 BKR.		υP			*****	
Rock Tavern 115kV	_				ļ	-	<del></del>	<del></del>
Rock Tavern 115kV	115	W-681 BKR.	****	EM			****-	
Rock Tavern 115kV	115	W-814 BKR.	****	EM/uP				\$EL-351
Rock Tavern 115kV	115	WM Line	none	υP				
Rock Tavern 115kV	115/69	T2	SCADA	EM				
Roseton Switchyard	ļ					2100	1	
Roseton Switchyard	345	30356 (B6) BKR	****	EM				
Roseton Switchyard	345	30356 (B6) BF A1	*	€M				<u> </u>
Roseton Switchyard	345	30356 (B6) BF A2		EM			*****	
Roseton Switchyard	345	303 Line A1	56454	υP				<del></del>
Roseton Switchyard	345	303 Line A2	SCADA	EM				<del> </del>
Roseton Switchyard	345	30551 (B7) BKR		EM			<del>-                                    </del>	<del></del>
Roseton Switchyard	345	30551 (B7) BF A1		EM		<del> </del>		
Roseton Switchyard	345	30551 (B7) BF A2		EM	<del></del>			<u> </u>
Roseton Switchyard	345	30553 (B3) BKR		EM	- Vene	4		
Roseton Switchyard		30553 (B3) BF A1		UP				
Roseton Switchyard		30553 (B3) BF A2	****	EM	*****	*****		
Roseton Switchyard	345	305 Line A1		uP		<del></del>	****	
Roseton Switchyard	345	305 Line A2	SCADA	EM/uP	<del></del>			
Roseton Switchyard		31151 (B1) BKR	*	EM				SEL-501 for DBC
Roseton Switchyard		31152 (B1) BF A1		···		*****		
Roseton Switchyard		31152 (B1) BF A2		EM				
Roseton Switchyard		31152 (B4) BKR		EM				
Roseton Switchyard		31152 (B4) BF A1		EM				
Roseton Switchyard		31152 (B4) BF A2	··-···	EM				
Roseton Switchyard		311 Line A1	*****	EM				
Roseton Switchyard			SCADA	υP	*			
Roseton Switchyard		311 Line A2	<u> </u>	EM			*****	
		B1		υP				
Roseton Switchyard		B2		υP				
Roseton Switchyard		U1	SCADA	EM				
Roseton Switchyard	d 345	U2	SCADA	EM				<del></del>

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			Electric Subst	tation Ups:	REEUS AS	26231116111		
	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment Radio to INW
	(117)					2300		Radio to itti
Smith Street		004 014	Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			
Smith Street	4	632 Ckt.	Charts - kW		EM EM			
Smith Street	4		Charts - kW		EM			
Smith Street	4	634 Ckt	None		EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street	13.8	PQ Line PS Line	None		EM			
Smith Street	13.8	W Line	None		EM			Volts
Smith Street Smith Street	13.8	81	SCADA		EM			Volts
Smith Street	13.8	B2	SCADA		υP			Volts
Smith Street	4	B1	SCADA		uP			Volts
Smith Street	4	82	SCADA		EM			
Smith Street	13.8/4	T1	None	***	EM			
Smith Street	13.8/4	Т2	None		CM	8890		<u> </u>
Smithfield					√P ∪P			
Smithfield	13.8	7095 Ckt.	SCADA					Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	uP- 200/uP				Amps
Smithfield	69	GE Line	SCADA*	EM		<del></del>	<del></del>	Amps
Smithfield	69	S Line	SCADA*	EM		****		Volts & Amps
Smithfield	69	SA Line	SCADA*	EM			<del></del>	Volts
Smithfield	69	B2	SCADA				*****	
Smithfield	69	B3	SCADA	ļ			<del></del>	Volts Toos I and
Smithfield	69/13.8	T1	None*					Only one feeder; T1 = 7095 load
South Cairo				.,	<del>,</del>	8890		
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP		ļ <del></del>	BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps	ļ	EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			*****	Com
South Cairo	69	CF Line	None	EM/uP			*****	79 done with NLR
South Cairo	69	CL Line	None	υP				<u> </u>
South Cairo	13.8	B1+G1	Charts - kW/SCADA	****	EM			SCADA Volts
South Cairo	69/13.8	T1	Charts - Amps	EM/uP				95P is SEL-587
South Wall St.				<del></del>	-1	None	Veda i	Single Phase; Oil; Hyd
South Wall St.	4	111 Ckt.	Grid Sense		EM		Kyle L Kyle L	Single Phase; Oil; Hyd; missing GS d
South Wall St.	13.8/4	112 Ckt. 71	Grid Sense Charts - kW/kVAr		EM		10/16 2	Shigle Friase, Oil, Hyu, missing 00 0
South Wall St.	13.8/4		Charts - KVV/KV AS			Orion	<del></del>	
Spackenkill	12.0	6041 Ckt.	SCADA		uР		*****	
Spackenkill	13.8			<del></del>	UP UP	<del></del>		<del></del>
Spackenkill	13.8	6042 Ckt.	SCADA		uP			
Spackenkill	13.8	6043 Ckt.	SCADA		uP			
Spackenkill	13.8	6044 Ckt.	\$CADA \$CADA		uP uP			<del></del>
Spackenkill	13.8	6045 Ckt.	SCADA		uP uP			
Spackenkill Spackenkill	13.8 13.8	6046 Ckt. 6047 Ckt.	SCADA SCADA		uP			
Spackenkill	13.8	6048 Ckt.	SCADA		uP			
Spackenkill	13.8	Com Equipment	JOADA					
Spackenkill	13.8	KR Line	SCADA		uP			
Spackenkili	13.8	KS Line	SCADA	*****	uP			
·	13.8	MC Line	SCADA		uP			
Spackenkill		MC-200-SK BKR.	SCADA		uP			
Spackenkill	13.8	**	SCADA		up			
Spackenkill	13.8	B1	3CADA		UP UP			
Spackenkill	13.8	B2	00454	uP				
Spackenkill	115/13.8		SCADA	UP UP		*****		
Spackenkill	115/13.8	T2		UP UP	1	BM		
Staatsburg								
	13.8	7041 Ckt.	SCADA		υP			<del></del>
			SCADA		uР			
Staatsburg		7042 Ckt.			uP			
	13.8	70.10.011	COVDV					The state of the s
Staatsburg	13.8	7043 Ckt.	SCADA					
Staatsburg Staatsburg Staatsburg		7043 Ckt. Com Equipment	SCADA					
Staatsburg Staatsburg	13.8		<del></del>		uP			

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			Electric Subs	tation Upgra	de Needs As	sessment	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					M-4000		
Standfordville	<u> </u>		101.00		EM		V4L	Single phase; vac; hyd
Standfordville	13.8	7071 Ckt.	MV-90	*****	EM	*****		<u> </u>
Standfordville	13.8	7072 Ckt.	MV-90					Volts
Standfordville	13.8	B1	\$CADA	Fuse				<u> </u>
Standfordville	69/13.8		MV-90	1035	l	2100		
Sturgeon Pool	<u></u>			****	EM		Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	341 Ckt.	Grid Sense					Com
Sturgeon Pool	4	Com Equipment	SCADA	uP				
Sturgeon Pool	69	N Line O Line	SCADA	uP				
Sturgeon Pool	69	P Line	SCADA	uP				
Sturgeon Pool	69	69k Bus	SCADA	EM				Volts
Sturgeon Pool	63	T5	None	Fuse				
	<del> </del>					44-500		
Sugarloaf	115	SD Line		EM		+		Combine load value
Sugarloaf Sugarloaf	115	SULine	SCADA	EM				Combine load value
	115	SL Line	None	EM			1	
Sugarloaf			SCADA	EM				Volts
Sugarloaf	115	B1		EM			· <del>   </del>	+ ONS
Sugarloaf	115/69	O & R Transformer	SCADA	EWI		2200		Radio to PVL
Tinkertown	42.0	7000 014		· · · · · · · · · · · · · · · · · · ·	1	2300	<del> </del>	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	UP			
Tinkertown	13.8	7023 Ckt.	SCADA	*****	uP	*****		
Tinkertown	13.8	7024 Ckt.	SCADA	*****	uP			
Tinkertown	13.8	7025 Ckt.	SCADA		uP			
Tinkertown	13.8	81	SCADA		uP	****		Volts
Tinkertown	13.8	B2	SCADA		υP			Volts
Tinkertown	13.8	Com Equipment		**-*-				Com
Tinkertown	69/13.8	T1	SCADA	Fuse				
Tinkertown	69/13.8	T2	SCADA	Fuse				
Tioronda						M-4000		,
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	W-566 Ckt. Sw		EM				Agastat
Tioronda	13.8	B1	SCADA		EM			Volts
Tioronda	115/13.8	Y1	Charts - kW/kVAr	EM				VOICS
Todd Hill						2200	<del></del>	
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
Todd Hill	13.8	6052 Ckt	SCADA		uP			<del> </del>
Todd Hill	13.8	6053 Ckt.	SCADA	*****	uP		<del></del>	<del>                                     </del>
Todd Hill	13.8	6054 Ckt.	SCADA		υP			<del> </del>
Todd Hill	13.8	6055 Ckt.	SCADA		EM			<del> </del>
Todd Hill	13.8	6056 Ckt.	SCADA		EM			<del> </del>
Todd Hill	13.8	6057 Ckt.	SCADA		EW EM			<del> </del>
Todd Hill	13.8	Com Equipment	30,40,4		Elvi			<del> </del>
Todd Hill	115	A Line	None	EM/Gen-1	<del></del>			Com
Todd Hill	115	A-520-C BKR.	None	EM/Gen-1				95BU is Optimho; in replacement plan
Todd Hill	115	C Line	None	EM/Gen-1				66011 2 1 1 1 1 1
Todd Hill	13.8	W - 524 BKR.	None		EM			95BU is Optimho; in replacement plan
Todd Hill	115	B1	SCADA					<del>                                     </del>
Todd Hill	13.8	81	<del></del>		EM/D			Volts
Todd Hill	13.8	B2	SCADA		EM/uP			95BU is SEL-351A; Volts
			SCADA SCADA		UP.			Volts
Todd Hill	115/13.8			EM/uP	1	1		95P is SEL-587

· · · · · · · · · · · · · · · · · · ·			Electric Subs	tation Up	> Needs Assessment				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment	
11 5 - 4 - 4	ļ		·			2200		Volts	
Union Ave	115	B1	SCADA	υP					
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF	
Union Ave	115	RJ-52 BKR.		EM/uP					
Union Ave	115	UB Line	SCADA	up	, <u></u>				
Union Ave	115	UB-51 BKR		uP				Amps	
Union Ave	115	UN Line	SCADA*	EM				Amps	
Union Ave	115	UW Line	SCADA*	EM EM					
Union Ave	115	W-1095 BKR.			υP				
Union Ave	13.8	81			υP				
Union Ave	13.8	B2 B3	SCADA		υP			Volts	
Union Ave	13.8	B4	SCADA		υP			Volts	
Union Ave	13.8	B3-B2			uP	****			
Union Ave	13.8	84-81			υP		,		
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4042 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4043 Ckt.	MV-90	*****	EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4045 Ckt.	MV-90	*****	EM/uP		****	BE1-851H as BU and 79	
Union Ave	13.8	4046 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4047 Ckt.	SCADA		uР				
Union Ave	13.8	4051 Ckt.	SCADA	*****	uP		****		
Union Ave	13.8	4052 Ckt.	SCADA		υP			•	
Union Ave	13.8	4053 Ckt.	SCADA		uP				
Union Ave	13.8	4054 Ckt.	SCADA		υP				
Union Ave	13.8	4055 Ckt.	SCADA	•	uP				
Union Ave	13.8	Com Equipment		*****				Com	
Union Ave	115/13.8	T1	SCADA	EM/uP	*****			95BU is SEL-387E	
Union Ave	115/13.8	Т2	SCADA	EM/uP			*****	95BU is SEL-387E	
Union Ave	115/13.8	T3	SCADA	u₽					
Van Wagner		·				NONE			
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd	
Van Wagner	4	732 Ckt.	Charts - kW/GS		<u> </u>	*****	Kyle L	Single phase; oil; hyd	
Vinegar Hill		<del>,,</del>				M-4000			
Vinegar Hill	34.5	2389 Ckt.	MV-90		uΡ		RVE	3 phase; oil; hyd	
West Balmville						2300			
West Balmville	115	B2	SCADA	EM				Volts	
West Balmville	13.8	B1	SCADA		uP			Combine Bus Volts to one point	
West Balmville	13.8	B2	00:5:	<del></del>	υP			<del>                                     </del>	
West Balmville	115	B Line	SCADA	uР		<del> </del>	*****		
West Balmville West Balmville	13.8	4011 Ckt.	MV-90	*****	EM			100/00-000	
West Balmville	13.8	4012 Ckt.	SCADA		uP uP			MV-90 still?	
SIDAINIPO ICAL	13.8	4013 Ckt. 4014 Ckt.	SCADA		UP UP			MV-90 still?	
	13.8	4014 Ckt. 4015 Ckt.	SCADA MV-90		EM	<del></del>		MV-90 still?	
West Balmville			M A - 2.0			<del></del>		Com	
West Balmville West Balmville	13.8				1				
West Balmville West Balmville West Balmville	13.8 13.8	Com Equipment	SCADA	uP				Cons	
West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line	SCADA	υP				Com	
West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line DB-875 BKR.	SCADA	uP uP				Com	
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115	Com Equipment DB Line DB-875 BKR. DW Line	SCADA	นค บค บค				Com	
West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line DB-875 BKR.	SCADA  SCADA	uP uP				5000	
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR.	SCADA SCADA SCADA	นP บP บP				5000	
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line	SCADA SCADA	นP					
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line R Line	SCADA SCADA SCADA SCADA	นค					
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 11.5 11.5 11.5 11.5 11.5 11.5 11.5 11	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line R Line W-478 BKR.	SCADA SCADA SCADA SCADA	นค				5001	
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line R Line W-478 BKR. W-855 BKR.	SCADA SCADA SCADA SCADA SCADA	иР иР иР иР иР иР иР			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Combine load value	

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			Electric Sub	station Upgra	de Needs As	sessment	T	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Refaying	RTU	Recloser	Comment
Westerlo	<del> </del>					DWI		
	13.8	1091 Ckt.	SCADA		uP .			
Westerlo	13.8	1092 Ckt.	SCADA		UP			
Westerlo	13.8	1093 Ckt.	SCADA		uP			
Westerlo	13.8	B1	SCADA		υP			
Westerlo	75.0	Com Equipment				****		Only has one 13.8 bus; T1 = Bus load
Westerlo	69/13.8	T1	SCADA	uP				Othy has one tole edg,
Westerlo Westerlo	69	Cap Bank		υP				
Westerlo	69	FW Line	SCADA	UP		*****		
Westerlo	69	NW Line	SCADA	υP				
Westerio	69	FW-1500-NW BKR		uP	J	L&N	<del>                                     </del>	
Wiccopee				EM				
Wiccopee	115	FSLine	None	up EM				
Wiccopee	115	WP Line	None	EM			<del></del>	
Wiccopee	115	FS - 1652- WP BKR.			EM			
Wiccopee_	13.8	F1-292 BKR.			EM			
Wiccopee	13.8	F2-280 BKR			EM		****	
Wiccopee	13.8	W-368 BKR.			EW		1	
Wiccopee	13.8	W-378 BKR.	****					
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.			EM		*****	<u> </u>
Wiccopee	13.8	Future (Unit #3)			EM			
Wiccopee	13.8	Future (Unit #9)			EM			
Wiccopee	13.8	, B1		- 10 14-17-0	EM			
Wiccopee	13.8	62			EM			
Wiccopee	13.8	Com Equipment			*****		*****	Com
Wiccopee	115/13.8	T1	SCADA	EM				
Wiccopee	115/13.8	T2	SCADA	EM				
Woodstock						M-4000		
Woodstock	13.8	3011 Ckt.	MV-90	****	EM			
Woodstock	13.8	3012 Ckt.	MV-90		EM			<del> </del>
Woodstock	13.8	3013 Ckt.	MV-90		EM			· · · · · · · · · · · · · · · · · · ·
Woodstock	13.8	3014 Ckt.	MV-90		EM		*****	<del></del>
Woodstock	13.8	B1	SCADA		EM			Volts
Woodstock	13.8	B2	SCADA		EM			Volts
Woodstock	69/13.8	T2+SR Line	*****	EM				
Woodstock	69/13.8	72 + B2		EM				
Woodstock	69/13.8	T1	MV-90			*****		
Woodstock	69/13.8	T2	MV-90					<u> </u>

# Attachment 6

	Station	Cost
	Dashville	\$190,000
2012	East Walden	\$610,000
	Tioronda	\$200,000
	Coxsackie	\$130,000
	South Cairo	\$160,000
2013	East Park	\$200,000
	Pleasant Valley	\$360,000
·	Todd Hill	\$160,000
	Sand Dock	\$510,000
2014	Fishkill Plains	\$480,000
	South Wall St.	\$84,000
2015	Manchester	\$340,000
2013	Forgebrook	\$730,000
2016	Rock Tavern	\$1,060,000
Subs		





Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Merritt Park PLC Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

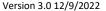
#### Describe the project objective and scope of work:

The first and second generation Programmable Logic Controllers (PLC's) require more extensive maintenance due to age-related component failures. Many of these PLC's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

#### Describe specific scope exclusions, assumptions and constraints:

Planned replacement of PLC located at Merritt Park Substation.







**B. JUSTIFICATION** 

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure Distribution Sustaining

**Discretion Level:** Maintain System Standards **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Replacing obsolete PLC equipment in order to optimize control and communications in Electric Substations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

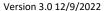
**Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Replacement of obsolete PLC equipment.

Why was the proposed project scope chosen over other alternatives?

N/A: Replacement of obsolete PLC equipment.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project?

Lack of Supervisory control and information in the substation possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process? None

Yes





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	cost estimates sh adjustments for i			
	\$1,192,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	_
	\$1,192,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	108,000	0	0	0	0	108,000	0	0
	Labor (Monthly Payroll)	54,000	0	0	0	0	54,000	0	0
Α	Stock Materials	54,000	0	0	0	0	54,000	0	0
D	Non-Stock Material (A/P taxable)	217,000	0	0	0	0	217,000	0	0
١٢	Contractors (A/P tax exempt)	77,000	0	0	0	0	77,000	0	0
Т	Overheads	541,000	0	0	0	0	541,000	0	0
	AFUDC*	32,000	0	0	0	0	32,000	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,083,000	0	0	0	0	1,083,000	0	0
R	Labor (Weekly Payroll)	16,000	0	0	0	0	16,000	0	0
E	Labor (Monthly Payroll)	33,000	0	0	0	0	33,000	0	0
1:	Contractors (A/P tax exempt)	6,000	0	0	0	0	6,000	0	0
R	Overheads	54,000	0	0	0	0	54,000	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	109,000	0	0	0	0	109,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Minimum (\$): 834,400 Maximum (\$): 1,549,600

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This project was part of the original RTU and PLC Replacement Program that has been separated out by project.



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Sand Dock 15 kV Breaker Replacements

Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/31/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

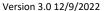
#### Describe the project objective and scope of work:

Central Hudson had an on-going condition based circuit breaker replacement program that has been broken out into individual projects. The majority of power circuit breakers on the Central Hudson System have been in operation for over 40 years. Some of the breakers have operating issues and others are obsolete and do not have spare parts available for repair or maintenance.

#### Describe specific scope exclusions, assumptions and constraints:

The 15 kV BP-1296, BP-1570, TW-902, TW-909, TW-910, W-116, W-1449, W-1453, W-1568, and W-1573 Circuit Breakers at Sand Dock will be replaced.





N/A



**B. JUSTIFICATION** 

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure Distribution Sustaining

**Discretion Level:** Maintain System Standards **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

OS2018-002 Infrastructure Recommendations.pdf and BRP 2024-2028 Five Year Forecast OFFICIAL BA 20230430.xlsx

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

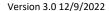
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** No

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project? Risk of circuit breaker failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	cost estimates sh adjustments for i			
	\$1,192,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	108,000	0	0	0	0	108,000	0	0
	Labor (Monthly Payroll)	54,000	0	0	0	0	54,000	0	0
A	Stock Materials	54,000	0	0	0	0	54,000	0	0
D	Non-Stock Material (A/P taxable)	217,000	0	0	0	0	217,000	0	0
Ĭ	Contractors (A/P tax exempt)	76,000	0	0	0	0	76,000	0	0
Т	Overheads	542,000	0	0	0	0	542,000	0	0
1	AFUDC*	32,000	0	0	0	0	32,000	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,083,000	0	0	0	0	1,083,000	0	0
R	Labor (Weekly Payroll)	16,000	0	0	0	0	16,000	0	0
E	Labor (Monthly Payroll)	33,000	0	0	0	0	33,000	0	0
H	Contractors (A/P tax exempt)	6,000	0	0	0	0	6,000	0	0
R	Overheads	54,000	0	0	0	0	54,000	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
'\	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	109,000	0	0	0	0	109,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

953,600

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Maximum (\$): 1,430,400

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

# **INFRASTRUCTURE REVIEW & RECOMMENDATIONS**

#### **VERSION HISTORY**

Memo No.	Date	Action	Author	Approval
OS2018-002	6/25/2018	Initial Document Creation	B. Perry	Jan Myseli

This memo is to memorialize Operations Services annual review of its infrastructure, maintenance and inspection programs for various pieces of substation equipment as well as physical infrastructure. This document will be modified annually.

#### **Breaker Replacement**

Below are the 115kV oil breakers remaining and the planned replacement as identified in the capital budget.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	ROCK TAVERN	115 kV	RJ-818	ALLIS CHALMERS	BZO-115-10000	OIL	1971
2018	ROCK TAVERN	115 kV	W-681	GE	FK-121-43000	OIL	1971
2018	UNION AVE	115 kV	RJ-52	GE	FK-439-115-3500	OIL	1952
2019	WEST BALMVILLE	115 kV	DW-662	ALLIS CHALMERS	BZO-115-7500	OIL	1965
2019	HURLEY AVE	115 kV	HP-1643	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	W-389	ALLIS CHALMERS	BZO-121-40-6	OIL	1973
2019	HURLEY AVE	115 kV	OR-1640	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	A-2451	ALLIS CHALMERS	BZO-121-40-3PST	OIL	1973
2019	ROCK TAVERN	115 kV	W-814	GE	FK-121-43000	OIL	1971
2019	ROCK TAVERN	115 kV	RD-809	ALLIS CHALMERS	BZO-115-10000	OIL	1971

			l .				
2019	ROCK TAVERN	115 kV	J-788	ALLIS CHALMERS	BZO-115-10000	OIL	1971
2020	BETHLEHEM ROAD	115 kV	RD-604-UB	ALLIS CHALMERS	BZO-121-40-6	OIL	1974
2020	PLEASANT VALLEY	115 kV	R-8	SIEMENS	BZO-121-50-6	OIL	1991
2020	PLEASANT VALLEY	115 kV	RX-4	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
2020	PLEASANT VALLEY	115 kV	R-81	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
2020	PLEASANT VALLEY	115 kV	R-10	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
2020	PLEASANT VALLEY	115 kV	R-62	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
2020	PLEASANT VALLEY	115 kV	R-61	MCGRAW EDISON	OHT-54	OIL	1973
2020	PLEASANT VALLEY	115 kV	R-643	ALLIS CHALMERS	BZO-121-40-6	OIL	1980
2021	LINCOLN PARK	115 kV	LR-1219-HP	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2021	LINCOLN PARK	115 kV	HP-1318	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2021	NORTH CATSKILL	115 kV	R-2	SIEMENS	BZO-121-20-7	OIL	1985
2022	SHENANDOAH	115 kV	FS-739	SIEMENS	BZO-121-40-6	OIL	1983
2022	SHENANDOAH	115 kV	FS-959	SIEMENS	BZO-121-40-6	OIL	1983
2022	BARNEGAT	115 kV	KB-749-KC	ALLIS CHALMERS	BZO-121-40-6	OIL	1987
Recommendation Requested	WICCOPEE	115 kV	FS-1652- WP	ALLIS CHALMERS	BZO-121-40-6	OIL	1988

<sup>\*</sup>Wiccopee has essentially no distribution load present. A recommendation about the necessity of this station is required for equipment replacement to be planed appropriately

Outlined below are the 69 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	HURLEY AVE	69 kV	SB-233	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	I-442	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	W-142	GE	FK-69-2500-5	OIL	1963
2019	HONK FALLS	69 kV	GM-737	GE	FK-69-2500	OIL	1963
2019	HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	FZO-151-69F	OIL	1953
2019	HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	FZO-151-69F	OIL	1952
2019	ROCK TAVERN	69 kV	WM-1675	GENERAL ELECTRIC	FK-69-2500-5	OIL	1964
2020	MYERS CORNERS	69 kV	TV-399- KM	SIEMENS	TDO-72.5- 20000	OIL	1981
2023	HIBERNIA	69 kV	E-972	ITE CIRCUIT BREAKER COMPANY	69KSB2500-12	OIL	1967
Substation Rebuild	KNAPPS CORNERS	69 kV	G-1175	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	KM-1185	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	TR-1195	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	W-1409	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981

Outlined below are the 15 kV oil breakers remaining and the associated years of planned replacement.

Anticipated		Voltage				Breaker	Mfg.
Replacement	Location	Class	Position	Manufacturer	Model	Туре	Date
	NEW						
2020	BALTIMORE	15 kV	TD-1081	SIEMENS	SDO-15-500	OIL	1990
	NEW						
2020	BALTIMORE	15 kV	TD-1082	SIEMENS	SDO-15-500	OIL	1982
	NEW						
2020	BALTIMORE	15 kV	TD-1083	SIEMENS	SDO-15-500	OIL	1990
					FK-255-13.8-		
2022	JANSEN AVE	15 kV	K-553	GE	250-1	OIL	1941
					FK-255-13.8-		
2022	JANSEN AVE	15 kV	KL-543	GE	250-1	OIL	1941
2022		4=114			FK-255-13.8-		4044
2022	JANSEN AVE	15 kV	K-583	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	K-593	GE	FK-255-250	OIL	1941
		4=114			FK-255-13.8-		4044
2022	JANSEN AVE	15 kV	KO-533	GE	250-1	OIL	1941
2022	LANCEN AVE	4F IA7	TD 1001	C.F.	FK-255-13.8-	011	1041
2022	JANSEN AVE	15 kV	TD-1001	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	TD-1002	GE	FK-255-13.8- 250-1	OIL	1941
2022	JANSEN AVE	12 KV	10-1002	GE	FK-255-13.8-	OIL	1541
2022	JANSEN AVE	15 kV	TD-1004	GE	250-1	OIL	1941
2022		13 KV	10 1004	GL .	250 1	OIL	1341
2023	STURGEON POOL	15 kV	OS-1	GE	FK-255-150	OIL	1924
2025		13 KV	03-1	GE	FN-255-150	OIL	1924
2022	STURGEON	45114	06.0	0.5	51/5 255	011	4024
2023	POOL	15 kV	OS-2	GE	FKR-255	OIL	1924
	STURGEON						
2023	POOL	15 kV	OS-3	WESTINGHOUSE	E-8	OIL	1924
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	CM-311	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	TD-8006	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	W-426	CHALMERS	Н	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 881	GE	FK-143	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 882	GE	FK-143	OIL	1958
Retirement	PLACE	15 kV	CKT 882	GE	FK-143	OIL	1958

Substation Retirement	MARYLAND AVE	15 kV	W-426	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 881	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 882	GE	FK-46	OIL	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8026	GE	FKD-15.5- 18000-4	OIL	1966
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8027	GE	FK-14.4-500	OIL	1958
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8028	GE	FK-14.4-500-1	OIL	1959

Outlined below are the 5 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
Substation Retirement	BEACON	5 kV	CKT 801	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 802	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 803	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	W-414	GE	FKR-255-7.2- 100-2	OIL	1957
Substation Retirement	BEACON	5 kV	W-463	GE	FKR-255-7.2- 100-2	OIL	1957
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 375	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 376	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 377	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 378	GE	FKR-255-100	OIL	1938

# 345kV SF6 Breaker Replacement

A replacement recommendation is in affect for Westinghouse type SFA SF6 breakers as these breakers have historically been leak prone and maintenance is extremely time consuming because of the design complexity. Outlined below are the type SFA breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2020	HURLEY AVE	345 kV	30354	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2021	HURLEY AVE	345 kV	30353	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2022	HURLEY AVE	345 kV	30151	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976

# **15kV Breaker Replacement**

A replacement recommendation is in affect for Westinghouse type DH and DHP breakers as these breakers are known to have components that contain asbestos. Outlined below are the type DH and DHP breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Break er Type	Mfg. Date
2018	FISHKILL PLAINS	15 kV	TD-8091	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8092	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8093	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8094	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-975	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-976	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-1000	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	UNION AVE	15 kV	W-1105	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-1095	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-837	WESTINGHOUSE	150-DH-500E	AIR	1964
2018	UNION AVE	15 kV	TD-4049	WESTINGHOUSE	150-DH-500A	AIR	1967
2018	UNION AVE	15 kV	UW-1494	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	UN-594	WESTINGHOUSE	150-DH-250A	AIR	1957
2018	UNION AVE	15 kV	TD-4046	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	TD-4045	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4044	WESTINGHOUSE	150-DH-500E	AIR	1969
2018	UNION AVE	15 kV	TD-4043	WESTINGHOUSE	150-DH-500A	AIR	1957
2018	UNION AVE	15 kV	TD-4042	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4041	WESTINGHOUSE	150-DH-500E	AIR	1964
2019	MONTGOMERY ST.	15 kV	NM-384	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	NB-385	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4001	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4002	WESTINGHOUSE	150-DH-500A	AIR	1958

	NAONTCONAEDY						
2019	MONTGOMERY ST.	15 kV	TD-4003	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-507	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-508	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-509	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	R-350	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	F-351	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	B-352	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-359	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	WN-486	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-489	WESTINGHOUSE	150-DH-500A	AIR	1958
2023	SAND DOCK	15 kV	BP-1296	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	BP-1570	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-909	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-910	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1449	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1453	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1568	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1573	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-902	WESTINGHOUSE	150-DHP-500	AIR	1973
2024	REYNOLDS HILL	15 kV	TD-6001	WESTINGHOUSE	150-DHP	AIR	1972
2024	REYNOLDS HILL	15 kV	TD-6005	WESTINGHOUSE	150-DHP	AIR	1973
Substation Retirement	BEACON	15 kV	NM-402	WESTINGHOUSE	150-DH-500E	AIR	1958
Substation Retirement	BEACON	15 kV	TD-8015A	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-408	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-420	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BOARDMAN ROAD	15 kV	Z-201	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-202	WESTINGHOUSE	150-DH-250A	AIR	

Substation Retirement	BOARDMAN ROAD	15 kV	Z-203	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-204	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-205	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-206	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-208	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-209	WESTINGHOUSE	150-DH-250A	AIR	
2025/2026	SHENANDOAH	15 kV	B-4453	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4454	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4455	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	B-4456	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S10-1015	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S11-405	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S12-401	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S13-412	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S14-410	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S7-1102	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	S8-1014	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S9-1009	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	TD-8071	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	TD-8072	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-1059	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-1279	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	W-1593	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-664	WESTINGHOUSE	150-DHP-750C	AIR	1986

2025/2026	SHENANDOAH	15 kV	W-665	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-802	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-803	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-805	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-807	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-845	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-846	WESTINGHOUSE	150-DH-500	AIR	1980
Replacement Deferral	TIORONDA	15 kV	TD-8085	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	TD-8086	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	W-567	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	TD-8087	WESTINGHOUSE	150-DHP-500	AIR	1971

<sup>\*</sup>Operations Services recommends the deferral of the Tioronda breaker replacement until a proper cost benefit switchgear replacement is developed to weigh the value of component replacement (wires, AC power, breakers, etc.) versus entire switchgear. The switchgear condition is questionable (discussed further in later section)

A replacement recommendation is in affect for General Electric type AM breakers as replacement parts are not available for these breakers and continuous issues have been reported. Outlined below are the type AM breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breake r Type	Mfg. Date
2019	COXSACKIE	15 kV	TD-1071	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1072	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1076	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1074A	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-1398	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-296	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-484	GE	AM-13.8-500-6H	AIR	1969
2020	JANSEN AVE	15 kV	TD-1003	GE	AM-15-250-1	AIR	1956
2020	WOODSTOCK	15 kV	TD-3012	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	TD-3013	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-1091	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-25	GE	AM-15-250-1	AIR	2001
2021	NEVERSINK	5 kV	CKT-391	GE	AM-5-150-5	AIR	1950
2021	NEVERSINK	5 kV	W-1128	GE	AM-5-150-5	AIR	1950
Substation Retirement	MARYLAND AVE	5 kV	CKT 623	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	CKT 624	GE	AM-5-150-7	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-1034	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-540	GE	AM-5-150-7	AIR	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1208	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1215	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1462	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1562	GE	AM-13.8-500-5H	AIR	1953
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 395	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 396	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 397	GE	AM-2.4/4.16- 100/150-1	AIR	1968

New Switchgear Recommendation	CONVERSE ST	5 kV	CKT 121	GE	AM-2.4/4.16- 150/250-1	AIR	1955
New Switchgear Recommendation	CONVERSE ST	5 kV	CKT 122	GE	AM-2.4/4.16- 100/150-1	AIR	1955
New Switchgear Recommendation	CONVERSE ST	5 kV	CKT 123	GE	AM-2.4/4.16- 150/250-2	AIR	1955

<sup>\*</sup>Operations Services recommends the replacement of the Converse Street breakers along with the switchgear due to parts constraints, wiring issues, old generation relaying, etc. A cost benefit analysis should be performed to determine the best course of action.

# **Transformer Replacement**

Typically a power transformer's useful life is 55 years old. When rebuilding a substation where the transformer is greater than 55 years old, consideration should be given to retiring and not reusing the transformer. Outlined below are the power transformers that are scheduled for replacement in the 5 year budget.

Location	Asset Name	Age	Plan	Replacement Reason	Condition Analysis
BOULEVARD	TR. #1 PH 1	64	Substation Rebuild	Age	
BOULEVARD	TR. #1 PH 2	64	Substation Rebuild	Age	
BOULEVARD	TR. #1 PH 3	64	Substation Rebuild	Age	
BOULEVARD	TR. #2	78	Substation Rebuild	Age	
BOULEVARD	TR. #3	47	Substation Rebuild	Potential Spare	
CONVERSE ST	TR. #2	62	Transformer Replacement	Condition	Very poor power factor test results and poor oil quality.
CONWAY PLACE	TR. #1	59	Substation Retirement	Substation Retirement	
MONTGOMERY ST	TR. #1	80	Transformer Replacement	Condition	Very poor power factor test results.
MONTGOMERY ST	TR. #2	80	Transformer Replacement	Condition	Very poor power factor test results.
MARYLAND AVE	TR. #1	63	Substation Retirement	Substation Retirement	
MARYLAND AVE	TR. #2	63	Substation Retirement	Substation Retirement	
NORTH CATSKILL	TR. #4	67	Transformer Replacement	Planning Recommendation	
NORTH CATSKILL	TR. #5	62	Transformer Replacement	Planning Recommendation	
NORTH CHELSEA	TR. #1 PH 1	71	Transformer Replacement	Condition	Very poor power factor test results. Poor DGA results.
NORTH CHELSEA	TR. #1 PH 2	71	Transformer Replacement	Condition	Very poor power factor test results.
NORTH CHELSEA	TR. #1 PH 3	71	Transformer Replacement	Condition	Very poor power factor test results. Poor DGA results.
REYNOLDS HILL	TR. #3	64	Transformer Replacement	Age & Refined LTC	
REYNOLDS HILL	TR. #4	66	Transformer Replacement	Age & Refined LTC	
KNAPPS CORNERS	TR. #1	52	Substation Rebuild	Age & Condition	Poor power factor test results and poor oil quality.
KNAPPS CORNERS	TR. #2	40	Substation Rebuild	Condition	Poor DGA results and poor oil quality.

Central Hudson's power transformers are evaluated based on analytical testing data compiled by Operations Services. Outlined below are the power transformers that need to be monitored for decreasing condition. Operations Services is requesting that planning make a recommendation related to the following power transformers.

Location	Asset Name	Age	Comment
ANCRAM	Bank 1 PH 1	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 2	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 3	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
CONVERSE ST	TR. #1	49	High hydrogen content.
FORGEBROOK	TR. #1	60	High hydrogen content. High combustible gas content overall. Oil quality deteriorating. High power factor results on CH insulation.
GREENFIELD ROAD	TR. #2	45	Very high CHL power factor results. Acetylene present in oil likely left over from previous lead damage.
HUNTER	TR. #1	23	High ethylene and ethane content. High combustible content overall.
TINKERTOWN	TR. #2	61	Elevated power factor results across the board. Relative saturation is elevated.

# **Switchgear Replacement**

Switchgear condition is evaluated by Operations Services on a five year schedule. Below is a list of switchgear that has been given a poor evaluation, where replacement needs to be considered.

Location	Asset Type	Comment
MYERS CORNERS	Switchgear	Poor roof condition. Switchgear roof has rotted through allowing water to ingress over relays. Breaker roll in alignment is problematic.
WOODSTOCK	Switchgear	Roof and rust condition is poor. Switchgear wiring and panels have aged. Needs replacement.
SHENANDOAH	Multiple Switchgear	Very difficult to rack breakers in and out due to misalignment and shifting of the switchgear floor. This issue makes switching very challenging.
TIORONDA	Switchgear	Wiring and CTs with the gear are deteriorated. Breakers require 240 VAC which would lead to extensive rewiring. It is recommended that the switchgear be replaced with the breakers
CONVERSE STREET	Switchgear	Switchgear wiring has aged and contains old electromechanical relaying. Parts for the switchgear breakers are hard to procure. It is recommended to couple the replacement of the switchgear breakers with a new switchgear.

Additionally, Operations Services is looking for several recommendations from planning related to the replacement of switchgear and possibility of low voltage conversion to assist with some of the substation initiatives.

- Lincoln Park outdoor switchgear necessity (some of these cables are in poor condition and are out of potentially out of service needs engineering/planning review)
- Shenandoah Bus #1 & Bus #2 switchgears
- Neversink feasibility of 4kV conversion to 13.8kV

# **Switch Replacement**

#### 345 kV Switch Replacement

Recently, problems have developed with the Pascor type TTT-7 and Memco type EA, VR2 and VT-1 style motor operated 345kV air disconnects at the Roseton, Rock Tavern and Hurley Avenue substations. Replacement parts availability is limited for these switch styles.

Operations Services has determined that these disconnects have reached the end of their useful life due to increasing issues, troubleshooting and callouts.

Below is a list of remaining switches that need replacement based on this recommendation in prioritized order. This order can be shuffled if replacements are to be packaged together, but can be followed as a guideline.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
ROCK TAVERN 345 kV	RTB-3451	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3092	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30382	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3091	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30393	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-4483	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30193	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31194	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30181	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB-A- 2492	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31193	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30398	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30394	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30581	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-3493	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-3484	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots

ROCK TAVERN 345 kV	RTB-4491	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-C3392	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB-A- 2491	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3397	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3393	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30192	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3394	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-31191	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3094	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30392	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3396	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3395	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB- 376934	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- 376945	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- C33911	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C- 3093	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31181	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	
ROCK TAVERN 345 kV	RTB-31182	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3398	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3399	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB- C33910	345 kV	MEMCO	EA	1/1/1972	
HURLEY AVENUE - 345kV	HAB- 30191	345 kV	MEMCO	VR2	1/1/1976	
ROSETON SWITCHYARD	RSB-30591	345 kV	MEMCO	VR2	1/1/1970	
ROSETON SWITCHYARD	RSB-30391	345 kV	MEMCO	VR2	1/1/1970	
ROCK TAVERN 345 kV	RTB-4492	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	
ROCK TAVERN 345 kV	RTB-C3373	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB-C3371	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31192	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C-	345 kV	PASCOR	VT-1	1/1/1980	

	3081		ATLANTIC			
ROSETON SWITCHYARD	RSB-C- 3082	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	

# 115 kV Switch Replacement

Operations Services collects and trends hotspot information as well as trouble orders documenting issues with switches over the lifespan of a switch. Below is an identified list of 115 kV switches that are recommended for replacement.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
BARNEGAT	KB-747	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KB-748	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KC-750	115 kV	MEMCO	VM1-204	1987	Reoccurring Hotspots
BARNEGAT	KC-752	115 kV	SOUTHERN STATES	VM-1-104	1987	
INWOOD AVENUE	X-970	115 kV	SOUTHERN STATES	VM-1-208	1975	December Heterete
INWOOD AVENUE	X-977	115 kV	SOUTHERN STATES	VM-1-208	1975	Reoccurring Hotspots
NORTH CATSKILL REACTOR	293	115 kV	PASCOR	CBSA	2014	Reoccurring Hotspots, Adjustment Issues, Poor Quality Construction
PLEASANT VALLEY	1077	115 kV			-	
PLEASANT VALLEY	1099	115 kV			-	
PLEASANT VALLEY	1277	115 kV			-	
PLEASANT VALLEY	1288	115 kV			-	Reoccurring Hotspots causing switches to become
PLEASANT VALLEY	1299	115 kV			-	inoperable. Switches are hand operated and are very difficult to open making operation dangerous
PLEASANT VALLEY	1377	115 kV			-	during switching.
PLEASANT VALLEY	1388	115 kV			-	
PLEASANT VALLEY	1399	115 kV			-	
PLEASANT VALLEY	6177	115 kV			-	

PLEASANT VALLEY	6199	115 kV		-	
PLEASANT VALLEY	6277	115 kV		-	
PLEASANT VALLEY	6299	115 kV		-	
PLEASANT VALLEY	64377	115 kV		-	
PLEASANT VALLEY	64399	115 kV		-	
PLEASANT VALLEY	8171	115 kV		-	
PLEASANT VALLEY	8172	115 kV		-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to
PLEASANT VALLEY	8191	115 kV		-	open making operation dangerous during switching.
PLEASANT VALLEY	8192	115 kV		-	
PLEASANT VALLEY	877	115 kV		-	
PLEASANT VALLEY	888	115 kV		-	
PLEASANT VALLEY	899	115 kV		-	
PLEASANT VALLEY	93932- 44	115 kV		-	
PLEASANT VALLEY	93931- 44	115 kV		-	

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PLEASANT VALLEY	C677	115 kV			-	
PLEASANT VALLEY	C688	115 kV			-	
PLEASANT VALLEY	C699	115 kV			-	
PLEASANT VALLEY	M77	115 kV			-	
PLEASANT VALLEY	M88	115 kV			-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to
PLEASANT VALLEY	M99 115 kV			-	open making operation dangerous during switching.	
PLEASANT VALLEY	Q302	115 kV			-	
PLEASANT VALLEY	X-477	115 kV			-	
PLEASANT VALLEY	X-488	115 kV			-	
PLEASANT VALLEY	X-499	115 kV			-	
TODD HILL	A-523	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C line during recent work order

TODD HILL	A-702	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor
TODD HILL	A-521	115 kV	SIEMENS	CM-4A	1989	problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C
TODD HILL	C-519	115 kV	SIEMENS	CM-4A	1989	line during recent work order

<sup>\*</sup>Model numbers for switches may not always be accurate

Operations Services recommends that the switches at Pleasant Valley be replaced with or prior to the planned replacement of the existing 115kV oil breakers in 2020, a systematic plan needs to be coordinated to allow for proper isolation of each breaker prior to replacement. The existing switch problems will prevent proper clearances to be taken if they are not replaced prior to the breakers.

## **Non-Equipment Based Replacements**

A 5 year substation evaluation program that assesses "non-equipment" assets has been implemented in 2016 to address the following equipment: steel, foundations, fence, ground grid, etc. As projects are identified through this program, Operations Services will bring issues to the attention of Substation Design or manage with local work orders as needed.

#### **Steel Replacement**

As replacement recommendations are identified, this work should be completed with future rebuilds unless there is imminent danger of failure, in which case the repairs should be handled sooner. It is also recommended that during any future rebuilds, that Substation Design evaluates the steel in and around any equipment that will be affected during the work order. An example of this is in 2019, as part of the Boulevard substation upgrade, the steel on the 69kV portion of the yard will be replaced due to condition concerns which were caused by poor foundations.

#### **Foundation Replacement**

These replacement recommendations should be considered during future work order planning to improve the existing infrastructure. Overall foundations are acceptable, with some older stations showing deteriorated foundations due to weather such as flaking. Some flaking is addressed as part of general maintenance by patching the foundations as necessary.

#### Fence Review

Operations Services completes fence inspections on a monthly as well as a more thorough inspection on a 5 year cycle and recommends either fence maintenance repair or complete rebuilds. Most recently the East Walden Substation fence was replaced which had rotten top rails as well as posts. It is recommended that 1 inch fence fabric is utilized for new substation fences to limit fence cuts.

#### **Ground Grid Review**

Operations Services completes ground grid testing on an 8 year cycle and reports ground grid deficiencies as they are determined. When adding or replacing equipment within a substation, the ground grid should be reviewed by Substation Design to ensure that the existing grid is adequate.

Substation	Comments
Manchester	There are ground grid deficiencies that were noted during recent construction. It is recommended that a formal review of the substation ground grid be conducted.
West Balmville	During fence repair an electrical arc was drawn. This could be due to lack of fence bonding, however as part of the future breaker replacements, it is recommended that a more thorough engineered review be completed.

#### Stone Review

Operations Services recommendation is to review the integrity of the stone fill within a substation when any major work order is being executed to ensure there is adequate stone coverage throughout the entire station and incorporate this work as part of any major work to be performed.







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Converse Street Upgrade Work Order #: 2 0 2 0 - H

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2020 In-Service: 12/31/2027

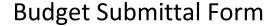
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

#### Describe specific scope exclusions, assumptions and constraints:

Replacement of Transformer #1, Transformer #2, and Bus #1 and Bus #2 switchgears. The substation is in poor condition requiring a full substation rebuild.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

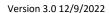
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year applicable				
	\$2,577,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	236,000	4,000	0	0	21,000	211,000	0	0
	Labor (Monthly Payroll)	118,000	2,000	0	0	10,000	106,000	0	0
A	Stock Materials	118,000	2,000	0	0	10,000	106,000	0	0
D	Non-Stock Material (A/P taxable)	472,000	8,000	0	0	42,000	422,000	0	0
١ĭ	Contractors (A/P tax exempt)	165,800	2,800	0	0	15,000	148,000	0	0
Т	Overheads	1,181,000	20,000	0	0	105,000	1,056,000	0	0
I I	AFUDC*	69,200	1,200	0	0	6,000	62,000	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,360,000	40,000	0	0	209,000	2,111,000	0	0
R	Labor (Weekly Payroll)	32,150	150	0	0	8,000	24,000	0	0
E	Labor (Monthly Payroll)	65,300	300	0	0	16,000	49,000	0	0
1:	Contractors (A/P tax exempt)	11,050	50	0	0	3,000	8,000	0	0
R	Overheads	108,500	500	0	0	26,000	82,000	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
``T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	217,000	1,000	0	0	53,000	163,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	727	727	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

Cost Estimate Range: Minimum (\$): 1,803,900 Maximum (\$): 3,350,100

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Shenandoah Substation Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/31/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

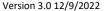
#### Describe the project objective and scope of work:

Much of the equipment at the Shenandoah Substation has been identified for replacement on the following programs that have been broken out into individual projects: Breaker Replacement Program, DA/LTC Replacement Program, and the ESP Infrastructure Replacement Program.

#### Describe specific scope exclusions, assumptions and constraints:

The various programs above have been combined into one substation modernization project. All electromechanical relays will be replaced along with the replacement of 25-15 kV circuit breakers.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A: Infrastructure Replacements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

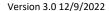
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? None



**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	,						
	\$7,100,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	656,000	0	0	61,000	188,000	407,000	0	0
	Labor (Monthly Payroll)	328,000	0	0	30,000	94,000	204,000	0	0
A	Stock Materials	328,000	0	0	30,000	94,000	204,000	0	0
D	Non-Stock Material (A/P taxable)	1,312,000	0	0	122,000	376,000	814,000	0	0
l	Contractors (A/P tax exempt)	461,000	0	0	43,000	133,000	285,000	0	0
Т	Overheads	3,282,000	0	0	305,000	941,000	2,036,000	0	0
I	AFUDC*	196,000	0	0	18,000	56,000	122,000	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,563,000	0	0	609,000	1,882,000	4,072,000	0	0
R	Labor (Weekly Payroll)	81,000	0	0	16,000	16,000	49,000	0	0
I E	Labor (Monthly Payroll)	161,000	0	0	31,000	32,000	98,000	0	0
l:	Contractors (A/P tax exempt)	27,000	0	0	5,000	6,000	16,000	0	0
R	Overheads	268,000	0	0	52,000	53,000	163,000	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	537,000	0	0	104,000	107,000	326,000	0	0
	* AFUDC may require adjustment after Finance Depa Expense \$ (if applicable):								
	Expense \$ (ii applicable):	U							

2021-2023 2024

1,722

Prior years funding; not actuals.

3,539

1,817



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

4,970,000

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

9,230,000

Cost Estimate Range: Minimum (\$): No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Pulvers Corners Transformer #1 Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

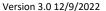
As part of the original Transformer Condition-Based Replacement Program that has been broken out into individual projects, several existing power transformers have been identified for potential replacement due to condition and are on the above 55 years of age listing. These transformers include: Pulvers Corners Transformer #1 (69/13.8 kV), Forgebrook Transformers #1 & #2 (115/13.8 kV),

Ancram
Transformer #1 (1 Phase 34.5/13.8 kV), Woodstock Transformers #1 & #2 (69/13.8 kV).

#### Describe specific scope exclusions, assumptions and constraints:

Replace Transformer #1 (three single phase transformers) at Ancram Substation with a new three-phase Wye-Delta-Wye 34.5/13.8 kV transformer and replace any associated relaying as appropriate. Purchase a replacement 34.5/13.8 kV spare three-phase transformer to be located at Eltings Corners to be utilized at either Ancram or Hunter Substations due to a failure.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

EP 2022-013 Pulvers Ancram Area Review.pdf

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

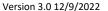
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project? Risk of power transformer failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•						
	\$3,405,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	
	\$3,403,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	311,000	0	0	0	84,000	227,000	0	0
	Labor (Monthly Payroll)	156,000	0	0	0	42,000	114,000	0	0
Α	· · · · · · · · · · · · · · · · · · ·	156,000	0	0	0	42,000	114,000	0	0
	Non-Stock Material (A/P taxable)	622,000	0	0	0	167,000	455,000	0	0
	Contractors (A/P tax exempt)	218,000	0	0	0	59,000	159,000	0	0
T	Overheads	1,555,000	0	0	0	418,000	1,137,000	0	0
1	AFUDC*	93,000	0	0	0	25,000	68,000	0	0
l N	Journal vouchers (JVS)	0							
S	OLAGE ( ODEDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,111,000	0	0	0	837,000	2,274,000	0	0
R	Labor (Weekly Payroll)	44,000	0	0	0	0	44,000	0	0
E	Labor (Monthly Payroll)	88,000	0	0	0	0	88,000	0	0
l¦	Contractors (A/P tax exempt)	15,000	0	0	0	0	15,000	0	0
R	Overheads	147,000	0	0	0	0	147,000	0	0
E	Journal Vouchers (JVs)	0							
N	Oalvage OILDII	0							
E	CIAC I ayillelis CILDII	0							
T	Laint Hillian Danmarata ODEDIT	0							
s	1017121121110171201	294,000	0	0	0	0	294,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

2,383,500

No further estimate range is required.

Formulas give standard ranges

• per estimate level, but may be

**Maximum (\$):** 4,426,500

per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Galeville PLC Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The first and second generation Programmable Logic Controllers (PLC's) require more extensive maintenance due to age-related component failures. Many of these PLC's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

#### Describe specific scope exclusions, assumptions and constraints:

Planned replacement of PLC located at Galeville Substation.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Replacing obsolete PLC equipment in order to optimize control and communications in Electric Substations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

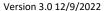
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Replacement of obsolete PLC equipment.

Why was the proposed project scope chosen over other alternatives?

N/A: Replacement of obsolete PLC equipment.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project?

Lack of Supervisory control and information in the substation possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process? None





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•						
	\$1,204,000	TOTAL	Prior Years Actuals +	Year 1	Year 2	Year 3	Year 4	Year 5	Future Years
	¥ :,= : :, : :	IOIAL	Projections	2024	2025	2026	2027	2028	Tuture rears
	Labor (Weekly Payroll)	108,000	0	0	0	0	11,000	97,000	0
	Labor (Monthly Payroll)	54,000	0	0	0	0	5,000	49,000	0
A	Stock Materials	54,000	0	0	0	0	5,000	49,000	0
D	Non-Stock Material (A/P taxable)	217,000	0	0	0	0	22,000	195,000	0
Ī	Contractors (A/P tax exempt)	76,000	0	0	0	0	8,000	68,000	0
Т	Overheads	541,000	0	0	0	0	54,000	487,000	0
I	AFUDC*	32,000	0	0	0	0	3,000	29,000	0
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,082,000	0	0	0	0	108,000	974,000	0
R	Labor (Weekly Payroll)	18,000	0	0	0	0	5,000	13,000	0
E	Labor (Monthly Payroll)	37,000	0	0	0	0	10,000	27,000	0
H	Contractors (A/P tax exempt)	7,000	0	0	0	0	2,000	5,000	0
R	Overheads	60,000	0	0	0	0	16,000	44,000	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	122,000	0	0	0	0	33,000	89,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

842.800

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 1,565,200

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This project was part of the original RTU and PLC Replacement Program that has been separated out by project.



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Saugerties PLC Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The first and second generation Programmable Logic Controllers (PLC's) require more extensive maintenance due to age-related component failures. Many of these PLC's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

## Describe specific scope exclusions, assumptions and constraints:

Planned replacement of PLC located at Saugerties Substation.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Replacing obsolete PLC equipment in order to optimize control and communications in Electric Substations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

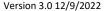
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Replacement of obsolete PLC equipment.

Why was the proposed project scope chosen over other alternatives?

N/A: Replacement of obsolete PLC equipment.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project?

Lack of Supervisory control and information in the substation possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•						
	\$1,204,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	_
	\$1,204,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	108,000	0	0	0	0	0	108,000	0
	Labor (Monthly Payroll)	54,000	0	0	0	0	0	54,000	0
A	Stock Materials	54,000	0	0	0	0	0	54,000	0
D	Non-Stock Material (A/P taxable)	216,000	0	0	0	0	0	216,000	0
l	Contractors (A/P tax exempt)	77,000	0	0	0	0	0	77,000	0
Т	Overheads	541,000	0	0	0	0	0	541,000	0
I	AFUDC*	32,000	0	0	0	0	0	32,000	0
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,082,000	0	0	0	0	0	1,082,000	0
R	Labor (Weekly Payroll)	18,000	0	0	0	0	5,000	13,000	0
E	Labor (Monthly Payroll)	37,000	0	0	0	0	10,000	27,000	0
1:	Contractors (A/P tax exempt)	7,000	0	0	0	0	2,000	5,000	0
R	Overheads	60,000	0	0	0	0	16,000	44,000	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	122,000	0	0	0	0	33,000	89,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Minimum (\$): 842,800 Maximum (\$): 1,565,200

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This project was part of the original RTU and PLC Replacement Program that has been separated out by project.



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Saugerties PLC Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The first and second generation Programmable Logic Controllers (PLC's) require more extensive maintenance due to age-related component failures. Many of these PLC's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

## Describe specific scope exclusions, assumptions and constraints:

Planned replacement of PLC located at Saugerties Substation.





N/A



**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Replacing obsolete PLC equipment in order to optimize control and communications in Electric Substations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

#### ESG (Environmental, Social and Governance) and Sustainability:

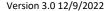
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Replacement of obsolete PLC equipment.

Why was the proposed project scope chosen over other alternatives?

N/A: Replacement of obsolete PLC equipment.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace obsolete equipment before failure.

What are the risks and consequences of not completing this project?

Lack of Supervisory control and information in the substation possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		All future year cost estimates should include applicable adjustments for inflation.					
	\$1,204,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	108,000	0	0	0	0	0	108,000	0	
	Labor (Monthly Payroll)	54,000	0	0	0	0	0	54,000	0	
A	Stock Materials	54,000	0	0	0	0	0	54,000	0	
D	Non-Stock Material (A/P taxable)	216,000	0	0	0	0	0	216,000	0	
ī	Contractors (A/P tax exempt)	77,000	0	0	0	0	0	77,000	0	
Т	Overheads	541,000	0	0	0	0	0	541,000	0	
1	AFUDC*	32,000	0	0	0	0	0	32,000	0	
O N	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,082,000	0	0	0	0	0	1,082,000	0	
R	Labor (Weekly Payroll)	18,000	0	0	0	0	5,000	13,000	0	
E	Labor (Monthly Payroll)	37,000	0	0	0	0	10,000	27,000	0	
H	Contractors (A/P tax exempt)	7,000	0	0	0	0	2,000	5,000	0	
R	Overheads	60,000	0	0	0	0	16,000	44,000	0	
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	122,000	0	0	0	0	33,000	89,000	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								
	Current Approved Rate Case Funding (\$):	0	0	0						

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

Minimum (\$): 842,800 Maximum (\$): 1,565,200

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This project was part of the original RTU and PLC Replacement Program that has been separated out by project.



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Tioronda Switchgear Replacement Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

As part of the original Switchgear Replacement Program that has been broken out into its individual project, the existing external switchgear at Tioronda Substation has reached the end of its useful life and replacement parts are difficult to obtain or no longer available.

#### Describe specific scope exclusions, assumptions and constraints:

It is recommended that the external switchgear at Tioronda Substation be replaced with a new switchgear. The switchgear will contain two bus's with a normally closed tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A: Infrastructure Replacements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•			cost estimates sh adjustments for i			
	\$3,079,000	TOTAL	Prior Years Actuals +	Year 1	Year 2	Year 3	Year 4	Year 5	Future Years
			Projections	2024	2025	2026	2027	2028	
	Labor (Weekly Payroll)	274,000	0	0	0	0	58,000	216,000	0
	Labor (Monthly Payroll)	137,000	0	0	0	0	29,000	108,000	0
A	Stock Materials	137,000	0	0	0	0	29,000	108,000	0
D	Non-Stock Material (A/P taxable)	550,000	0	0	0	0	117,000	433,000	0
l	Contractors (A/P tax exempt)	193,000	0	0	0	0	41,000	152,000	0
Т	Overheads	1,374,000	0	0	0	0	292,000	1,082,000	0
1	AFUDC*	83,000	0	0	0	0	18,000	65,000	0
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,748,000	0	0	0	0	584,000	2,164,000	0
R	Labor (Weekly Payroll)	49,000	0	0	0	0	16,000	33,000	0
E	Labor (Monthly Payroll)	99,000	0	0	0	0	33,000	66,000	0
1;	Contractors (A/P tax exempt)	17,000	0	0	0	0	5,000	12,000	0
R	Overheads	166,000	0	0	0	0	55,000	111,000	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	331,000	0	0	0	0	109,000	222,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Cost Estimate Range: Minimum (\$): 2,155,300 Maximum (\$):

4.002.700

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Jansen Avenue Substation Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/31/2029

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

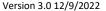
#### Describe the project objective and scope of work:

Much of the equipment at the Shenandoah Substation has been identified for replacement on the following programs that have been broken out into individual projects: Breaker Replacement Program, DA/LTC Replacement Program, and the ESP Infrastructure Replacement Program.

### Describe specific scope exclusions, assumptions and constraints:

The various programs above have been combined into one substation modernization project. All electromechanical relays will be replaced along with the replacement of 9-15 kV circuit breakers.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A: Infrastructure Replacements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

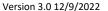
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

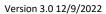
Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•			cost estimates sh e adjustments for i			
	\$5,731,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	516,000	0	0	0	0	11,000	305,000	200,000
	Labor (Monthly Payroll)	257,000	0	0	0	0	5,000	152,000	100,000
A	Stock Materials	257,000	0	0	0	0	5,000	152,000	100,000
D	Non-Stock Material (A/P taxable)	1,031,000	0	0	0	0	22,000	609,000	400,000
l	Contractors (A/P tax exempt)	362,000	0	0	0	0	8,000	214,000	140,000
Т	Overheads	2,577,000	0	0	0	0	54,000	1,523,000	1,000,000
I	AFUDC*	154,000	0	0	0	0	3,000	91,000	60,000
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,154,000	0	0	0	0	108,000	3,046,000	2,000,000
R	Labor (Weekly Payroll)	87,000	0	0	0	0	0	42,000	45,000
E	Labor (Monthly Payroll)	173,000	0	0	0	0	0	83,000	90,000
H	Contractors (A/P tax exempt)	29,000	0	0	0	0	0	14,000	15,000
R	Overheads	288,000	0	0	0	0	0	138,000	150,000
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	577,000	0	0	0	0	0	277,000	300,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

501 8 2021-2023 2024

Prior years funding; not actuals.

1,356

855



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

4,011,700

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

7.450.300

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Hurley Avenue 115 kV Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-99-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2028 In-Service: 12/31/2029

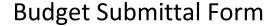
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

#### Describe specific scope exclusions, assumptions and constraints:

Replacement of 115/13.8 kV Transformer #4 and replacement of 6-15 kV circuit breakers and associated relaying.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

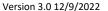
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? None





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	cost estimates she adjustments for in			
	\$6,833,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	654,000	0	0	0	0	0	354,000	300,000
	Labor (Monthly Payroll)	327,000	0	0	0	0	0	177,000	150,000
A	Stock Materials	327,000	0	0	0	0	0	177,000	150,000
D	Non-Stock Material (A/P taxable)	1,308,000	0	0	0	0	0	708,000	600,000
Ī	Contractors (A/P tax exempt)	458,000	0	0	0	0	0	248,000	210,000
Т	Overheads	3,270,000	0	0	0	0	0	1,770,000	1,500,000
I	AFUDC*	195,000	0	0	0	0	0	105,000	90,000
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,539,000	0	0	0	0	0	3,539,000	3,000,000
R	Labor (Weekly Payroll)	44,000	0	0	0	0	0	29,000	15,000
E	Labor (Monthly Payroll)	88,000	0	0	0	0	0	58,000	30,000
1:	Contractors (A/P tax exempt)	15,000	0	0	0	0	0	10,000	5,000
R	Overheads	147,000	0	0	0	0	0	97,000	50,000
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	294,000	0	0	0	0	0	194,000	100,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

4,783,100 **Maximum (\$):** 8,882,900

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nue 54' 5011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

### L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact, 2) Customer Services (Line Forces) to sid in fault locating and thereby limiting patrol time and area; 3) ©perations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for luture system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability, Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### Discussion:

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

### C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- ♦ They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

#### Attachment 2

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### **Discussion:**

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

### Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti: (Manl	Cost	
A	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

			Tin	ne			Cost		İ
Retrofit Options			Manh	ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9 9
Grid Sense Meter	W / VAr	•	are for the Line		E and	\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	takes	the line	man an	d the	\$2,272			\$2,700
POT Line		2.0	15 minu n data c			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tin	ne and	15			\$430	\$430
Site Registration	per D/C	20	utes of el to ea			-waived-			
TOTAL GS Installation	ā	beer	n assum hou		e 1				\$9,000
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

#### **Attachment 3**

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### **Re: Remote Terminal Unit Review**

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

• Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

#### **Attachment 4**

Copy to:

Mr. P.E. Haering

Mr. H.W.Turner Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

#### Discussion:

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### Conclusions:

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

	Cost				
Retrofit Options	Parts	TOTAL			
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1		
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1		
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2		
R-Mag Breaker	\$25,000	\$90,000			

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

Voltage Voltage T Relaying D. Relaying RTU Recloser Comment				Electric Sub	station Upgra	ide Meeds Wa	Sessment		
Second   A	Substation	1	Line/Ckt.				į	Recloser	
Accord 4 RF CVI Company		0.000		C2		EM	NONE		
Ancertain   13.8   7965 CH   W1920   SADA	Accord	4					NONE		Only has a 13.8 Voltage Regulator
Spring	Ancram	13.8	7085 Ckt.	Grid Sense			NONE		
Samproville   4   411 CM   W. O.     EM   C.580   Matering Source?		T				EM			
Barringst		4							
Sampage		4	412 Ckt.	MV-90			C-300		
Berneget   115   CFD Line   ARTS   EM									Metering source?
Barriegal   115		115							
Barringst   115									
Emringat   11511.8   T.   SCADA   EM		115	KB-749-KC BKR						IPM Foods
Barringst   11971-8   72		115/13.8				+			IBM reeds
Barregal   13.8   51   SCADA   EM		115/13.8							
Barnegat   13.8   S   S   S   S   S   S   S   S   S		· 13.8							IBM Feeds
Barrel   19   \$2,734 GR   \$CADA		13.8					<u> </u>		
D-20		13.8							IBM Feeds
Beacon   13.8   909.6 Cht   SCADA   EM			S2-734 BKR	SCADA		EM	<del></del>		
Seacon   13.8   8005 CM.   SCADA   EM							+		
Beacon   13.8   8015 Ckt   SCADA   EM		13.8	8006 Ckt.	SCADA		EM			
Beacon						EM			Previously 8087A?
Beacon									
Beacon   4   89.3 Ckt   SCADA   EM							+	<del>                                     </del>	<del> </del>
Beacon   4	Beacon							*****	ļ
Bescon	Beacon	4	803 Ckt.	SCADA			****	*****	
Beson	Beacon	4	W-414 BKR	SCADA		EM			
Bescon   4	Beacon	4	W-463 BKR	SCADA		EM			
Bescon   4	Beacon	4	Bus 1	SCADA					
Beacon   13.8/4   T1   SCADA   EM		4					<del></del>	<del></del>	
Bescon					<del></del>	<del></del>	+	<del>+</del>	<del>                                     </del>
Beson   13.8   BF Cable   SCADA   EM					<del></del>		<del> </del>	<del></del>	MDB has an entry with T1+T2 calculated
Beacon   13.8								*****	
Beacon   13.8   CM Cubis   SCADA   EM					****				
Bescon								*****	
Beston						EM			
Sethilehem Rd.   13.8				SCADA		EM			†
Sethiehem Rd   13.8		13.8	Bus 2	SCADA		EM		<del></del>	<del> </del>
Bethiehem Rd.   13.8							2400	<del></del>	_ <del></del>
Bethlehem Rd. 13.8 4092 Ckt. MV-90			( 4091 Ckt.	MV-90		EM/uP		·	851-851H as Bill and 79
Bethlehem Rd. 13.8	Bethlehem Rd.	13.8	4092 Gkt.	MV-90		EM/uP		<del></del>	
Bethiehem Rd. 13.8 4094 Ckt. MV-90	Bethlehem Rd.	13.8	4093 Ckt.	MV-96				<del></del>	
Bethiehem Rd.   13.8   4095 Ckt.   MV-90									
Bethiehem Rd.   13.8   4096 Ckt.   MV-90     EM							<del></del>		BE1-851H as BU and 79
Bethlehem Rd.   13.8   4097 Ckt   MV-90     EM									
Bethlehem Rd.         13.8         4098 Ckt.         MV-90         EM         EM           Bethlehem Rd.         13.8         Bus 1         EMS         EM            Bethlehem Rd.         113.8         Bus 2         EMS          EM            Bethlehem Rd.         115         RD Line         None         EM              Bethlehem Rd.         115         RD GO-00-UB BKR          EM  .									
Bethlehem Rd.   13.8   4098 Ckt.   MV-90     EM				MV-90		EM		*****	
Bethlehem Rd.         13.8         Bus 1         EMS         EM          EM           BM          BM           BM <th< td=""><td></td><td>13.8</td><td>4098 Ckt.</td><td>MV-90</td><td>2.0</td><td>EM</td><td></td><td></td><td></td></th<>		13.8	4098 Ckt.	MV-90	2.0	EM			
Bethlehem Rd.         13.8         Bus 2         EMS         —         EM         —         —         Bethlehem Rd         —	Bethlehem Rd.	13.8	Bus 1	EMS					
Bethlehem Rd.   115		13.8	Bus 2						
Bethlehem Rd.	Bethlehem Rd.			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				<del></del>
Bethlehem Rd.				·				·	<del></del>
Bethlehem Rd.   115/13.8   T2   EMS   EM						<del></del>	<del></del>		·-
Bethlehem Rd.   115/13.8   T2   EMS   EM		<del></del>		<del></del>		<del></del>			
Bethlehem Rd.   13.8   W-613 BKR									Metering combined
Bethlehem Rd.   13.8   W-619 BKR     EM									motoring opinionies
Berthlehem Rd.   13.8   W-804 BKR     EM         EM									
Bordman Rd.   13.8   6081A Ckt.   EM       EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM						EM			
Bordman Rd.   13.8   6081A Ckt.   EM		13.8	W-804 BKR			EM			
Bordman Rd.         13.8         6082A Ckt.         —         EM         —         —         EM         —         —         EM         —         —         EM         —         —         —         EM         —	Bordman Rd.						NONE		
Bordman Rd.         13.8         6082A Ckt.         EM          EM           EM	Bordman Rd.	13.8	6081A Ckt.			EM			
Bordman Rd.         13.8         Z-203 Ckt.         EM           Bordman Rd.         13.8         Z-204 Ckt.         EM           Bordman Rd.         13.8         Z-205 Ckt.         EM           Bordman Rd.         13.8         Z-206 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-208 Ckt.         EM	Bordman Rd.	13.8	6082A Ckt.						
Bordman Rd.   13.8   Z-204 Ckt.   EM									
Bordman Rd.         13.8         Z-204 Ckt.         EM	Boroman Rd	13.8							
Bordman Rd.   13.8   Z-205 Ckt.     EM	Bordman Rd	13.8	Z-204 Ckt.						
Bordman Rd.   13.8   Z-206 Ckt.     EM       Bordman Rd.   13.8   Z-207 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM			Z-205 Ckt.						
Bordman Rd.         13.8         Z-206 Ckt.         EM            Bordman Rd.         13.8         Z-207 Ckt.          EM            Bordman Rd.         13.8         Z-208 Ckt.          EM						EM			
Bordman Rd.   13.8   Z-207 Ckt.   EM   .	Bordman Rd	i. 13.8							·
Bordman Rd. 13.8 Z-208 Ckt EM	Bordman Ro	13.8	Z-207 Ckt.					<del></del>	
FM						EM			
		J. 13.0				FM			

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				-	ਨਵ Needs As:	ļ	}	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2100		
Boulevard		OB Line	SCADA	UP	,			
Boulevard	69	N Line	SCADA	υP				
Boulevard	69	1 Line	SCADA	uP				Line Amps & W/VAr
Boulevard	13.8	KO Line	SCADA		uP			
Boulevard Boulevard	13.8	KK Line	SCADA		uP EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1012	SCADA		UP			
Boulevard	13.8	Ckt. 1013	SCADA		EM/uP	*****		
Boulevard	13.8	Ckt. 1014	SCADA		EM			
Boulevard	13.8	Bus 1	SCADA		EM			
Boulevard	13.8	Bus 2	SCADA	EM				
Boulevard	69	Bus 1	SCADA					
Boulevard	69	Bus 2	SCADA	EM	<del></del>			
Boulevard	69	Overall		EM				
Boulevard	69/13.8	T1	SCADA	EM				Metering combined
Boulevard	69/13.8	T3	SCADA	EM			<del></del>	<del> </del>
Boulevard	69/13.8	T2	SCADA	EM		11,400	*****	1
Clinton Ave.	00,100					M-4000		
Clinton Ave.	4	395 Ckt.	MV-90		EM		******	
Clinton Ave.	4	396 Ckt.	MV-90		EM			<del></del>
Clinton Ave.	4	397 Ckt.	MV-90		EM			4
Clinton Ave.	4	Bus	SCADA		***			·
Clinton Ave.	13.8/4	T1	MV-90		Fuse			
Cold Spring	10,07					NONE		
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two
Cold Spring	4	872 Ckt.	Charts - kW		EM			eircuits.
Coldenham						D-20		· · · · · · · · · · · · · · · · · · ·
Coldenham	13.8	4021 Ckt.	SCADA _		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	****	uP-200/uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP - 200/ uP			95P is SEL-251
Coldenham	13.8	4024 Ckt.	SCADA	*****	uP- 200/ ∪P			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		. uP- 200/ uP	****		95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
Coldenham	13.8	4027 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM		*****	
Coldenham	13.8	Bus 2	SCADA		EM		****	
Coldenham	13.8	B1-B2 Tie			EM			
Coldenham	115	J Line	SCADA	Gen 1				95P is DLP; 95BU is REL-301; part o
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
Coldenham	115/13.8	T1	SCADA	EM				
	115/13.8	T2	SCADA	EM				
Coldenham Coldenham	115/13.8	J-19-CW BKR	SCAUA	SS			<u> </u>	
Converse St.	110	1 0-19-044 DVW		<u> </u>		NONE	1	
Converse St.	4	121 Ckt.	M(V-90		E₩			
Converse St.	4	122 Ckt.	MV-90		EM			
Converse St.	4	123 Ckt.	MV-90		EM			
Conway Place	+	J1			<u> </u>	NONE		
Conway Place	4	881 Ckt.	MV-90		EM			
Conway Place	4	882 Ckt.	MV-90		EM			
	<del></del>	602 CKt.	187-30	·		8890		
Coxsackie	120	1074 Cb+	Charte - Amns	1	EM			
Coxsackie	13.8	1071 Ckt.	SCADA/ Charts - kW		EM			Bitronics for the SCADA portion
Coxsackie	13.8	1072 Ckt.			EM/uP			BE1-851H as BU and 79
Coxsackie	13.8	1074 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
Coxsackie	13.8	1076 Ckt.	SCADA/ Charts - kW	<del>_</del>	EM			
Coxsackie	13.8	Bus 1 (T1+G1)	SCADA					
		Bus 2	???		EM			Metering data available through relay,
Coxsackie	13.8	DUS 4	<del> </del>					
Coxsackie	69	CN Line	None	uP				configured.
0	69	NC Line	SCADA	uP		<del>_                                     </del>		95P is SEL-587
	1 03	110						301 13 0 4 2 4 37
Coxsackie Coxsackie	22122	8 T1	Charts - Amps	uP/EM	1			<del></del>

13.8

Coxsackie

East Park

#### Electric Substation Upgrade Needs Assessment Comment Recloser RTU D. Relaying Voltage T. Relaying Metering Line/Ckt. Substation Class (kV) 2100 Siemens meters 485 to RTU AJ Danskammer Siemens meters 485 to RTU AJ ΕM SCADA - Amps 115 AC Line -----**~---**Danskammer EM Siemens meters 485 to RTU Al SCADA - Amps DC Line 115 -----Danskammer υP Siemens meters 485 to RTU Al SCADA - Amps 115 DB Line ----Danskammer ---υP Siemens meters 485 to RTU AI SCADA - Amps 115 **DR** Line .... Danskammer uР ----Siemens meters 485 to RTU Al SCADA - Amps DW Line 115 ----------Danskammer EΜ ----RS Line SCADA - Amps 115 Danskammer SS W - 323 8KR 115 Danskammer SCADA - Volts EM North Bus 115 Danskammer -----EM SCADA - Volts Middle Bus Danskammer 115 ----ΕM SCADA - Volts 115 South Bus Danskammer υP ...-**DB-1171 BKR** 115 Danskammer υP DR-1421 BKR 115 Danskammer ----υP 115 DW-1061 BKR ----Danskammer ~~~~ EM SCADA 115 T5&T6 Danskammer 2300 Dashville V4L Single Phase; Vac; Hydr ĔΜ 345 Ckt. MV-90 4 Dashville EM 6.6 Bus Dashville ----Fused Transformer w/ CR 67 relay EM --------Dashville T1 SCADA ------------G1-G2 Dashville East Fishkill 345kV C9751 Breaker A1 BR EM .... -----345 -----East Fishkill 345kV C9751 Breaker A2 BR EΜ East Fishkill 345kV 345 --------East Fishkill 345kV Transformer #1 Alt. 1 EM 115 SCADA Transformer #1 Alt. 2 EМ East Fishkill 345kV 115 ..... ----.... East Fishkill 8890 95P is MDAR; 95BU is Optimho - Replacing East Fishkill 115 **EF** Line SCADA υP\* -------with 311C & D60. East Fishkill 115 HF Line SCADA uP\* --------95BU is Optimho - Replacing with D60. East Fishkill 115 EF-672 BKR EΜ -----East Fishkill 115 EF-679 BKR ΕM ----East Fishkill 115 W-640 BKR ÉM East Fishkill 115 T1 SCADA see EFB ----------East Kingston Orion 13.8 Đus 1 SCADA East Kingston υP ---------East Kingston 13.8 Bus 2 SCADA υP -----East Kingston 13.8 1021 Ckt. SCADA υP .... East Kingston 13.8 1022 Ckt. SCADA υP 13.8 1023 Ckt. East Kingston uР SCADA East Kingston 13.8 1024 Ckt. ψP SCADA ----East Kingston 13.8 1025 Ckt. SCADA uΡ East Kingston 13.8 1026 Ckt. SCADA ---υP ----------East Kingston 13.8 1027 Ckt. SCADA uΡ --------East Kingston 13.8 1028 Ckt. SCADA uР East Kingston 115 **ER Line** SCADA υP East Kingston 115 LR Line SCADA υP 115 LR-201-ER Breaker uΡ East Kingston East Kingston Com Com Equipment ..... East Kingston 115/13.8 SCADA υP T1 East Kingston 115/13.8 72 SCADA υP --------8890 East Park EM/uP BE1-851H as BU and 79 East Park 13.8 6073 Ckt. SCADA SCADA -----BE1-851H as BU and 79 East Park 13.8 6074 Ckt. EM/uP ΕM ----6075 Ckt. SCADA 13.8 East Park --------EM Q Line None 69 95P is SEL-587 East Park uP/EM ---------SCADA 69/13.8 ₹1

$\overline{}$			Electric Subst	1011011 0hr /	veeds As			
ubstation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
ı	CIBES (KA)					2400		3 phase; oil; electronic; GS not working
ast Walden			Cold Seese		EM/UP		ES ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5041 Ckt.	Grid Sense Grid Sense		EM/uP			GS not working
ast Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
ast Walden	13.8	5043 Ckt.	Grid Series					
ast Walden	13.8	Com Equipment	SCADA		uP		<del> </del>	95P is DLP; part of replacement program
ast Walden	13.8	81		Gen1/uP				already.
ast Walden	115	CW Line	None					
	115	CW -712		EM				
East Walden East Walden	115	D Line	None	EM EM				
East Walden	115	D-722 BKR		UP				
East Walden	115	DW Line	SCADA	UP				
East Walden	115	DW-1071 BKR	CCADA	UP				<u> </u>
East Walden	115	EM Line	SCADA	uP				Amps & Volts
East Walden	115	EM-642 BKR	SCADA	UP				Anips a voits
East Walden	69	WM Line	SCADA	EM				<del></del>
East Walden	115	W-644		EM				Combine Bus Volts to one point
East Walden	115	B1 B2	SCADA	EM				95P is SEL-587
East Walden	115	T1	SCADA	uP/EM				95P IS SEL-587
East Walden	69/13.8	T3	SCADA	EM/uP				32BO IS 2ET-301
East Walden	69/13.8	1	00,2			D-20		DE4 05411 B11 and 70
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Fishkill Plains Fishkill Plains	13.8	8092 Ckt.	WV-90		EM			051 D. L 05DII is 051 501
Fishkill Plains	13.8	8093 Ckt.	SCADA		บค- 200	<del></del>		SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.	SCADA		uP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP	<u> </u>		
Fishkill Plains	13.8	8096 Ckt.	SCADA		υP			ACTIVITY OF STATE AND ACTIVITY OF ACTIVITY
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1			*****	95BU is Optimho; part of replacemen program.
Fishkill Plains	115	HF-703 BKR		EM				
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	υP		*****		
Fishkill Plains	115	A-1036-FP	V-+	uP- 200				279/2BFR relays 279/2BFR relays
Fishkill Plains	115	A-1498		uP- 200				Com
Fishkill Plains	115	Com Equipment					<del></del>	95P is DLP; part of replacement progr
Fishkill Plains	115	FP Line	SCADA	uP/Gen 1		**-1-		already; 95BU is SEL-321
Fishkill Plains	115	81	SCADA	EM _	EM			
Fishkill Plains	13.8	B1	SCADA					Combine Bus Volts to one point
Fishkill Plains	13.8	92			EM		<del></del>	
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	95BU is SEL-587; metering is combin
Fishkill Plains	115/13.8	T2	<u> </u>	EM/UP		2300		
Forgebrook	<del> </del>				EM			
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM			
Forgebrook	13.8	Bus #2 8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8012 CKt. 8013 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8 13.8	8013 CRt. 8014 Ckt.	Charts - Amps		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook Forgebrook	13.8	8016 Ckt.	Charts - kW		EW			No Chart Data
Forgebrook	115	Com Equipment						Com
Forgebrook	115	FO Line	None	EM				
	115	FO-1430-FT		EM				
Forgebrook	115		None	EM				
Forgebrook				EM				
Forgebrook	115			EM				
Forgebrook	11!		SCADA	uР				
Forgebrook	11				EM			Amne
Forgebrook		8 CM Line	None	+	EM			Amps
			SCADA		EM			
Forgebrook								<del></del> -
Forgebroo					EM	*****		
	i.   2°	.8 W-994	200-0					Metering combined
Forgebroo	k   1.	13.8		EW.	j i			_

200-2

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			Electric Subs	station Upgra	ide Needs As	sessment		Ι
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	ļ			·		M-4000		3 phase; oil; electronic; 95BU is BE1-851H;
Freehold	<del>                                     </del>				EM/oP		PR-560M	GS not working
Freehold	13.8	2061 Ckt.	Grid Sense		Linioi			3 phase; oil; electronic; 95BU is BE1-851H;
	<del></del>		5 dd C-100		EM/uP		PR-560M	GS not working
Freehold	13.8	2071 Ckt.	Grid Sense				PR-560M	3 phase; oil; electronic
Freehold	13.8	W-1155 BKR						
Freehold	13.8	T1	Charts - kW/kVAr	fuse	EM			
Freehold	13.8	B1	SCADA			Orion .		
Galeville			SCADA		υP			
Galeville	13.8	B1 B2	SCADA		uP			
Galeville	13.8	5030 Ckt.	SCADA		uР			
Galeville Galeville	13.8	5031 Ckt.	SCADA		uP		20 to 20 to	
Galeville	13.8	5032 Ckt.	SCADA		up			1
Galeville	13.8	5033 Ckt.	SCADA		υP			
Galeville	13.8	5034 Ckt.	SCADA		υP			
Galeville	13.8	5035 Ckt.	SCADA		υP			
Galeville		Com Equipment			***-			Com
Galeville	69	MG Line	SCADA	υP	4		*****	
Galeville	69	MG-200-MK BKR		υP				
Galeville	69	MK Line	SCADA	υP				
Galeville	69/13.8	Ţ1	SCADA	υΡ				
Galeville	69/13.8	Т2	SCADA	υP				
Greenfield Rd.						M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP	h-1-m	ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	4	375-376 Ckt.	. Charts - kW		EM			
Greenfield Rd.	4	377-378 Ckt.	Charts - kW		EM			
Greenfield Rd. Greenfield Rd.	13.8/4	W-1608			EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8	T2 B1	Charts - kW		EM		*****	
Greenfield Rd.	13.8	81	SCADA		***	*****		Volts
Greenfield Rd.	4	B3	SCADA SCADA		*****			Volts
Grimley Rd.			SCAUA			NONE-Soon to		Volts
						have DNP RTU		
Grimley Rd.	4	385 Ckt.	Grid Sense		EM	****	Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4	386 Ckt.	Grid Sense		EM			No DATA
Hibernia						Micro 1C	1	
Hibernia	13.8	7011 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	7012 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	B1	SCADA		EM/uP			95BU is DFP-100
Hibernia	69/13.8	T1	SCADA	EM/uP				95BU is DFP-100
Hibernia	13.8	Com Equipment						Com
High Falls		2001 5::			<del></del>	D-20		
High Falls	13.8	3021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls High Falls	13.8	3022 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8 13.8	3023 Ckt. 3024 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3025 Ckt.	SCADA SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	69	HK Line	SCADA		uP	<del></del>		95P is SEL-251; 95BU is SEL-501
High Falls	69	HK-696-P BKR.	SCAUA		uP- 200			95P is DLP
High Falls	69	P Line	SCADA		uP 200			\$EL-279
High Falls	13.8	W-998 BKR.	SCADA		uP 200/ uP			95P is DLP
High Falls	13.8	B1	SCADA		uP/ uP - 200		7	95P is SEL-251; 95BU is SEL-501 95BU is SEL-251
High Falls	13.8	B2	SCADA		UP/ UP - 200		*****	95BU is SEL-251
			SCADA		4170(-200			Com
		COM Equipment			1			
High Falls	13.8	Com Equipment						95P is \$R-745 & 95BU is SEL-587; Vo
	13.8 69/13.8		SCADA SCADA	uP uP				95P is SR-745 & 95BU is SEL-587; VC 95P is SR-745 & 95BU is SEL-587; VC

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			Flectuc 200	Station ups	Needs As	00001110		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (AV)					2300		95BU is BE1-IPS-100
Highland			- COADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA SCADA		EM/uP			958U is 8E1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			93B0 (3 BC)-17 0 .00
Highland	13.8	5083 Ckt.	SCADA		uP			
Highland	13.8	5084 Ckt. 5085 Ckt.	SCADA		υP			
Highland	13.8	HR Line	SCADA	υP				
Highland	115	OR Line	SCADA	uP				
Highland Highland	115	OR-761-HR BKR.		EM	EM			
Highland	13.8	B1	SCADA		UP UP			
Highland	13.8	82	SCADA		ur			Com
Highland	13.8	Com Equipment		υP/EM				958U is SEL-587
Highland	115/13.8	T1	SCADA	UP UP				
Highland	115/13.8	T2	SCADA	UP	1	D-20		
Honk Falls					EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EW		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA	EM				
Honk Falls	13.8	B1	SCADA	EM/UP				79 Relay is EM
Honk Falls	69	GM Line	SCADA	uP	***			
Honk Falls	69	HG Line	SCADA	uP/EM				79 Relay is EM
Honk Falls	69	HK Line	SCADA	UP/EM			****	
Honk Falls	69	MK Line	SCADA SCADA	uP/EM			*****	79 Relay is EM
Honk Falls	69	WH Line overall diff B1+T1	SCADA	EM			****	
Honk Falls	69 69/13.8	T1	SCAUA	fuse	<del></del>			
Honk Falls	69/13.6	<del> </del>		_,,,,,,,		M-4000		
Hunter Hunter	34.5	Z-666					VR-3S	3 phase; vac; hyd
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase; oil; hyd
Hunter	13.8	Cap Bank			EM	T	4	
Hurley Ave. 345kV	15.5	1	·,			2400		
Hurley Ave. 345kV	345	30151 BKR.	****	EM				79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		υP			*****	
Hurley Ave. 345kV	345	30152 A2 BF	*****	EM				
Hurley Ave. 345kV	345	301 Line A1	SCADA	uΡ				
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				
Hurley Ave. 345kV	345	30353 BKR.		EM*		-2		79 Relay is EM; In process replacement w SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		υp				
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; in process replacement w SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM				
Hurley Ave. 345kV	345	30354 A2 BF	*****	EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	303 Line A1	SCADA	uP				
Hurley Ave. 345kV	345	303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV	345	Bus A1		EM				
Hurley Ave. 345kV	345	Bus A2		EM EM				
Hurley Ave. 345kV	115	A2451 BKR.		EM				
Hurley Ave. 345kV	115	A2451 A1 BF A2451 A2 BF		EM				
Hurley Ave. 345kV	115 345	T1 A1 Out of Step	*****	EM				
Hurley Ave. 345kV				EM				
Hurley Ave. 345kV	345	T1 A2 Out of Step		EM				
Hurley Ave. 345kV		T1 A2		EM				
	1 345	[ [3 AZ ]	4					
Hurley Ave. 345kV Hurley Ave. 345kV		TILS		ł uP	*****		1	Volts

			Electric Substa					F
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (AV)					2400		BE1-851H as BU and 79
Hurley Ave.			Charle Amos		EM/uP			BE1-851H as 8U and 79
Hurley Ave.	13.8	2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as 8U and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps Charts - Amps		EM/∪P			BE1-851H as 80 and 19
Hurley Ave.	13.8	2094 Ckt.	Charts - Adrips	EM				<u> </u>
Hurley Ave.	115	Cap Bank		EM		*****		(id an alternation is
Hurley Ave.	115	HP Line	SCADA					Quadramho part of the package; metering Amp value only
Hurley Ave.	69	Line	SCADA	Gen1				Any value only
Hurley Ave.	115	OR Line	SCADA	EM				Quadramho part of the package; metering
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
Marchan Area	115	HP-1643 BKR.		EM				
Hurley Ave. Hurley Ave.	115	OR-1640 BKR.		EM			<del></del>	<del></del>
Hurley Ave.	69	W-142 BKR.	LAULE	uP				<del> </del>
Hurley Ave.	13.8	W-1575 BKR.		****	EM	****		
Hurley Ave.	115	W-389 BKR.		EM				<del> </del>
Hurley Ave.	115	B1	None	EM			*****	<u> </u>
Hurley Ave.	115	B2	\$CADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM				Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	T3	SCADA	EM		*****		
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				<u> </u>
inwood Ave.	ļ					3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA	*	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP		*	
Inwood Ave.	13.8	6066 Ckt. 6067 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6068 Ckt.	SCADA SCADA		UP UP			
inwood Ave.	13.8	Com Equipment	SCAOM		- OP			0
Inwood Ave.	115	IR Line	SCADA	υP				Cơm
Inwood Ave.	115	IR-201-X BKR.	30.00	υP				
Inwood Ave.	115	X Line	SCADA	υP				
Inwood Ave.	13.8	B1	SCADA		uP		*	
Inwood Ave.	13.8	82	SCADA		Qρ			···-
inwood Ave.	115/13.8	T1	SCADA	υP	24-04			
Inwood Ave	115/13.8	τ2	SCADA	uP				
Jansen Ave.		•				M-4000		<del>'</del>
Jansen Ave.	13.8	1001 Ckt.	MV-90		υP			
Jansen Ave.	13.8	1002 Ckt.	MV-90		EM			
Jansen Ave.	13.8	1003 Ckt.	M∨-90		uP			
Jansen Ave.	13.8	1004 Ckt.	MV-90		EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM			
Jansen Ave.	13.8	81	SCADA		EM			
Jansen Ave.	13.8	82	SCADA		EM	*	- 14-416	
Jansen Ave.	13.8	Com Equipment						Com
Jansen Ave.	13.8	T - Grounding	MV-90		uP	2000	**	
Kerhonkson	42.0	2004 014	0440	T	EM	8890	Kyle D	Single phases sile book ato CS Data
Kerhonkson	13.8	3081 Ckt.	Grid Sense		EM	<del></del>	Kyle D	Single phase; oil; hyd; No GS Data Single phase; oil; hyd; No GS Data
Kerhonkson	13.8	3082 Ckt.	Grid Sense	EM			7,0,0	
Kerhonkson	69	MK-929 MOS		EM				
Kerhonkson	69	MK-930 MOS	*****					Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS	fuse				Amps for each transformer
Kerhonkson	69/13.8		<u> </u>	luse				Volts & Amps
Kerhonkson	69	HK	SCADA					
USHIOHW2011	69	WK	SCADA					Volts & Amps

Substation  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8 13.8							
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8					2100		Not sure if charts were removed
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8		Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8	8022 Ckt.	Charts - Amps		EM/uP			Not sure if charts were removed
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8	8022 Ckt.	Charts - Amps/SCADA		uP/EM			8E1-851H as BU and 79
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners		8024 Ckt.	Charts - kW		EM/uP			
Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.0	8025 Ckt.	Charts - kW		EM			Com
Knapps Corners Knapps Corners Knapps Corners	13.8	Com Equipment						
Knapps Corners Knapps Corners	115	K8 Line	None	EM .		*****		SEL-279
Knapps Corners	115	KB-1558-MC BKR.		υΡ- 200 uP				
Knapps Corners	115	SK Line	SCADA	EM	<del>                                     </del>			Amps
	13.8	KN Line	SCADA*	EM				Amps
Knapps Corners	13.8	KR Line	SCADA*	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				·
Knapps Corners	69	KM Line	SCADA	EM				
Knapps Corners	69	TR Line	SCADA	uР				
Knapps Corners	69	G Line			EM			
Knapps Corners	13.8	W-1215 BKR.		uP				
Knapps Corners	69	W-1409 BKR.			EW			
Knapps Corners	13.8	W-1462 BKR.			EM			
Knapps Corners	13.8	B1	50404		EM			Combine Bus Volts to one point
Knapps Corners	13.8	82	SCADA	****	EM			i _
Knapps Corners	13.8	B3		EM		<del> </del>		Volts
Knapps Corners	69	69k Bus	SCADA	EM		<del></del>		Cambias land value
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		uP				
Knapps Corners	115/69	T2	SCADA	UP		M-4000		L
Lawrenceville		2005 014	0448	EM/uP		,,,,	CXE-400A	3 phase; oil; hyd
Lawrenceville	34,5	2385 Ckt.	Grid Sense SCADA*	EMIOF				Volts
Lawrenceville	34.5 69/34.5	81 T1	MV90/Grid Sense/SCADA	EM				Amps.
Lawrenceville Lincoln Park	69/34.5	<del></del>	MV 50/Grid Serise/SCADA			2300		
Lincoln Park	13.8	Com Equipment			,			Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps	****	EM		V	
Lincoln Park	13.8	2012 Ckt.	Charts - kW	*****	€₩			
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1			EM			
Lincoln Park.	13.8	Cap Bank 2			EM			
Lincoln Park	115	HP Line	None	EM				Relay Replacement Progam in proc
Lincoln Park	115	HP-1318 BKR.		EM				
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uР				·
Lincoln Park	13.8	W -1321 BKR.			EM			
Lincoln Park	13.8	W-45 BKR.			EM			
Lincoln Park	13.8	W-534 BKR.			EM			
Lincoln Park	13.8	W-554 BKR.			EW.			
Lincoln Park	13.8	WT-206 BKR.			EM			<del></del>
Lincoln Park	13.8	WT-207 BKR.	*****		EM			
Lincoln Park	13.8	WT-525 BKR.	•		EM			
Lincoln Park	13.8	WT-528 BKR.			EM EM			
Lincoln Park	13.8	B1	SCADA	·	EM.			Combine Bus Volts to one poi
	13.8	B2	SCADA		EM			Volts
Lincoln Park		B3	SCADA		EM			VURS
Lincoln Park	13.8		None		EM			
Lincoln Park	13.8	84		EM				Volts
Lincoln Park	115	115k bus	SCADA					Combine load value
Lincoln Park	115/13	.8 T1	SCADA	EM		<del>-</del>		Compile to ac value
	1.0		SCADA	EM		*****	*****	
Lincoln Park	115/1	3.8 T2 3.8 T3	SCADA	EM			.,,,,,	_

	<u> </u>		Electric Subs	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
· · · · · · · · · · · · · · · · · · ·	Class (K*)					2400		BE1-851H as BU and 79
Manchester	T		201/ 00	T	EM/uP			BE1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90 MV-90		EM/uP			
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP		*****	BE1-851H as BU and 79
Manchester	13.8	6094 Ckt.			EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	υP	EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EM			
Manchester	13.8	W-650 BKR.		<del></del>	EM			S. I.i. S.: Walte to any anish
Manchester	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Manchester	13.8	82			<del></del>			
Manchester	115/13.8	T1	SCADA	EM		<del></del>		Combine load value
Manchester	115/13.8	Т2		EM				????
Marlboro						8890		
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			8E1-IP\$100 as 80 and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/UP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP			Volts
Mariboro	115/13.8	T1	SCADA	uP/EM*	****	i		95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP			<del> </del>	301.13.022.031
Maryland Ave.		·		<del></del>		M-4000		-,1
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			T
Maryland Ave.	4	622 Ckt.	Charts - kW		EM	****		
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Ckt.	Charts - kW		EM			<del></del>
Maryland Ave.	13.8	MS Line			EM			
Maryland Ave.	13.8	PH-284 BKR.			EM			·
Maryland Ave.	13.8	PH-286 BKR.			EM			
Maryland Ave.	4	W-1032 BKR.			EM			
Maryland Ave.	4	W-1033 BKR.		*	EM		<del>                                     </del>	<del></del>
Maryland Ave.	4	W-1034 BKR.			EM			-
Maryland Ave.	13.8	B1	SCADA		EM	+		Volts
Maryland Ave.	13.8	82	SCADA	· · · · · · · · · · · · · · · · · · ·	EM			
Maryland Ave.	4	81			EM			Volts
Maryland Ave.	4	82	SCADA		EM		<del>-  </del>	Volts
Maryland Ave.	13.8/4	T1	+		EM			<del></del>
		T2	****		EM		*	+
Maryland Ave. Maybrook	13.8/4	12		*	E3M	M-4000		
Maybrook	13.8	5051 Ckt.	MIV-90	- T	EM	W-4000	RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	MV-90		UP			Previously 5081-83?
					EM	<del></del>	RXE	
Maybrook	13.8	5053 Ckt.	MV-90	*****	<del></del>	+	<del></del>	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Mayorook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None					
Maybrook	69/13.8	T2	None					
McKinley St.						NONE		T
McKinley St.	4	845 Ckt.	MV-90		EM			

			Electric Subs	ration obdis	SIACCAD WO	3336774778		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 8M	Recloser	Comment
Merritt Park	<del> </del>				uP			
Merritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA	<del></del>	uP			
Merritt Park	13.8	8063 Ckt.	SCADA		u₽			
Merritt Park	13.8	8064 Ckt.	SCADA		υP			
Werritt Park	13.8	8065 Ckt.	SCADA		uP			
Merritt Park	13.8	8066 Ckt.	SCADA		UP			
Merritt Park	13.8	8067 Ckt.	SCADA SCADA	<u> </u>	uP		+	Com
Merritt Park	13.8	8068 Ckt.	SCADA					
Merritt Park	13.8	Com Equipment WF Line	SCADA	υP				
Merritt Park	115	WP Line	SCADA	υP				SEL-279
Merritt Park	115	WF-439-WP BKR.		uP-200				3,000
Merritt Park	115		SCADA		uP			
Merritt Park	13.8	B1 B2	SCADA		uΡ			
Merritt Park	13.8	T1	SCADA	uP				
Merritt Park	115/13.8		SCADA	UP				
Merritt Park	115/13.8	T2	JUNUM			BM		
Milan	<del></del>	7004 02:4	SCADA		uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA				*****	Com
Milan	13.8	Com Equipment	2117	υP	<del></del>			
Milan	115	B-4561 Ckt Sw	SCADA	uP				
Milan	115	MR Line	SCADA	υP				
Milan	115	MR-501 BKR.	SCADA	uP				•
Milan	115	RT-7 BKR.		υP				
Milan	115	R-10 BKR. T-7 Line	SCADA	υP				
Milan	115 115	10 Line	SCADA		uP			
Milan	115	B1	SCADA	up				
Milan		B1	SCADA		UP			
Milan	13.8	T1	SCADA	υP				
Milan	115/13.8	<u> </u>	3CAUA_			L&N	<del> </del>	·
Millerton	13.8	7081 Ckt.	SCADA		EM		****	
Millerton	69	GE-823 MOS		EM				
Millerton		T1	SCADA	EM		*****		Only one feeder; T1 = 7081 load
Millerton	69/13.8	Line to SMI	SCADA					Volts
Millerton Millerton	69 69	Line to PUL	SCADA					Volts
Modena 115kV		Line to FOC	30,00			ВМ		
Modena 115kV	13.8	B1	SCADA		υP			
Modena 115kV	13.8	C-1651 BKR.			uР			
Modena 115kV	13.8	5011 Ckt.	SCADA		υP			1
Modena 115kV	13.8	5012 Ckt.	SCADA		υP		****	<u> </u>
Modena 115kV	13.8	5013 Ckt.	ŞCADA		uР			1
Modena 115kV	13.8	Com Equipment						Com
Modena 115kV	115	EM Line	SCADA	υP				
Modena 115kV	115	EW-201-PX BKR.		υP				<u> </u>
Modena 115kV	115	PX Line	SCADA	υP				10 0 TO - D - 10
Modena 115kV	115/13.8		SCADA	uР				Only has one 13.8 bus; T3 = Bus lo
Modena 69kV	-					8890		
Modena 69kV	69	B1	SCADA	EM				volts
Modena 69kV	69	MG Line	SCADA	υP				
Modena 69kV	69	W-941 BKR.		EM				<u> </u>
Modena 69kV	69	MG-380 BKR.		EM				
Modena 69kV	115/69		SCADA	EM/uP				GE F35 is installed
			None	Fuse/uP		1016		GE F35 IS RISTAILED
Modena 69kV		<u></u>				NONE		Single phase; Vac; Hyd
					EM		V4L	
Montgomery Montgomery		571 Ckt.	Charts - kW				V4L	Single phase; Vac; Hyd

			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU M-4000	Recloser	Comment
						141-24000		volts
Montgomery St.	13.8	B1	SCADA		EM .			Volts
Montgomery St.	13.8	B2	SCADA	****	EM			volts
Montgomery St.	13.8	B3	\$CADA		EM			
Montgomery St.  Montgomery St.	13.8	B Line	None		EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr					
	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.   Montgomery St.	13.8	4003 Ckt.	Charts - kW/kVAr		EM EM			
Montgomery St.	4	401 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	402-3 Ckt.	Charts - kW demand	****	EM			
Montgomery St.	4	404 Ckt.	Charts - kW demand Charts - kW demand		EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	410A/8 Ckt.	SCADA		EM			Volts
Montgomery St.	4	<u>81</u>	SCADA		EM		*****	volts
Montgomery St.	4	B2			EM			
Montgomery St.	13.8	F Line	None		EM			
Montgomery St.	13.8	NB Line	None	<del></del>	EM	<del></del>	<del></del>	
Montgomery St.	13.8	NM Line	None		EM			
Montgomery St.	13.8	R Line	None			···	1	
Montgomery St.	13.8	W-507 BKR.			EM			
Montgomery St.	13.8	W-508 BKR.			EM		<del> </del>	
Montgomery St.	13.8	W-509 BKR.		*****	EM			
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	72			EM			
Myers Corners	<u> </u>					44-550		
Myers Corners	13.8	8041 Ckt.	Charts - kW		uP			
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM	*****		
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM	*****		
Myers Corners	13.8	8046 Ckt.	SCADA		υP			
Myers Corners	69	KM Line	None	EM	*****			
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.		EM:				
Myers Corners	13.8	W-63 BKR.	*****		EM			
Myers Corners	13.8	W-66 BKR.			EM			
Myers Corners	13.8	Feeder M1-75		****	EM			
Myers Corners	13.8	Feeder M2-76			EM			
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1	SCADA		EM			0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Myers Corners	13.8	B2	SCADA		EM			Combine Bus Volts to one point
Myers Corners	69/13.8	T1	SCADA	EM				B
Myers Corners	69/13.8	T2	30,402	EM				Combine load value
Neversink			· · · · · · · · · · · · · · · · · · ·			2200		
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	*****	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM				Amps
Neversink	69	WH Line	\$CADA*	EM	*****		**	Amps
Neversink	4	W-1128 BKR.			EM EM		*****	
Neversink	69	69k Bus	SCADA	uP/EM		*****		Volts
New Baltimore						2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	\$CADA*		EM			kW MW
New Baltimore	13.8	1083 Ckt.	SCADA*		EM			KW
	69	Cap Bank		EM/uP				<del> </del>
New Baltimore		<del></del>					****	Com
New Baltimore	13.8	Com Equipment		UP				]
New Baltimore	69	CN Line	None					
New Baltimore	69	NW Line	None	υP				Vates
		B1	SCADA		EM			Volts
New Baltimore				EM/+D	-			95P is SEL-587
New Baltimore	69/13.1	8 71	SCADA	) LIMINAU	*****	*****	1	001 10 000

( ,			Electric Sub	station Up	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)		·	<u> </u>		NONE		
New Windsor					EM			No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA No DATA
New Windsor	4	463 Ckt.	Grid Sense Grid Sense		EM			NODATA
New Windsor	4	464 Ckt.			υP			
New Windsor	13.8	UN & UW ATC	None		uΡ			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kV Ar		υP			
New Windsor	13.8/4	T2				D-20	L	95P is SEL-251
North Catskill	<del> </del>	2001A Ckt.	SCADA		นP- 200/ บP			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA		uP- 200/ uP	****		
North Catskill	13.8		SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA	****	υP-200/ υP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA		นค- 200/ นค	****		95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA				·	Com
North Catskill	13.8	Com Equipment		EM				
North Catskill	115	2 Line	SCADA					
North Catskill	115	R-2 BKR.		EM		<del></del>		···
North Catskill	115	RT-7 BKR.		EM			2000	Amps
North Catskill	115	T-7 Line	SCADA*	EM		\		7,103
North Catskill	69	Cap Bank		EM		*****		
North Catskill	69	CL Line	SCADA	υP				
North Catskill	69	H Line	SCADA	uP				
North Catskill	69	NC Line	SCADA	धP	****	****	*****	<del></del>
North Catskill	69	W-1107 BKR		EM/uP*			V	check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*				check on TD-5
North Catskill	115	W-791 BKR.		uP- 200				SEL-2BFR
North Catskill	69	W-269 & W-1107 BKR			EM			us
North Catskill	115	B1	SCADA	EM	****			Volts
North Catskill	69	B1	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP				Volts
North Catskill	13.8	B1	SCADA		EM/uP			Volts: 95BU is DFP-100
North Catskill	13.8	B2	SCADA	4====	EM/uP			Volts: 95BU is DFP-100
North Catskill	115/69	74	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	17	SCADA	EM/uP				95BU is DFP-100

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			Electric Subs	tation Upgrad	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del></del>							
North Chelsea	42.0	8051 Ckt.	SCADA		٩υ			
North Chelsea	13.8	8052 Ckt.	SCADA		υP			· · · · · · · · · · · · · · · · · · ·
North Chelsea	13.8	8053 Ckt.	SCADA		υP			<u> </u>
North Chelsea	13.8	8054 Ckt.	SCADA		uP )			
North Chelsea	13.8		SCADA	.,	UP			
North Chelsea	13.8	8055 Ckt.	SCADA		υP			
North Chelsea	13.8	8056 Ckt. 8057 Ckt.	SCADA		uP			
North Cheisea	13.8	8058 Ckt.	SCADA		uP			Com
North Chelses	13.8	Com Equipment						
North Chelsea North Chelsea	115	AC Line	SCADA	υP				
North Chelses	115	AC-1086 BKR.		UP	****			
North Chelsea	115	DC Line	SCADA	υP				
North Chelsea	115	DC-1414 BKR.	*****	υP				
North Chelsea	115	FO-1482 BKR.		uP.				
North Chelsea	115	FO Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.		υP			+	
	115	SC Line	SCADA	UP			*****	
North Chelsea			SCADA	uP	****		<u> </u>	
North Chelsea	115	SC-1566 BKR.		υP			<del></del>	
North Chelsea	69	TV Line	SCADA			<del></del>	<del></del>	
North Chelsea	115	B-2651 BKR.	****	UP		*****		
North Chelsea	115	B-2652 BKR	*****	υP	**			
North Chelsea	115	B-2653 BKR.	4222	uP			ļ	
North Chelsea	115	W-1572 BKR.		υP				
North Chelsea	115	B1	SCADA	uΡ		*****		•
North Chelses	13.8	<b>B</b> 1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP			
North Chelsea	115/69	T1	SCADA	υP				
North Cheisea	115/13.8	T2	SCADA	υP				<del></del>
North Chelsea	115/13.8	T3	SCADA	υP				Volts
Ohioville					*	2100	<del></del>	1003
Ohioville	13.8	5021 Ckt.	Charts - Amps	T	EM/uP	****	1	BE1-851H as BU and 79
Ohioville	13.8	5022 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA		uP			0C1-03117 45 00 810 79
Ohioville	13.8	Com Equipment	- GCADA			-		Com
Ohioville	115	Cap Bank		EM	<del></del>			Com
Ohioville	69	O Line	None	UP				
Ohioville	69	OB Line	None	υP			*****	<del></del>
Ohioville	115	OR Line		EM				
Ohioville		<del></del>	None	EM	<del></del>		*****	
	115	OR-1075 BKR.						
Ohioville	115	PX Line	SCADA	EM/UP			*****	
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				
Ohiovitte	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM				Volts
Ohioville	69	69k Bus	SCADA	EM				Volts
Ohioville	13.8	81	None	****	EM			
Ohioville	13.8	B2	None		EM			
Ohioville	115/13.8	T1	50.50	EM				Combine load value
			- SCADA	F-10				Combine load value
Ohioville	115/13.	8 T2	1	EM				95BU is SEL-251

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			Electric Sub	station Upgra	de Needs As	sessmem		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2300		Grid owns Line
leasant Valley				T uP		*****	L	Grid Owns 2.55
Pleasant Valley	115	8 Line	SCADA**	UP				Grid owns Line
Pleasant Valley	115	10 Line	SCADA	UP			<u> </u>	Grid owns Line
Pleasant Valley	115	12 Line		uP				95BU is Optimho; in replacement plan
leasant Valley	115	13 Line	SCADA**	EM/Gen-1				95BO IS Optimio, in representative
Pleasant Valley	115	C Line	SCADA	EM				
Pleasant Valley	115	M Line	SCADA	UP				Com
Pleasant Valley	115	X Line	SCADA					SEL-279
Pleasant Valley	115	Com Equipment		υ₽- 200		****		SEL-279
Pleasant Valley	115	R-12 BKR.		uP- 200				SEL-279
Pleasant Valley	115	R-13 BKR.		uP- 200				355-210
Pleasant Valley	115	R-8 BKR.		EM				
Pleasant Valley	115	RC-6 BKR.		EM	****			
Pleasant Valley	115	RM BKR.		uP				
Pleasant Valley	115	RX-4 BKR.		EM			,	Con Ed owns the Bkr
Pleasant Valley	115	R-61 BKR.	\$CADA**	EM .	7,100		V	Con Ed owns the Bkr
Pleasant Valley	115	R-62 BKR.	SCADA**					
Pleasant Valley	115	R-643 BKR.		EM	<del></del>			
Pleasant Valley	115	R-81 BKR.		EM		<del> </del>		Volts
Pleasant Valley	115	81	SCADA	EM				Volts
Pleasant Valley	115	B2	SCADA	EM				kW
Pleasant Valley	69	ELine	SCADA*	υP				kW
Pleasant Valley	69	GLine	SCADA*	υP				kW
Pleasant Valley	69	Q Line	SCADA*	uР				
Pleasant Valley	69	81	SCADA	υP				Volts
Pleasant Valley	13.8	W-387		****	EM			
Pleasant Valley	345/115	S1	SCADA					Con Ed owns bank and protection
Pleasant Valley	115/69	T10	SCADA	EM				<u> </u>
	113103	1,10				D-20		
Pulvers Corners	42.0	7091 Ckt.	SCADA		EM		V4L	single phase; vac; hyd
Pulvers Corners	13.8	7091 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd
Pulvers Corners	13.8	7092 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd
Pulvers Corners	34.5	Com Equipment	SCADA					Com
Pulvers Comers	13.8			EM				
Pulvers Corners	69	Cap Bank	SCADA					Volts
Pulvers Corners	69	B1	SCADA				****	Volts
Pulvers Corners		B1	SCADA				-21	Volts
Pulvers Corners		B1		Fuse				
Pulvers Corners	69/13.8	71	SCADA	EM/uP			<del></del>	95P is SR-745

			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	ļ					2100		
Reynolds Hill			Charts - kW		EM			
Reynolds Hill	13.8	6001 Ckt.	SCADA	4774-	υP			
Reynolds Hill	13.8	6004 Ckt.	Charls - kW		EM			
Reynolds Hill	13.8		SCADA		υP			
Reynolds Hill	13.8	6008 Ckt.	30,40,4	****				Com
Reynolds Hill		Com Equipment		uP				
Reynolds Hill	115	DR-1418 BKR. DR Line	SCADA	UP UP				
Reynolds Hill	115	HR-1285 BKR.	30805	EM				
Reynolds Hill Reynolds Hill	115	HR Line	SCADA	υP			*****	
Reynolds Hill	115	IR Line	SCADA	υP				
Reynolds Hill	13.8	B Cable	SCADA		uP			
Reynolds Hill	13.8	W Cable	SCADA		uP			
Reynolds Hill	13.8	PD Cable	SCADA		uP		*****	
Reynolds Hill	13.8	PH Line	SCADA		υP	***		
Reynolds Hill	13.8	PK Line	SCADA	*****	uP			
Revnolds Hill	13.8	PO Line	SCADA		υP			
Reynolds Hill	13.8	PQ Line	SCADA		υP	*****		
Reynolds Hill	13.8	PS Line	SCADA		UP			
Reynolds Hill	13.8	PU Cable	SCADA		υP			
Reynolds Hill	115	T-31 BKR.		EM				
Reynolds Hill	115	B1	SCADA	EM			<del></del>	
Reynolds Hill	115	B2	SCADA	EM		<del></del>		Volts
Reynolds Hill	13.8	81	SCAUA				****	Volts
Reynolds Hill	13.8	B2	SCADA		EM/uP			958U is SEL-501
Reynolds Hill	13.8	83	56484		υP			Volts
Reynolds Hill	115	W-1543 BKR.	SCADA		uP	*	*****	Volts
Reynolds Hill	115/13.8	T3	SCADA	EM				
Reynolds Hill	115/13.8	T4	SCADA	EM/uP				95P is SEL-351A
Rhinebeck		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	SCADA	EM/uP				95P is SEL-351A
Rhinebeck	13.8	7051 Ckt.	Charts - kW/SCADA			2300		
Rhinebeck	13.8	7052 Ckt.			uP- 200/ טP			95P is SEL-251, 95BU is SEL-501
Rhinebeck	13.8		Charts - Amps	-1	EM		*****	3 3 2 2 2 3 7 2 3 3 3 3 2 2 3 3 7
Rhinebeck		7053 Ckt.	Charts - Amps		EM			
	13.8	7054 Ckt.	Charts - Amps		EM			
Rhinebeck	13.8	7055 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Rhinebeck Rhinebeck	13.8	7056 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
		Com Equipment	****					
Rhinebeck	69	Cap Bank		EM				
Rhinebeck	115	ER Line	SCADA*	uP				Amps
Rhinebeck	115	LR-830-MR BKR.		UP				70.190
Rhinebeck	115	MR Line	None	ųΡ	<b></b> -			
Rhinebeck	69	Q-1471 BKR.		EM				
Rhinebeck	13.8	W-1017 BKR.	2-0-0		EM			
Rhinebeck	13.8	W-1238 BKR.			EM			
Rhinebeck	69	W-258 BKR.		EM				
Rhinebeck	13.8	W-367 BKR.			EM			
Rhinebeck	69	Q Line	SCADA*					Volts
Rhinebeck	13.8	B1	SCADA		EM			T
Rhinebeck	13.8	B2	none	***	EM			Combine Bus Volts to one point
Rhinebeck	69	69kV Bus	SCADA					Volts
Rhinebeck	69/13.8	T1	SCADA*	EM	****			Amps & Volts
Rhinebeck	69/13.8	T2	SCADA*	EM				Amps & Volts
Rhinebeck	115/13.8	T4	SCADA	EM				
Rhinebeck	115/69	T3	SCADA	EM				

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· ( )———			Electric Subst	ation Up	, Needs As	sessment	_	
			Flectile agast	30011 0 0 3				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
Rock Tavern 345kV					****	2100		
Rock Tavern 345kV	345	311 Line A1	SCADA	uP .				
Rock Tavern 345kV	345	311 Line A2		EM EM				
Rock Tavern 345kV	345	3456 BKR.		uP				
Rock Tavern 345kV	345	3456 BF A1		υP				
Rock Tavern 345kV	345	3456 BF A2		EM				
Rock Tavern 345kV	345	Cap Bank 1 A1	<u> </u>	EM				Combined MVArs
Rock Tavern 345kV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345kV	345	Cap Bank 2 A1	<u> </u>	EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	\$CADA -	UP			****	
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.		uP				
Rock Tavern 345kV	345	37751 BF A1		EM		*****		
Rock Tavern 345kV	345	37751 BF A2		EM				<u></u>
Rock Tavern 345kV	345	37752 BKR.		υP				
Rock Tavern 345kV	345	37752 BF A1		EM				
Rock Tavern 345kV	345	37752 BF A2		uP				
Rock Tavern 345kV	345	377 Line A1	SCADA	EM				
Rock Tavern 345kV	345	377 Line A2		EM				
Rock Tavern 345kV	345	4255 BKR.		EM				
Rock Tavern 345kV	345	4255 BF A1		EM				
Rock Tavern 345kV	345	4255 BF A2 42 Line A1		SS				
Rock Tavern 345kV	345	42 Line A2		EM				
Rock Tavern 345kV	345 345	C3351 BKR.		EM			<u></u>	
Rock Tavern 345kV Rock Tavern 345kV	345	C3351 BF A1		EM				
Rock Tavern 345kV	345	C3351 BF A2		EM		*****		1
Rock Tavern 345kV	345	C3352 BKR.		EM	+			<del> </del>
Rock Tavern 345kV	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM	· · · · · · · · · · · · · · · · · · ·			
Rock Tavern 345kV	345	C3353 BKR.		uP- 200				<del>                                     </del>
Rock Tavern 345kV	345	C3353 BF A1		υP			<del></del>	<u> </u>
Rock Tavern 345kV	<del></del>	C3353 BF A1		uP			****	
Rock Tayern 345kV		31153 BKR.		EM				
Rock Tavern 345kV		31153 BF A1		uP				
Rock Tavern 345kV		31153 BF A2	****	UP		<del></del>		1
Rock Tavern 345kV		31154 BKR.		EM			<del></del>	
Rock Tavern 345kV		31154 BF A1		EM				
Rock Tavern 345kV		31154 BF A2	*****	EM				
Rock Tavern 345kV	<del></del>	Com Equipment						Com
Rock Tavern 345k		81 A1		EM				
Rock Tavern 345k\		B1 A2	ware.	EM			*****	
Rock Tavern 345k\		B2 A1		EM	·   · · · · · · · · · · · · · · · · · ·		****	
Rock Tavern 345k\	-	B2 A2		EM				
Rock Tavern 345k		T1 A1		EM				
Rock Tavern 345k		T1 A2	SCADA	EM				
Rock Tavern 345k	<del></del>	T3 A1	20121	uР				
Rock Tavern 345k		T3 A2	SCADA	UP	****			

´			Flantin Cul	station Up.	, Needs As	sessment		
			Flectlic and	Station ob.	1000000		·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KT)					2400	<del>1</del>	
Sand Dock	<u> </u>		Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.	CHARTO		EW			
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM			
Sand Dock	13.8	GB Line KC-1447-SC BKR.	3020	EM				
Sand Dock	115 115	KC Line	None	EM				
Sand Dock	115	SC Line	None	υP				
Sand Dock	13.8	SH-886 BKR			EM			<u> </u>
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock		TW-902 BKR			EM			
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-910 BKR.	*		EM		*****	
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM	7		
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.					+	
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4				<del></del>	<del></del>	
Sand Dock	13.8	81			EM			Combine Bus Volts to one point
Sand Dock	13.8	B2	SCADA			1		Sometime sus voids to one point
Sand Dock	13.8	B3			EW	*****		
Sand Dock	13.8	84	SCADA		EM			
Sand Dock	13.8	T1	SCADA	EM			*****	Combine load value
Sand Dock	13.8	73		EM		*****		
Sand Dock	13.8	T4	SCADA	EM			*****	
Saugerties						Orion	1	

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			Electric Subs	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Shenandoah	<del> </del>	,				2400		
	115	East Bus	22.224	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	SCADA	EM				<u></u>
Shenandoah	13.8	B1	00101		EM		,	Combine Bus Volts to one point
Shenandoah	13.8	B2	SCADA		EM			
Shenandoah	13.8	B3			EM		*****	Combine Bus Volts to one point
Shenandoah	13.8	B4	SCADA		EM			
Shenandoah Shenandoah	13.8	B5	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	96	SCADA		EM			
Shenandoah	13.8	B7	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	€8			EM			
Shenandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2	****		EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM EM			
Shenandoah	13.8	Cap Bank 5				<del></del>		
Shenandoah	13.8	Cap Bank 6			EM		P	
Shenandoah	13.8	B-4451 BKR. (CB1)	<u>.</u>		uР			
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			
Shenandoah	13.8	8072 Ckt.	Charts - kW		EM	*****		
Shenandoah	115	EF Line	None	uP/Gen-1				95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM		*****		
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah	115	FS-892-EF BKR.		EM				· · · · · · · · · · · · · · · · · · ·
Shenandoah	115	FS-959 BKR.		EM				
Shenandoah	13.8	Feeder S1	None		EM	<del></del>		
Shenandoah	13.8	Feeder S2	None	*****	ÉM		<del>                                     </del>	<del></del>
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None		EM	<del></del>		
Shenandoah	13.8	Feeder S5	None		EM	/		
Shenandoah	13.8	Feeder \$6	None		EM			
Shenandoah	13.8	Feeder S7	None		EM			
Shenandoah	13.8	Feeder S8	None		EM	*****		
Shenandoah	13.8	Feeder S9	None		EM			<del></del>
Shenandoah	13.8	Feeder S10	None		EM			
Shenandoah	13.8	Feeder S11	None	****	EM	<del></del>	*****	
Shenandoah	13,8	Feeder S12	None	<del></del>	EM	*****		
Shenandoah	13.8	Feeder \$13	None		EM			<u></u>
Shenandoah	13.8	Feeder S14	None		EM	<del></del>		
Shenandoah	13.8	Feeder S15	None	· <del>                                      </del>				
Shenandoah	115/13.8	T1		EM	EM			
Shenandoah	115/13.8	T2	SCADA	EM		<del></del>		Combine load value
Shenandoah	115/13.8	T3		EM		<del></del>		
Shenandoah	115/13.8	T4	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5		EW	<del></del>			
Shenandoah	115/13.8	T6	SCADA	EM		*****	/	Combine load value
Shenandoah	115/13.8	T7	SCADA	EM				
Shenandoah	13.8	W-1266 BKR.	SCADA		EM			+
Shenandoah	13.8	W-1279 BKR.		<del></del>				<u> </u>
Shenandoah	13.8	W-1450 BKR.	****		EM			
Shenandoah	13.8	W-1593 BKR.			EM			****
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	<del>~</del>	· · <del> </del>				<del></del>
		_	y***-		EM		*****	
Shenandoah	13.8	W-802 BKR.			EM			
Shenandoah	13.8	W-803 BKR.			EM			
Shenandoah	13.8	W-805 BKR.			EM			<del></del>
U	13.8	W-807 BKR.			EM			

			Electric Sub	station Upgra	ne ideenz wa	26221116111	ı	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						44-550		
Rock Tavern 115kV				EM				
Rock Tavern 115kV	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV	115	115-0.48kV SST					****	Com
Rock Tavern 115kV	115	Com Equipment		E.M				Amps
Rock Tavern 115kV	115	D Line	SCADA*	EM	****			
Rock Tavern 115kV	115	D-448 BKR.	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
Rock Tavern 115kV	L			EM	*****			
Rock Tavern 115kV	115	J-788 BKR.	SCADA*	EM			****	Amps
Rock Tavern 115kV	115	RD Line RD-809 BKR.	SCADA	EM				
Rock Tavern 115kV Rock Tavern 115kV	115	RD-809 BKK.	SCADA*	EM				Amps
Rock Tavern 115kV	115	RJ-818 BKR.		EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM	*****			
Rock Tavern 115kV	115	SL-684 BKR.	30707	EM				
Rock Tavern 115kV	115	W-467 BKR.		υP			****	
						1	<del>-</del>	<del> </del>
Rock Tavern 115kV	115	W-681 BKR.	*****	EM			****-	
Rock Tavern 115kV	115	W-814 BKR.	****	EM/uP				\$EL-351
Rock Tavern 115kV	115	WM Line	none	uP			·	ļ
Rock Tavern 115kV	115/69	T2	SCADA	EM	<u> </u>			
Roseton Switchyard	ļ <del></del>					2100		
Roseton Switchyard	345	30356 (B6) BKR	404-	EM				
Roseton Switchyard	345	30356 (B6) BF A1		EM				
Roseton Switchyard	345	30356 (B6) BF A2		EM				
Roseton Switchyard	345	303 Line A1	SCADA	uP			****	<del></del>
Roseton Switchyard	345	303 Line A2	30,404	EM				<del></del>
Roseton Switchyard	345	30551 (B7) BKR		EM			·	<del></del>
Roseton Switchyard		30551 (B7) BF A1		€M			****	
Roseton Switchyard		30551 (B7) BF A2		E₩	*****	†	<del></del>	<u> </u>
Roseton Switchyard		30553 (B3) BKR		EM	****			
Roseton Switchyard		30553 (B3) BF A1		υP		<del></del>		
Roseton Switchyard		30553 (B3) BF A2		EM	1			<u> </u>
Roseton Switchyard		305 Line A1	65.54	υP				<u> </u>
Roseton Switchyard	345	305 Line A2	SCADA	EM/uP				
Roseton Switchyard	345	31151 (B1) BKR		EM				SEL-501 for DBC
Roseton Switchyard	345	31152 (B1) BF A1		EM			*****	
Roseton Switchyard	345	31152 (B1) BF A2		EM			<del></del>	
Roseton Switchyard		31152 (B4) BKR		EM			*****	
Roseton Switchyard		31152 (B4) BF A1		EM				
Roseton Switchyard		31152 (B4) BF A2	****	EM				
Roseton Switchyard		311 Line A1		UP				
Roseton Switchyard		311 Line A2	SCADA					
Roseton Switchyard		B1	<u> </u>	EM			*****	
Roseton Switchyard		B2		υP				
Roseton Switchyard				uP				
Roseton Switchyard		U1 U1	SCADA	EM				
	d 345	U2	SCADA	EM EM				

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#### Electric Substation Ups - Needs Assessment Comment RTU Recloser D. Relaying Voltage T. Relaying Metering Line/Ckt. Substation Class (kV) Radio to INW 2300 Smith Street EM Charts - kW 631 Ckt. Smith Street 4 EW ----Charts - kW 632 Ckt. 4 EM Smith Street Charts - kW 633 Ckt. Smith Street 4 ΕM Charts - kW 634 Ckt. 4 Smith Street EM None 13.8 MS Line Smith Street EM ----None PQ Line 13.8 Smith Street EM None PS Line Smith Street 13.8 EM W Line None Volts 13.8 Smith Street ĔΜ \_\_\_\_ SCADA ----Volts 13.8 B1 Smith Street ΕM -----SCADA 13.8 B2 **Volts** Smith Street υP ----**SCADA** 4 81 Volts Smith Street uР •---------SCADA Δ 82 Smith Street EΜ ••-------13.8/4 T1 None Smith Street EΜ None T2 13.8/4 Smith Street 8890 Smithfield u۶ ----7095 Ckt. SCADA Smithfield 13.8 Com --------13.8 Com Equipment Smithfield 95P is SEL-267 uP- 200/uP \_\_\_ -----None 69 E Line Smithfield 95P is SEL-267; Volts & Amps uP- 200/uP FV Line SCADA\* ----Smithfield 69 Amps EM 69 GE Line SCADA\* Smithfield Amps ΕM SCADA\* 69 S Line Smithfield Volts & Amps SCADA\* ΕM ----69 SA Line Smithfield Volts SCADA \_\_\_\_ 69 B2 Smithfield Volts **B**3 --------69 SCADA Smithfield ----Only one feeder; T1 = 7095 load 69/13.8 Υ1 None\* --------Smithfield 8890 South Cairo EM/uP BE1-851H as BU and 79 2041 Ckt. Charts - Amps -----South Cairo 13.8 BE1-851H as BU and 79 South Cairo 13.8 2042 Ckt. EM/uP ----\*\*\*\*\* Charts - Amos ΕM ----South Cairo 13.8 2043 Ckt. Charts - kW ----Com South Cairo 13.8 Com Equipment \*\*\*\*\* \*\*\*\*\* ----EM/uP 79 done with NLR None South Cairo 69 CF Line -------------69 υÞ South Cairo ČL Line None -----SCADA Volts EM South Cairo 13.8 B1+G1 Charts - kW/SCADA EM/uP 95P is SEL-587 -----South Cairo 69/13.8 T1 Charts - Amps None South Wall St. Single Phase; Oil; Hyd EM 111 Ckt. Kyle L South Wall St. Grid Sense -----Single Phase: Oil; Hyd; missing GS data EM Kyle L 112 Ckt. South Wall St **Grid Sense** ----13.8/4 Charts - kW/kVAr EM South Wall St. 71 Orion Spackenkill uР \*\*\*\* 6041 Ckt. **SCADA** Spackenkill 13.8 ---υP Spackenkill 13.8 6042 Ckt. SCADA uP ----Spackenkill 13.8 6043 Ckt. SCADA Spackenkill 13.8 6044 Ckt. \$CADA uP --------\*\*\*\*\* Spackenkill 13.8 6045 Ckt. SCADA uΡ -----Spackenkill 13.8 6046 Ckt. **SCADA** ---űP υP 13.8 6047 Ckt. SCADA Spackenkill uР Spackenkill 13.8 6048 Ckt. SCADA ----Spackenkill 13.8 Com Equipment \*\*\*\* uP 13.8 KR Line SCADA -----Spackenkill 13.8 KS Line SCADA υP Spackenkill ----13.8 MC Line .... uΡ ----------Spackenkill SCADA u۶ 13.8 MC-200-SK BKR \$CADA --------------Spackenkill uP Spackenkill 13.8 81 SCADA --------u٩ ----13.8 **B**2 Spackenkill .---uP **T1** SCADA 115/13.8 Spackenkill -------υP Т2 115/13.8 Spackenkill BM Staatsburg ---цP **SCADA** 7041 Ckt. 13.8 Staatsburg uР ----SCADA 7042 Ckt 13.8 Staatsburg -------uР 7043 Ckt. SCADA 13.8 Staatsburg ---------13.8 Com Equipment Staatsburg ųΡ SCADA 13.8 **B**1 Staatsburg

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SCADA

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			Electric Subs	tation Upgra	de Needs As	sessment	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	1					M-4000	<u></u>	Six-la abassivasi byd
Standfordville	<u> </u>		MV-90		EM		V4L	Single phase; vac; hyd
Standfordville	13.8	7071 Ckt.	MV-90	*****	EM	*****		
Standfordville	13.8	7072 Ckt.	SCADA					Volts
Standfordville	13.8	B1	MV-90	Fuse				
Standfordville	69/13.8	T1	(V) V - 30		·	2100	i	
Sturgeon Pool			0.116	7,-5-	EM	****	Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	341 Ckt.	Grid Sense					Com
Sturgeon Pool	4	Com Equipment N Line	SCADA	QD.				
Sturgeon Pool	69	O Line	SCADA	υP				
Sturgeon Pool	69 69	P Line	SCADA	up				
Sturgeon Pool Sturgeon Pool	69	69k Bus	SCADA	EM				Volts
Sturgeon Pool		T5	None	Fuse				
Sugarloaf	<del> </del>					44-500		
Sugarloaf	115	SD Line	00151	EM		+	*****	Combine load value
Sugarloat	115	SJ Line	SCADA	EM				Compile load value
Sugarloaf	115	SL Line	None	EM		****		
Sugarloaf	115	B1	SCADA	EM				Volts
	115/69	O & R Transformer	SCADA	EM				
Sugarloaf Tinkertown	113/69	O & R Transformer	GCADA		<u> </u>	2300	<del>                                     </del>	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	UP	2500		TOUR TO THE
Tinkertown	13.8	7023 Ckt.	SCADA		UP UP	· · · · · · · · · · · · · · · · · · ·	+	
Tinkertown	13.8	7024 Ckt.		*****	- <del> </del>	7		
Tinkertown	13.8		SCADA		UP P			
Tinkertown	13.8	7025 Ckt. B1	SCADA		uP			
Tinkertown	13.8	82	SCADA SCADA		uP	4-4		Volts
Tinkertown	13.8				υP			Volts
Tinkertown	69/13.8	Com Equipment			10000			Com
Tinkertown	69/13.8	T1	SCADA	Fuse		*****		
Tioronda	03/13.8	T2	SCADA	Fuse				
Tioronda	13.8	8085 Ckt.		γ		M-4000		
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Tioronda	13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115		Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda		W-566 Ckt. Sw		EM				Agastat
	13.8	B1	SCADA		EM			Volts
Tioronda	115/13.8	T1	Charts - kW/kVAr	EM				
Todd Hill		<del></del>				2200		
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
Todd Hill	13.8	6052 Ckt	SCADA		uP			
Todd Hill	13.8	6053 Ckt.	SCADA	*****	uР			1 . "
Todd Hill	13.8	6054 Ckt.	SCADA		υP			T
Todd Hill	13.8	6055 Ckt.	SCADA		EM			
Todd Hill	13.8	6056 Ckt.	SCADA		EM			
Todd Hill	13.8	6057 Ckt.	SCADA		EM	*****		T
Todd Hill	13.8	Com Equipment	****		*****			Com
Todd Hill	115	A Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	115	A-520-C BKR.		EM				o panno, in replacement plan
Todd Hill	115	C Line	None	EM/Gen-1				95BU is Optimho; in replacement plan
Todd Hill	13.8	W - 524 BKR.	7777		EM			
Todd Hill	115	B1	SCADA					Volts
Todd Hill	13.8	81	SCADA		EM/uP			95BU is SEL-351A; Volts
Todd Hill	13.8	B2	SCADA		UP			Volts
Todd Hill	115/13.8		SCADA	EM/uP				95P is SEL-587
Todd Hill	115/13.8	T2	SCADA	υP				33. 33. 33. 33.

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Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
11 5 - 4 - 4	ļ		·			2200		Volts
Union Ave	115	B1	SCADA	υP				
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF
Union Ave	115	RJ-52 BKR.		EM/uP				
Union Ave	115	UB Line	SCADA	up	, <u></u>			
Union Ave	115	UB-51 BKR		uP				Amps
Union Ave	115	UN Line	SCADA*	EM				Amps
Union Ave	115	UW Line	SCADA*	EM EM				
Union Ave	115	W-1095 BKR.			υP			
Union Ave	13.8	81			υP			
Union Ave	13.8	B2 B3	SCADA		υP			Volts
Union Ave	13.8	B4	SCADA		υP			Volts
Union Ave	13.8	B3-B2			uP	****		
Union Ave	13.8	84-81			υP		,	
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4042 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4043 Ckt.	MV-90	*****	EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4045 Ckt.	MV-90	*****	EM/uP		****	BE1-851H as BU and 79
Union Ave	13.8	4046 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4047 Ckt.	SCADA		uР			
Union Ave	13.8	4051 Ckt.	SCADA	*****	uP		****	
Union Ave	13.8	4052 Ckt.	SCADA		υP			•
Union Ave	13.8	4053 Ckt.	SCADA		uP			
Union Ave	13.8	4054 Ckt.	SCADA		υP			
Union Ave	13.8	4055 Ckt.	SCADA	•	uP			
Union Ave	13.8	Com Equipment		*****				Com
Union Ave	115/13.8	T1	SCADA	EM/uP	*****			95BU is SEL-387E
Union Ave	115/13.8	Т2	SCADA	EM/uP			*****	95BU is SEL-387E
Union Ave	115/13.8	T3	SCADA	u₽				
Van Wagner		·				NONE		
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd
Van Wagner	4	732 Ckt.	Charts - kW/GS		<u> </u>	*****	Kyle L	Single phase; oil; hyd
Vinegar Hill		<del>,,</del>				M-4000		
Vinegar Hill	34.5	2389 Ckt.	MV-90		uΡ		RVE	3 phase; oil; hyd
West Balmville						2300		
West Balmville	115	B2	SCADA	EM				Volts
West Balmville	13.8	B1	SCADA		uP			Combine Bus Volts to one point
West Balmville	13.8	B2	00:5:	<del></del>	υP			<del>                                     </del>
West Balmville	115	B Line	SCADA	uР		<del> </del>	*****	
West Balmville West Balmville	13.8	4011 Ckt.	MV-90	*****	EM			100/00-000
West Balmville	13.8	4012 Ckt.	SCADA		uP uP			MV-90 still?
SIDAINIPO ICAL	13.8	4013 Ckt. 4014 Ckt.	SCADA		UP UP			MV-90 still?
	13.8	4014 Ckt. 4015 Ckt.	SCADA MV-90		EM	<del></del>		MV-90 still?
West Balmville			M A - 2.0			<del></del>		Com
West Balmville West Balmville	13.8				1			
West Balmville West Balmville West Balmville	13.8 13.8	Com Equipment	SCADA	uP				Cons
West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line	SCADA	υP				Com
West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line DB-875 BKR.	SCADA	uP uP				Com
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115	Com Equipment DB Line DB-875 BKR. DW Line	SCADA	นค บค บค				Com
West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115	Com Equipment DB Line DB-875 BKR.	SCADA  SCADA	uP uP				5000
West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR.	SCADA SCADA SCADA	นP บP บP				5000
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West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line R Line	SCADA SCADA SCADA SCADA	นค				
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West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville West Balmville	13.8 13.8 115 115 115 115 115 115 115	Com Equipment DB Line DB-875 BKR. DW Line DW-662 BKR. F Line R Line W-478 BKR. W-855 BKR.	SCADA SCADA SCADA SCADA SCADA	иР иР иР иР иР иР иР			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Combine load value

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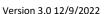
			Electric Sub	ostation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckf.	Metering	T. Relaying	D. Refaying	RTU	Recloser	Comment
Natural and and the	<del> </del>							
Westerlo	13.8	1091 Ckt.	SCADA		uP .			
Westerlo	13.8	1092 Ckt.	SCADA		UP I			
Westerlo	13.8	1093 Ckt.	SCADA		uP			
Westerlo	13.8	B1	SCADA		υP			
Westerlo		Com Equipment				****		Only has one 13.8 bus; T1 = Bus load
Westerlo			SCADA	uP		****		Only has one 13.8 bus, 11 - bus load
Westerlo	69/13.8	T1	3CADA	υP				
Westerlo	69	Cap Bank FW Line	SCADA	UP				
Westerlo	69	NW Line	SCADA	υP		****		
Westerlo	69	FW-1500-NW BKR.		uP				
Westerio		1 1111300 1011 211111				L&N		
Wiccopee	115	FS Line	None	EM				
Wiccopee	115	WP Line	None	uP				
Wiccopee	115	FS - 1652- WP BKR.		EM				<u> </u>
Wiccopee Wiccopee	13.8	F1-292 BKR			EM			
	13.8	F2-280 BKR			EM			
Wiccopee Wiccopee	13.8	W-368 BKR.			EM			
Wiccopee	13.8	W-378 BKR.			EM			
	13.8	W-632 BKR.			EM			
Wiccopee		W-636 BKR.			EM		·	<del> </del>
Wiccopee	13.8					<del>}</del>	<del>                                     </del>	ļ
Wiccopee	13.8	Future (Unit #3)	****		EM			
Wiccopee	13.8	Future (Unit #9)			EM			<u> </u>
Wiccopee	13.8	, B1			EM			
Wiccopee	13.8	82			EM	****		
Wiccopee	13.8	Com Equipment			****		*****	Com
Wiccopee	115/13.8	Tt	SCADA	EM				
Wiccopee	115/13.8	T2	SCADA	EM				
Woodstock						M-4000		·
Woodstock	13.8	3011 Ckt.	MV-90		EM			1
Woodstock	13.8	3012 Ckt.	MV-90		EM	1		<del></del>
Woodstock	13.8	3013 Ckt.	MV-90		EM			<del>-</del>
Woodstock	13.8	3014 Ckt.	MV-90		EM			<del></del>
Woodstock	13.8	B1	SCADA		EM		2222	Volts
Woodstock	13.8	B2	SCADA		EM	<del> </del>		
Woodstock	69/13.8	T2+SR Line	*****	EM				Volts
Woodstock	69/13.8	T2 + B2		EM				<del> </del>
Woodstock	69/13.8	T1	MV-90	2.01				<del> </del>
Woodstock	69/13.8	T2	MV-90			*****		<u> </u>

# Attachment 6

		Station	Cost
Γ		Dashville	\$190,000
	2012	East Walden	\$610,000
		Tioronda	\$200,000
		Coxsackie	\$130,000
		South Cairo	\$160,000
	2013	East Park	\$200,000
		Pleasant Valley	\$360,000
		Todd Hill	\$160,000
		Sand Dock	\$510,000
	2014	Fishkill Plains	\$480,000
		South Wall St.	\$84,000
	2015	Manchester	\$340,000
	2010	Forgebrook	\$730,000
η Ο	2016	Rock Tavern	\$1,060,000
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Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: 345 kV Switch Replacement Program

Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Various 345 kV disconnect replacement projects have been included in this budget item.

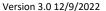
#### Describe the project objective and scope of work:

Problems have been identified with the TTT-7, EA, VR2 and VT-1 style motor operated 345kV air disconnects at the Roseton, Rock Tavern and Hurley Ave substations. Limited to no replacement parts are available for these style switches. These disconnects have reached the end of their useful lives, are problematic, and have resulted in extended time trouble-shooting problems and result in increased callouts. There have been several failures in recent times due to frequency of operation and general condition.

## Describe specific scope exclusions, assumptions and constraints:

With the developing trend of problems and consideration given to the criticality of the bulk 345kV system, a multi-year systematic 345kV disconnect replacement program has been developed.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Selective replacement of disconnect switches as specified by the program. (This represents the continuation of our on-going disconnect replacement program). See "Operations Services Infrastructure Projects Rev 5-10-13 (06.10.15 MDM).doc" and "OS2018-002 Infrastructure Recommendations.pdf"

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

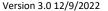
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Infrastructure Replacements

Why was the proposed project scope chosen over other alternatives?

N/A: Infrastructure Replacements

# D. PRIORITIZATION

Why do we need to complete this project in the period requested? Infrastructure Replacements as required.

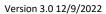
What are the risks and consequences of not completing this project?

Failed substation disconnect switches would not be replaced possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	,			cost estimates she adjustments for in			
	\$6,753,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	556,100	54,100	51,000	51,000	52,000	54,000	54,000	240,000
	Labor (Monthly Payroll)	277,050	27,050	25,000	25,000	26,000	27,000	27,000	120,000
A	Stock Materials	277,050	27,050	25,000	25,000	26,000	27,000	27,000	120,000
D	Non-Stock Material (A/P taxable)	1,112,200	108,200	101,000	102,000	105,000	108,000	108,000	480,000
ī	Contractors (A/P tax exempt)	390,870	37,870	36,000	36,000	37,000	38,000	38,000	168,000
Т	Overheads	2,781,500	270,500	254,000	254,000	261,000	271,000	271,000	1,200,000
ı	AFUDC*	166,230	16,230	15,000	15,000	16,000	16,000	16,000	72,000
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,561,000	541,000	507,000	508,000	523,000	541,000	541,000	2,400,000
R	Labor (Weekly Payroll)	178,800	33,450	23,000	24,000	24,000	24,000	25,000	25,350
E	Labor (Monthly Payroll)	357,600	66,900	46,000	47,000	48,000	49,000	50,000	50,700
Hi	Contractors (A/P tax exempt)	59,600	11,150	8,000	8,000	8,000	8,000	8,000	8,450
R	Overheads	596,000	111,500	77,000	78,000	80,000	82,000	83,000	84,500
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	1,192,000	223,000	154,000	157,000	160,000	163,000	166,000	169,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

1,586

Prior years funding; not actuals.

2,133

547



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

**Cost Estimate Level:** Conceptual

**High Confidence Cost Estimate Confidence:** (that final cost will be within +/-30% of the estimate):

4,727,100

No further estimate range is required.

Formulas give standard ranges ← per estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Historical Proforma Pricing Basis for estimate:

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

8,778,900

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

# **INFRASTRUCTURE REVIEW & RECOMMENDATIONS**

## **VERSION HISTORY**

Memo No.	Date	Action	Author	Approval
OS2018-002	6/25/2018	Initial Document Creation	B. Perry	Jan Myseli

This memo is to memorialize Operations Services annual review of its infrastructure, maintenance and inspection programs for various pieces of substation equipment as well as physical infrastructure. This document will be modified annually.

## **Breaker Replacement**

Below are the 115kV oil breakers remaining and the planned replacement as identified in the capital budget.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	ROCK TAVERN	115 kV	RJ-818	ALLIS CHALMERS	BZO-115-10000	OIL	1971
2018	ROCK TAVERN	115 kV	W-681	GE	FK-121-43000	OIL	1971
2018	UNION AVE	115 kV	RJ-52	GE	FK-439-115-3500	OIL	1952
2019	WEST BALMVILLE	115 kV	DW-662	ALLIS CHALMERS	BZO-115-7500	OIL	1965
2019	HURLEY AVE	115 kV	HP-1643	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	W-389	ALLIS CHALMERS	BZO-121-40-6	OIL	1973
2019	HURLEY AVE	115 kV	OR-1640	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	A-2451	ALLIS CHALMERS	BZO-121-40-3PST	OIL	1973
2019	ROCK TAVERN	115 kV	W-814	GE	FK-121-43000	OIL	1971
2019	ROCK TAVERN	115 kV	RD-809	ALLIS CHALMERS	BZO-115-10000	OIL	1971

2019	ROCK TAVERN	115 kV	J-788	ALLIS CHALMERS	BZO-115-10000	OIL	1971
2020	BETHLEHEM ROAD	115 kV	RD-604-UB	ALLIS CHALMERS	BZO-121-40-6	OIL	1974
2020	PLEASANT VALLEY	115 kV	R-8	SIEMENS	BZO-121-50-6	OIL	1991
2020	PLEASANT VALLEY	115 kV	RX-4	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
2020	PLEASANT VALLEY	115 kV	R-81	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
2020	PLEASANT VALLEY	115 kV	R-10	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
2020	PLEASANT VALLEY	115 kV	R-62	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
2020	PLEASANT VALLEY	115 kV	R-61	MCGRAW EDISON	OHT-54	OIL	1973
2020	PLEASANT VALLEY	115 kV	R-643	ALLIS CHALMERS	BZO-121-40-6	OIL	1980
2021	LINCOLN PARK	115 kV	LR-1219-HP	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2021	LINCOLN PARK	115 kV	HP-1318	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2021	NORTH CATSKILL	115 kV	R-2	SIEMENS	BZO-121-20-7	OIL	1985
2022	SHENANDOAH	115 kV	FS-739	SIEMENS	BZO-121-40-6	OIL	1983
2022	SHENANDOAH	115 kV	FS-959	SIEMENS	BZO-121-40-6	OIL	1983
2022	BARNEGAT	115 kV	KB-749-KC	ALLIS CHALMERS	BZO-121-40-6	OIL	1987
Recommendation Requested	WICCOPEE	115 kV	FS-1652- WP	ALLIS CHALMERS	BZO-121-40-6	OIL	1988

<sup>\*</sup>Wiccopee has essentially no distribution load present. A recommendation about the necessity of this station is required for equipment replacement to be planed appropriately

Outlined below are the 69 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	HURLEY AVE	69 kV	SB-233	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	I-442	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	W-142	GE	FK-69-2500-5	OIL	1963
2019	HONK FALLS	69 kV	GM-737	GE	FK-69-2500	OIL	1963
2019	HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	FZO-151-69F	OIL	1953
2019	HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	FZO-151-69F	OIL	1952
2019	ROCK TAVERN	69 kV	WM-1675	GENERAL ELECTRIC	FK-69-2500-5	OIL	1964
2020	MYERS CORNERS	69 kV	TV-399- KM	SIEMENS	TDO-72.5- 20000	OIL	1981
2023	HIBERNIA	69 kV	E-972	ITE CIRCUIT BREAKER COMPANY	69KSB2500-12	OIL	1967
Substation Rebuild	KNAPPS CORNERS	69 kV	G-1175	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	KM-1185	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	TR-1195	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	W-1409	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981

Outlined below are the 15 kV oil breakers remaining and the associated years of planned replacement.

Anticipated		Voltage				Breaker	Mfg.
Replacement	Location	Class	Position	Manufacturer	Model	Туре	Date
	NEW						
2020	BALTIMORE	15 kV	TD-1081	SIEMENS	SDO-15-500	OIL	1990
	NEW						
2020	BALTIMORE	15 kV	TD-1082	SIEMENS	SDO-15-500	OIL	1982
	NEW						
2020	BALTIMORE	15 kV	TD-1083	SIEMENS	SDO-15-500	OIL	1990
					FK-255-13.8-		
2022	JANSEN AVE	15 kV	K-553	GE	250-1	OIL	1941
2022		4=154	=		FK-255-13.8-		
2022	JANSEN AVE	15 kV	KL-543	GE	250-1	OIL	1941
2022	LANICENLANE	45137	V E03	C.F.	FK-255-13.8-	OII	1044
2022	JANSEN AVE	15 kV	K-583	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	K-593	GE	FK-255-250	OIL	1941
2022	LANICENLANE	45137	KO 233	C.F.	FK-255-13.8-	OII	1044
2022	JANSEN AVE	15 kV	KO-533	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	TD-1001	GE	FK-255-13.8- 250-1	OIL	1941
2022	JANSEN AVE	12 KA	10-1001	GE	FK-255-13.8-	OIL	1941
2022	JANSEN AVE	15 kV	TD-1002	GE	250-1	OIL	1941
2022	37(143)2147(4)2	13 KV	10 1002	OL .	FK-255-13.8-	OIL	1341
2022	JANSEN AVE	15 kV	TD-1004	GE	250-1	OIL	1941
	STURGEON					_	
2023	POOL	15 kV	OS-1	GE	FK-255-150	OIL	1924
2023		13 KV	03 1	OL.	1 K 233 130	OIL	1324
2023	STURGEON POOL	15 kV	OS-2	GE	FKR-255	OIL	1924
2025		12 KV	U3-2	GE	FNR-255	OIL	1924
2022	STURGEON	45111	06.2	MESTINICULOUSE	F 0	011	1024
2023	POOL	15 kV	OS-3	WESTINGHOUSE	E-8	OIL	1924
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	CM-311	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	TD-8006	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	W-426	CHALMERS	Н	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 881	GE	FK-143	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 882	GE	FK-143	OIL	1958

Substation Retirement	MARYLAND AVE	15 kV	W-426	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 881	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 882	GE	FK-46	OIL	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8026	GE	FKD-15.5- 18000-4	OIL	1966
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8027	GE	FK-14.4-500	OIL	1958
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8028	GE	FK-14.4-500-1	OIL	1959

Outlined below are the 5 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
Substation Retirement	BEACON	5 kV	CKT 801	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 802	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 803	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	W-414	GE	FKR-255-7.2- 100-2	OIL	1957
Substation Retirement	BEACON	5 kV	W-463	GE	FKR-255-7.2- 100-2	OIL	1957
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 375	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 376	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 377	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 378	GE	FKR-255-100	OIL	1938

# 345kV SF6 Breaker Replacement

A replacement recommendation is in affect for Westinghouse type SFA SF6 breakers as these breakers have historically been leak prone and maintenance is extremely time consuming because of the design complexity. Outlined below are the type SFA breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2020	HURLEY AVE	345 kV	30354	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2021	HURLEY AVE	345 kV	30353	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2022	HURLEY AVE	345 kV	30151	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976

# 15kV Breaker Replacement

A replacement recommendation is in affect for Westinghouse type DH and DHP breakers as these breakers are known to have components that contain asbestos. Outlined below are the type DH and DHP breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Break er Type	Mfg. Date
2018	FISHKILL PLAINS	15 kV	TD-8091	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8092	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8093	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8094	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-975	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-976	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-1000	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	UNION AVE	15 kV	W-1105	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-1095	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-837	WESTINGHOUSE	150-DH-500E	AIR	1964
2018	UNION AVE	15 kV	TD-4049	WESTINGHOUSE	150-DH-500A	AIR	1967
2018	UNION AVE	15 kV	UW-1494	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	UN-594	WESTINGHOUSE	150-DH-250A	AIR	1957
2018	UNION AVE	15 kV	TD-4046	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	TD-4045	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4044	WESTINGHOUSE	150-DH-500E	AIR	1969
2018	UNION AVE	15 kV	TD-4043	WESTINGHOUSE	150-DH-500A	AIR	1957
2018	UNION AVE	15 kV	TD-4042	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4041	WESTINGHOUSE	150-DH-500E	AIR	1964
2019	MONTGOMERY ST.	15 kV	NM-384	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	NB-385	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4001	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4002	WESTINGHOUSE	150-DH-500A	AIR	1958

	NAONTCONAEDY						
2019	MONTGOMERY ST.	15 kV	TD-4003	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-507	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-508	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-509	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	R-350	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	F-351	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	B-352	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-359	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	WN-486	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-489	WESTINGHOUSE	150-DH-500A	AIR	1958
2023	SAND DOCK	15 kV	BP-1296	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	BP-1570	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-909	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-910	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1449	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1453	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1568	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1573	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-902	WESTINGHOUSE	150-DHP-500	AIR	1973
2024	REYNOLDS HILL	15 kV	TD-6001	WESTINGHOUSE	150-DHP	AIR	1972
2024	REYNOLDS HILL	15 kV	TD-6005	WESTINGHOUSE	150-DHP	AIR	1973
Substation Retirement	BEACON	15 kV	NM-402	WESTINGHOUSE	150-DH-500E	AIR	1958
Substation Retirement	BEACON	15 kV	TD-8015A	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-408	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-420	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BOARDMAN ROAD	15 kV	Z-201	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-202	WESTINGHOUSE	150-DH-250A	AIR	

Substation Retirement	BOARDMAN ROAD	15 kV	Z-203	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-204	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-205	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-206	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-208	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-209	WESTINGHOUSE	150-DH-250A	AIR	
2025/2026	SHENANDOAH	15 kV	B-4453	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4454	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4455	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	B-4456	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S10-1015	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S11-405	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S12-401	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S13-412	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S14-410	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S7-1102	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	S8-1014	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S9-1009	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	TD-8071	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	TD-8072	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-1059	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-1279	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	W-1593	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-664	WESTINGHOUSE	150-DHP-750C	AIR	1986

SHENANDOAH	15 kV	W-665	WESTINGHOUSE	150-DHP-750C	AIR	1986
SHENANDOAH	15 kV	W-802	WESTINGHOUSE	150-DHP-750C	AIR	1986
SHENANDOAH	15 kV	W-803	WESTINGHOUSE	150-DHP-750C	AIR	1986
SHENANDOAH	15 kV	W-805	WESTINGHOUSE	150-DHP-750C	AIR	1986
SHENANDOAH	15 kV	W-807	WESTINGHOUSE	150-DHP-750C	AIR	1986
SHENANDOAH	15 kV	W-845	WESTINGHOUSE	150-DHP-500	AIR	1982
SHENANDOAH	15 kV	W-846	WESTINGHOUSE	150-DH-500	AIR	1980
TIORONDA	15 kV	TD-8085	WESTINGHOUSE	150-DHP-500	AIR	1971
TIORONDA	15 kV	TD-8086	WESTINGHOUSE	150-DHP-500	AIR	1971
TIORONDA	15 kV	W-567	WESTINGHOUSE	150-DHP-500	AIR	1971
TIORONDA	15 kV	TD-8087	WESTINGHOUSE	150-DHP-500	AIR	1971
	SHENANDOAH SHENANDOAH SHENANDOAH SHENANDOAH SHENANDOAH TIORONDA TIORONDA TIORONDA	SHENANDOAH 15 kV  SHENANDOAH 15 kV  SHENANDOAH 15 kV  SHENANDOAH 15 kV  SHENANDOAH 15 kV  TIORONDA 15 kV  TIORONDA 15 kV  TIORONDA 15 kV	SHENANDOAH         15 kV         W-802           SHENANDOAH         15 kV         W-803           SHENANDOAH         15 kV         W-805           SHENANDOAH         15 kV         W-807           SHENANDOAH         15 kV         W-845           SHENANDOAH         15 kV         W-846           TIORONDA         15 kV         TD-8085           TIORONDA         15 kV         W-567	SHENANDOAH 15 kV W-802 WESTINGHOUSE  SHENANDOAH 15 kV W-803 WESTINGHOUSE  SHENANDOAH 15 kV W-805 WESTINGHOUSE  SHENANDOAH 15 kV W-807 WESTINGHOUSE  SHENANDOAH 15 kV W-845 WESTINGHOUSE  SHENANDOAH 15 kV W-846 WESTINGHOUSE  TIORONDA 15 kV TD-8085 WESTINGHOUSE  TIORONDA 15 kV TD-8086 WESTINGHOUSE  TIORONDA 15 kV W-567 WESTINGHOUSE	SHENANDOAH         15 kV         W-802         WESTINGHOUSE         150-DHP-750C           SHENANDOAH         15 kV         W-803         WESTINGHOUSE         150-DHP-750C           SHENANDOAH         15 kV         W-805         WESTINGHOUSE         150-DHP-750C           SHENANDOAH         15 kV         W-845         WESTINGHOUSE         150-DHP-500           SHENANDOAH         15 kV         W-846         WESTINGHOUSE         150-DHP-500           TIORONDA         15 kV         TD-8085         WESTINGHOUSE         150-DHP-500           TIORONDA         15 kV         W-567         WESTINGHOUSE         150-DHP-500	SHENANDOAH 15 kV W-802 WESTINGHOUSE 150-DHP-750C AIR  SHENANDOAH 15 kV W-803 WESTINGHOUSE 150-DHP-750C AIR  SHENANDOAH 15 kV W-805 WESTINGHOUSE 150-DHP-750C AIR  SHENANDOAH 15 kV W-807 WESTINGHOUSE 150-DHP-750C AIR  SHENANDOAH 15 kV W-845 WESTINGHOUSE 150-DHP-500 AIR  SHENANDOAH 15 kV W-846 WESTINGHOUSE 150-DH-500 AIR  TIORONDA 15 kV TD-8085 WESTINGHOUSE 150-DHP-500 AIR  TIORONDA 15 kV TD-8086 WESTINGHOUSE 150-DHP-500 AIR  TIORONDA 15 kV W-567 WESTINGHOUSE 150-DHP-500 AIR

<sup>\*</sup>Operations Services recommends the deferral of the Tioronda breaker replacement until a proper cost benefit switchgear replacement is developed to weigh the value of component replacement (wires, AC power, breakers, etc.) versus entire switchgear. The switchgear condition is questionable (discussed further in later section)

A replacement recommendation is in affect for General Electric type AM breakers as replacement parts are not available for these breakers and continuous issues have been reported. Outlined below are the type AM breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breake r Type	Mfg. Date
2019	COXSACKIE	15 kV	TD-1071	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1072	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1076	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1074A	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-1398	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-296	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-484	GE	AM-13.8-500-6H	AIR	1969
2020	JANSEN AVE	15 kV	TD-1003	GE	AM-15-250-1	AIR	1956
2020	WOODSTOCK	15 kV	TD-3012	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	TD-3013	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-1091	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-25	GE	AM-15-250-1	AIR	2001
2021	NEVERSINK	5 kV	CKT-391	GE	AM-5-150-5	AIR	1950
2021	NEVERSINK	5 kV	W-1128	GE	AM-5-150-5	AIR	1950
Substation Retirement	MARYLAND AVE	5 kV	CKT 623	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	CKT 624	GE	AM-5-150-7	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-1034	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-540	GE	AM-5-150-7	AIR	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1208	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1215	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1462	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1562	GE	AM-13.8-500-5H	AIR	1953
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 395	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 396	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 397	GE	AM-2.4/4.16- 100/150-1	AIR	1968

lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 121	GE	AM-2.4/4.16- 150/250-1	AIR	1955
lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 122	GE	AM-2.4/4.16- 100/150-1	AIR	1955
lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 123	GE	AM-2.4/4.16- 150/250-2	AIR	1955

<sup>\*</sup>Operations Services recommends the replacement of the Converse Street breakers along with the switchgear due to parts constraints, wiring issues, old generation relaying, etc. A cost benefit analysis should be performed to determine the best course of action.

# **Transformer Replacement**

Typically a power transformer's useful life is 55 years old. When rebuilding a substation where the transformer is greater than 55 years old, consideration should be given to retiring and not reusing the transformer. Outlined below are the power transformers that are scheduled for replacement in the 5 year budget.

Location	Asset Name	Age	Plan	Replacement Reason	Condition Analysis
BOULEVARD	TR. #1 PH 1	64	Substation Rebuild Age		
BOULEVARD	TR. #1 PH 2	64	Substation Rebuild	Age	
BOULEVARD	TR. #1 PH 3	64	Substation Rebuild	Age	
BOULEVARD	TR. #2	78	Substation Rebuild	Age	
BOULEVARD	TR. #3	47	Substation Rebuild	Potential Spare	
CONVERSE ST	TR. #2	62	Transformer Replacement Condition		Very poor power factor test results and poor oil quality.
CONWAY PLACE	TR. #1	59	Substation Retirement Substation Retirement		
MONTGOMERY ST	TR. #1	80	Transformer Replacement Condition		Very poor power factor test results.
MONTGOMERY ST	TR. #2	80	Transformer Replacement Condition		Very poor power factor test results.
MARYLAND AVE	TR. #1	63	Substation Retirement Substation Retirement		
MARYLAND AVE	TR. #2	63	Substation Retirement Substation Retiremen		
NORTH CATSKILL	TR. #4	67	Transformer Replacement	Planning Recommendation	
NORTH CATSKILL	TR. #5	62	Transformer Replacement	Planning Recommendation	
NORTH CHELSEA	TR. #1 PH 1	71	Transformer Replacement Condition		Very poor power factor test results. Poor DGA results.
NORTH CHELSEA	TR. #1 PH 2	71	Transformer Replacement	Condition	Very poor power factor test results.
NORTH CHELSEA	TR. #1 PH 3	71	Transformer Replacement Condition		Very poor power factor test results. Poor DGA results.
REYNOLDS HILL	TR. #3	64	Transformer Replacement	Age & Refined LTC	
REYNOLDS HILL	TR. #4	66	Transformer Replacement	Age & Refined LTC	
KNAPPS CORNERS	TR. #1	52	Substation Rebuild	Age & Condition	Poor power factor test results and poor oil quality.
KNAPPS CORNERS	TR. #2	40	Substation Rebuild	Condition Poor DGA results and poor oil quality.	

Central Hudson's power transformers are evaluated based on analytical testing data compiled by Operations Services. Outlined below are the power transformers that need to be monitored for decreasing condition. Operations Services is requesting that planning make a recommendation related to the following power transformers.

Location	Asset Name	Age	Comment
ANCRAM	Bank 1 PH 1	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 2	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 3	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
CONVERSE ST	TR. #1	49	High hydrogen content.
FORGEBROOK	TR. #1	60	High hydrogen content. High combustible gas content overall. Oil quality deteriorating. High power factor results on CH insulation.
GREENFIELD ROAD	TR. #2	45	Very high CHL power factor results. Acetylene present in oil likely left over from previous lead damage.
HUNTER	TR. #1	23	High ethylene and ethane content. High combustible content overall.
TINKERTOWN	TR. #2	61	Elevated power factor results across the board. Relative saturation is elevated.

## **Switchgear Replacement**

Switchgear condition is evaluated by Operations Services on a five year schedule. Below is a list of switchgear that has been given a poor evaluation, where replacement needs to be considered.

Location	Asset Type	Comment
MYERS CORNERS	Switchgear	Poor roof condition. Switchgear roof has rotted through allowing water to ingress over relays. Breaker roll in alignment is problematic.
WOODSTOCK	Switchgear	Roof and rust condition is poor. Switchgear wiring and panels have aged. Needs replacement.
SHENANDOAH Multiple Switchgear		Very difficult to rack breakers in and out due to misalignment and shifting of the switchgear floor. This issue makes switching very challenging.
TIORONDA	Switchgear	Wiring and CTs with the gear are deteriorated.  Breakers require 240 VAC which would lead to extensive rewiring. It is recommended that the switchgear be replaced with the breakers
CONVERSE STREET	Switchgear	Switchgear wiring has aged and contains old electromechanical relaying. Parts for the switchgear breakers are hard to procure. It is recommended to couple the replacement of the switchgear breakers with a new switchgear.

Additionally, Operations Services is looking for several recommendations from planning related to the replacement of switchgear and possibility of low voltage conversion to assist with some of the substation initiatives.

- Lincoln Park outdoor switchgear necessity (some of these cables are in poor condition and are
  out of potentially out of service needs engineering/planning review)
- Shenandoah Bus #1 & Bus #2 switchgears
- Neversink feasibility of 4kV conversion to 13.8kV

# **Switch Replacement**

#### 345 kV Switch Replacement

Recently, problems have developed with the Pascor type TTT-7 and Memco type EA, VR2 and VT-1 style motor operated 345kV air disconnects at the Roseton, Rock Tavern and Hurley Avenue substations. Replacement parts availability is limited for these switch styles.

Operations Services has determined that these disconnects have reached the end of their useful life due to increasing issues, troubleshooting and callouts.

Below is a list of remaining switches that need replacement based on this recommendation in prioritized order. This order can be shuffled if replacements are to be packaged together, but can be followed as a guideline.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
ROCK TAVERN 345 kV	RTB-3451	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3092	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30382	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3091	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30393	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-4483	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30193	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31194	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30181	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB-A- 2492	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31193	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30398	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30394	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30581	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-3493	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-3484	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots

ROCK TAVERN 345 kV	RTB-4491	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-C3392	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB-A- 2491	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3397	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3393	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30192	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3394	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-31191	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3094	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30392	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3396	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3395	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB- 376934	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- 376945	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- C33911	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C- 3093	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31181	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	
ROCK TAVERN 345 kV	RTB-31182	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3398	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3399	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB- C33910	345 kV	MEMCO	EA	1/1/1972	
HURLEY AVENUE - 345kV	HAB- 30191	345 kV	MEMCO	VR2	1/1/1976	
ROSETON SWITCHYARD	RSB-30591	345 kV	MEMCO	VR2	1/1/1970	
ROSETON SWITCHYARD	RSB-30391	345 kV	MEMCO	VR2	1/1/1970	
ROCK TAVERN 345 kV	RTB-4492	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	
ROCK TAVERN 345 kV	RTB-C3373	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB-C3371	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31192	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C-	345 kV	PASCOR	VT-1	1/1/1980	

	3081		ATLANTIC			
ROSETON SWITCHYARD	RSB-C- 3082	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	

## 115 kV Switch Replacement

Operations Services collects and trends hotspot information as well as trouble orders documenting issues with switches over the lifespan of a switch. Below is an identified list of 115 kV switches that are recommended for replacement.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
BARNEGAT	KB-747	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KB-748	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KC-750	115 kV	MEMCO	VM1-204	1987	Reoccurring Hotspots
BARNEGAT	KC-752	115 kV	SOUTHERN STATES	VM-1-104	1987	
INWOOD AVENUE	X-970	115 kV	SOUTHERN STATES	VM-1-208	1975	Pooccurring Hotenote
INWOOD AVENUE	X-977	115 kV	SOUTHERN STATES	VM-1-208	1975	Reoccurring Hotspots
NORTH CATSKILL REACTOR	293	115 kV	PASCOR	CBSA	2014	Reoccurring Hotspots, Adjustment Issues, Poor Quality Construction
PLEASANT VALLEY	1077	115 kV			-	
PLEASANT VALLEY	1099	115 kV			-	
PLEASANT VALLEY	1277	115 kV			-	
PLEASANT VALLEY	1288	115 kV			-	Reoccurring Hotspots causing switches to become
PLEASANT VALLEY	1299	115 kV			-	inoperable. Switches are hand operated and are very difficult to open making operation dangerous
PLEASANT VALLEY	1377	115 kV			-	during switching.
PLEASANT VALLEY	1388	115 kV			-	
PLEASANT VALLEY	1399	115 kV			-	
PLEASANT VALLEY	6177	115 kV			-	

PLEASANT VALLEY	6199	115 kV		-	
PLEASANT VALLEY	6277	115 kV		-	
PLEASANT VALLEY	6299	115 kV		-	
PLEASANT VALLEY	64377	115 kV		-	
PLEASANT VALLEY	64399	115 kV		-	
PLEASANT VALLEY	8171	115 kV		-	
PLEASANT VALLEY	8172	115 kV		-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to
PLEASANT VALLEY	8191	115 kV		-	open making operation dangerous during switching.
PLEASANT VALLEY	8192	115 kV		-	
PLEASANT VALLEY	877	115 kV		-	
PLEASANT VALLEY	888	115 kV		-	
PLEASANT VALLEY	899	115 kV		-	
PLEASANT VALLEY	93932- 44	115 kV		-	
PLEASANT VALLEY	93931- 44	115 kV		-	

PLEASANT VALLEY	C677	115 kV			-	
PLEASANT VALLEY	C688	115 kV			-	
PLEASANT VALLEY	C699	115 kV			-	
PLEASANT VALLEY	M77	115 kV			-	
PLEASANT VALLEY	M88	115 kV			-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to
PLEASANT VALLEY	M99	115 kV			-	open making operation dangerous during switching.
PLEASANT VALLEY	Q302	115 kV			-	
PLEASANT VALLEY	X-477	115 kV			-	
PLEASANT VALLEY	X-488	115 kV			-	
PLEASANT VALLEY	X-499	115 kV			-	
TODD HILL	A-523	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C line during recent work order

TODD HILL	A-702	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor
TODD HILL	A-521	115 kV	SIEMENS	CM-4A	1989	problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C
TODD HILL	C-519	115 kV	SIEMENS	CM-4A	1989	line during recent work order

<sup>\*</sup>Model numbers for switches may not always be accurate

Operations Services recommends that the switches at Pleasant Valley be replaced with or prior to the planned replacement of the existing 115kV oil breakers in 2020, a systematic plan needs to be coordinated to allow for proper isolation of each breaker prior to replacement. The existing switch problems will prevent proper clearances to be taken if they are not replaced prior to the breakers.

# **Non-Equipment Based Replacements**

A 5 year substation evaluation program that assesses "non-equipment" assets has been implemented in 2016 to address the following equipment: steel, foundations, fence, ground grid, etc. As projects are identified through this program, Operations Services will bring issues to the attention of Substation Design or manage with local work orders as needed.

#### **Steel Replacement**

As replacement recommendations are identified, this work should be completed with future rebuilds unless there is imminent danger of failure, in which case the repairs should be handled sooner. It is also recommended that during any future rebuilds, that Substation Design evaluates the steel in and around any equipment that will be affected during the work order. An example of this is in 2019, as part of the Boulevard substation upgrade, the steel on the 69kV portion of the yard will be replaced due to condition concerns which were caused by poor foundations.

#### **Foundation Replacement**

These replacement recommendations should be considered during future work order planning to improve the existing infrastructure. Overall foundations are acceptable, with some older stations showing deteriorated foundations due to weather such as flaking. Some flaking is addressed as part of general maintenance by patching the foundations as necessary.

#### Fence Review

Operations Services completes fence inspections on a monthly as well as a more thorough inspection on a 5 year cycle and recommends either fence maintenance repair or complete rebuilds. Most recently the East Walden Substation fence was replaced which had rotten top rails as well as posts. It is recommended that 1 inch fence fabric is utilized for new substation fences to limit fence cuts.

#### **Ground Grid Review**

Operations Services completes ground grid testing on an 8 year cycle and reports ground grid deficiencies as they are determined. When adding or replacing equipment within a substation, the ground grid should be reviewed by Substation Design to ensure that the existing grid is adequate.

Substation	Comments
Manchester	There are ground grid deficiencies that were noted during recent construction. It is recommended that a formal review of the substation ground grid be conducted.
West Balmville	During fence repair an electrical arc was drawn. This could be due to lack of fence bonding, however as part of the future breaker replacements, it is recommended that a more thorough engineered review be completed.

#### Stone Review

Operations Services recommendation is to review the integrity of the stone fill within a substation when any major work order is being executed to ensure there is adequate stone coverage throughout the entire station and incorporate this work as part of any major work to be performed.



# **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: 115 kV Switch Replacement Program Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Various 115 kV disconnect replacement projects have been included in this budget item.

#### Describe the project objective and scope of work:

Based on condition, age and criticality, Substation Operations has identified 115 kV disconnect switches as candidates for targeted replacements. The 115kV Switch Replacement Program will operate similar to our original Breaker Replacement Program that has been broken out into separate projects. Switches will be identified by condition, criticality, age, use, availability of parts, and maintenance issues in order to create a prioritized list for replacement.

#### Describe specific scope exclusions, assumptions and constraints:

Development of a 115kV switch replacement program.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Selective replacement of disconnect switches as specified by the program. (This represents the continuation of our on-going disconnect replacement program). See "Operations Services Infrastructure Projects Rev 5-10-13 (06.10.15 MDM).doc" and "OS2018-002 Infrastructure Recommendations.pdf"

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Installation of equipment to modernize and enhance the operation of Electric Substations.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

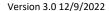
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A: Infrastructure Replacements

Why was the proposed project scope chosen over other alternatives?

N/A: Infrastructure Replacements

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Infrastructure Replacements as required.

What are the risks and consequences of not completing this project?

Failed substation disconnect switches would not be replaced possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	•		All future year cost estimates should include applicable adjustments for inflation.				
	\$7,568,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	682,900	11,900	11,000	81,000	84,000	87,000	87,000	321,000
	Labor (Monthly Payroll)	340,950	5,950	5,000	41,000	42,000	43,000	43,000	161,000
A	Otook Materials	340,950	5,950	5,000	41,000	42,000	43,000	43,000	161,000
D D	Non-Stock Material (A/P taxable)	1,362,800	23,800	21,000	162,000	167,000	173,000	173,000	643,000
l	Contractors (A/P tax exempt)	479,330	8,330	8,000	57,000	59,000	61,000	61,000	225,000
Т	Overheads	3,409,500	59,500	53,000	406,000	418,000	433,000	433,000	1,607,000
I	AFUDC*	203,570	3,570	3,000	24,000	25,000	26,000	26,000	96,000
O	Journal vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,820,000	119,000	106,000	812,000	837,000	866,000	866,000	3,214,000
R	<u> </u>	112,250	15,150	15,000	16,000	16,000	16,000	17,000	17,100
E	Labor (Monthly Payroll)	224,500	30,300	31,000	31,000	32,000	33,000	33,000	34,200
Hi	Contractors (A/P tax exempt)	38,750	5,050	5,000	5,000	6,000	6,000	6,000	5,700
R	Overheads	372,500	50,500	51,000	52,000	53,000	54,000	55,000	57,000
E	Journal Vouchers (JVs)	0							
M	Daivage OINEDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		748,000	101,000	102,000	104,000	107,000	109,000	111,000	114,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

Current Approved Rate Case Funding (\$): 2,795 1,865 930

2021-2023 2024

Prior years funding; not actuals.



# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

 Cost Estimate Range:
 Minimum (\$):
 5,297,600
 Maximum (\$):
 9,838,400

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

# **INFRASTRUCTURE REVIEW & RECOMMENDATIONS**

#### **VERSION HISTORY**

Memo No.	Date	Action	Author	Approval
OS2018-002	6/25/2018	Initial Document Creation	B. Perry	Jun lingali:

This memo is to memorialize Operations Services annual review of its infrastructure, maintenance and inspection programs for various pieces of substation equipment as well as physical infrastructure. This document will be modified annually.

## **Breaker Replacement**

Below are the 115kV oil breakers remaining and the planned replacement as identified in the capital budget.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	ROCK TAVERN	115 kV	RJ-818	ALLIS CHALMERS	BZO-115-10000	OIL	1971
2018	ROCK TAVERN	115 kV	W-681	GE	FK-121-43000	OIL	1971
2018	UNION AVE	115 kV	RJ-52	GE	FK-439-115-3500	OIL	1952
2019	WEST BALMVILLE	115 kV	DW-662	ALLIS CHALMERS	BZO-115-7500	OIL	1965
2019	HURLEY AVE	115 kV	HP-1643	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	W-389	ALLIS CHALMERS	BZO-121-40-6	OIL	1973
2019	HURLEY AVE	115 kV	OR-1640	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
2019	HURLEY AVE	115 kV	A-2451	ALLIS CHALMERS	BZO-121-40-3PST	OIL	1973
2019	ROCK TAVERN	115 kV	W-814	GE	FK-121-43000	OIL	1971
2019	ROCK TAVERN	115 kV	RD-809	ALLIS CHALMERS	BZO-115-10000	OIL	1971

ROCK TAVERN	115 kV	J-788	ALLIS CHALMERS	BZO-115-10000	OIL	1971
BETHLEHEM ROAD	115 kV	RD-604-UB	ALLIS CHALMERS	BZO-121-40-6	OIL	1974
PLEASANT VALLEY	115 kV	R-8	SIEMENS	BZO-121-50-6	OIL	1991
PLEASANT VALLEY	115 kV	RX-4	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
PLEASANT VALLEY	115 kV	R-81	ALLIS CHALMERS	BZO-115-10000-2	OIL	1968
PLEASANT VALLEY	115 kV	R-10	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
PLEASANT VALLEY	115 kV	R-62	ALLIS CHALMERS	BZO-115-10000-2	OIL	1980
PLEASANT VALLEY	115 kV	R-61	MCGRAW EDISON	OHT-54	OIL	1973
PLEASANT VALLEY	115 kV	R-643	ALLIS CHALMERS	BZO-121-40-6	OIL	1980
LINCOLN PARK	115 kV	LR-1219-HP	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
LINCOLN PARK	115 kV	HP-1318	ALLIS CHALMERS	BZO-115-10000-2	OIL	1969
NORTH CATSKILL	115 kV	R-2	SIEMENS	BZO-121-20-7	OIL	1985
SHENANDOAH	115 kV	FS-739	SIEMENS	BZO-121-40-6	OIL	1983
SHENANDOAH	115 kV	FS-959	SIEMENS	BZO-121-40-6	OIL	1983
BARNEGAT	115 kV	KB-749-KC	ALLIS CHALMERS	BZO-121-40-6	OIL	1987
WICCOPEE	115 kV	FS-1652- WP	ALLIS CHALMERS	BZO-121-40-6	OIL	1988
	BETHLEHEM ROAD  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  PLEASANT VALLEY  SHENANDOAH SHENANDOAH BARNEGAT	BETHLEHEM ROAD 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT VALLEY 115 kV PLEASANT 115 kV PLEASANT 115 kV PLEASANT 115 kV PLEASANT 115 kV PLEASANT 115 kV	BETHLEHEM ROAD  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-62  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PLEASANT VALLEY  R-61  PL	BETHLEHEM ROAD  115 kV RD-604-UB CHALMERS  PLEASANT VALLEY  PLEASANT VALLIS CHALMERS  CHALMERS  CHALMERS  CHALMERS  CHALMERS  SIEMENS  SIEMENS  SIEMENS  SIEMENS  SHENANDOAH  115 kV  FS-739  SIEMENS  SHENANDOAH  115 kV  FS-749-KC  ALLIS CHALMERS	ROCK TAVERN         115 kV         J-788         CHALMERS         BZO-115-10000           BETHLEHEM ROAD         115 kV         RD-604-UB         ALLIS CHALMERS         BZO-121-40-6           PLEASANT VALLEY         115 kV         R-8         SIEMENS         BZO-121-50-6           PLEASANT VALLEY         115 kV         RX-4         ALLIS CHALMERS         BZO-115-10000-2           PLEASANT VALLEY         115 kV         R-81         ALLIS CHALMERS         BZO-115-10000-2           PLEASANT VALLEY         115 kV         R-62         ALLIS CHALMERS         BZO-115-10000-2           PLEASANT VALLEY         115 kV         R-61         MCGRAW EDISON         OHT-54           PLEASANT VALLEY         115 kV         R-643         ALLIS CHALMERS         BZO-121-40-6           LINCOLN PARK         115 kV         R-643         ALLIS CHALMERS         BZO-115-10000-2           LINCOLN PARK         115 kV         HP-1318         ALLIS CHALMERS         BZO-115-10000-2           NORTH CATSKILL         115 kV         FS-739         SIEMENS         BZO-121-20-7           SHENANDOAH         115 kV         FS-959         SIEMENS         BZO-121-40-6           BARNEGAT         115 kV         FS-1652-         ALLIS CHALMERS         BZO-121-40-6 <td>  ROCK TAVERN   115 kV</td>	ROCK TAVERN   115 kV

<sup>\*</sup>Wiccopee has essentially no distribution load present. A recommendation about the necessity of this station is required for equipment replacement to be planed appropriately

Outlined below are the 69 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2018	HURLEY AVE	69 kV	SB-233	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	I-442	GE	FK-69-2500-5	OIL	1963
2018	HURLEY AVE	69 kV	W-142	GE	FK-69-2500-5	OIL	1963
2019	HONK FALLS	69 kV	GM-737	GE	FK-69-2500	OIL	1963
2019	HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	FZO-151-69F	OIL	1953
2019	HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	FZO-151-69F	OIL	1952
2019	ROCK TAVERN	69 kV	WM-1675	GENERAL ELECTRIC	FK-69-2500-5	OIL	1964
2020	MYERS CORNERS	69 kV	TV-399- KM	SIEMENS	TDO-72.5- 20000	OIL	1981
2023	HIBERNIA	69 kV	E-972	ITE CIRCUIT BREAKER COMPANY	69KSB2500-12	OIL	1967
Substation Rebuild	KNAPPS CORNERS	69 kV	G-1175	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	KM-1185	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	TR-1195	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981
Substation Rebuild	KNAPPS CORNERS	69 kV	W-1409	SIEMENS ALLIS	TDO-72.5- 20000	OIL	1981

Outlined below are the 15 kV oil breakers remaining and the associated years of planned replacement.

Anticipated		Voltage				Breaker	Mfg.
Replacement	Location	Class	Position	Manufacturer	Model	Туре	Date
	NEW						
2020	BALTIMORE	15 kV	TD-1081	SIEMENS	SDO-15-500	OIL	1990
	NEW						
2020	BALTIMORE	15 kV	TD-1082	SIEMENS	SDO-15-500	OIL	1982
	NEW						
2020	BALTIMORE	15 kV	TD-1083	SIEMENS	SDO-15-500	OIL	1990
					FK-255-13.8-		
2022	JANSEN AVE	15 kV	K-553	GE	250-1	OIL	1941
					FK-255-13.8-		
2022	JANSEN AVE	15 kV	KL-543	GE	250-1	OIL	1941
2022		4=114			FK-255-13.8-		4044
2022	JANSEN AVE	15 kV	K-583	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	K-593	GE	FK-255-250	OIL	1941
		4=114			FK-255-13.8-		4044
2022	JANSEN AVE	15 kV	KO-533	GE	250-1	OIL	1941
2022	LANCEN AVE	4F IA7	TD 1001	C.F.	FK-255-13.8-	011	1041
2022	JANSEN AVE	15 kV	TD-1001	GE	250-1	OIL	1941
2022	JANSEN AVE	15 kV	TD-1002	GE	FK-255-13.8- 250-1	OIL	1941
2022	JANSEN AVE	12 KV	10-1002	GE	FK-255-13.8-	OIL	1541
2022	JANSEN AVE	15 kV	TD-1004	GE	250-1	OIL	1941
2022		13 KV	10 1004	GL .	250 1	OIL	1341
2023	STURGEON POOL	15 kV	OS-1	GE	FK-255-150	OIL	1924
2025		13 KV	03-1	GE	FN-255-150	OIL	1924
2022	STURGEON	45114	06.0	0.5	51/5 255	011	4024
2023	POOL	15 kV	OS-2	GE	FKR-255	OIL	1924
	STURGEON						
2023	POOL	15 kV	OS-3	WESTINGHOUSE	E-8	OIL	1924
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	CM-311	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	TD-8006	CHALMERS	Н	OIL	1958
Substation				ALLIS	FZO-15-1000-		
Retirement	BEACON	15 kV	W-426	CHALMERS	Н	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 881	GE	FK-143	OIL	1958
Substation	CONWAY						
Retirement	PLACE	15 kV	CKT 882	GE	FK-143	OIL	1958
Retirement	PLACE	15 kV	CKT 882	GE	FK-143	OIL	1958

Substation Retirement	MARYLAND AVE	15 kV	W-426	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 881	GE	FK-46	OIL	1951
Substation Retirement	MARYLAND AVE	15 kV	CKT 882	GE	FK-46	OIL	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8026	GE	FKD-15.5- 18000-4	OIL	1966
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8027	GE	FK-14.4-500	OIL	1958
Substation Rebuild	KNAPPS CORNERS	15 kV	CKT 8028	GE	FK-14.4-500-1	OIL	1959

Outlined below are the 5 kV oil breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
Substation Retirement	BEACON	5 kV	CKT 801	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 802	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	CKT 803	GE	FKR-155-16	OIL	1929
Substation Retirement	BEACON	5 kV	W-414	GE	FKR-255-7.2- 100-2	OIL	1957
Substation Retirement	BEACON	5 kV	W-463	GE	FKR-255-7.2- 100-2	OIL	1957
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 375	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 376	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 377	GE	FKR-255-100	OIL	1938
Low Voltage Retirement	GREENFIELD ROAD	5 kV	CKT 378	GE	FKR-255-100	OIL	1938

## 345kV SF6 Breaker Replacement

A replacement recommendation is in affect for Westinghouse type SFA SF6 breakers as these breakers have historically been leak prone and maintenance is extremely time consuming because of the design complexity. Outlined below are the type SFA breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breaker Type	Mfg. Date
2020	HURLEY AVE	345 kV	30354	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2021	HURLEY AVE	345 kV	30353	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976
2022	HURLEY AVE	345 kV	30151	WESTINGHOUSE	362-SFA-40	SF6 GAS	1976

# 15kV Breaker Replacement

A replacement recommendation is in affect for Westinghouse type DH and DHP breakers as these breakers are known to have components that contain asbestos. Outlined below are the type DH and DHP breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Break er Type	Mfg. Date
2018	FISHKILL PLAINS	15 kV	TD-8091	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8092	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8093	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	TD-8094	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-975	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-976	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	FISHKILL PLAINS	15 kV	W-1000	WESTINGHOUSE	150-DH-500E	AIR	1963
2018	UNION AVE	15 kV	W-1105	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-1095	WESTINGHOUSE	150-DH-500E	AIR	1961
2018	UNION AVE	15 kV	W-837	WESTINGHOUSE	150-DH-500E	AIR	1964
2018	UNION AVE	15 kV	TD-4049	WESTINGHOUSE	150-DH-500A	AIR	1967
2018	UNION AVE	15 kV	UW-1494	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	UN-594	WESTINGHOUSE	150-DH-250A	AIR	1957
2018	UNION AVE	15 kV	TD-4046	WESTINGHOUSE	150-DH-500A	AIR	1958
2018	UNION AVE	15 kV	TD-4045	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4044	WESTINGHOUSE	150-DH-500E	AIR	1969
2018	UNION AVE	15 kV	TD-4043	WESTINGHOUSE	150-DH-500A	AIR	1957
2018	UNION AVE	15 kV	TD-4042	WESTINGHOUSE	150-DH-500A	AIR	1956
2018	UNION AVE	15 kV	TD-4041	WESTINGHOUSE	150-DH-500E	AIR	1964
2019	MONTGOMERY ST.	15 kV	NM-384	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	NB-385	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4001	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	TD-4002	WESTINGHOUSE	150-DH-500A	AIR	1958

2019	MONTGOMERY ST.	15 kV	TD-4003	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-507	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-508	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-509	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	R-350	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	F-351	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	B-352	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-359	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	WN-486	WESTINGHOUSE	150-DH-500A	AIR	1958
2019	MONTGOMERY ST.	15 kV	W-489	WESTINGHOUSE	150-DH-500A	AIR	1958
2023	SAND DOCK	15 kV	BP-1296	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	BP-1570	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-909	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-910	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1449	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1453	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1568	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	W-1573	WESTINGHOUSE	150-DHP-500	AIR	1973
2023	SAND DOCK	15 kV	TW-902	WESTINGHOUSE	150-DHP-500	AIR	1973
2024	REYNOLDS HILL	15 kV	TD-6001	WESTINGHOUSE	150-DHP	AIR	1972
2024	REYNOLDS HILL	15 kV	TD-6005	WESTINGHOUSE	150-DHP	AIR	1973
Substation Retirement	BEACON	15 kV	NM-402	WESTINGHOUSE	150-DH-500E	AIR	1958
Substation Retirement	BEACON	15 kV	TD-8015A	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-408	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BEACON	15 kV	W-420	WESTINGHOUSE	150-DH-500E	AIR	1959
Substation Retirement	BOARDMAN ROAD	15 kV	Z-201	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-202	WESTINGHOUSE	150-DH-250A	AIR	

Substation Retirement	BOARDMAN ROAD	15 kV	Z-203	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-204	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-205	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-206	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-208	WESTINGHOUSE	150-DH-250A	AIR	
Substation Retirement	BOARDMAN ROAD	15 kV	Z-209	WESTINGHOUSE	150-DH-250A	AIR	
2025/2026	SHENANDOAH	15 kV	B-4453	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4454	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	B-4455	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	B-4456	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S10-1015	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S11-405	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S12-401	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S13-412	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S14-410	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	S7-1102	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	S8-1014	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	S9-1009	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	TD-8071	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	TD-8072	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-1059	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-1279	WESTINGHOUSE	150-DHP-500	AIR	1980
2025/2026	SHENANDOAH	15 kV	W-1593	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-664	WESTINGHOUSE	150-DHP-750C	AIR	1986

2025/2026	SHENANDOAH	15 kV	W-665	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-802	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-803	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-805	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-807	WESTINGHOUSE	150-DHP-750C	AIR	1986
2025/2026	SHENANDOAH	15 kV	W-845	WESTINGHOUSE	150-DHP-500	AIR	1982
2025/2026	SHENANDOAH	15 kV	W-846	WESTINGHOUSE	150-DH-500	AIR	1980
Replacement Deferral	TIORONDA	15 kV	TD-8085	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	TD-8086	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	W-567	WESTINGHOUSE	150-DHP-500	AIR	1971
Replacement Deferral	TIORONDA	15 kV	TD-8087	WESTINGHOUSE	150-DHP-500	AIR	1971

<sup>\*</sup>Operations Services recommends the deferral of the Tioronda breaker replacement until a proper cost benefit switchgear replacement is developed to weigh the value of component replacement (wires, AC power, breakers, etc.) versus entire switchgear. The switchgear condition is questionable (discussed further in later section)

A replacement recommendation is in affect for General Electric type AM breakers as replacement parts are not available for these breakers and continuous issues have been reported. Outlined below are the type AM breakers remaining and the associated years of planned replacement.

Anticipated Replacement	Location	Voltage Class	Position	Manufacturer	Model	Breake r Type	Mfg. Date
2019	COXSACKIE	15 kV	TD-1071	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1072	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1076	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	TD-1074A	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-1398	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-296	GE	AM-13.8-500-6H	AIR	1969
2019	COXSACKIE	15 kV	W-484	GE	AM-13.8-500-6H	AIR	1969
2020	JANSEN AVE	15 kV	TD-1003	GE	AM-15-250-1	AIR	1956
2020	WOODSTOCK	15 kV	TD-3012	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	TD-3013	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-1091	GE	AM-15-250-1	AIR	1947
2020	WOODSTOCK	15 kV	W-25	GE	AM-15-250-1	AIR	2001
2021	NEVERSINK	5 kV	CKT-391	GE	AM-5-150-5	AIR	1950
2021	NEVERSINK	5 kV	W-1128	GE	AM-5-150-5	AIR	1950
Substation Retirement	MARYLAND AVE	5 kV	CKT 623	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	CKT 624	GE	AM-5-150-7	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-1034	GE	AM-5-150-4	AIR	1951
Substation Retirement	MARYLAND AVE	5 kV	W-540	GE	AM-5-150-7	AIR	1951
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1208	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1215	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1462	GE	AM-13.8-500-5H	AIR	1953
Substation Rebuild	KNAPPS CORNERS	15 kV	W-1562	GE	AM-13.8-500-5H	AIR	1953
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 395	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 396	GE	AM-2.4/4.16- 150/250-3	AIR	1968
Low Voltage Retirement	CLINTON AVE	5 kV	CKT 397	GE	AM-2.4/4.16- 100/150-1	AIR	1968

lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 121	GE	AM-2.4/4.16- 150/250-1	AIR	1955
lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 122	GE	AM-2.4/4.16- 100/150-1	AIR	1955
lew Switchgear ecommendation	CONVERSE ST	5 kV	CKT 123	GE	AM-2.4/4.16- 150/250-2	AIR	1955

<sup>\*</sup>Operations Services recommends the replacement of the Converse Street breakers along with the switchgear due to parts constraints, wiring issues, old generation relaying, etc. A cost benefit analysis should be performed to determine the best course of action.

## **Transformer Replacement**

Typically a power transformer's useful life is 55 years old. When rebuilding a substation where the transformer is greater than 55 years old, consideration should be given to retiring and not reusing the transformer. Outlined below are the power transformers that are scheduled for replacement in the 5 year budget.

Location	Asset Name	Age	Plan	Replacement Reason	Condition Analysis
BOULEVARD	TR. #1 PH 1	64	Substation Rebuild	Age	
BOULEVARD	TR. #1 PH 2	64	Substation Rebuild	Age	
BOULEVARD	TR. #1 PH 3	64	Substation Rebuild	Age	
BOULEVARD	TR. #2	78	Substation Rebuild	Age	
BOULEVARD	TR. #3	47	Substation Rebuild	Potential Spare	
CONVERSE ST	TR. #2	62	Transformer Replacement	Condition	Very poor power factor test results and poor oil quality.
CONWAY PLACE	TR. #1	59	Substation Retirement	Substation Retirement	
MONTGOMERY ST	TR. #1	80	Transformer Replacement	Condition	Very poor power factor test results.
MONTGOMERY ST	TR. #2	80	Transformer Replacement	Condition	Very poor power factor test results.
MARYLAND AVE	TR. #1	63	Substation Retirement	Substation Retirement Substation Retirement	
MARYLAND AVE	TR. #2	63	Substation Retirement	Substation Retirement	
NORTH CATSKILL	TR. #4	67	Transformer Replacement	Planning Recommendation	
NORTH CATSKILL	TR. #5	62	Transformer Replacement	Planning Recommendation	
NORTH CHELSEA	TR. #1 PH 1	71	Transformer Replacement	Condition	Very poor power factor test results. Poor DGA results.
NORTH CHELSEA	TR. #1 PH 2	71	Transformer Replacement	Condition	Very poor power factor test results.
NORTH CHELSEA	TR. #1 PH 3	71	Transformer Replacement	Condition	Very poor power factor test results. Poor DGA results.
REYNOLDS HILL	TR. #3	64	Transformer Replacement	Age & Refined LTC	
REYNOLDS HILL	TR. #4	66	Transformer Replacement	Age & Refined LTC	
KNAPPS CORNERS	TR. #1	52	Substation Rebuild	Age & Condition	Poor power factor test results and poor oil quality.
KNAPPS CORNERS	TR. #2	40	Substation Rebuild	Condition	Poor DGA results and poor oil quality.

Central Hudson's power transformers are evaluated based on analytical testing data compiled by Operations Services. Outlined below are the power transformers that need to be monitored for decreasing condition. Operations Services is requesting that planning make a recommendation related to the following power transformers.

Location	Asset Name	Age	Comment
ANCRAM	Bank 1 PH 1	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 2	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
ANCRAM	Bank 1 PH 3	50	Slightly elevated power factor results. Slightly elevated combustible gas content.
CONVERSE ST	TR. #1	49	High hydrogen content.
FORGEBROOK	TR. #1	60	High hydrogen content. High combustible gas content overall. Oil quality deteriorating. High power factor results on CH insulation.
GREENFIELD ROAD	TR. #2	45	Very high CHL power factor results. Acetylene present in oil likely left over from previous lead damage.
HUNTER	TR. #1	23	High ethylene and ethane content. High combustible content overall.
TINKERTOWN	TR. #2	61	Elevated power factor results across the board. Relative saturation is elevated.

## **Switchgear Replacement**

Switchgear condition is evaluated by Operations Services on a five year schedule. Below is a list of switchgear that has been given a poor evaluation, where replacement needs to be considered.

Location	Asset Type	Comment			
MYERS CORNERS	Switchgear	Poor roof condition. Switchgear roof has rotted through allowing water to ingress over relays. Breaker roll in alignment is problematic.			
WOODSTOCK	Switchgear	Roof and rust condition is poor. Switchgear wiring and panels have aged. Needs replacement.			
SHENANDOAH	Multiple Switchgear	Very difficult to rack breakers in and out due to misalignment and shifting of the switchgear floor. This issue makes switching very challenging.			
TIORONDA	Switchgear	Wiring and CTs with the gear are deteriorated. Breakers require 240 VAC which would lead to extensive rewiring. It is recommended that the switchgear be replaced with the breakers			
CONVERSE STREET	Switchgear	Switchgear wiring has aged and contains old electromechanical relaying. Parts for the switchgear breakers are hard to procure. It is recommended to couple the replacement of the switchgear breakers with a new switchgear.			

Additionally, Operations Services is looking for several recommendations from planning related to the replacement of switchgear and possibility of low voltage conversion to assist with some of the substation initiatives.

- Lincoln Park outdoor switchgear necessity (some of these cables are in poor condition and are
  out of potentially out of service needs engineering/planning review)
- Shenandoah Bus #1 & Bus #2 switchgears
- Neversink feasibility of 4kV conversion to 13.8kV

# **Switch Replacement**

#### 345 kV Switch Replacement

Recently, problems have developed with the Pascor type TTT-7 and Memco type EA, VR2 and VT-1 style motor operated 345kV air disconnects at the Roseton, Rock Tavern and Hurley Avenue substations. Replacement parts availability is limited for these switch styles.

Operations Services has determined that these disconnects have reached the end of their useful life due to increasing issues, troubleshooting and callouts.

Below is a list of remaining switches that need replacement based on this recommendation in prioritized order. This order can be shuffled if replacements are to be packaged together, but can be followed as a guideline.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
ROCK TAVERN 345 kV	RTB-3451	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3092	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30382	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3091	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB- 30393	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots, Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-4483	345 kV	МЕМСО	EA	1/1/1972	Reoccurring Hotspots, Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30193	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31194	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30181	345 kV	MEMCO	EA	1/1/1976	Reoccurring Hotspots
HURLEY AVENUE - 345kV	HAB-A- 2492	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-31193	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30398	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30394	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30581	345 kV	MEMCO	EA	1/1/1970	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-3493	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-3484	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots

ROCK TAVERN 345 kV	RTB-4491	345 kV	MEMCO	EA	1/1/1972	Reoccurring Hotspots
ROCK TAVERN 345 kV	RTB-C3392	345 kV	MEMCO	EA	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB-A- 2491	345 kV	MEMCO	VR2	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3397	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3393	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
HURLEY AVENUE - 345kV	HAB- 30192	345 kV	MEMCO	EA	1/1/1976	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3394	345 kV	MEMCO	VR2	1/1/1972	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-31191	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-C- 3094	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	Reoccurring Trouble
ROSETON SWITCHYARD	RSB-30392	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	Reoccurring Trouble
ROCK TAVERN 345 kV	RTB-C3396	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3395	345 kV	MEMCO	VR2	1/1/1972	
ROCK TAVERN 345 kV	RTB- 376934	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- 376945	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB- C33911	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C- 3093	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31181	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	
ROCK TAVERN 345 kV	RTB-31182	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3398	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB-C3399	345 kV	MEMCO	EA	1/1/1972	
ROCK TAVERN 345 kV	RTB- C33910	345 kV	MEMCO	EA	1/1/1972	
HURLEY AVENUE - 345kV	HAB- 30191	345 kV	MEMCO	VR2	1/1/1976	
ROSETON SWITCHYARD	RSB-30591	345 kV	MEMCO	VR2	1/1/1970	
ROSETON SWITCHYARD	RSB-30391	345 kV	MEMCO	VR2	1/1/1970	
ROCK TAVERN 345 kV	RTB-4492	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1986	
ROCK TAVERN 345 kV	RTB-C3373	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROCK TAVERN 345 kV	RTB-C3371	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-31192	345 kV	PASCOR ATLANTIC	TTT-7	1/1/1980	
ROSETON SWITCHYARD	RSB-C-	345 kV	PASCOR	VT-1	1/1/1980	

	3081		ATLANTIC			
ROSETON SWITCHYARD	RSB-C- 3082	345 kV	PASCOR ATLANTIC	VT-1	1/1/1980	

## 115 kV Switch Replacement

Operations Services collects and trends hotspot information as well as trouble orders documenting issues with switches over the lifespan of a switch. Below is an identified list of 115 kV switches that are recommended for replacement.

Location	Position	Voltage	Manufacturer	Model	Mfg. Date	Issues
BARNEGAT	KB-747	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KB-748	115 kV	MEMCO	VM1-204	1987	
BARNEGAT	KC-750	115 kV	MEMCO	VM1-204	1987	Reoccurring Hotspots
BARNEGAT	KC-752	115 kV	SOUTHERN STATES	VM-1-104	1987	
INWOOD AVENUE	X-970	115 kV	SOUTHERN STATES	VM-1-208	1975	December Heterete
INWOOD AVENUE	X-977	115 kV	SOUTHERN STATES	VM-1-208	1975	Reoccurring Hotspots
NORTH CATSKILL REACTOR	293	115 kV	PASCOR	CBSA	2014	Reoccurring Hotspots, Adjustment Issues, Poor Quality Construction
PLEASANT VALLEY	1077	115 kV			-	
PLEASANT VALLEY	1099	115 kV			-	
PLEASANT VALLEY	1277	115 kV			-	
PLEASANT VALLEY	1288	115 kV			-	Reoccurring Hotspots causing switches to become
PLEASANT VALLEY	1299	115 kV			-	inoperable. Switches are hand operated and are very difficult to open making operation dangerous
PLEASANT VALLEY	1377	115 kV			-	during switching.
PLEASANT VALLEY	1388	115 kV			-	
PLEASANT VALLEY	1399	115 kV			-	
PLEASANT VALLEY	6177	115 kV			-	

PLEASANT VALLEY	6199	115 kV		-	
PLEASANT VALLEY	6277	115 kV		-	
PLEASANT VALLEY	6299	115 kV		-	
PLEASANT VALLEY	64377	115 kV		-	
PLEASANT VALLEY	64399	115 kV		-	
PLEASANT VALLEY	8171	115 kV		-	
PLEASANT VALLEY	8172	115 kV		-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to open making operation dangerous during switching.
PLEASANT VALLEY	8191	115 kV		-	
PLEASANT VALLEY	8192	115 kV		-	
PLEASANT VALLEY	877	115 kV		-	
PLEASANT VALLEY	888	115 kV		-	
PLEASANT VALLEY	899	115 kV		-	
PLEASANT VALLEY	93932- 44	115 kV		-	
PLEASANT VALLEY	93931- 44	115 kV		-	

1				1	I	
PLEASANT VALLEY	C677	115 kV			-	
PLEASANT VALLEY	C688	115 kV			-	
PLEASANT VALLEY	C699	115 kV			-	
PLEASANT VALLEY	M77	115 kV			-	
PLEASANT VALLEY	M88	115 kV			-	Reoccurring Hotspots causing switches to become inoperable. Switches are hand operated and are very difficult to
PLEASANT VALLEY	M99	115 kV			-	open making operation dangerous during switching.
PLEASANT VALLEY	Q302	115 kV			-	
PLEASANT VALLEY	X-477	115 kV			-	
PLEASANT VALLEY	X-488	115 kV			-	
PLEASANT VALLEY	X-499	115 kV			-	
TODD HILL	A-523	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C line during recent work order

TODD HILL	A-702	115 kV	SIEMENS	CM-4A	1989	Hotspot issues, DC motor
TODD HILL	A-521	115 kV	SIEMENS	CM-4A	1989	problems, switches have been burning up motors. We recommend replacing with same style switches as install on the C
TODD HILL	C-519	115 kV	SIEMENS	CM-4A	1989	line during recent work order

<sup>\*</sup>Model numbers for switches may not always be accurate

Operations Services recommends that the switches at Pleasant Valley be replaced with or prior to the planned replacement of the existing 115kV oil breakers in 2020, a systematic plan needs to be coordinated to allow for proper isolation of each breaker prior to replacement. The existing switch problems will prevent proper clearances to be taken if they are not replaced prior to the breakers.

### **Non-Equipment Based Replacements**

A 5 year substation evaluation program that assesses "non-equipment" assets has been implemented in 2016 to address the following equipment: steel, foundations, fence, ground grid, etc. As projects are identified through this program, Operations Services will bring issues to the attention of Substation Design or manage with local work orders as needed.

#### **Steel Replacement**

As replacement recommendations are identified, this work should be completed with future rebuilds unless there is imminent danger of failure, in which case the repairs should be handled sooner. It is also recommended that during any future rebuilds, that Substation Design evaluates the steel in and around any equipment that will be affected during the work order. An example of this is in 2019, as part of the Boulevard substation upgrade, the steel on the 69kV portion of the yard will be replaced due to condition concerns which were caused by poor foundations.

#### **Foundation Replacement**

These replacement recommendations should be considered during future work order planning to improve the existing infrastructure. Overall foundations are acceptable, with some older stations showing deteriorated foundations due to weather such as flaking. Some flaking is addressed as part of general maintenance by patching the foundations as necessary.

#### Fence Review

Operations Services completes fence inspections on a monthly as well as a more thorough inspection on a 5 year cycle and recommends either fence maintenance repair or complete rebuilds. Most recently the East Walden Substation fence was replaced which had rotten top rails as well as posts. It is recommended that 1 inch fence fabric is utilized for new substation fences to limit fence cuts.

### **Ground Grid Review**

Operations Services completes ground grid testing on an 8 year cycle and reports ground grid deficiencies as they are determined. When adding or replacing equipment within a substation, the ground grid should be reviewed by Substation Design to ensure that the existing grid is adequate.

Substation	Comments
Manchester	There are ground grid deficiencies that were noted during recent construction. It is recommended that a formal review of the substation ground grid be conducted.
West Balmville	During fence repair an electrical arc was drawn. This could be due to lack of fence bonding, however as part of the future breaker replacements, it is recommended that a more thorough engineered review be completed.

#### Stone Review

Operations Services recommendation is to review the integrity of the stone fill within a substation when any major work order is being executed to ensure there is adequate stone coverage throughout the entire station and incorporate this work as part of any major work to be performed.



# **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Kerhonkson 115/69 kV Autotransformers Phase 2 & Remove 61850 Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

In order to complete this project, conversions to 115 kV will take place at High Falls and Sturgeon Pool Substations.

#### Describe the project objective and scope of work:

Based on a review of the Ellenville Transmission Area, it is recommended that following the retirement of the Modena 115kV/69 kV autotransformers, new autotransformers be installed at the Kerhonkson Substation. This work will be completed in conjunction with the upgrade of the P and MK Lines to 115 kV operation. In addition to addressing the infrastructure issues, this work will increase the load serving capability within the Ellenville Area. It is recommended to complete this work to also serve a new large customer load in the Ellenville area.

### Describe specific scope exclusions, assumptions and constraints:

The majority of the work required for the line conversion has been completed previously based predominately on infrastructure issues (rebuild of the P & MK Lines, rebuild of the High Falls, Galeville, Kerhonkson and Sturgeon Pool Substations). Install two new 115/69 kV autotransformers at the Kerhonkson Substation and reconfigure the 69 kV bus at the Honk Falls Substation while removing the 61850 control of Kerhonkson Substation.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Chan, R.: "P & MK Area Study". E.P. #2010-008. May 2, 2011 & "EP2011-010 WH-1 and WH-2 Line Rebuild.pdf"

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Provide load serving capability for the Cresco Project in the Ellenville Area.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No; Article VII - Electric

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

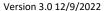
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

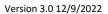
Why do we need to complete this project in the period requested? In order to provide load serving capability to a large customer.

What are the risks and consequences of not completing this project? Losing a large customer to another area or utility.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the  5-year budget plan  All future year cost estimates should include applicable adjustments for inflation.							
	\$1,727,000	TOTAL	Prior Years Actuals +	Year 1	Year 2	Year 3	Year 4	Year 5	Future Years
		101712	Projections	2024	2025	2026	2027	2028	ratare rears
	Labor (Weekly Payroll)	163,000	10,000	153,000	0	0	0	0	0
	Labor (Monthly Payroll)	81,000	5,000	76,000	0	0	0	0	0
A	Stock Materials	81,000	5,000	76,000	0	0	0	0	0
D	Non-Stock Material (A/P taxable)	325,000	20,000	305,000	0	0	0	0	0
ī	Contractors (A/P tax exempt)	114,000	7,000	107,000	0	0	0	0	0
Т	Overheads	813,000	50,000	763,000	0	0	0	0	0
1	AFUDC*	48,000	3,000	45,000	0	0	0	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,625,000	100,000	1,525,000	0	0	0	0	0
R	Labor (Weekly Payroll)	15,000	0	15,000	0	0	0	0	0
E	Labor (Monthly Payroll)	31,000	0	31,000	0	0	0	0	0
H	Contractors (A/P tax exempt)	5,000	0	5,000	0	0	0	0	0
R	Overheads	51,000	0	51,000	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	102,000	0	102,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

0 2021-2023 2024

Prior years funding; not actuals.

0

0



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

1,208,900

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 2,245,100

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



## **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Hurley Avenue 345 kV Relay Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

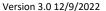
#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

### Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All electromechanical relays at Hurley Avenue 345 kV Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		•	I future year cost estimates should include applicable adjustments for inflation.					
	\$1,163,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5			
	ψ1,103,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years		
	Labor (Weekly Payroll)	105,000	0	0	0	105,000	0	0	0		
	Labor (Monthly Payroll)	52,000	0	0	0	52,000	0	0	0		
A	Stock Materials	52,000	0	0	0	52,000	0	0	0		
D	Non-Stock Material (A/P taxable)	209,000	0	0	0	209,000	0	0	0		
١ĭ	Contractors (A/P tax exempt)	74,000	0	0	0	74,000	0	0	0		
Т	Overheads	523,000	0	0	0	523,000	0	0	0		
1	AFUDC*	31,000	0	0	0	31,000	0	0	0		
O	Journal Vouchers (JVs)	0									
S	CIAC Payments CREDIT	0									
	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	1,046,000	0	0	0	1,046,000	0	0	0		
R	Labor (Weekly Payroll)	18,000	0	0	2,000	16,000	0	0	0		
E	Labor (Monthly Payroll)	35,000	0	0	3,000	32,000	0	0	0		
1:	Contractors (A/P tax exempt)	7,000	0	0	1,000	6,000	0	0	0		
R	Overheads	57,000	0	0	4,000	53,000	0	0	0		
E	Journal Vouchers (JVs)	0									
M	Salvage CREDIT	0									
E	CIAC Payments CREDIT	0									
T	Joint Utility Payments CREDIT	0									
S	TOTAL REMOVALS:	117,000	0	0	10,000	107,000	0	0	0		
	* AFUDC may require adjustment after Finance Depart										
	Expense \$ (if applicable):										
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0							

2021-2023 2024

Prior years funding; not actuals.



# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

814,100

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 1,511,900

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nue 54' 5011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

### L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact, 2) Customer Services (Line Forces) to sid in fault locating and thereby limiting patrol time and area; 3) ©perations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability, Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### Discussion:

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

### C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

#### Attachment 2

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### **Discussion:**

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

### Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti: (Manl	Cost	
	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

			Tin	ne					
Retrofit Options			Manh	ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9
Grid Sense Meter	W / VAr	•	are for the Line		E and	\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	takes	Per installation, each meter takes the lineman and the						\$2,700
POT Line		2.0	15 minu n data c			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tin	ne and	15			\$430	\$430
Site Registration	per D/C	Trav	utes of el to ea	ch site	has	-waived-			
TOTAL GS Installation	i 	been assumed to be 1 hour.						\$9,000	
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

#### **Attachment 3**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### **Re: Remote Terminal Unit Review**

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

• Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

#### **Attachment 4**

Copy to:

Mr. P.E. Haering Mr. H.W.Turner

Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

### **Discussion:**

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### Conclusions:

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

	Co	ost	
tetrofit Options	Parts	TOTAL	1
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note
R-Mag Breaker	\$25,000	\$90,000	

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

Voltage Voltage T Relaying D. Relaying RTU Recloser Comment				Electric Sub	station Upgra	ide Meeds Wa	Sessineiii		
Second   A	Substation	1	Line/Ckt.				į	Recloser	
Accord 4 RF CVI Company		0.000		C2		EM	NONE		
Ancertain   13.8   7965 CH   W1920   SADA	Accord	4					NONE		Only has a 13.8 Voltage Regulator
Spring	Ancram	13.8	7085 Ckt.	Grid Sense			NONE		
Samproville   4   411 CM   W. O.     EM   C.580   Matering Source?		T				EM			
Barringst		4							
Sampage		4	412 Ckt.	MV-90			C-300		
Berneget   115   CFD Line   ARTS   EM									Metering source?
Barriegal   115		115							
Barringst   115									
Emringat   11511.8   T.   SCADA   EM		115	KB-749-KC BKR						IPM Foods
Barringst   11971-8   72		115/13.8				+			IBM reeds
Barregal   13.8   51   SCADA   EM		115/13.8							
Barnegat   13.8   S   S   S   S   S   S   S   S   S		· 13.8							IBM Feeds
Barrel   19   \$2,734 GR   \$CADA		13.8					Ļ		
D-20		13.8							IBM Feeds
Beacon   13.8   909.6 Cht   SCADA   EM			S2-734 BKR	SCADA		EM	<del></del>		
Seacon   13.8   8005 CM.   SCADA   EM							+		
Beacon   13.8   8015 Ckt   SCADA   EM		13.8	8006 Ckt.	SCADA		EM			
Beacon						EM			Previously 8087A?
Beacon									
Beacon   4   89.3 Ckt   SCADA   EM							+	<del>                                     </del>	<del> </del>
Beacon   4	Beacon							*****	ļ
Bescon	Beacon	4	803 Ckt.	SCADA			****	*****	
Beson	Beacon	4	W-414 BKR	SCADA		EM			
Bescon   4	Beacon	4	W-463 BKR	SCADA		EM			
Bescon   4	Beacon	4	Bus 1	SCADA					
Beacon   13.8/4   T1   SCADA   EM		4					<del></del>	<del></del>	
Bescon					<del></del>	<del></del>	+	<del>+</del>	<del>                                     </del>
Beson   13.8   BF Cable   SCADA   EM					<del></del>		<del> </del>	<del></del>	MDB has an entry with T1+T2 calculated
Beacon   13.8								*****	
Beacon   13.8   CM Cubis   SCADA   EM					****				
Bescon								*****	
Beston						EM			
Sethilehem Rd.   13.8				SCADA		EM			†
Sethiehem Rd   13.8		13.8	Bus 2	SCADA		EM		<del></del>	<del> </del>
Bethiehem Rd.   13.8							2400	<del></del>	_ <del></del>
Bethlehem Rd. 13.8 4092 Ckt. MV-90			( 4091 Ckt.	MV-90		EM/uP		·	851-851H as Bill and 79
Bethlehem Rd. 13.8	Bethlehem Rd.	13.8	4092 Gkt.	MV-90		EM/uP		<del></del>	
Bethiehem Rd. 13.8 4094 Ckt. MV-90	Bethlehem Rd.	13.8	4093 Ckt.	MV-96				<del></del>	
Bethiehem Rd.   13.8   4095 Ckt.   MV-90									
Bethiehem Rd.   13.8   4096 Ckt.   MV-90     EM							<del></del>		BE1-851H as BU and 79
Bethlehem Rd.   13.8   4097 Ckt   MV-90     EM									
Bethlehem Rd.         13.8         4098 Ckt.         MV-90         EM         EM           Bethlehem Rd.         13.8         Bus 1         EMS         EM            Bethlehem Rd.         113.8         Bus 2         EMS          EM            Bethlehem Rd.         115         RD Line         None         EM              Bethlehem Rd.         115         RD GO-00-UB BKR          EM  .									
Bethlehem Rd.   13.8   4098 Ckt.   MV-90     EM				MV-90		EM		*****	
Bethlehem Rd.         13.8         Bus 1         EMS         EM          EM           BM          BM           BM           BM		13.8	4098 Ckt.	MV-90	2.0	EM			
Bethlehem Rd.         13.8         Bus 2         EMS         —         EM         —         EM         —         Bethlehem Rd         115         RD Line         None         EM         —	Bethlehem Rd.	13.8	Bus 1	EMS					
Bethlehem Rd.   115		13.8	Bus 2						
Bethlehem Rd.	Bethlehem Rd.			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				<del></del>
Bethlehem Rd.				·				·	<del></del>
Bethlehem Rd.   115/13.8   T2   EMS   EM						<del></del>	<del></del>		·-
Bethlehem Rd.   115/13.8   T2   EMS   EM		<del></del>		<del></del>		<del></del>			
Bethlehem Rd.   13.8   W-613 BKR									Metering combined
Bethlehem Rd.   13.8   W-619 BKR     EM									motoring opinionies
Berthlehem Rd.   13.8   W-804 BKR     EM         EM									
Bordman Rd.   13.8   6081A Ckt.   EM       EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM						EM			
Bordman Rd.   13.8   6081A Ckt.   EM		13.8	W-804 BKR			EM			
Bordman Rd.         13.8         6082A Ckt.         —         EM         —         —         EM         —         —         EM         —         —         EM         —         —         —         EM         —	Bordman Rd.						NONE		
Bordman Rd.         13.8         6082A Ckt.         EM          EM           EM	Bordman Rd.	13.8	6081A Ckt.			EM			
Bordman Rd.         13.8         Z-203 Ckt.         EM           Bordman Rd.         13.8         Z-204 Ckt.         EM           Bordman Rd.         13.8         Z-205 Ckt.         EM           Bordman Rd.         13.8         Z-206 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-207 Ckt.         EM           Bordman Rd.         13.8         Z-208 Ckt.         EM	Bordman Rd.	13.8	6082A Ckt.						
Bordman Rd.   13.8   Z-204 Ckt.   EM									
Bordman Rd.         13.8         Z-204 Ckt.         EM	Boroman Rd	13.8							
Bordman Rd.   13.8   Z-205 Ckt.     EM	Bordman Rd	13.8	Z-204 Ckt.						
Bordman Rd.   13.8   Z-206 Ckt.     EM       Bordman Rd.   13.8   Z-207 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM			Z-205 Ckt.						
Bordman Rd.         13.8         Z-206 Ckt.         EM            Bordman Rd.         13.8         Z-207 Ckt.          EM            Bordman Rd.         13.8         Z-208 Ckt.          EM						EM			
Bordman Rd.   13.8   Z-207 Ckt.   EM   EM   EM   EM   EM   EM   EM   E	Bordman Rd	i. 13.8							·
Bordman Rd. 13.8 Z-208 Ckt EM	Bordman Ro	13.8	Z-207 Ckt.					<del></del>	
						EM			
		J. 13.0				FM			

			Electric Substa	mon ohara				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
Davisand								
Boulevard	69	OB Line	SCADA	<u>uP</u>				
Boulevard	69	N Line	SCADA	υP				
Boulevard	69	1 Line	SCADA	<u> </u>				Line Amps & W/VAr
Boulevard		KO Line	SCADA		uP			
Boulevard	13.8	KK Line	SCADA		υP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8 13.8	Ckt. 1012	SCADA		EM/uP			
Boulevard	13.8	ÇKI. 1013	SCADA		UP	*****		
Boulevard	13.8	Ckt. 1014	SCADA		EM/uP			
Boulevard Boulevard	13.8	Bus 1	SCADA		EM			
	13.8	Bus 2	SCADA		EM			<del>                                     </del>
Boulevard	69	Bus 1	SCADA	EM				ļ
Boulevard			SCADA	EM		*****		
Boulevard	69	Bus 2		EM				
Boulevard	69	Overall						testarias sombined
Boulevard	69/13.8	T1	SCADA	EM				Metering combined
Boulevard	69/13.8	T3	SCADA	EM			<del></del>	1
Boulevard	69/13.8	T2 .	SCADA	EM			*****	<u> </u>
Clinton Ave.	00,700		· · · · · · · · · · · · · · · · · · ·			M-4000		
Clinton Ave.	4	395 Ckt.	MV-90		EM			<del>                                     </del>
	4	396 Ckt.	MV-90		EM			<u> </u>
Clinton Ave.		397 Ckt.	MV-90		EM			<u> </u>
Clinton Ave.	4		SCADA		*			
Clinton Ave.	4	Bus			Fuse			
Clinton Ave.	13.8/4	T1	MV-90		1 032	NONE		
Cold Spring					EM	14014	†	Install a Grid Sense Package for two
Cold Spring	4	871 Ckt.	Charts - kW			<del></del>		eircuits.
Cold Spring	4	872 Ckt.	Charts - kW		EM	7.00		circuits.
Coldenham						D-20	ļ .	
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	****	uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
	13.8	4026 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham					uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4027 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		EM			331 13 OCC-201
Coldenham	13.8	Bus 1	SCADA					
Coldenham	13.8	Bus 2	SCADA		EM			<u> </u>
Coldenham	13.8	B1-B2 Tie			EM			255 255 255 255 255 255 255
Coldenham	115	J Line	SCADA	Gen 1			*****	95P is DLP; 95BU is REL-301; part of
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
Coldenham	115/13.8	T1	SCADA	EM				
Coldenham	115/13.8	T2	SCADA	EM				
Coldenham	115	J-19-CW BKR		SS				
Converse St.	110	0-10-0 0 O:CIX		<del></del>	<del></del>	NONE	1	
Converse St.	4	121 Ckt.	MV-90		EM			
Converse St.	4	122 Ckt.	MV-90		EM			
	4	123 Ckt.	MV-90		EM			
Converse St.		123 CKL	M14-20			NONE	-	
Conway Place		***************************************		T	EM			
Conway Place	4	881 Ckt.	MV-90	*****				
Conway Place	4	882 Ckt.	MV-90		EM			
Coxsackie				_,		8890		
	13.8	1071 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
Coxsackie	13.8	1072 Ckt.	SCADA/ Charts - kW		EM			BE1-851H as BU and 79
		1074 Ckt.	Charts - Amps		EM/uP			Bitronics for the SCADA portion
Coxsackie	120				EM			Bittories for the SCADA portion
Coxsackie Coxsackie	13.8	4070 014			EM			
Coxsackie	13.8	1076 Ckt.	SCADA/ Charts - kW		( (210)			
Coxsackie Coxsackie Coxsackie	13.8		SCADA CHARS - KW					
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8	Bus 1 (T1+G1)			EM			Matering data available through relay
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	Bus 1 (T1+G1) Bus 2	SCADA ???					Metering data available through relay, configured.
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	Bus 1 (T1+G1)	SCADA	uP	EM			
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 69	Bus 1 (T1+G1) Bus 2 CN Line	SCADA ??? None		EM			
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 69	Bus 1 (T1+G1) Bus 2 CN Line NC Line	SCADA ???	uP	EM			

13.8

Coxsackie

·			Electric Sub	station Upgra	<u>de Needs As</u>	sessment 	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU	Recloser	Comment
	5.655 (,					2100		Siemens meters 485 to RTU Al
Danskammer	i			EM				Siemens meters 485 to RTU Al
Danskammer	115	AC Line	SCADA - Amps	EM			~	Siemens meters 465 to RTU Al
Danskammer	115	DC Line	SCADA - Amps	UP UP				Siemens meters 485 to RTU Al
Danskammer	115	DB Line	SCADA - Amps					Siemens meters 485 to RTU Al
Danskammer	115	DR Line	SCADA - Amps	UP				Siemens meters 485 to RTU Al
	115	DW Line	SCADA - Amps	uР				Siemens meters 485 to RTU Al
Danskammer	115	RS Line .	SCADA - Amps	EM				
Danskammer	115	W - 323 8KR		SS				
Danskammer Danskammer	115	North Bus	SCADA - Volts	EM			****	
Danskammer	115	Middle Bus	SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA - Volts	EM				
Danskammer	115	DB-1171 BKR		υP				
Danskammer	115	DR-1421 BKR		υP				<u> </u>
Danskammer	115	DW-1061 BKR	****	υP			*****	ļ
Danskammer	115	T5&T6	SCADA	EM			***-*	<u> </u>
Dashville	1.13	1				2300		
	4	345 Ckt.	-MV-90		EM		V4L	Single Phase; Vac; Hydr
Dashville	6.6	Bus	- 144 Y - 30		EM			
Dashville	6.6			EM				Fused Transformer w/ CR 67 relay
Dashville		T1						1 daed fransionner wild to teldy
Dashville		G1-G2	SCADA					<u> </u>
East Fishkill 345kV								
East Fishkill 345kV	345	C9751 Breaker A1 BR	·	EM				
East Fishkill 345kV	345	C9751 Breaker A2 BR		EM			*****	
East Fishkill 345kV	115	Transformer #1 Alt. 1		EM				
East Fishkill 345kV		Transformer #1 Alt. 2	SCADA	EM			*****	
East Fishkill		1				8890	<u> </u>	
East Fishkill	115	EF Line	SCADA	υ <b>Ρ</b> *				95P is MDAR; 95BU is Optimho - Replacin
East Fishkill	115	HF Line			<del></del>	<del></del>		with 311C & D60.
East Fishkill	115	EF-672 BKR	SCADA	u₽*				95BU is Optimho - Replacing with D60.
East Fishkill				EM				
	115	EF-679 BKR		EM				
East Fishkill	115	W-640 BKR		ĖM	*****			
East Fishkill	115	T1	SCADA	see EFB				
East Kingston						Orion		
East Kingston	13.8	Đus 1	SCADA		UP		****	
East Kingston	13.8	Bus 2	SCADA	N	υP			
East Kingston	13.8	1021 Ckt.	SCADA		qu		·	
East Kingston	13.8	1022 Ckt.	SCADA		υP			
East Kingston	13.8	1023 Ckt.	SCADA		uP			
East Kingston	13.8	1024 Ckt.	SCADA		UP			~ <del></del>
East Kingston	13.8	1025 Ckt.	SCADA		uP			<del>-  </del>
East Kingston	13.8	1026 Ckt.	SCADA		υP			-
East Kingston	13.8	1026 Ckt.			UP			
			SCADA					
East Kingston	13.8	1028 Ckt.	SCADA		uP			
East Kingston	115	ER Line	SCADA	∪P				
East Kingston	115	LR Line	SCADA	υP				
	115	LR-201-ER Breaker	****	uP				
East Kingston		Com Equipment		,				Com
			SCADA	υP			*****	
East Kingston	115/13.8		SCADA	UP				
East Kingston East Kingston	115/13.8	172		1 01		8890		
East Kingston East Kingston East Kingston	115/13.8 115/13.8	T2	J GCADA					
East Kingston East Kingston East Kingston East Park	115/13.8		· · · · · · · · · · · · · · · · · · ·		EMILID			RE1-851M as RI1 and 70
East Kingston East Kingston East Kingston East Park East Park	115/13.8	6073 Ckt.	SCADA		EM/uP			BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Kingston East Park East Park East Park	115/13.8 13.8 13.8	6073 Ckt.	SCADA SCADA		EM/uP			BE1-851H as BU and 79 BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Park East Park	115/13.8	6073 Ckt. 6074 Ckt. 6075 Ckt.	SCADA SCADA SCADA		EM/uP EM	*****		
East Kingston East Kingston East Kingston East Kingston East Park East Park East Park	115/13.8 13.8 13.8	6073 Ckt.	SCADA SCADA		EM/uP			

			Electric Subs	tation obs	veeds As	<del></del>		
Cultoration !	Voltage Class (kV)	Line/Ckt.	Wetering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
					EM/uP		ES	3 phase; oil; electronic; GS not working
ast Walden	120	5041 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5042 Ckt.	Grid Sense		EM			GS not working
East Walden	13.8	5043 Ckt.	Grid Sense		- EM			Com
East Walden	13.8	Com Equipment			uP			
ast Walden		B1	SCADA					95P is DLP; part of replacement program
East Walden	13.8			Gen1/uP				already.
East Walden	115	CW Line	None	EM				
East Walden	115	CW -712		EM				
East Walden	115	D Line	None	EM				1
East Walden	115	D-722 BKR		UP				
East Walden	115	DW Line	\$CADA	UP				
East Walden	115	DW-1071 BKR	00.404	UP				<u> </u>
East Walden	115	EM Line	SCADA	uP				Anna 9 Valla
East Walden	115	EM-642 BKR	CCADA	UP				Amps & Volts
East Walden	69	WM Line	SCADA	EM				
East Walden	115	W-644		EM				Combine Bus Volts to one point
East Walden	115	B1	SCADA	EM				
East Walden	115	B2				<del></del>	2,	95P is SEL-587
East Walden	69/13.8	T1	SCADA	uP/EM				95BU is SEL-587
East Walden	69/13.8	T3	SCADA	EM/uP	<u> </u>	D-20		
Fishkill Plains					EM/uP			BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM			
Fishkill Plains	13.8	8092 Ckt.	MV-90		UP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	ŞCADA					SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.	SCADA	*****	uP-200			022 00 1100 1100 1100 1100 1100 1100 11
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA		υP			95BU is Optimho; part of replacemen
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1				program.
Fishkill Plains	115	HF-703 BKR		EM				
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	υP		*****		
Fishkill Plains	115	A-1036-FP	VA.+==	uP- 200				279/2BFR relays 279/2BFR relays
Fishkill Plains	115	A-1498		uP- 200				Com
Fishkill Plains	115	Com Equipment						95P is DLP; part of replacement prog
Fishkill Plains	115	FP Line	SCADA	uP/Gen 1				already; 95BU is SEL-321
Fishkill Plains	115	81	SCADA	EM				
Fishkill Plains	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Fishkill Plains	13.8	92	SCADA		EM			
Fishkill Plains	115/13.8	T1	SCADA	EM/uP				95BU is SEL-587; metering is combi
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	
Forgebrook	T					2300		
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM			
Forgebrook	13.8	Bus #2	CHOIG - RANKAN		EM		*****	BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8013 Ckt.	Charts - Amps		€M/uP			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8014 Ckt.	Charts - kW		uP/EM			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM/uP			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW		EW.			Com
Forgebrook	115	Com Equipment						Com
Forgebrook	115	FO Line	None	EM		*****		
Forgebrook	115	FO-1430-FT		EW				
	115	FT Line	None	EM				
Forgebrook		FT-1432	<del>                                     </del>	EM				
Forgebrook	115			EM				
Forgebrook	115			uР				
Forgebrook	115		SCADA		EM			
	13.6		None		EM			Amps
Forgebrook			SCADA					
Forgebrook					EM			
Forgebrook	13.				EM			
		8 W-994	FA6-1					Metering combined
Forgebrook		*	SCADA	EW				

200-2

120

			Electric Sub	station Upgra	de Needs As	sessment		T
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	1					M-4000		3 phase; oil; electronic; 958U is BE1-851H;
Freehold	120	2061 Ckt.	Grid Sense		EM/cP		PR-560M	GS not working
Freehold	13.8				EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H; GS not working
Freehold	13.8	2071 Ckt.	Grid Sense				PR-560M	3 phase; oil; electronic
Freehold	13.8	W-1155 BKR	Charts - kW/kVAr	fuse		****		
Freehold	13.8	T1	SCADA	1035	EM			<u> </u>
Freehold	13.8	81	30,20,2			Orion .		T
Galeville Galeville	13.8	B1	SCADA		UP			
Galeville	13.8	82	SCADA		uP			
Galeville	13.8	5030 Ckt.	SCADA		uP		*****	
Galeville	13.8	5031 Ckt.	SCADA		υP	ļ <del></del>		
Galeville	13.8	5032 Ckt.	SCADA		UP			
Galeville	13.8	5033 Ckt.	SCADA		υ <u>Ρ</u>			<del></del>
Galeville	13.8	5034 Ckt.	SCADA		UP UP			<del></del>
Galeville	13.8	5035 Ckt.	SCADA		UP			Com
Galeville		Com Equipment						Com
Galeville	69	MG Line	\$CADA	υP				
Galeville	69	MG-200-MK BKR		υP			••••	
Galeville	69	MK Line	SCADA	υP				
Galeville	69/13.8	Ţ1	SCADA	υ۶				
Galeville	69/13.8	т2	SCADA	ŲΡ	<u> </u>		****	
Greenfield Rd.	<del></del>					M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP	****	ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd. Greenfield Rd.	4	375-376 Ckt.	Charts - kW		EM	*****		
Greenfield Rd.	13.8	377-378 Ckt.	Charts - kW		EM			
Greenfield Rd.	13.8/4	W-1608 T2	Ch - d - 1201		EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8	B1	Charts - kW		EW			
Greenfield Rd.	4	81	SCADA SCADA		******	****		Volts
Greenfield Rd.	4	B3	SCADA		*****			Volts
Grimley Rd.		- 03	SCADA			NONE-Soon to		Volts
Grimley Rd.	4	385 Ckt.	Grid Sense		EM		Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4	386 Ckt.	Grid Sense		EM		17,16 2	No DATA
Hibernia				<del></del>		Micro 1C		NO DATA
Hibernia	13.8	7011 Ckt.	SCADA		uP- 200/ ∪P			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	7012 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	B1	SCADA		EM/uP			958U is DFP-100
Hibernia	69/13.8	Τ1	SCADA	EM/uP			*****	958U is DFP-100
Hibernia	13.8	Com Equipment			=			Com
High Falls						D-20		
High Falls	13.8	3021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3022 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3023 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3025 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	69	HK Line	SCADA		UP			95P is DLP
High Falls	69	HK-696-P BKR.			uP- 200			SEL-279
High Falls	69	P Line	SCADA		uP	*****		95P is DLP
High Falls	13.8	W-998 BKR.	SCADA		uP - 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	B1	SCADA		UP/ uP - 200		*****	95BU is SEL-251
High Falls	13.8	B2	SCADA		uPI uP- 200			95BU is SEL-251 Com
High Falls	13.8	Com Equipment	****					95P is \$R-745 & 95BU is SEL-587; Vol
High Falls	69/13.	8 T1	SCADA	UP _				95P is SR-745 & 95BU is SEL-587; Vol
1000.00	69/13.	<u> </u>	SCADA	uP				33F IS 3R-140 & 33DU IS 3CC-361, 40R

				station Up				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1833 (KV)					2300		95BU is BE1-IPS-100
Highland			SCADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA	*****	EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			3050 10 55 10 10 10 10 10 10 10 10 10 10 10 10 10
Highland	13.8	5083 Ckt.	SCADA		υP			
Highland	13.8	5084 Ckt.	SCADA		UP			
Highland	13.8	5085 Ckt.	SCADA	υP				
Highland	115	HR Line OR Line	SCADA	υP				
Highland	115	OR-761-HR BKR.		EM				
Highland	13.8	B1	SCADA		EM			
Highland Highland	13.8	B2	SCADA		uP			Com
Highland	13.8	Com Equipment						958U is SEL-587
Highland	115/13.8	T1	SCADA	υP/EM	<u> </u>			
Highland	115/13.8	T2	SCADA	υP		ļ		
Honk Falls						D-20	WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA		EM		<del></del>	3 phase, on, creations
Honk Falls	13.8	B1	SCADA	EM				79 Relay is EM
Honk Falls	69	GM Line	SCADA	EM/uP				75 Relay 13 Cill
Honk Falls	69	HG Line	SCADA	· uP		*****		79 Relay is EM
Honk Falls	69	HK Line	SCADA	uP/EM				13 Relay IS CIVI
Honk Falls	69	MK Line	SCADA	υP			****	70 Palaria 500
Honk Falls	69	WH Line	SCADA	uP/EM			4+-1-	79 Relay is £M
Honk Falls	69	overall diff B1+T1	SCADA	EM				<del></del>
Honk Falls	69/13.8	T1		fuse				<u> </u>
Hunter	T					N-4000		<del></del>
Hunter	34.5	Z-666					VR-35	3 phase; vac; hyd
Hunter	13.8	2081 Ckt.	MV-90			ļ	Kyle W	3 phase; oil; hyd
Hunter	13.8	Cap Bank			EM		4	<u> </u>
turtey Ave. 345kV		L				2400	ļ	
Hurley Ave. 345kV	345	30151 BKR.	****	EM				79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		υP		*****	*****	<u> </u>
lurley Ave. 345kV	345	30152 A2 BF	A manual	EM				
Hurley Ave. 345kV	345	301 Line A1	SCADA	uΡ				
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				
Hurley Ave. 345kV	345	30353 BKR.	*****	EM*				79 Relay is EM; in process replacement v SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		up				· · · · · · · · · · · · · · · · · · ·
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM				<u> </u>
Hurley Ave. 345kV	345	30354 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	303 Line A1	SCADA	uP				
Hurley Ave. 345kV	345	303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV	345	Bus A1		EM		*****		
Hurley Ave. 345kV	345	Bus A2		EM				
Hurley Ave. 345kV	115	A2451 BKR.		EM		****		
Hurley Ave. 345kV		A2451 A1 BF		<u>EM</u>			**	
Hurley Ave. 345kV		A2451 A2 BF	****	EM				
Hurley Ave. 345kV		T1 A1 Out of Step	*****	EM				
Hurley Ave. 345kV	345	T1 A2 Out of Step	****	EM			*****	
Hurley Ave. 345kV		T1 A1		EM				<del></del>
Hurley Ave. 345kV	345	T1 A2	*****	EM				
Hurley Ave. 345k		TILS		υP	****			Volts
	V 115	B1	SCADA					VOILS

			Electric Substa	ation Upgra	de Needs As	sessment		1
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
								BE1-851H as BU and 79
Hurley Ave.		2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as 8U and 79
Hurley Ave.	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2092 Ckt. 2093 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		EM/uP			
Hurley Ave.	13.8	Cap Bank		EM				<del>                                     </del>
Hurley Ave.	115		SCADA	EM		*****		Quadramho part of the package; metering
Hurley Ave.	115	HP Line		Gen1				Amp value only
Hurley Ave.	69	l line	SCADA					
Hurley Ave.	115	OR Line	SCADA	EM				Quadramho part of the package; metering
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
Hurley Ave.	115	HP-1643 BKR.		EM		<u> </u>		
Hurley Ave.	115	OR-1640 BKR.		EM		<del></del>		
Hurley Ave.	69	W-142 BKR.		uP	500			<del>                                     </del>
Hurley Ave.	13.8	W-1575 BKR.			EM	****	·	<del>                                     </del>
Hurley Ave.	115	W-389 BKR.		EM				<del></del>
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM				Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	T3	SCADA	EM				<u> </u>
Hurley Ave.	115/13.9	Т4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM			*****	
inwood Ave.	1					3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA	*	EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
Inwood Ave.	13.8	Com Equipment			**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115 115	IR-201-X BKR.	50151	υP				
Inwood Ave.	13.8	X Line B1	SCADA	· uP				
~	13.8	82	SCADA		uP			<del></del>
Inwood Ave.			SCADA		UP			
Inwood Ave.	115/13.8	τ1 τ2	SCADA	υP	**			
Inwood Ave Jansen Ave.	115/13.8	12	SCADA	υP		M-4000		
Jansen Ave.	13.8	1001 Ckt.	MV-90		υP			
Jansen Ave.	13.8	1002 Ckt.	MV-90		EM			
Jansen Ave.	13.8	1002 Ckt.	MV-90		uP			
Jansen Ave.	13.8	1003 Ckt.	MV-90		EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM		*	
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM			
Jansen Ave.	13.8	Com Equipment						Com
Jansen Ave.	13.8	T - Grounding	MV-90		υP		*	
Kerhonkson						8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat:
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat
Kerhonkson	69	MK-929 MOS		EM				
Kerhonkson	69	MK-930 MOS	*****	EM				
				fuse				Amps for each Transformer
Kerhonkson	69/13.8	\	Charts - kW/kVAr /GS	fuse		*****		
Kerhonkson	69/13.8		66484	1036				Volts & Amps
Kernonkson								
Kerhonkson	69	HK	SCADA SCADA					Volts & Amps

Substation  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners  Knapps Corners	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8 13.8							
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8					2100		Not sure if charts were removed
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8 13.8		Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8 13.8	8022 Ckt.	Charts - Amps		EM/uP			Not sure if charts were removed
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.8	8022 Ckt.	Charts - Amps/SCADA		uP/EM			8E1-851H as BU and 79
Knapps Corners Knapps Corners Knapps Corners Knapps Corners Knapps Corners		8024 Ckt.	Charts - kW		EM/uP			
Knapps Corners Knapps Corners Knapps Corners Knapps Corners	13.0	8025 Ckt.	Charts - kW		EM			Com
Knapps Corners Knapps Corners Knapps Corners	13.8	Com Equipment						
Knapps Corners Knapps Corners	115	K8 Line	None	EM .		*****		SEL-279
Knapps Corners	115	KB-1558-MC BKR.		υΡ- 200 uP				
Knapps Corners	115	SK Line	SCADA	EM	<del>                                     </del>			Amps
	13.8	KN Line	SCADA*	EM				Amps
Knapps Corners	13.8	KR Line	SCADA"	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				·
Knapps Corners	69	KM Line	SCADA	EM				
Knapps Corners	69	TR Line	SCADA	uР				
Knapps Corners	69	G Line			EM			
Knapps Corners	13.8	W-1215 BKR.		uP				
Knapps Corners	69	W-1409 BKR.			EW			
Knapps Corners	13.8	W-1462 BKR.			EM			
Knapps Corners	13.8	B1	50404		EM			Combine Bus Volts to one point
Knapps Corners	13.8	82	SCADA	****	EM			i _
Knapps Corners	13.8	B3		EM		<del> </del>		Volts
Knapps Corners	69	69k Bus	SCADA	EM		<del></del>		Cambias land value
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		uP				
Knapps Corners	115/69	T2	SCADA	UP		M-4000		L
Lawrenceville		2005 014	0448	EM/uP		,,,,	CXE-400A	3 phase; oil; hyd
Lawrenceville	34,5	2385 Ckt.	Grid Sense SCADA*	EMIOF				Volts
Lawrenceville	34.5 69/34.5	81 T1	MV90/Grid Sense/SCADA	EM				Amps.
Lawrenceville Lincoln Park	69/34.5	<del></del>	MV 50/Grid Serise/SCADA			2300		
Lincoln Park	13.8	Com Equipment			,			Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps	****	EM		V	
Lincoln Park	13.8	2012 Ckt.	Charts - kW	*****	€₩			
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1			EM			
Lincoln Park.	13.8	Cap Bank 2			EM			
Lincoln Park	115	HP Line	None	EM				Relay Replacement Progam in proc
Lincoln Park	115	HP-1318 BKR.		EM				
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uР				·
Lincoln Park	13.8	W -1321 BKR.			EM			
Lincoln Park	13.8	W-45 BKR.			EM			
Lincoln Park	13.8	W-534 BKR.			EM			
Lincoln Park	13.8	W-554 BKR.			EW.			
Lincoln Park	13.8	WT-206 BKR.			EM			<del></del>
Lincoln Park	13.8	WT-207 BKR.	*****		EM			
Lincoln Park	13.8	WT-525 BKR.	•		EM			
Lincoln Park	13.8	WT-528 BKR.			EM EM			
Lincoln Park	13.8	B1	SCADA	·	EM.			Combine Bus Volts to one poi
	13.8	B2	SCADA		EM			Volts
Lincoln Park		B3	SCADA		EM			VURS
Lincoln Park	13.8		None		EM			
Lincoln Park	13.8	84		EM				Volts
Lincoln Park	115	115k bus	SCADA					Combine load value
Lincoln Park	115/13	.8 T1	SCADA	EM		<del>-</del>		Compile to ac value
	1.0		SCADA	EM		*****	*****	
Lincoln Park	115/1	3.8 T2 3.8 T3	SCADA	EM			.,,,,,	_

			Electric Subs	station Upgra	de Needs As	sessment ———		<u> </u>
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2400		BE1-851H as BU and 79
Manchester		<del></del>	MV-90	· · · · · · · · · · · · · · · · · · ·	EM/uP			8E1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			8E1-851H as BU and 79
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP			
Manchester	13.8	6094 Ckt.			EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	- UF	EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EW			
Manchester	13.8	W-650 BKR.		<del></del>	EM			2 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Manchester	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Manchester	13.8	82						<u> </u>
Manchester	115/13.8	Τ1	SCADA	EM		<del></del>		Combine load value
Manchester	115/13.8	т2		EM		2000		7777
Mariboro	T					8890		
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			8E1-IP\$100 as 80 and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP		****	Volts
Marlboro	115/13.8	T1	SCADA	uP/EM*	*****			95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP				
Maryland Ave.						M-4000		
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			1
Maryland Ave.	4	622 Ckt.	Charts - kW		EM			
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Ckt.	Charts - kW		EM		*	<del></del>
Maryland Ave.	13.8	MS Line			EM			<u> </u>
Maryland Ave.	13.8	PH-284 BKR.			EM	*****		·
Maryland Ave.	13.8	PH-286 BKR.			EM	+		
Maryland Ave.	4	W-1032 BKR.			EM			<del></del>
Maryland Ave.	4	W-1033 BKR.			EM			*
Maryland Ave.	4	W-1034 BKR.			EM			<del> </del>
Maryland Ave.	13.8	B1	SCADA		EM			Votts
Maryland Ave.	13.8	82	<del></del>	<del> </del>	EM			
Maryland Ave.	13.8	91	SCADA		EM			Volts
Maryland Ave.	4	82	SCADA	*****	EM	****	_	Volts
Maryland Ave.	13.8/4	T1			EM		<del></del>	· <del> </del>
		T2			EW			- +
Maryland Ave.	13.8/4	1 2	1	*	E3M	M-4000		
Maybrook Maybrook	13.8	5051 Ckt.	MV-90	· · · · · · · · · · · · · · · · · · ·	EM	WI-4000	RXE	3 phase; oil; electronic
	13.8	5051 Ckt.	MV-90		uP		- RAE	
Maybrook							<del></del>	Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90		EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Mayorook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None	· · · · · · · · · · · · · · · · · · ·				
Maybrook	69/13.8	τ2	None					
McKinley St.						NONE		
McKinley St.	4	845 Ckt.	MV-90		EM			

_			Electric Subs	ration obdia				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T, Relaying	D. Relaying	RTU	Recloser	Comment .
l l	0.833 (4.4)					BM		
Merritt Park			SCADA		uР			
Merritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA		uP		<del></del>	
Merritt Park	13.8	8063 Ckt.	SCADA		uP			
Merritt Park	13.8	8064 Ckt.	SCADA		บP			
Merritt Park	13.8	8065 Ckt.			uΡ			
Merritt Park	13.8	8066 Ckt.	SCADA SCADA		uP			
Merritt Park	13.8	8067 Ckt.	SCADA _		uP		<del></del> +	Com
Merritt Park	13.8	8068 Ckt.			<u> </u>			
Merritt Park	13.8	Com Equipment WF Line	SCADA	υP				
Merritt Park	115	WP Line	SCADA	υP				SEL-279
Merritt Park	115	WF-439-WP BKR.		uP-200				
Merritt Park	115		SCADA		uP			
Merritt Park	13.8	B1	SCADA		υP			
Merritt Park	13.8	B2	SCADA	uP				<del></del>
Merritt Park	115/13.8	<u>T1</u>		UP				
Merritt Park	115/13.8	Т2	SCADA	<u> </u>		BM		
Milan				т	uP uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA		ur		*****	Com
Milan	13.8	Com Equipment						
Milan	115	B-4561 Ckt Sw		uP				
Milan	115	MR Line	SCADA	uP				
Milan	115	MR-501 BKR.	SCADA	υP		· <del> </del>		
Milan	115	RT-7 BKR.		υP				
Milan	115	R-10 BKR.		υP		<u> </u>		
Milan	115	T-7 Line	SCADA	υP			****	
Milan	115	10 Line	SCADA		uP			
Milan	115	B1	SCADA	up				
₩ilan	13.8	B1	SCADA		υP		***	
Milan	115/13.8	11	SCADA	υP				<u> </u>
Millerton						L&N	<u> </u>	
Millerton	13.8	7081 Ckt.	SCADA		EM		****	<u> </u>
Millerton	69	GE-823 MOS		EM				
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; Y1 = 7081 load
Millerton	69	Line to SMI	SCADA			-2410		Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV	+	Line to voc				BM		
Modena 115kV	13.8	B1	SCADA		uP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			uР			
Modena 115kV	13.8	5011 Ckt.	SCADA		υP			
Modena 115kV	13.8	5012 Ckt.	SCADA		uP			
	13.8	5012 Ckt.	SCADA		uP			
Modena 115kV		Com Equipment	- SCAUA			*****		Com
Modena 115kV	13.8	EM Line	SCADA	υP				
Modena 115kV		EM-201-PX BKR.	SCADA	uP				
Modena 115kV	115	PX Line	SCADA	⊎P ⊎P				
Modena 115kV	115			UP				Only has one 13.8 bus; T3 = Bus lo
Modena 115kV	115/13.8	T3	SCADA	1 0		8890		
Modena 69kV	<del></del>	T 54	SCADA	EM				volts
Modena 69kV	69	B1	SCADA	uP UP				
Modena 69kV	69	MG Line	SCADA	EM				
Modena 69kV	69	W-941 BKR.		EM				
Modena 69kV	69	MG-380 BKR.		EM/uP				
Modena 69kV	115/69	T1	SCADA					GE F35 is installed
Modena 69kV	69/13.8	T2	None	Fuse/uP		NONE		
Montgomery	<del></del>					140142	V4L	Single phase; Vac; Hyd
	4	571 Ckt.	Charts - kW		EM		V4L	Single phase; Vac; Hyd
Montgomery	4	572 Ckt.	Charts - kW		EM.			

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			Electric Subs	tation Upgra	de Needs <u>As</u>	sessment		
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RŤU	Recloser	Comment
	Class (kV)					M-4000		
Montgomery St.					EM			volts
Montgomery St.	13.8	B1	SCADA .	*****	EM			Volts
Montgomery St.	13.8	B2	SCADA		EM			volts
Montgomery St.	13.8	B3	SCADA None		EM			
Montgomery St.	13.8	B Line	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4002 Ckt. 4003 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	401 Ckt.	Charts - kW demand		EM			
Montgomery St.  Montgomery St.	4	402-3 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	404 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	410A/B Ckt.	Charts - kW demand SCADA		EM			Volts
Montgomery St.	4	81 P2	SCADA		EM			volts
Montgomery St.	4	B2			EM			-
Montgomery St.	13.8	F Line	None		EM		*****	
Montgomery St.	13.8	NB Line	None		EM			
Montgomery St.	13.8	NM Line	None		EM			
Montgomery St.	13.8	R Line	None		EM			
Montgomery St.	13.8	W-507 BKR.		<del></del>	EM	<del> </del>	·	
Montgomery St.	13.8	W-508 BKR.				<u> </u>	····	
Montgomery St.	13.8	W-509 BKR.		*****	EM	****		
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	T2			EM	44.550		
Myers Corners Myers Corners	43.0	2044 CI-4	Ob . 4. 1382		<del></del>	44-550	ļ <sub>-</sub>	
Myers Corners	13.8	8041 Ckt. 8043 Ckt.	Charts - kW Charts - kW		uP		*****	
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM			·
Myers Corners	13.8	8045 Ckt.			EM			
Myers Corners	13.8	8046 Ckt.	Charts - kW SCADA		EM	*****		
Myers Corners	69	KM Line	None	EM	UP			
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.	110116	EM				
Myers Corners	13.8	W-63 BKR.	*****					<u> </u>
Myers Corners	13.8	W-66 BKR.			EM			<del> </del>
Myers Corners	13.8	Feeder M1-75			EM		<del> </del>	
Myers Corners	13.8	Feeder M2-76			EM			<del> </del>
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1			EM			
Myers Corners	13.8	B2	SCADA		EM			Combine Bus Volts to one point
Myers Corners	69/13.8	T1	50404	EM.				<u> </u>
Myers Corners	69/13.8	T2	SCADA	EM		4===		Combine load value
Neversink						2200		· · · · · · · · · · · · · · · · · · ·
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	~~~~	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM			to by sphere	Amps
Neversink	69	WH Line	SCADA*	EM	*****		**	Amps
Neversink	4	W-1128 BKR.			EM		*****	
Neversink	69	69k Bus	SCADA	uP/EM				Volts
New Baltimore						2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	\$CADA*		M			kW
New Baltimore	13.8	1083 Ckt.	SCADA*		EM			NII .
New Baltimore	69	Cap Bank		EM/uP		*****		Com
		Com Equipment						COSII
New Baltimore		CN Line	None	υP				
New Battimore				υP				
New Baltimore		NW Line	None		EM			Volts
New Baltimore	e 13.8	B1	SCADA	*****				
New Baltimor		8 71	SCADA	EW/"p		****		95P is SEL-587

′ <u></u>				4 (: 10.	Needs As	coccmont		
			Electric Subs	station upsc	Neeus As	36331116111		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)			<u> </u>		NONE		No DATA
New Windsor			0.116		EM			No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	463 Ckt.	Grid Sense		EM			NO DATA
New Windsor	4	464 Ckt.	Grid Sense		υP			
New Windsor	13.8	UN & UW ATC	None	<del></del>	υP			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kVAr		UP			
New Windsor	13.8/4	T2				D-20		
North Catskill				T	นค- 200/ บค			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA	<del></del>	uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2003A Ckt.	SCADA	<del></del>	uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA	****	UP-200/ UP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA	*****				95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA		นฅ- 200/ นฅ		<del></del>	Com
North Catskill	13.8	Com Equipment					·	COIII
North Catskill	115	2 Line	SCADA	EM				
	115	R-2 BKR.		EM				<u></u>
North Catskill		RT-7 BKR.		EM			••-	
North Catskill	115	T-7 Line	SCADA*	EM				Amps
North Catskill	115			EM				
North Catskill	69	Cap Bank						
North Catskill	69	CL Line	SCADA	UP UP				<del>-</del> -
North Catskill	69	H Line	SCADA	uP		<del></del>		
North Catskill	69	NC Line	SCADA	υP		*****		` check on TD-5
North Catskill	69	W-1107 BKR.		EM/oP*				
North Catskill	69	W-269 BKR.		EM/uP*				check on TD-5
North Catskill	115	W-791 BKR.		uP- 200				SEL-2BFR
North Catskill	69	W-269 & W-1107 BKR			EM			มร
North Catskill	115	B1	SCADA	EM	****			Volts
North Catskill	69	B1	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP				Volts
North Catskill	13.8	B1	SCADA		EM/uP		.,,,,	Volts: 95BU is DFP-100
North Catskill	13.8	B2	SCADA	4=-4-	EM/uP			Volts: 95BU is DFP-100
North Catskill	115/69	T4	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
		T6		EM/uP			-	95BU is DFP-100
North Catskill North Catskill	115/13.8	77	SCADA SCADA	EM/uP				95BU IS DEP-100 95BU IS DEP-100

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Substation	E1	lectric Subst	ation Upgrad	de Needs As	sessment		
North Chelsea		Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
North Chelsea							
North Chelsea		SCADA		٩υ			
North Chelsea		SCADA		uP			
North Chelsea   13.8   8054 Ckt.		SCADA		υP			
North Chelsea   13.8   8055 Ckt.		SCADA		υP			
North Chelsea   13.8   8056 Ckt.		SCADA		uP			
North Chelsea		SCADA		υP			
North Chelses		SCADA		uP			
North Chelses		SCADA		υP			Com
North Chelsea	nent						
North Chelsea		SCADA	uP				
North Chelsea			UP	****			
North Chelsea         115         FO-1482 BM           North Chelsea         115         FO Line           North Chelsea         115         NF Line           North Chelsea         115         NF-1116 BM           North Chelsea         115         NF-1116 BM           North Chelsea         115         SC-1566 BM           North Chelsea         69         TV Line           North Chelsea         115         B-2651 BM           North Chelsea         115         B-2651 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-2653 BM           North Chelsea         115         B-1           North Chelsea         115         B-1           North Chelsea         115/9         T1           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2		SCADA	UP O				
North Chelsea         115         FO Line           North Chelsea         115         NF Line           North Chelsea         115         NF-1116 BH           North Chelsea         115         SC Line           North Chelsea         115         SC-1566 BH           North Chelsea         115         B-2651 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115/9         T1           North Chelsea         115/69         T1           North Chelsea         115/13.8         T2           North Chelsea         115/13.8         T2		****	υP				
North Chelsea	KR.		UP.		<del></del>		95P is LCB-1I
North Chelsea	,	SCADA	UP				
North Chelsea         115         SC Line           North Chelsea         115         SC-1566 Br           North Chelsea         69         TV Line           North Chelsea         115         B-2651 Br           North Chelsea         115         B-2651 Br           North Chelsea         115         B-2653 Br           North Chelsea         115         B-2653 Br           North Chelsea         115         B1           North Chelsea         115         B1           North Chelsea         13.8         B2           North Chelsea         115/69         T1           North Chelsea         115/13.8         T2           Ohioville         13.8         5022 Ck           Ohioville		SCADA	υP				95P is LCB-II
North Chelsea         115         SC Line           North Chelsea         115         SC-1566 Br           North Chelsea         69         TV Line           North Chelsea         115         B-2651 BK           North Chelsea         115         B-2652 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         115         B-2653 BK           North Chelsea         13.8         B1           North Chelsea         13.8         B2           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/49         T1           North Chelsea         115/43.8         T2           North Chelsea         115/49         T1           Ohioville         13.8         5021 Ck           Ohiovill	KR.		υP			**	
North Chelsea	e	SCADA	υP			*****	
North Chelsea   69	KR.		uΡ	****			
North Chelsea	e	SCADA	υP				
North Chelsea	KR.	****	uP				
North Chelsea			υP	****	*-***		
North Chelsea		*****	υP				
North Chelsea   115			υP				····
North Chelsea   13.8   B1     North Chelsea   13.8   B2     North Chelsea   115/69   T1     North Chelsea   115/69   T1     North Chelsea   115/13.8   T2     North Chelsea   115/13.8   T3     Ohioville   T3.8   T3     Ohioville   T3     Ohiovile   T3		SCADA	υP		*****		
North Chelsea		SCADA		υP			
North Chelsea		SCADA		UP			<del></del>
North Chelsea		SCADA	υP				
North Chelsea		SCADA	uP				<del></del>
Ohioville         13.8         5021 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         13.8         Com Equip           Ohioville         69         O Line           Ohioville         69         O B Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         PX Line           Ohioville         115         PX Line           Ohioville         115         PX Line           Ohioville         69         W - 1537           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA	UP			<del></del>	
Ohioville         13.8         5021 Ck           Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5024 Ck           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Lin           Ohioville         115         OR Lin           Ohioville         115         OR-1075           Ohioville         115         PX Lin           Ohioville         115         PX - 1659           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2				I	2100	<del></del>	Volls
Ohioville         13.8         5022 Ck           Ohioville         13.8         5023 Ck           Ohioville         13.8         5024 Cf           Ohioville         13.8         5025 Ck           Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O B Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         PX Lin           Ohioville         115         PX Lin           Ohioville         69         W - 1517           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2	ket (	Charts - Amps		EM/uP	2100	·	BE1-851H as BU and 79
Ohioville         13.8         5023 Ch           Ohioville         13.8         5024 Cc           Ohioville         13.8         5025 Cc           Ohioville         13.8         Com Equip           Ohioville         113.8         Com Equip           Ohioville         69         O Lin           Ohioville         69         OB Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         OR Lin           Ohioville         115         PX Lin           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohiovitte         13.8         5024 Cf           Ohiovitle         13.8         5025 Cf           Ohiovitle         13.8         Com Equip           Ohiovitle         115         Cap Ba           Ohiovitle         69         O Line           Ohiovitle         115         OR Line           Ohiovitle         115         OR Line           Ohiovitle         115         OR Line           Ohiovitle         115         PX Line           Ohiovitle         115         PX Line           Ohiovitle         69         W - 1511           Ohiovitle         13.8         W - 1600           Ohiovitle         13.8         W - 1600           Ohiovitle         69         69k B           Ohiovitle         13.8         B1           Ohiovitle         13.8         B1           Ohiovitle         13.8         B2		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville         13.8         5025 Cl           Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Lin           Ohioville         69         OB Lir           Ohioville         115         OR Lir           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		Charts - kW		EM/uP			8E1-851H as BU and 79
Ohioville         13.8         Com Equip           Ohioville         115         Cap Ba           Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR-1075           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA		uP	*****		8E1-831M as 80 and 79
Ohioville         11S         Cap Ba           Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR Line           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1600           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		00707					Com
Ohioville         69         O Line           Ohioville         69         OB Line           Ohioville         115         OR Line           Ohioville         115         OR.1075(           Ohioville         115         PX Line           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1637           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2			EM	<del></del>		<del></del>	Com
Ohioville         69         OB Lir           Ohioville         115         OR Lir           Ohioville         115         OR-10751           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	uP				
Ohioville         115         OR Lir           Ohioville         115         OR-10751           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	UP				
Ohioville         115         OR-1075           Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W · 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		None	EM				
Ohioville         115         PX Lir           Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2		140116	EM				
Ohioville         115         PX - 1659           Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W - 1600           Ohioville         115         B 1           Ohioville         69         69k B           Ohioville         13.8         B 1           Ohioville         13.8         B 2		SCADA	EM/uP				
Ohioville         69         W - 1511           Ohioville         13.8         W - 1537           Ohioville         13.8         W · 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		SCAUA	UP				1
Ohioville         13.8         W - 1537           Ohioville         13.8         W · 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B1           Ohioville         13.8         B2			EM	<del></del>			<del> </del>
Ohiovitle         13.8         W - 1600           Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		*****	+		!		<del></del>
Ohioville         115         B1           Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2				EM			
Ohioville         69         69k B           Ohioville         13.8         B1           Ohioville         13.8         B2		00454	EM	EM			<del>                                     </del>
Ohioville         13.8         B1           Ohioville         13.8         B2		SCADA		ļ			Volts
Ohiovitle 13.8 B2		SCADA	EM				Volts
		None		EM			- <del></del>
	<del></del>	None		EM		******	
Ohioville 115/13.8 T1		ACADA	EM		<del></del>		Combine load value
Ohioville 115/13.8 T2		SCADA	EM/UP-200				95BU is SEL-251

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			Electric Subst	ation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2300		Grid owns Line
Pleasant Valley			SCADA**	u₽				
Pleasant Valley	115	8 Line	SCADA	UP				Grid owns Line
Pleasant Valley	115	10 Line	SCADA**	ψP				Grid owns Line
Pleasant Valley	115	12 Line	SCADA**	υP				95BU is Optimho; in replacement plan
Pleasant Valley	115	13 Line		EM/Gen-1				3580 13 Optimio, 11 35
Pleasant Valley	115	C Line	SCADA	EM				
Pleasant Valley	115	M Line	SCADA SCADA	UP		ļ		Çom
Pleasant Valley	115	X Line	SCADA					SEL-279
Pleasant Valley	115	Com Equipment		u₱- 200		****		SEL-279
Pleasant Valley	115	R-12 BKR.		uP- 200				SEL-279
Pleasant Valley	115	R-13 BKR.		⊍P- 200				
Pleasant Valley	115	R-8 BKR.		EM				
Pleasant Valley	115	RC-6 BKR.		EM	****			
Pleasant Valley	115	RM BKR.		uP				
Pleasant Valley	115	RX-4 BKR.	00404#	EM				Con Ed owns the Bkr
Pleasant Valley	115	R-61 BKR.	SCADA**	EM .	7,700	T	*****	Con Ed owns the Bkr
Pleasant Valley	115	R-62 BKR.	SCADA**	EM				
Pleasant Valley	115	R-643 BKR.		EM		<del>                                     </del>	*****	
Pleasant Valley	115	R-81 BKR.						Volts
Pleasant Valley	115	81	SCADA	EM				Volts
Pleasant Valley	115	B2	SCADA	EM		<del></del>		kW
Pleasant Valley	69	E Line	SCADA*	uP	<del></del> _			kW
Pleasant Valley	69	GLine	SCADA*	υP				kW
Pleasant Valley	69	Q Line	SCADA*	uР				Volts
Pleasant Valley	69	81	SCADA	υP				
Pleasant Valley	13.8	W-387			EM			Con Ed owns bank and protection
Pleasant Valley	345/115	S1	SCADA					CON EQ OWNS DANK and protection
Pleasant Valley	115/69	T10	SCADA	EM			<del></del>	<u> </u>
Pulvers Corners						D-20		
Pulvers Corners	13.8	7091 Ckt.	SCADA		EM		V4L	single phase; vac; hyd
Pulvers Corners	13.8	7092 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd
Pulvers Corners	34.5	7395 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd
Pulvers Corners	<del></del>	Com Equipment						Com
		Cap Bank	******	EM				
Pulvers Corners		B1	SCADA					Volts
Pulvers Corners		B1	SCADA				****	Volts
Pulvers Corners		B1	SCADA					Volts
Pulvers Corners		71	SCADA	Fuse				<u> </u>
Pulvers Corners Pulvers Corners		T2	None	EM/uP				95P is SR-745

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			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Damada Hill	<del> </del>					2100		
Reynolds Hill	13.8	6001 Ckt.	Charts - kW		EM		100	
Reynolds Hill	13.8	6004 Ckt.	SCADA	****	υP			
Reynolds Hill	13.8	6005 Ckt.	Charts - kW		EM			
Reynolds Hill	13.8	6008 Ckt.	SCADA		υP			
Reynolds Hill	13.0	Com Equipment		****				Com
Reynolds Hill		DR-1418 BKR.		uΡ				
Reynolds Hill Reynolds Hill	115	DR Line	SCADA	uP				
Reynolds Hill	115	HR-1285 BKR.		EM	****		*****	
Reynolds Hill	115	HR Line	SCADA	υP				
Reynolds Hill	115	IR Line	SCADA	υP				
Reynolds Hill	13.8	B Cable	SCADA		υP			
Reynolds Hill	13.8	W Cable	SCADA		uP			
Reynolds Hill	13.8	PD Cable	SCADA		uP			
Reynolds Hill	13.8	PH Line	SCADA		υP	++		
Reynolds Hill	13.8	PK Line	SCADA	*****	υP			
Reynolds Hill	13.8	PO Line	SÇADA		υP			
Reynolds Hill	13.8	PQ Line	SCADA		υP			
Reynolds Hill	13.B	PS Line	SCADA		υP			
Reynolds Hill	13.8	PU Cable	SCADA		υP			
Reynolds Hill	115	T-31 BKR.		EM		*****		
Reynolds Hill	115	B1	SCADA	EM				Volts
Reynolds Hill	115	B2	SCADA	EM:				Volts
Reynolds Hill	13.8	81			EM/uP		<del>  </del>	···
Reynolds Hill	13.8	B2	SCADA		uP		1333	958U is SEL-501
Reynolds Hill	13.8	83	SCADA		uP	<del></del>		Volts
Reynolds Hill	115	W-1543 BKR.		EM			*****	Volts
Reynolds Hill	115/13.8	Т3	SCADA	EM/uP				
Reynolds Hill	115/13.8	T4	SCADA	EM/up	<del></del>			95P is SEL-351A
Rhinebeck				<u> </u>		2200		95P is SEL-351A
Rhinebeck	13.8	7051 Ckt.	Charts - kW/SCADA		0.000	2300		
Rhinebeck	13.8	7052 Ckt.	Charts - Amps		uP - 200/ uP			95P is SEL-251, 95BU is SEL-501
Rhinebeck	13.8	7053 Ckt.	Charts - Amps	<del> </del>	EM		*****	
Rhinebeck	13.8	7054 Ckt.			EM			
Rhinebeck	13.8	7055 Ckt.	Charts - Amps		EM	*****		-
Rhinebeck	13.8		Charts - kW		EM/uP			BE1-851H as BU and 79
Rhinebeck	13.8	7056 Ckt.	SCADA	<del>                                       </del>	υP- 200/ υP			95P is SEL-251; 95BU is SEL-501
Rhinebeck	<del></del>	Com Equipment						
Rhinebeck	115	Cap Bank		EM				
Rhinebeck		ER Line	SCADA*	uP				Amps
Rhinebeck	115	LR-830-MR BKR.		UP				
	115	MR Line	None	uP uP				
Rhinebeck Rhinebeck	69	Q-1471 BKR.		EM				
Rhinebeck	13.8	W-1017 BKR.			EM			
Rhinebeck	13.8	W-1238 BKR.	*		EM			
Rhinebeck	69	W-258 BKR.		EM				
Rhinebeck	13.8	W-367 BKR.			EM			
Rhinebeck	69	Q Line	SCADA*					Volts
	13.8	B1	SCADA		EM			· · · · · · · · · · · · · · · · · · ·
Rhinebeck	13.8	B2	none	*****	EM			Combine Bus Volts to one point
Rhinebeck	69	69kV Bus	SCADA				*****	Volts
Rhinebeck	69/13.8	T1	SCADA*	EM	**			Amps & Volts
Rhinebeck	69/13.8	<b>T2</b>	SCADA*	EM				Amps & Volts
Rhinebeck	115/13.8	T4	SCADA	EM				
Rhinebeck	115/69	T3	SCADA	EM				

\ /			Electric Subs	10000011 012				
	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Substation	Class (kV)					2100	···	
	,,,,							
ock Tavern 345kV		311 Line A1	SCADA	UP EM				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV	345	3456 BKR.		uP				
Rock Tavern 345kV	345	3456 BF A1		UP				
Rock Tavern 345kV	345	3456 BF A2		EM		**		Combined MVArs
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined
Rock Tavern 345kV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345KV	345	Cap Bank 2 A1		EM		3777		
Rock Tavern 345kV Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	υP				
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.		uP		*****		
Rock Tavern 345kV	345	37751 BF A1		EM				
Rock Tavern 345kV	345	37751 BF A2	****	EM				
Rock Tavern 345kV	345	37752 BKR.		υP				
Rock Tavern 345kV	345	37752 BF A1	*****	EM	4	ļ		
Rock Tavern 345kV	345	37752 BF A2		uP				
Rock Tavern 345kV	345	377 Line A1	SCADA	EM				
Rock Tavern 345kV	345	377 Line A2		EM				
Rock Tavern 345kV	345	4255 BKR.	2000	EM.				
Rock Tavern 345kV	345	4255 BF A1		EM				
Rock Tavern 345kV	345	4255 BF A2		SS			1	
Rock Tavern 345kV	345	42 Line A1 42 Line A2		EM				
Rock Tavern 345kV	345	C3351 BKR.		EM				
Rock Tavern 345kV	345	C3351 BF A1		EM				
Rock Tavern 345kV		C3351 BF A2		E₩				
Rock Tavern 345kV		C3352 BKR.		EM		<del></del>		
Rock Tavern 345kV	_	C3352 BF A1		EM				
Rock Tavern 345kV		C3352 BF A2		EM	****		_	
Rock Tavern 345kV		C3353 BKR.		uP- 200			<del></del>	
Rock Tavern 345kV		C3353 BF A1		υP			*****	
Rock Tavern 345kV		C3353 BF A2		uP				
Rock Tavern 345k		31153 BKR.		EM				
Rock Tayern 345k		31153 BF A1		uP				
Rock Tavern 345k	-	31153 BF A2		υP				
Rock Tavern 345k		31154 BKR.		EM				
Rock Tavern 345k		31154 BF A1		EM			-	
Rock Tavern 345k		31154 BF A2	*****	EM				Com
Rock Tavern 345k		Com Equipment			*****			
Rock Tavern 345k	.,	B1 A1	*	EM				
Rock Tavern 345k		B1 A2	*****	EM				
Rock Tavern 345		B2 A1		EM				
Rock Tavern 345		B2 A2		EM				
Rock Tavern 345		5 T1 A1	SCADA	EM				
Rock Tavern 345			30,55	EM uP				

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			Flectlic and	Station ob.	1000000		·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KT)					2400	<del>1</del>	
Sand Dock	<u> </u>		Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.	CHARTO		EW			
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM			
Sand Dock	13.8	GB Line KC-1447-SC BKR.	3020	EM				
Sand Dock	115 115	KC Line	None	EM				
Sand Dock	115	SC Line	None	υP				
Sand Dock	13.8	SH-886 BKR			EM			<u> </u>
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock		TW-902 BKR			EM			
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-910 BKR.	*		EM		*****	
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM	7		
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.					+	
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4				<del></del>	<del></del>	
Sand Dock	13.8	81			EM			Combine Bus Volts to one point
Sand Dock	13.8	B2	SCADA			1		Sometime sus voids to one point
Sand Dock	13.8	B3			EW	*****		
Sand Dock	13.8	84	SCADA		EM			
Sand Dock	13.8	T1	SCADA	EM			*****	Combine load value
Sand Dock	13.8	73		EM		*****		
Sand Dock	13.8	T4	SCADA	EM			*****	
Saugerties						Orion	1	

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			Electric Sub	station Upgra	<u> </u>	sessmem.		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2400		
Shenandoah				EM				Combine Bus Volts to one point
Shenandoah	115	East Bus	SCADA	EM				
Shenandoah	115	West Bus			EM			Combine Bus Volts to one point
Shenandoah	13.8	B1 B2	SCADA		EM			
Shenandoah	13.8				EM		****	Combine Bus Volts to one point
Shenandoah	13.8	B3 B4	SCADA		EM			
Shenandoah	13.8 13.8	B5			EM			Combine Bus Volts to one point
Shenandoah Shenandoah	13.8	96	SCADA		EM			
Shenandoah	13.8	B7	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	88			EM			
Shenandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2	****	****	EM EM			· · · · · · · · · · · · · · · · · · ·
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5			EM		****	<del> </del>
Shenandoah	13.8	Cap Bank 6						
Shenandoah	13.8	B-4451 BKR. (CB1)	1. Share		UP			<del></del>
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			
Shenandoah	13.8	8072 Ckt.	Charts - k₩		EM	*		
Shenandoah	115	EF Line	None	υP/Gen-1				95BU is Optimho; in replacement pla
Shenandoah	115	FS Line	None	EM				ļ
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	****	EM				
Shenandoah	115	FS-892-EF BKR.		EM				
Shenandoah	115	FS-959 BKR.		EM				
Shenandoah	13.8	Feeder S1	None	*****	EM			
Shenandoah	13.8	Feeder S2	None		ÉM			
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	· None		EM	/		<del></del>
Shenandoah	13.8	Feeder S5	None	****	EM			
Shenandoah Shenandoah	13.8	Feeder \$6	None		EM			
Shenandoah	13.8 13.8	Feeder S7	None		EM	*****		†··
Shenandoah	13.8	Feeder S8	None		EM			
Shenandoah		Feeder S9	None		EM			
	13.8	Feeder \$10	None		EM		*****	
Shenandoah Shenandoah	13.8	Feeder S11	None		EM	*****		-
Shenandoah	13.8	Feeder S12	None		EM			
Shenandoah	13.8	Feeder \$13	None		EM			
Shenandoah		Feeder S14	None		EM			
Shenandoah	13.8	Feeder S15	None		EM			
Shenandoah	115/13.8	T1 T2	SCADA	EM				Combine load value
Shenandoah	115/13.8	T3		EM				Comone to a value
Shenandoah	115/13.8	T4	SCADA	EM			****	Combine load value
Shenandoah	115/13.8	T5		EM	*****			233876.030 70.03
Shenandoah	115/13.8	T6	SCADA	EM EM				Combine toad value
Shenandoah	115/13.8	T7	SCADA	EM				
Shenandoah	13.8	W-1266 BKR.	SCADA					· <del> </del>
Shenandoah	13.8	W-1279 BKR.	*****		EM EM			
Shenandoah	13.8	W-1450 BKR.			EM			
Shenandoah	13.8	W-1593 BKR.			EM			
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	****		EM			<del></del>
Shenandoah	13.8	W-802 BKR.			EM			1
					EW			
Shenandoah	13.8	W-803 BKR.	<del></del>		EM			
Shenandoah	13.8	W-805 BKR.						
Shenandoah	13.8	W-807 BKR.			EM			

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Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						44-550		
Rock Tavern 115kV				EM				
Rock Tavern 115kV	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV	115	115-0.48kV SST						Com
Rock Tavern 115kV	115	Com Equipment		EM				Amps
Rock Tavern 115kV	115	D Line	SCADA*	EM	****			
Rock Tavern 115kV	115	D-448 BKR. J Line	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
Rock Tavern 115kV	·			EM				
Rock Tavern 115kV	115	J-788 BKR.	5CADA*	EM				Amps
Rock Tavern 115kV	115	RD Line	SCADA*	EM				
Rock Tavern 115kV	115	RD-809 BKR. RJ Line	SCADA*	EM				Amps
Rock Tavern 115kV Rock Tavern 115kV	115	RJ-818 BKR.	SCADA	EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM				
Rock Tavern 115kV	115	SL-684 BKR.	30202	EM	<del></del>			<del></del>
Rock Tavern 115kV	115	W-467 BKR.		υP			*****	
						<del></del>		<del></del>
Rock Tavern 115kV	115	W-681 BKR.	****	EM		ļ	****-	
Rock Tavern 115kV	115	W-814 BKR.		EM/uP	·			\$EL-351
Rock Tavern 115kV	115	WM Line	none	uP uP				
Rock Tavern 115kV	115/69	T2	SCADA	EM				
Roseton Switchyard						2100		
Roseton Switchyard	345	30356 (B6) BKR		EM				
Roseton Switchyard	345	30356 (B6) BF A1		€M				1
Roseton Switchyard	345	30356 (B6) BF A2		EM			*****	
Roseton Switchyard	345	303 Line A1	SCADA	υP		*****		<del> </del>
Roseton Switchyard	345	303 Line A2	SCADA	EM				<del> </del>
Roseton Switchyard	345	30551 (B7) BKR		EM				· · · · · · · · · · · · · · · · · · ·
Roseton Switchyard	345	30551 (B7) BF A1		€M				
Roseton Switchyard	345	30551 (B7) BF A2		EM	1	<del></del>		
Roseton Switchyard		30553 (B3) BKR		EM	*****	<del> </del> -		
Roseton Switchyard		30553 (B3) BF A1		υP				
Roseton Switchyard		30553 (B3) BF A2		EM				
Roseton Switchyard	345	305 Line A1		UP				<u> </u>
Roseton Switchyard	345	305 Line A2	SCADA	EM/uP		<del></del>		<u> </u>
Roseton Switchyard	345	31151 (B1) BKR		EM				SEL-501 for DBC
Roseton Switchyard		31152 (B1) BF A1		EM			*****	
Roseton Switchyard		31152 (B1) BF A2		EM				
Roseton Switchyard		31152 (B4) BKR		EM				
Roseton Switchyard		31152 (B4) BF A1		EM				
Roseton Switchyard		31152 (B4) BF A2	****		*****			
Roseton Switchyard		311 Line A1		EM				
Roseton Switchyard		311 Line A2	SCADA	υP	*			
Roseton Switchyard			<u> </u>	EM E				
Roseton Switchyard		B1		υP				
Roseton Switchyard		B2		uP				
		U1	SCADA	EM			*****	
Roseton Switchyar	d 345	U2	SCADA	EM				<del></del>

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			Electric Subs	tation Ups	Needs As	Sessineiii	<del></del>	
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)			_,	<u> </u>	2300		Radio to INW
Smith Street			Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			······································
Smith Street	4	632 Ckt.	Charts - KW		EM			
Smith Street	4	634 Ckt	Charts - kW		EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street Smith Street	13.8	PQ Line	None		EM			
Smith Street	13.8	PS Line	None		EM			
Smith Street	13.8	W Line	None SCADA		EM			Volts
Smith Street	13.8	B1 B2	SCADA		EM			Volts
Smith Street	13.8	B1	SCADA		υP			Volts
Smith Street Smith Street	4	B2	SCADA		uP			
Smith Street	13.8/4		None	***	EM			
Smith Street	13.8/4	Т2	None		EM	8890		·
Smithfield				<del></del>		<del></del>		
Smithfield	13.8	7095 Ckt.	SCADA		uP			Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	EM				Amps
Smithfield	69	GE Line	SCADA* SCADA*	EM			<b></b>	Amps
Smithfield	69	S Line SA Line	SCADA*	EM				Volts & Amps
Smithfield	69	B2	SCADA					Volts
Smithfield Smithfield	69	B3	SCADA					Volts
Smithfield	69/13.8	T1	None*					Only one feeder; T1 = 7095 load
South Cairo	1 03/13/0 [					8890	1	
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps		EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			*****	Com
South Cairo	69	CF Line	None	EM/uP				79 done with NLR
South Cairo	69	CL Line	None	uP				
South Cairo	13.8	B1+G1	Charts - kW/SCADA		EM			SCADA Volts 95P is SEL-587
South Cairo	69/13.8	T1	Charts - Amps	EM/uP		None		33F IS 3EL-367
South Wall St. South Wall St.	4	111 Ckt.	Grid Sense		EM	HOITE	Kyle L	Single Phase; Oil; Hyd
South Wall St.	4	112 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd; missing GS of
South Wall St.	13.8/4	71	Charts - kW/kVAr		EM		*****	
Spackenkill						Orion		
Spackenkill	13.8	6041 Ckt.	SCADA		uР		****	
Spackenkill	13.8	6042 Ckt.	SCADA		υP			
Spackenkill	13.8	6043 Ckt.	SCADA		uР		*****	
Spackenkill	13.8	6044 Ckt.	\$CADA	*****	uP uP			
Spackenkill	13.8	6045 Ckt.	SCADA	*****	υP			
Spackenkill	13.8	6046 Ckt.	SCADA		υP			
Spackenkill	13.8	6047 Ckt. 6048 Ckt.	SCADA SCADA		UP UP			
Spackenkill Spackenkill	13.8	Com Equipment	JOADA			*****		~ 1
Spackenkill	13.8	KR Line	\$CADA		uP			
Spackenkili	13.8	KS Line	SCADA	****	uP			
Spackenkill	13.8	MC Line	SCADA		uP			
Spackenkill	13.8	MC-200-SK BKR.	ŞCADA		υP			
Spackenkill	13.8	B1	SCADA		uP			
Spackenkill	13.8	B2			uP			
	115/13.8		SCADA	u₽			<del></del>	
Spackenkill	115/13.8			υP				
Spackenkill	113/13.0					BM		
Staatsburg		70.44 Cb+	SCADA		uР			
Staatsburg	13.8	7041 Ckt.			uР			
Staatsburg	13.8	7042 Ckt.	SCADA		uP			
Staatsburg	13.8	7043 Ckt.	SCADA					
		Com Equipment		*****				
Staatshirn	1 13.8	Out Edablina						
Staatsburg Staatsburg	13.8	B1	SCADA		qu			

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			Electric Subst	lation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del> </del>					M~4000	7	Single phase; vac; hyd
Standfordville	1-430 T	7071 Ckt.	MV-90		EM		V4L	Siligle priase, vec, myc
Standfordville	13.8	7072 Ckt.	MV-90	*****	EM	****		Volts
Standfordville	13.8	B1	SCADA					
Standfordville	13.8	T1	MV-90	Fuse				
Standfordville	69/13.8					2100		
Sturgeon Pool	<b>↓</b> ~		Grid Sense		EM	****	Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	341 Ckt.	Grid Serise					Com
Sturgeon Pool	69	N Line	SCADA	uP				
Sturgeon Pool	69	O Line	SCADA	υP				
Sturgeon Pool Sturgeon Pool	69	P Line	SCADA	υP				
Sturgeon Pool	69	69k Bus	SCADA	EM				Volts
Sturgeon Pool		T5	None	Fuse				
Sugarloaf	<del>                                     </del>					44-500		
	115	SD Line		EM		+	*****	Combine load value
Sugarloaf	115	SJ Line	SCADA	EM				Compine load value
Sugarloaf	115	SL Line	None	EM			1	
Sugarloaf				EM				Volts
Sugarloaf	115	B1	SCADA		<del></del>	+	· <del> </del>	40/15
Sugarloaf	115/69	O & R Transformer	SCADA	EM				
Tinkertown				· · · · · · · · · · · · · · · · · · ·		2300	<del> </del>	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	UP		**-**	
Tinkertown	13.8	7023 Ckt.	SCADA		υP	*****		
Tinkertown	13.8	7024 Ckt.	SCADA		υP			
Tinkertown	13.8	7025 Ckt.	SCADA		uP			
Tinkertown	13.8	61	SCADA		uP	4-4		Volts
Tinkertown	13.8	B2	SCADA		υP			Volts
Tinkertown	13.8	Com Equipment						
Tinkertown	69/13.8	T1	SCADA	Fuse				Com
Tinkertown	69/13.8	T2	SCADA	Fuse				<u> </u>
Tioronda					1	M-4000		<u> </u>
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/uP			, , , , , , , , , , , , , , , , , , ,
Tioronda	13.8	8085 Ckt.	Charts - Amps			<del></del>		BE1-851H as BU and 79
Tioronda	13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	W-566 Ckt. Sw	Charts - Amps	EM	EM/uP		A.B. again as	BE1-851H as BU and 79
Tioronda	13.8	B1						Agastat
Tioronda	115/13.8	T1	SCADA		EM			Volts
Todd Hill	113/13.6	11	Charts - kW/kVAr	EM				
·	42.0	7			·	2200		
Todd Hill	13.8	6051 Ckt.	SCADA		υP		*****	
Todd Hill	13.8	6052 Ckt.	SCADA		υP			
Todd Hill	13.8	6053 Ckt.	SCADA	*****	uР			1
Todd Hill	13.8	6054 Ckt.	SCADA		υP			T
Todd Hill	13.8	6055 Ckt.	SCADA		EM			
Todd Hill	13.8	6056 Ckt.	SCADA		EM			<del></del>
Todd Hill	13.8	6057 Ckt.	SCADA		EM	*****	**	<del> </del>
Todd Hill	13.8	Com Equipment						6
Todd Hill	115	A Line	None	EM/Gen-1				Com
Todd Hill	115	A-520-C BKR.		EM				958U is Optimho; in replacement plan
Todd Hill	115	C Line	None	EM/Gen-1				95911 to Dotte has to contract the
Todd Hill	13.8	W - 524 BKR.			EM			95BU is Optimho; in replacement plan
Todd Hill	115	B1	SCADA					Volte
Todd Hill	13.8	81	SCADA		EM/uP	1		Volts
Todd Hill	13.8	B2	SCADA		UP EW/UP			95BU is SEL-351A; Volts
Todd Hill	115/13.8		SCADA	EM/uP	<del></del>			Volts
Todd Hill	115/13.8		SCADA					95P is SEL-587
1000 mill	1 335013.8	1 12	SCAUA	UP UP		<u> </u>		1

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-	٠,	V

<u> </u>			Electric Subs	tation Ut	Needs Assessment				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment	
11 (1 4 4 4	ļ					2200		Volts	
Union Ave	115	B1	SCADA	UΡ					
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF	
Union Ave	115	RJ-52 BKR.		EM/uP					
Union Ave	115	UB Line	SCADA	up					
Union Ave	115	UB-51 BKR.		uP				Amps	
Union Ave	115	UN Line	SCADA*	EM				Amps	
Union Ave	115	UW Line	SCADA*	EM					
Union Ave	115	W-1095 BKR.		EM	UP				
Union Ave	13.8	81			υP				
Union Ave	13.8	B2	SCADA		υP			Volts	
Union Ave	13.8	B3	SCADA		υp			Volts	
Union Ave	13.8	84			uP	*****			
Union Ave	13.8	B3-B2			uP				
Union Ave	13.8	B4-B1	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4041 Ckt.			EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4042 Ckt.	MV-90	<del></del>	EM/uP		<del>                                     </del>	BE1-851H as BU and 79	
Union Ave	13.8	4043 Ckt.	MV-90		EM/uP		<del>                                     </del>	BE1-851H as BU and 79	
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4045 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4046 Ckt.	MV-90		uP			BE1-03117 83 00 6110 73	
Union Ave	13.8	4047 Ckt.	SCADA			4			
Union Ave	13.8	4051 Ckt.	SCADA	broke	uP				
Union Ave	13.8	4052 Ckt.	SCADA		UP				
Union Ave	13.8	4053 Ckt.	SCADA		uP				
Union Ave	13.8	4054 Ckt.	SCADA		υP				
Union Ave	13.8	4055 Ckt	SCADA		uP				
Union Ave	13.8	Com Equipment			+	*****		Com	
Union Ave	115/13.8	T1 T2	SCADA	EM/uP				95BU is SEL-387E	
Union Ave	115/13.8	T3	SCADA SCADA	uP			*****	95BU is SEL-387E	
Van Wagner	170/10.0		SCADA	1 ur		NCAPE			
Van Wagner	4	731 Ckt.	Charles Marco	1		NONE			
Van Wagner	4	731 Ckt.	Charts - kW/GS Charts - kW/GS	<del></del>			Kyle L	Single phase; oil; hyd	
Vinegar Hill	<del> </del>	732 CM.	Charts - KW/GS		<u> </u>	M-4000	Kyle L	Single phase; oil; hyd	
Vinegar Hill	24.5	2200 01-4	8017.00				D)/F	0.1	
West Balmville	34.5	2389 Ckt.	MV-90	74	uP	2220	RVE	3 phase; oil; hyd	
West Balmville	115	B2				2300	-		
West Balmville	13.8	B1	SCADA	EM	uP			Volts	
West Balmville	13.8	B2	SCADA		uP			Combine Bus Volts to one point	
West Balmville	115	B Line	SCADA	uP					
West Balmville	13.8	4011 Ckt.	SCADA MV-90		EM	<del></del>	*****		
West Balmville	13.8	4012 Ckt.	SCADA		UP EW			MV-90 still?	
West Balmville	13.8	4012 CAC	SCADA		uP uP			MV-90 still?	
West Balmville	13.8	4013 CRt.	SCADA		uP			MV-90 still?	
West Balmville	13.8	4015 Ckt.	MV-90	*****	EM			M 4-30 SOUT	
West Balmville	13.8	Com Equipment	MIV-90				*****	Com	
West Balmville	115	DB Line	SCADA	uP				COM	
West Balmville	115	DB-875 BKR.		υP					
West Balmville	115	DW Line	SCADA	υP					
West Balmville	115	DW-662 BKR.	JUADA	uP				1	
West Balmville	115	F Line	SCADA	UP UP				· · · · · · · · · · · · · · · · · · ·	
West Balmville	115	R Line	SCADA	UP				<del></del>	
West Balmville	115	W-478 BKR.	90000	υP				<u> </u>	
West Balmville	115	W-855 BKR.		uP				<del> </del>	
	115	WN Line	SCADA	uP					
West Balmville	113		JOANA	EM				Combine land water	
West Balmville	1	T1	SCADA		<del></del>			Combine load value	
AA62( Dannane		T2		EM		*****		•	

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			Electric Sub	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckf.	Metering	T. Relaying	D. Refaying	RTU	Recloser	Comment
- internation	<del> </del>				, <del></del>	BWI		
Westerlo	13.8	1091 Ckt.	SCADA		uP .			
Westerlo	13.8	1092 Ckt.	SCADA		UP			
Westerlo	13.8	1093 Ckt.	SCADA		uP			
Westerlo	13.8	B1	SCADA		υP			
Westerlo		Com Equipment					<del> </del>	Only has one 13.8 bus; T1 = Bus load
Westerlo		T1	SCADA	uP		****		Office itas one 15.0 cos; 11 cos ious
Westerlo	69/13.8	Cap Bank		υP				· · · · · · · · · · · · · · · · · · ·
Westerlo	69	FW Line	SCADA	UP				
Westerlo Westerlo	69	NW Line	SCADA	บค		*****		
Westerio	69	FW-1500-NW BKR.		uP				
Wiccopee					<u> </u>	L&N	<del> </del>	
Wiccopee	115	FSLine	None	EM	*****			
Wiccopee	115	WP Line	None	uP		*****		
Wiccopee	115	FS - 1652- WP BKR.		EM				
Wiccopee.	13.8	F1-292 BKR			EM			
Wiccopee	13.8	F2-280 BKR			E₩			·
Wiccopee	13.8	W-368 BKR.			E₩			
Wiccopee	13.8	W-378 BKR.	*****		EM			
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.			EM			
Wiccopee	13.8	Future (Unit #3)		4	EM			···-
Wiccopee	13.8	Future (Unit #9)			EM	<del> </del>	- <del></del>	<del></del>
Wiccopee	13.8	B1			EM		· · · · · · · · · · · · · · · · · · ·	<u> </u>
Wiccopee	13.8	B2		- 10 \$117.0				·
Wiccopee	13.8	Com Equipment			EM			
Wiccopee	115/13.8	T1	SCADA		*****	*	*****	Com
Wiccopee	115/13.8	T2	<del></del>	EM				
Woodstock	113/13.6	1 12	SCADA	EM				<u> </u>
Woodstock	13.8	3011 Ckt.	MV-90		· · · · · · · · · · · · · · · · · · ·	M-4000	<del>- </del>	
Woodstock	13.8	3011 Ckt.			EM			
Woodstock	13.8	3012 Ckt.	MV-90		EM			
Woodstock	13.8		MV-90		EM		*****	
Woodstock		3014 Ckt.	MV-90		EM			
	13.8	B1	SCADA		EM			Volts
Woodstock	13.8	B2	SCADA		EM			Volts
Woodstock	69/13.8	T2+SR Line	*****	EM				<u> </u>
Woodstock	69/13.8	T2 + B2		EM				
Woodstock	69/13.8	T1	MV-90	*****		*****		<u> </u>
Woodstock	69/13.8	T2	MV-90					*

	Station	Cost
	Dashville	\$190,000
2012	East Walden	\$610,000
	Tioronda	\$200,000
	Coxsackie	\$130,000
	South Cairo	\$160,000
2013	East Park	\$200,000
	Pleasant Valley	\$360,000
-	Todd Hill	\$160,000
	Sand Dock	\$510,000
2014	Fishkill Plains	\$480,000
	South Wall St.	\$84,000
2015	Manchester	\$340,000
2013	Forgebrook	\$730,000
2016	Rock Tavern	\$1,060,000
2		1
Subs		





# **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

# A. GENERAL

Project/Program Name: Rock Tavern 345 kV Relay Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

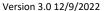
### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

# Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All remaining electromechanical relays at Rock Tavern 345 kV Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

# ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

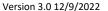
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

# D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•			cost estimates she adjustments for i			
	\$3,086,000		Prior Years	Year 1	Year 2	Year 3	Year 4	Year 5	
	\$3,080,000	TOTAL	Actuals + Projections	2024	2025	2026	2027	2028	Future Years
	Labor (Weekly Payroll)	298,000	0	0	0	0	238,000	60,000	0
	Labor (Monthly Payroll)	149,000	0	0	0	0	119,000	30,000	0
Α	Stock Materials	149,000	0	0	0	0	119,000	30,000	0
	Non-Stock Material (A/P taxable)	595,000	0	0	0	0	476,000	119,000	0
١ï	Contractors (A/P tax exempt)	208,000	0	0	0	0	168,000	40,000	0
T	Overheads	1,489,000	0	0	0	0	1,191,000	298,000	0
l	AFUDC*	89,000	0	0	0	0	71,000	18,000	0
l N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,977,000	0	0	0	0	2,382,000	595,000	0
R	Labor (Weekly Payroll)	16,000	0	0	0	0	8,000	8,000	0
E	Labor (Monthly Payroll)	32,000	0	0	0	0	16,000	16,000	0
l¦	Contractors (A/P tax exempt)	6,000	0	0	0	0	3,000	3,000	0
R	Overheads	55,000	0	0	0	0	27,000	28,000	0
E	Journal Vouchers (JVs)	0							
M	Daivage ONEDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	1017(21(20)	109,000	0	0	0	0	54,000	55,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

2,160,200

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 4,011,800

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

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Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

# L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. Various departments rely on information from these devices in order to perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

# Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact; 2) Customer Services (Line Forces) to aid in fault locating and thereby limiting patrol time and area; 3) penalions Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a cenduit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

## Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - o Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

# Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

# II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

# 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

# Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability, Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

# Discussion:

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

# C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- ♦ They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

<sup>&</sup>lt;sup>1</sup> Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner

Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

# **Re: Substation Metering Review**

# **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

# Discussion:

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

## A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

# **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

# Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti (Manl	Cost	
A	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

	Time				Cost				
Retrofit Options		<u>Manhours</u>				<u>Parts</u>		<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9
Grid Sense Meter	W / VAr	Hours are for the EOE and the Linemen.			\$4,775			\$5,700	
Data Concentrator	1 for every 4 ckts.	takes	the line	man an	d the	\$2,272			\$2,700
POT Line		2.0	15 minu n data c			\$100			\$110
Labor (including travel time)	per Station	requires 20 minutes of lineman time and 15					\$430	\$430	
Site Registration	per D/C	minutes of EOE time. Travel to each site has		-waived-					
TOTAL GS Installation	i 	been assumed to be 1 hour.						\$9,000	
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

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Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

# Re: Remote Terminal Unit Review

## **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

# Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

# B. Retrofit/Replacement Options:

• Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

# **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ♦ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

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Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

# Re: Substation Recloser Review

## Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

# **Discussion:**

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

# C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### Conclusions:

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

	C		
Retrofit Options	Parts	TOTAL	
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2
R-Mag Breaker	\$25,000	\$90,000	

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

C. Ladatian (	Voltage Class (kV)	Line/Ckt.						
Accord Ancram Balmville	, .1	LIDE/ONL	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment  Retired as part of P/MK Upgrade
Ancram Balmville			Charts - kW		EM	NONE		
Balmville	4	361 CKI.			EM	NONE		Only has a 13.8 Voltage Regulator
Balmville	13.8	7085 Ckt.	Grid Sense			NONE		
				<del></del>	EM			
DOMINIO L	4	411 Ckt.	MV-90		EM			
Balmville	4	412 Ckt.	MV-90			C-300		
					ļ			Metering source?
Barnegat	115	KB Line	Amps	EM				
Barnegat Barnegat	115	KC Line	None	EM				
Barnegat	115	KB-749-KC BKR		EM				
Barnegat	115/13.8	Т1	SCADA	EM				IBM Feeds
Barnegat	115/13.8	72	SCADA	EM				
Barnegat	13.8	S1	SCADA		EW			IBM Feeds
Barnegat	13.8	52	SCADA		EM			
Barnegat	13.8	\$1-706 BKR	SCADA		EM		*****	IBM Feeds
Barnegat	13.8	S2-734 BKR	SCADA		EM			
Beacon						D-20		
	13.8	8006 Ckt.	SCADA		EM			
Beacon					EM		·	Previously 8087A?
Beacon	13.8	8015 Ckt.	SCADA	*****		<del></del>		r reviously over A r
Beacon	4	801 Ckt.	SCADA		EM			
Beacon	4,	802 Ckt.	SCADA		EM			
Beacon	4	803 Ckt.	SCADA		EM	****		
Beacon	4	W-414 BKR	SCADA		EM			
Beacon	4	W-463 BKR	SCADA		EM			151, 121, 121
Beacon	4	Bus 1	SCADA					<del> </del>
Beacon	4	Bus 2	SCADA					· · · · · · · · · · · · · · · · · · ·
Beacon	13.8/4	T1						
			SCADA		EM	*****		MDB has an entry with T1+T2 calculated
Beacon	13.8/4	T2	SCADA		EM			
Beacon	13.8	BF Cable	SCADA	****	EM			1
Beacon	13.8	NM Cable	SCADA		EM		*****	<del>                                     </del>
Beacon	13.8	CM Cable	SCADA		EM			<del> </del>
Beacon	13.8	Bus 1	SCADA		EM			· · · · · · · · · · · · · · · · · · ·
Beacon	13.8	Bus 2	SCADA		EM		<del></del>	<u> </u>
Bethlehem Rd.				'	_1			_ <del></del>
Bethlehem Rd.	13.8	4091 Ckt.	M/V-90		EM/uP	2400		
Bethlehem Rd.	13.8	4092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4093 Ckt.		·				BE1-851H as BU and 79
Bethlehem Rd.		+	MV-96		EM/uP			BE1-851H as BU and 79
	13.8	4094 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4095 Ckt.	MV-90		E₩			
Bethlehem Rd.	13.8	4096 Ckt.	MV-90		EM			
Bethlehem Rd.	13.8	4097 Ckt.	MV-90		EM		*****	<del></del>
Bethlehem Rd.	13.8	4098 Ckt.	MV-90		EM			<del></del>
Bethlehem Rd.	13.8	Bus 1	EMS		EM			<del></del>
Bethlehem Rd.	13.8	Bus 2	EMS		EW EW			<del></del>
Bethlehem Rd.	115	RD Line		EM				
Bethlehem Rd.	115	UB Line	None	EM				
~			None	EM	**			
Bethlehem Rd.	115	RD-604-UB BKR		EM				
Bethlehem Rd.	115/13.8	T1	EMS	EM				20.45.
Bethlehem Rd.	115/13.8	T2	EMS	EM	*****			Metering combined '
Bethlehem Rd.	13.8	W-613 BKR			EM			
Bethlehem Rd.	13.8	W-619 BKR			EM			····
Bethlehem Rd.	13.8	W-804 BKR			EM			
Bordman Rd.						NONE		<del></del>
Bordman Rd.	13.8	6081A Ckt.			EM			
			····		EM			
Bordman Rd.	13.8	6082A Ckt.					7	<del></del>
Bordman Rd.	13.8	Z-203 Ckt.			EM			
Bordman Rd	13.8	Z-204 Ckt.			EM			
		Z-205 Ckt.			EM			
Bordman Rd.	13.8				EM			
Bordman Rd.	13.8	Z-206 Ckt.						<del></del>
Bordman Rd.	13.8	Z-207 Ckt.		*****	EM		<del></del>	
		Z-208 Ckt.			EM			
Bordman Rd. Bordman Rd.	13.8				EM			•

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Coxsackie

			Electric Substa	tion Upgra	Ge Needs As:	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
	<del> </del>							
Boulevard	69	OB Line	SCADA	υP				
Boulevard	69	N Line	SCADA	υP				
Boulevard		1 Line	SCADA	<u>uP</u>				Line Amps & W/VAr
Boulevard	69	KO Line	SCADA		up			
Boulevard	13.8		SCADA		υP			BE1-851H as BU and 79
Boulevard	13.8	KK Line	SCADA		EM/uP	*****		BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011 Ckt. 1012	SCADA		EM/uP			BE1-05/11 45 00 0/10 1
Boulevard	13.8	Ckt. 1013	SCADA		UP			
Boulevard	13.8	Ckt. 1013	SCADA		EM/uP			
Boulevard	13.8	Bus 1	SCADA		EM		<u> </u>	
Boulevard	13.8		SCADA		EM			
Boulevard	13.8	Bus 2	SCADA	EM				
Boulevard	69	Bus 1				*****		
Boulevard	69	Bus 2	SCADA	EM	+			
Boulevard	69	Overall		EM			4	
Boulevard	69/13.8	T1	SCADA	EM				Metering combined
	69/13.8	T3	SCADA	EM				<u> </u>
Boulevard		T2	SCADA	EM			****	
Boulevard	69/13.8	12	3000			M-4000		
Clinton Ave.	<del></del>	505.014	101/ 90		EM			
Clinton Ave.	4	395 Ckt.	MV-90		EM			
Clinton Ave.	4	396 Ckt.	MV-90		EM			†
Clinton Ave.	4	397 Ckt.	MV-90			4		+
Clinton Ave.	4	Bus	SCADA		*		<del></del>	
Clinton Ave.	13.8/4	T1	MV-90	****	Fuse		****	<u></u>
Cold Spring					<u> </u>	NONE		
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two (2)
Cold Spring	4	872 Ckt.	Charts - kW		EM			circuits.
Coldenham				·		D-20		
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
					uP-200/ uP	1		95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA			+	<del></del>	
Coldenham	13.8	4024 Ckt.	SCADA		uP- 200/ ∪P			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
Coldenham	13.8	4927 Ckt.	SCADA		υP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM		****	
Coldenham	13.8	Bus 2	SCADA		EM		*****	<u> </u>
Coldenham	13.8	B1-B2 Tie			EM			
	115	J Line	SCADA	Gen 1				95P is DLP; 95BU is REL-301; part of
Coldenham		4	,	Gen 1				replacement program already.
Coldenham	115	CW Line	SCADA			<del></del>		- cpiecomon program en cooy.
Coldenham	115/13.8	T1	SCADA	EM				<del></del>
Coldenham	115/13.8	T2	SCADA	EM			*****	
Coldenham	115	J-19-CW BKR		SS				
Converse St.						NONE		
Converse St.	4	121 Ckt.	Mr∨-90		EM			
Converse St.	4	122 Ckt.	MV-90		EM			
Converse St.	4	123 Ckt.	MV-90		EM			
Conway Place	<del></del>	<u> </u>				NONE		
Conway Place	4	881 Ckt.	MV-90		EM			
	~		MV-90		EM			
Conway Place	44	882 Ckt.	M4-80	<u> </u>		8890		
Coxsackie			·					
Coxsackie	13.8	1071 Ckt.	Charts - Amps		EM			Bitronics for the SCADA portion
CONSECVIE	13.8	1072 Ckt.	SCADA/ Charts - kW		EM _			BE1-851H as BU and 79
	1 13.0	<del></del>	Charts - Amps		EM/uP			Bitronics for the SCADA portion
Coxsackie		1074 Ckt.		ı	\ ∈м			Bid Office for the Contact Post Contact
Coxsackie Coxsackie	13.8	1074 Ckt.						
Coxsackie	13.8 13.8	1076 Ckt.	SCADA/ Charts - kW	<del></del>				
Coxsackie Coxsackie Coxsackie	13.8 13.8		SCADA/ Charts - kW SCADA		EM			
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	1076 Ckt. Bus 1 (T1+G1)	SCADA/ Charts - kW	<del></del>				Motoring data available through relay, but
Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8	1076 Ckt.	SCADA/ Charts - kW SCADA		EM3			Metering data available through relay, but
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8	1076 Ckt.  Bus 1 (T1+G1)  Bus 2	SCADA Charts - kW SCADA ???		EM			Metering data available through relay, but configured.
Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8	1076 Ckt. Bus 1 (T1+G1)	SCADA/ Charts - kW SCADA	uP	EM EM			
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 69	1076 Ckt.  Bus 1 (T1+G1)  Bus 2  CN Line	SCADA/ Charts - kW SCADA ??? None		EM3			configured.
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 69	1076 Ckt.  Bus 1 (T1+G1)  Bus 2  CN Line  NC Line	SCADA/ Charts - kW SCADA ??? None SCADA	UP	EM EM			
Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 69	1076 Ckt.  Bus 1 (T1+G1)  Bus 2  CN Line  NC Line	SCADA/ Charts - kW SCADA ??? None	uP	EM EM			configured.

			Electric Sub	station Upgra	de Needs As	sessment_	<del></del>	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU	Recloser	Comment
	C1833 (A1)					2100		Siemens meters 485 to RTU Al
Danskammer				EM				Siemens meters 485 to RTU Al
Danskammer	115	AC Line	SCADA - Amps	EM				Siemens meters 485 to RTU Al
Danskammer	115	DC Line	SCADA - Amps	υP				Siemens meters 465 to RTU Al
Danskammer	115	DB Line	SCADA - Amps	UP				Siemens meters 485 to RTU Al
Danskammer	115	DR Line	SCADA - Amps	uP				Siemens meters 485 to RTU AI
Danskammer	115	DW Line	SCADA - Amps					Siemens meters 485 to RTU Al
Danskammer	115	RS Line	SCADA - Amps	EM				
Danskammer	115	W - 323 8KR		SS EM				
Danskammer	115	North Bus	SCADA - Volts	EM			****	
Danskammer	115	Middle Bus	SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA - Volts	uP uP				
Danskammer	115	DB-1171 BKR		UP UP				
Danskammer	115	DR-1421 BKR		υP			*****	
Danskammer	115	DW-1061 BKR		EM			*****	<u> </u>
Danskammer	115	T5&T6	SCADA	EM.	J	2300	<u> </u>	
Dashville							VAL	Single Phase; Vac; Hydr
Dashville	4	345 Ckt.	- MV-90		EM		V4L	Single Fitase, Yac, Hyol
Dashville	6.6	Bus			EM			
Dashville		T1		EM				Fused Transformer w/ CR 67 relay
Dashville		G1-G2	SCADA					
East Fishkill 345kV								· · · · · · · · · · · · · · · · · · ·
East Fishkill 345kV	345	C9751 Breaker A1 BR		EM ·				
East Fishkill 345kV		C9751 Breaker A2 BR		EM				
East Fishkill 345kV		Transformer #1 Alt. 1	10000	EM				
East Fishkill 345kV		Transformer #1 Alt. 2	SCADA	EM	<del> </del>		+	
	119	Transformer #1 Alt. 4		C.M.			**	<u> </u>
East Fishkill					1	8890	1	95P is MDAR; 95BU is Optimho - Replacing
East Fishkill	115	EF Line	SCADA	υP*				with 311C & D60.
East Fishkill	115	HF Line	SCADA	up*		www		95BU is Optimho - Replacing with D60.
East Fishkill	115	EF-672 BKR		EM				
East Fishkill	115	EF-679 BKR		EM				
East Fishkill	115	W-640 BKR		. i. ÉM	*****			
East Fishkill	115	T1	SCADA	see EFB				
East Kingston				•		Orion		
East Kingston	13.8	Bus 1	SCADA		UP		****	
East Kingston	13.8	Bus 2	SCADA	N====	UP			
East Kingston	13.8	1021 Ckt.	SCADA		up		·	
East Kingston	13.8	1022 Ckt.	SCADA		UP.		<del></del>	
East Kingston	13.8	1023 Ckt.	SCADA		UP			
East Kingston	13.8	1023 Ckt.	SCADA		uP			<del></del>
East Kingston East Kingston	13.8	1024 Ckt.	SCADA		uP			<del></del>
East Kingston	13.8	1025 Ckt.	SCADA		υP			-
East Kingston	13.8	1026 CKt.	SCADA		UP			
East Kingston	13.8	1028 Ckt.	SCADA		uP			<u> </u>
East Kingston	115	ER Line	SCADA	υP				
East Kingston	115	LR Line	SCADA	υP				
East Kingston	115	LR-201-ER Breaker	<del></del>	uP				
		Com Equipment						Com
East Kingston		T1	SCADA	υP				
	115/13.8		20121	UP				
East Kingston	115/13.8	T2	SCADA					
East Kingston East Kingston East Kingston			] SCADA			8890	1	
East Kingston East Kingston			SCADA		EM/uP	8890		BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Park East Park	115/13.8	T2 6073 Ckt.	SCADA		EM/uP			BE1-851H as BU and 79 BE1-851H as BU and 79
East Kingston East Kingston East Kingston East Kingston East Park East Park East Park	115/13.8 13.8 13.8	5073 Ckt. 6074 Ckt.	SCADA SCADA					
East Kingston East Kingston East Kingston East Park East Park	115/13.8	T2 6073 Ckt.	SCADA		EM/uP	*****		

			Electric Subst		<u> </u>			
iubstation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (RV)					2400		3 phase; oil; electronic; GS not working
ast Walden					EM/uP		ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5041 Ckt.	Grid Sense		EM/uP		ES	GS not working
ast Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
ast Walden	13.8	5043 Ckt.	Grid Sense				<u> </u>	
ast Walden	13.8	Com Equipment			uP			95P is DLP; part of replacement program
ast Walden	13.8	81	SCADA		·———			already.
	115	CW Line	None	Gen1/uP				
ast Walden				EM			<del> </del>	
ast Walden	115	CW -712	None	EM				
ast Walden	115	D Line D-722 BKR		EM				
East Walden	115	DW Line	SCADA	υP				
East Walden	115	DW-1071 BKR		uP		<u> </u>		
East Walden	115	EM Line	SCADA	υP				
East Walden	115	EM-642 BKR		υP				Amps & Volts
East Walden	115	WM Line	SCADA	UP				<u> </u>
East Walden	69	W-644		EM				
East Walden	115	B1		EM				Combine Bus Volts to one point
East Walden	115		SCADA	EM				95P is SEL-587
East Walden	115	82	SCADA	uP/EM				
East Walden	69/13.8	T1	SCADA	EM/uP				95BU is SEL-587
East Walden	69/13.8	Т3	SUADA			D-20		
Fishkill Plains		0004 CH4	MV-90	1	EM/uP			BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90	T	EM			
Fishkill Plains	13.8	8092 Ckt.	\$CADA		uP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	SCADA		uP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.			υP			
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA	<u> </u>	<del></del>	<del></del>		95BU is Optimho; part of replacemen
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1				program.
Fishkill Plains	115	HF-703 BKR		EM				<del></del>
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	uP				279/2BFR relays
Fishkill Plains	115	A-1036-FP		uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498		uP- 200				Com
Fishkill Plains	115	Com Equipment FP Line	SCADA	uP/Gen 1				95P is DLP; part of replacement progr already; 95BU is SEL-321
Fishkill Plains					<del>                                     </del>			20003100000000
Fishkill Plains	115	81	SCADA	EM EM	530			
Fishkill Plains	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Fishkill Plains	13.8	₽2			EM			
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	95BU is SEL-587; metering is combin
Fishkill Plains	115/13.8	T2		EM/uP		2300		
Forgebrook			· · · · · · · · · · · · · · · · · · ·					
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM			
Forgebrook	13.8	Bus #2	55.5 7.7.7.7		EM			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8014 Ckt.	Charts - kW		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM/uP			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW	-17-1	EW.			Com
Forgebrook	115	Com Equipment						Coni
Forgebrook	115	FO Line	None	EM				
	115	FO-1430-FT		EM				
Forgebrook			None	EM				
Forgebrook	115			EM				
Forgebrook	115			EM				
Forgebrook	115			uP				
Forgebrook		~ <del></del> .	SCADA		EM			
			None					Amps
Forgebrook	<del> </del>		SCADA		EM_		<del></del>	
Forgebrook	k 13				EM			
Forgebroo	k 13	.8 W-1486			EM		*****	
								Metering combined
Forgebroo				EW			<del>`+</del> -	
Forgebroo	K 115/	13.8 ( 3.1	SCADA	EM	1			

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			Electric Subs	tation Upgra	de Needs As:	sessment		T
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1833 (X4)			J		M-4000		3 phase; oil; electronic; 958U is BE1-851H;
Freehold	<u> </u>		Grid Sense		EM/oP		PR-560M	GS not working
Freehold	13.8	2061 Ckt.	Gno Sense		EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H;
Freehold	13.8	2071 Ckt.	Grid Sense				PR-560M	GS not working 3 phase; oil; electronic
Freehold	13.8	W-1155 BKR						
Freehold	13.8	T1	Charts - kW/kVAr	fuse	EM			
Freehold	13.8	B1	SCADA			Orion .		
Galeville		<del></del>	SCADA		UΡ			
Galeville	13.8	B1	SCADA		uP			
Galeville	13.8	62	SCADA		υP			
Galeville	13.8	5030 Ckt.	SCADA		υP		****	
Galeville	13.8	5031 Ckt.	SCADA	·	υp			
Galeville	13.8	5032 Ckt.	SCADA		υP			
Galeville	13.8	5033 Ckt.	SCADA		uP			
Galeville	13.8	5034 Ckt.	SCADA		UP			
Galeville	13.8	5035 Ckt.						Com
Galeville		Com Equipment						
Galeville	69	MG Line	\$CADA	υP	<del></del>	ļ		
Galeville	69	MG-200-MK BKR		υP				
Galeville	69	MK Line	SCADA	υP				
Galeville	69/13.8	T1	SCADA	υΡ				
Galeville	69/13.8	Т2	SCADA	υP				
Greenfield Rd.	<u> </u>					M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP	h h-pp-h	ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	4	375-376 Ckt.	. Charts - kW		EM			
Greenfield Rd.	4	377-378 Ckt.	Charts - kW		EM			
Greenfield Rd.	13.8	W-1608			EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8/4	T2	Charts - kW		EM			5 5.1456, 611, 61664 6116
Greenfield Rd.	13.8	B1	SCADA			*****		\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Greenfield Rd.	4	81	SCADA					Volts
Greenfield Rd.	4	<b>B</b> 3	SCADA				<del></del>	Volts
Grimley Rd.						NONE-Soon to		Voits
	1						1	
Grimley Rd		385 Ckt	Grid Sansa	- т	EAS	have DNP RTU	1 10000	0. 1 5
Grimley Rd. Grimley Rd.	4	385 Ckt.	Grid Sense		EM	*****	Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4 4	385 Ckt. 386 Ckt.	Grid Sense Grid Sense		EM EM		Kyle L	Single Phase; Oil; Electronic No DATA
Grimley Rd. Hibernia	4	386 Ckt.	Grid Sense		EM	Micro 1C		No DATA
Grimley Rd Hibernia Hibernia	13.8	386 Ckt.	Grid Sense SCADA		EM uP- 200/ ∪P	Micro 1C		No DATA 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia	13.8 13.8	386 Ckt. 7011 Ckt. 7012 Ckt.	Grid Sense SCADA SCADA		UP- 200/ UP UP- 200/ UP	Micro 1C		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1	Grid Sense SCADA SCADA SCADA		EM uP- 200/ uP uP- 200/ uP EM/uP	Micro 1C	#1000 #1000	No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8 69/13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1	Grid Sense SCADA SCADA SCADA SCADA SCADA	  EM/ <sub>U</sub> P	ем uP- 200/ uP uP- 200/ uP EM/uP	Micro 1C	2.14	95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia	13.8 13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1	Grid Sense SCADA SCADA SCADA		EM uP- 200/ uP uP- 200/ uP EM/uP	Micro 1C	#1000 #1000	95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95BU is DFP-100
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls	13.8 13.8 13.8 69/13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1  Com Equipment	Grid Sense  SCADA  SCADA  SCADA  SCADA  SCADA	EM/ <sub>U</sub> P	UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls	13.8 13.8 13.8 69/13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/uP	EM  UP- 200/ UP  UP- 200/ UP  EM/UP   UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls	13.8 13.8 13.9 69/13.8 13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1  Com Equipment  3021 Ckt.  3022 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/vP	EM  UP- 200/ UP  UP- 200/ UP  EM/UP   UP- 200/ UP  UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hipernia High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1  Com Equipment  3021 Ckt.  3022 Ckt. 3023 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/uP	UP- 200/ UP  UP- 200/ UP  EM/UP   UP- 200/ UP  UP- 200/ UP  UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251: 95BU is SEL-501  95P is SEL-251: 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251: 95BU is SEL-501  95P is SEL-251: 95BU is SEL-501  95P is SEL-251: 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt.  B1 T1 Com Equipment  3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/uP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt.	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/vP	UP- 200/ UP  UP- 200/ UP  EM/UP  UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  Com  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hipernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment  3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt, 3025 Ckt. HK Line	Grid Sense  SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/vP	UP- 200/ UP  UP- 200/ UP  EM/UP   UP- 200/ UP  UP- 200/ UP  UP- 200/ UP  UP- 200/ UP  UP- 200/ UP  UP- 200/ UP	Micro 1C		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69	386 Ckt.  7011 Ckt.  7012 Ckt.  B1  T1  Com Equipment  3021 Ckt.  3022 Ckt.  3023 Ckt.  3024 Ckt.  3025 Ckt.  HK Line  HK-696-P BKR.	SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA SCADA	EM/uP	UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	Micro 1C		95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-251; 95BU is SEL-501 95P is SEL-279
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt, 3025 Ckt. HK Line HK-696-P BKR. P Line	Grid Sense  SCADA	EM/vP	UP- 200/ UP UP- 200/ UP EM/UP  UP- 200/ UP  UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	Grid Sense  SCADA	EM/vP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-938 BKR. B1	Grid Sense  SCADA	EM/vP	UP- 200/ UP UP- 200/ UP EM/UP  UP- 200/ UP   D-20		No DATA  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95BU is DFP-100 95BU is DFP-100 Com  95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501 95P is DLP SEL-279 95P is DLP 95P is SEL-251: 95BU is SEL-501 95P is SEL-251: 95BU is SEL-501	
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR.	Grid Sense  SCADA	EM/vP	UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is DLP  95P is SEL-251; 95BU is SEL-501  95P is DLP  95P is DLP  95P is DLP  95P is DLP
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-998 BKR. B1 B2	Grid Sense  SCADA	EM/vP	UP- 200/ UP UP- 200/ UP EM/UP  UP- 200/ UP   D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is SEL-251: 95BU is SEL-501  95P is DLP  95P is SEL-251: 95BU is SEL-501  95P is DLP  95P is SEL-251: 95BU is SEL-501  95BU is SEL-251  95BU is SEL-251  Com	
Grimley Rd. Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia Hibernia High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls High Falls	13.8 13.8 13.8 69/13.8 13.8 13.8 13.8 13.8 13.8 13.8 69 69	386 Ckt.  7011 Ckt. 7012 Ckt. B1 T1 Com Equipment 3021 Ckt. 3022 Ckt. 3023 Ckt. 3024 Ckt. 3025 Ckt. HK Line HK-696-P BKR. P Line W-938 BKR. B1	Grid Sense  SCADA	EM/uP	UP- 200/ UP UP- 200/ UP UP- 200/ UP EM/UP  UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP UP- 200/ UP	D-20		No DATA  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95BU is DFP-100  95BU is DFP-100  Com  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is SEL-251; 95BU is SEL-501  95P is DLP  SEL-279  95P is DLP  95P is DLP  95P is DLP  95P is SEL-251; 95BU is SEL-501  95P is DLP  95P is DLP  95P is DLP  95P is DLP

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			Electric Subs	station Up .	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Ciass (KV)					2300		95BU is BE1-IPS-100
Highland			SCADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA		EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			3080 13 52 111 5
Highland	13.8	5083 Ckt.	SCADA		uP			
Highland	13.8	5084 Ckt.	SCADA		uP			
Highland	13.8	5085 Ckt.	SCADA	υP				
Highland	115	HR Line OR Line	SCADA	uP				
Highland	115	OR-761-HR BKR.		EM	ļ <u> — — — — — — — — — — — — — — — — — — — </u>			
Highland	13.9	B1 _	SCADA		EM			
Highland Highland	13.8	82	SCADA		uP			Com
Highland	. 13.8	Com Equipment						95BU is SEL-587
	115/13.8	T1	SCADA	υP/EM		<del></del>		
Highland Highland	115/13.8	T2	SCADA	υP		0.20		1
	1707,0.0				.,	D-20	)A(C	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA		EW		WE	3 phase, on, electronic
Honk Falls	13.8	B1	SCADA	EM				79 Relay is EM
Honk Falls	69	GM Line	SCADA	EM/uP				79 Relay IS EM
Honk Falls Honk Falls	69	HG Line	SCADA	UP				70 D. L
Honk Falls	69	HK Line	SCADA	uP/EM				79 Relay is EM
Honk Falls	69	MK Line	SCADA	υP			****	
Honk Falls	69	WH Line	SCADA	uP/EM			****	79 Relay is EM
Honk Falls	69	overall diff B1+T1	SCADA	EM			****	<u> </u>
Honk Falls	69/13.8	71		fuse				<u> </u>
Hunter	T					M-4000		
Hunter	34.5	Z-666					VR-3S	3 phase; vac; hyd
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase; oil; hyd
Hunter	13.8	Cap Bank			EM		4	
Hurley Ave. 345kV						2400		
Hurley Ave. 345kV	345	30151 BKR.	****	EM	****			79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		υP		****	*****	
Hurley Ave. 345kV	345	30152 A2 BF		EM				
Hurley Ave. 345kV	345	301 Line A1	SCADA	uΡ				
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				
Hurley Ave. 345kV	345	30353 BKR.		EM*				79 Relay is EM; In process replacement with SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		up				
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement with SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM			*****	
Hurley Ave. 345kV	345	30354 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	303 Line A1	SCADA	υP				
Hurley Ave. 345kV	345	303 Line A2	SCADA	EM*				In process replacement with GE D90
	345	Bus A1		EM				
Hurley Ave. 345kV		Bus A2		EM3				
Hurley Ave. 345kV Hurley Ave. 345kV	345	D 03 AZ		EM				
		A2451 BKR.						
Hurley Ave. 345kV	115	A2451 BKR. A2451 A1 BF		EM				
Hurley Ave. 345kV Hurley Ave. 345kV	115 115	A2451 BKR.	<del></del>	EM EM				
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	115 115 115	A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step		EM EM				
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	115 115 115 115 345	A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step		EM EM EM EM		*****		
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	115 115 115 115 345 345	A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step		EM EM EM				
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	115 115 115 115 345 345 345	A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step		EM EM EM EM EM				
Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV Hurley Ave. 345kV	115 115 115 115 345 345 345 345 345	A2451 BKR. A2451 A1 BF A2451 A2 BF T1 A1 Out of Step T1 A2 Out of Step T1 A1		EM EM EM				Volts

			Electric Subst	anni ahaio	OC 110000 100			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Marie Area	,,,,,					2400		BE1-851H as BU and 79
Hurley Ave.	13.8	2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps	*****	EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Hurley Ave. Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		CMITOF			
Hurley Ave.	115	Cap Bank		EM		*****		
Hurley Ave.	115	HP Line	SCADA	EM	<u> </u>			Quadramho part of the package; metering
	69	l line	SCADA	Gen1				Amp value only
Hurley Ave.			SCADA	EM				a destate and the package; metering
Hurley Ave.	115	OR Line						Quadramho part of the package; metering  Amp value only
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
	115	HP-1643 BKR.		EM				
Hurley Ave. Hurley Ave.	115	OR-1640 BKR.		EM				
Hurley Ave.	69	W-142 BKR.		uP			ļ	
Hurley Ave.	13.8	W-1575 BKR.			EM	****	ļ	<del> </del>
Hurley Ave.	115	W-389 BKR.		EM				<u> </u>
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM	Auto			Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	Т3	SCADA	€M			Ţ	
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				
inwood Ave.		·				3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	*****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/oP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
inwood Ave.	13.8	Com Equipment			**-**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115	IR-201-X BKR		υP				
Inwood Ave.	115	X Line	SCADA	· uP				
	13.8	B1	SCADA		uP			<del></del>
Inwood Ave.	13.8	82	SCADA		υP			
Inwood Ave.	115/13.8	T1	SCADA	υP	**			
Inwood Ave.	115/13.8	Τ2	SCADA	υP		10.4000		
Jansen Ave. Jansen Ave.	130	1001 011	807 00		] · · · · · · · · · · · · · · · · · · ·	M-4000		
Jansen Ave. Jansen Ave.	13.8	1001 Ckt. 1002 Ckt.	MV-90 MV-90		UP EM			· · · · · · · · · · · · · · · · · · ·
				*****				
Jansen Ave. Jansen Ave.	13.8	1003 Ckt. 1004 Ckt.	MV-90 MV-90		uP EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM			<u> </u>
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM		- 10-410-5	
Jansen Ave.	13.8	Com Equipment	SCADA	<del></del>				Com
Jansen Ave.	13.8	T - Grounding	MV-90		υP			, , , , , , , , , , , , , , , , , , , ,
Kerhonkson		, c. ounding	10.4.00	· · · · · · · · · · · · · · · · · · ·		8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense	-1	EM		Kyle D	Single phase; oil; hyd; No GS Dat:
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat
	69	MK-929 MOS		EM				
Kerhonkson		MK-930 MOS	*****	EM				
Kerhonkson	69		1	fuse				Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS					701100 101 00011 1701013
Kerhonkson	69/13.8			fuse				Volts & Amps
Kerhonkson	69	HK	SCADA					
(Common)	69	MK	SCADA					Volts & Amps

		<u></u>	Electric Substa	, , ,				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	ļ					2100		Not sure if charts were removed
napps Corners	13.8	8021 Ckt.	Charts - Amps/SCADA		UP EM/UP			BE1-851H as BU and 79
napps Corners	13.8	8022 Ckt.	Charts - Amps		uP/EM			Not sure if charts were removed
napps Corners napps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		EM/uP			BE1-851H as BU and 79
napps Corners	13.8	8024 Ckt.	Charts - kW		EM			Com
napps Corners	13.8	8025 Ckt.	Charts - kW					Com
napps Corners	13.8	Com Equipment K8 Line	None	EM				SEL-279
napps Corners	115	KB-1558-MC BKR.		uP- 200	ļ			
napps Corners napps Corners	115	SK Line	SCADA	uP EM				Amps
napps Comers	13.8	KN Line	SCADA*	EM				Amps
napps Corners	13.8	KR Line	SCADA*	EM				Amps
napps Corners	13.8	KS Line	SCADA	υP				·
napps Corners	69	KM Line TR Line	SCADA	EM				
napps Corners	69	G Line	SCADA	uР				
napps Corners	69	W-1215 BKR.			EM			
napps Corners	13.8	W-1409 BKR.		υP				
napps Corners	13.8	W-1462 BKR.			EM			
(napps Corners (napps Corners	13.8	B1			EM		*****	Orankina Buo Malta ta ana maint
(napps Corners	13.8	82	SCADA		EM			Combine Bus Volts to one point
(napps Corners	13.8	B3			EM			Volta
Knapps Corners	69	69k Bus	SCADA	EM		<del></del>		Volts
Knapps Corners	115/13.8	T1	SCADA	EM			<del> </del>	Combine load value
Knapps Corners	115/13.8	T3		EM				
Knapps Corners	115/69	T2	SCADA	υP		M-4000		l
Lawrenceville				CN0/D		191-4000	CXE-400A	3 phase; oil; hyd
Lawrenceville	34.5	2385 Ckt.	Grid Sense	EM/uP			UKL 400A	Volts
Lawrenceville	34.5 69/34.5	B1	SCADA* MV90/Grid Sense/SCADA	EM				Amps.
Lawrenceville Lincoln Park	65/34.5	_ <del>  </del>	IN V 30/01/10 Serise/30 AUA			2300	<u> </u>	
Lincoln Park	13.8	Com Equipment			, in the second		*****	Com
Lincoln Park	13.8	2011 Ckt.	Charls - Amps		EM	T	*****	
Lincoln Park	13.8	2012 Ckt.	Charts - kW	*****	EM	<del></del>		
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt	Charts - kW		EM			054.05411 011 4.70
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP		·	BE1-851H as BU and 79 GE F60 installed HiZ pilot
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM/uP*		рава	GE F60 Installed HIZ pilot
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM EM			
Lincoln Park	13.8	2018 Ckt. Cap Bank 1	Charts - kW		EM		707	
Lincoln Park Lincoln Park	13.8	Cap Bank 2			EM			
Lincoln Park	115	HP Line	None	EM				Relay Replacement Progam in pro
Lincoln Park	115	HP-1318 BKR.		EM				
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uР				<u> </u>
Lincoln Park	13.8	W -1321 BKR.	2-0-2-7		EM			<del></del>
Lincoln Park	13.8	W-45 BKR.		ļ	EM			
	13.8	W-534 BKR.		<del>}</del>	EM EM			
Lincoln Park	13.8	W-554 BKR.			EM			
Lincoln Park	12.	WT-206 BKR.	7777		EM		*****	
Lincoln Park Lincoln Park	13.8	W/T 207 DVD	*****		EM			
Lincoln Park Lincoln Park Lincoln Park	13.8	WT-207 BKR.			EM			
Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8	WT-525 BKR.	*****		C 101		_ ·,	
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8	WT-525 BKR. WT-528 BKR.			EM			Combine Bus Volts to one po
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1						
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2	SCADA		EM			Combine Bus Volts to one po
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2 B3	SCADA SCADA		EM EM			Volts
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2 B3 B4	SCADA SCADA None		EM EM EM			
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2 B3 B4	SCADA SCADA		EM EM EM			Volts Volts
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2 B3 B4 115k bus	SCADA SCADA None SCADA		EM EM EM			Volts
Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park Lincoln Park	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	WT-525 BKR. WT-528 BKR. B1 B2 B3 B4 115k bus 3.8 T1	SCADA SCADA None		EM EM EM			Volts

	<del></del>		Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
•	Class (KV)					2400		BE1-851H as BU and 79
Manchester			MV-90		EM/uP			8E1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6094 Ckt.	MV-90		EM/uP			8E1-631H as 60 and 70
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt. 6097 Ckt.	MV-90		EM			Com
Manchester	13.8	Com Equipment						95BU is REL-301; part of replacement
Manchester Manchester	13.8	M Line	None	EM/Gen-1				program.
	115	MC Line	SCADA	UP				A
Manchester	13.8	MS Line	SCADA*		EM			Amps
Manchester Manchester	13.8	W-1458 BKR.			EM			
Manchester	13.8	W-650 BKR.			EM			
Manchester	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Manchester	13.8	B2	SCAUA		EM			<del> </del>
Manchester	115/13.8	T1	50454	EM				Combine load value
Manchester	115/13.8	т2	SCADA	EM				<u> </u>
Mariboro		J <u> </u>				8890		, : ????
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP			Volts
Mariboro	115/13.8	T1	SCADA	uP/EM*		i		95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP				351 13 022-037
Maryland Ave.		······································		· · · · · · · · · · · · · · · · · · ·		M-4000		-1
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			1
Maryland Ave.	4	622 Ckt.	Charts - kW		EM			
Maryland Ave.	4	623 Ckt.	Charts - kW		EM		<del></del>	
Maryland Ave.	4	624 Çkt.	Charts - kW		EM			<del></del>
Maryland Ave.	13.8	MS Line			EM			
Maryland Ave.	13.8	PH-284 BKR.			EM			
Maryland Ave.	13.8	PH-286 BKR.			EM			
Maryland Ave.	4	W-1032 BKR.			EM			
Maryland Ave.	Δ	W-1033 BKR.			EM			
Maryland Ave.	4	W-1034 BKR.			EM			
Maryland Ave.	13.8	B1	SCADA		EM			Volts
Maryland Ave.	13.8	82	SCADA		EM			Volts
Maryland Ave.	4	81	SCADA		EM			Volts
Maryland Ave.	4	B2	30ADA		EM			VORS
Maryland Ave.	13.8/4	T1			EM			
Maryland Ave.	13.8/4	T2			EW			
Maybrook						M-4000		
Maybrook	13.8	5051 Ckt.	MV-90		EM		RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	MV-90		uP			Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90	*****	EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA	q				Volts
Maybrook	13.8	82	SCADA					Volts
Maybrook	69/13.8		None					
Maybrook	69/13.8	τ2	None					
McKinley St.						NONE		
McKinley St.	4	845 Ckt.	MV-90		EM			

			Electric Subs	tation Upgi's	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T, Relaying	D. Relaying	RTU BM	Recloser	Comment
Merritt Park	<del>                                     </del>				uP			
Merritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA	<del></del>	uP			
Merritt Park	13.8	8063 Ckt.	SCADA		υP			
Merritt Park	13.8	8064 Ckt.	SCADA		υP			
Merritt Park	13.8	8065 Ckt.	SCADA		uP			
Merritt Park	13.8	8066 Ckt.	SCADA		uP uP			
Merritt Park	13.8	8067 Ckt.	SCADA SCADA	<u> </u>	uP		+	Com
Merritt Park	13.8	8068 Ckt.	SCADA					
Merritt Park	13.8	Com Equipment	SCADA	uP				
Merritt Park	115	WF Line	SCADA	uP				SEL-279
Merritt Park	115	WP Line	3000	uP-200				366-213
Merritt Park	115	WF-439-WP BKR.	SCADA		uP			
Merritt Park	13.8	B1	SCADA		uP			
Merritt Park	13.8	B2	SCADA	uP				
Merritt Park	115/13.8	<u>T1</u>	SCADA	UP				
Merritt Park	115/13.8	T2	SCAUA	<u></u>	<del></del>	BM		
Milan					uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA	<del></del>			*****	Com
Milan	13.8	Com Equipment						
Milan	115	B-4561 Ckt Sw	.,	uP uP				
Milan	115	MR Line	SCADA			<del></del>		
Milan	115	MR-501 BKR	SCADA	υP				-
Milan	115	RT-7 BKR.		uP		1		
Milan	115	R-10 BKR.		UP O				
Milan	115	T-7 Line	SCADA	υP		·		
Milan	115	10 Line	SCADA		uP			
Milan	115	B1	SCADA	uP				
₩ilan	13.8	B1	SCADA		. UP			
Milan	115/13.8	T1	SCADA	υP			<u> </u>	<u> </u>
Millerton						L&N	<del>- </del>	}
Millerton	13.8	7081 Ckt.	SCADA		EM		*****	1
Millerton	69	GE-823 MOS		EM				O-1: fooder: 71 - 7091 lood
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; T1 = 7081 load
Millerton	69	Line to SMI	SCADA					Volts Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV					<u>-</u>	ВМ		· · · · · · · · · · · · · · · · · · ·
Modena 115kV	13.8	B1	SCADA		uP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			υP			
Modena 115kV	13.8	5011 Ckt.	\$CADA	4	UP			· · · · · · · · · · · · · · · · · · ·
Modena 115kV	13.8	5012 Ckt	SCADA		uP			<del>                                     </del>
Modena 115kV	13.8	5013 Ckt.	SCADA		uP			
Modena 115kV	13.8	Com Equipment						Com
Modena 115kV	115	EM Line	SCADA	υP				
Modena 115kV	115	EW-201-PX BKR.		UP				<del>                                     </del>
Modena 115kV	115	PX Line	SCADA	υP				Only has one 13.8 bus; T3 = Bus lo.
Modena 115kV	115/13.8	T3	SCADA	UP		9990		Umy has one 15.0 005, 15 - 005 to
Modena 69kV						8890		volts
Modena 69kV	69	B1	SCADA	EM				40/13
Modena 69kV	69	MG Line	SCADA	uP				
Modena 69kV	69	W-941 BKR.		EM				<del> </del>
Modena 69kV	69	MG-380 BKR.		EM				<del>-  </del>
Modena 69kV	115/69	T1	SCADA	EM/uP				GE F35 is installed
Modena 69kV			None	Fuse/uP		NONE		
	05, 13.					NONE	V4L	Single phase; Vac; Hyd
Montgomery		571 Ckt.	Charts - kW		EM			Single phase; Vac; Hyd
Montgomery	4	1 3/ F URG	Charts - kW		EM.	1	V4L	Single priase, vac, riye

			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU M-4000	Recloser	Comment
Mantenmen St					ENA			volts
Montgomery St.	13.8	B1	SCADA		EM			Volts
Montgomery St.	13.8	B2	SCADA	****	EM			volts
Montgomery St.	13.8	B3	\$CADA		EM			
Montgomery St.  Montgomery St.	13.8	B Line	None		EM			
Montgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr		EM			
	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.   Montgomery St.	13.8	4003 Ckt.	Charts - kW/kVAr		EM EM			
Montgomery St.	4	401 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	402-3 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	404 Ckt.	Charts - kW demand Charts - kW demand		EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt. 410A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	81	SCADA		EM			Volts
Montgomery St.		B2	SCADA		EM			volts
Montgomery St.	4	F Line	None		EM			
Montgomery St.	13.8		None		EM		*****	
Montgomery St.	13.8	NB Line NM Line	None		EM			
Montgomery St.	13.8	R Line	None		EM		†	
Montgomery St.	13.8	W-507 BKR.	None		EM			
Montgomery St.	13.8			<del></del>	EM		<del> </del>	
Montgomery St.	13.8	W-508 BKR.		1			····	
Montgomery St.	13.8	W-509 BKR.			EM			·
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	τ2			EM			
Myers Corners	120	0044.014				44-550	<del> </del>	
Myers Corners	13.8	8041 Ckt.	Charts - kW	· · · · · · · · · · · · · · · · · · ·	uP			
Myers Corners Myers Corners	13.8	8043 Ckt. 8044 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM		<u> </u>	
Myers Corners	13.8	8045 Ckt.	Charts - kW SCADA		EM			
Myers Corners	69	KM Line	None	EM	uP			<del></del>
Myers Corners	69	TV Line	None	EM	*****			·
Myers Corners	69	TV-399-KM BKR.	140116			<del></del>		
Myers Corners	13.8			EM				
Myers Corners	13.8	W-63 BKR. W-66 BKR.	*****		EM			
Myers Corners	13.8	Feeder M1-75			EM			
Myers Corners	13.8	Feeder M2-76	*****	*****	EM			
Myers Corners			B#-1-		EM			
	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Myers Corners	13.8	B2	<del></del>	500	EM	7774		
Myers Corners	69/13.8	T1	SCADA	EM				Combine load value
Myers Corners	69/13.8	T2	L-,	EM		9700		
Neversink Neversink		301.014	06		T	2200		
Neversink Neversink	13.8	391 Ckt. 3091 Ckt.	Charts - kW		EM		Kulo W	2 4544 - 02.45.4
Neversink	69	HG Line	Grid Sense SCADA*	EM	EW	*****	Kyle W	3 phase; Oil; Hyd
Neversink	69	WH Line	SCADA*	EM				Amps
Neversink	4	W-1128 BKR.		EW	EM		*****	Amps
Neversink	69	69k Bus	SCADA	uP/EM				Volts
New Baltimore	<del></del>	V3A 503	COMPA	1 0115111		2300		Voits .
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM	2300		kW
	13.8	1081 Ckt.	SCADA*		EM			kw
New Baltimore			<del></del>		EM			kW
New Baltimore	13.8	1083 Ckt.	SCADA*	EM/uP				
New Baltimore	69	Cap Bank					*****	Com
New Baltimore	13.8	Com Equipment	****					1
		CN Line	None	υP				
New Battimore			None	υP				<u> </u>
New Baltimore		NW Line		<del></del>	EM			Volts
New Baltimore	13.8	B1	SCADA	****			<del></del>	95P is SEL-587
			SCADA	EM/MD	ı			402 K 301 (00)

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			Electric Subs	station Up.	Needs As	sessment		
	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Substation	Class (kV)	Lillerone.				NONE		N- DATA
	3,000 ( )				EM			No DATA No DATA
New Windsor			Grid Sense		EM			No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			NODATA
New Windsor	4	463 Ckt.	Grid Sense		UP UP			
New Windsor	4	464 Ckt.	None					Combine load value
New Windsor	13.8	UN & UW ATC			uP uP			
New Windsor	13.8/4	T1	Charts - kW/kVAr		UP	D-20		95P is SEL-251
New Windsor	13.8/4	T2			uP- 200/ uP			95P is SEL-251 95P is SEL-251
North Catskill	1	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2001A CKt.	SCADA		UP- 200/ UP			
North Catskill	13.8	2002A Ckt.	SCADA					95P is SEL-251
North Catskill	13.8		SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt.	SCADA		uP-200/ uP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA		uP- 200/ uP		-	Com
North Catskill	13.8	2006 Ckt.	SCADA					
North Catskill	13.8	Com Equipment		EM				
North Catskill	115	2 Line	SCADA	EM				
North Catskill	115	R-2 BKR.		EM EM			*****	
North Catskill	115	RT-7 BKR.		EM			~	Amps
North Catskill	115	T-7 Line	SCADA*	EM EM				
North Catskill	69	Cap Bank			+			
	69	CL Line	SCADA	υP				
North Catskill	69	H Line	SCADA	uP		*****		
North Catskill	69	NC Line	SCADA	uP				check on TD-5
North Catskill	69	W-1107 BKR.		EM/oP*				check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*				SEL-2BFR
North Catskill	115	W-791 BKR.		uP- 200				IJS ·
	69	W-269 & W-1107 BKR			EM			Volts
North Catskill	115	B1	SCADA	EM	*****			Volts
North Catskill		B1	SCADA	EM/uP				
North Catskill	69	B2	SCADA	EM/uP				Volts
North Catskill	69	B2 B1	SCADA		EM/uP			Volts; 95BU is DFP-100
North Catskill	13.8		SCADA	44-44-7	EM/uP			Volts: 95BU is DFP-100
North Catskill	13.8	B2	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T4		EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	7.7	SCADA	EW/UP		1		

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			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<del> </del>					BM		
North Chelsea	<del> </del>	8051 Ckt.	SCADA		Ρوں			
North Chelsea	13.8		SCADA		υP	*****		
North Cheisea	13.8	8052 Ckt.	SCADA		υP			
North Chelsea	13.8	8053 Ckt.	SCADA		υP			
North Chelsea	13.8	8054 Ckt.	SCADA		UP I			
North Chelsea	13.8	8055 Ckt.			υP			
North Chelsea	13.8	8056 Ckt.	SCADA		uP			
North Chelsea	13.8	8057 Ckt.	SCADA SCADA		υP			
North Cheises	13.8	8058 Ckt.	3CAOA				<del></del>	Com
North Chelsea	13.8	Com Equipment	SCADA	uP				
North Chelsea	115	AC Line	30A0A	UP				
North Chelsea	115	AC-1086 BKR.	SCADA	UP				
North Chelsea	115	DC Line	SCADA	υP		****		
North Chelsea	115	DC-1414 BKR.		UP				
North Chelsea	115	FO-1482 BKR.						95P is LCB-II
North Chelsea	115	FO Line	SCADA	uP	,	<del></del>	<del> </del>	
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.		υP				
North Chelsea	115	SC Line	SCADA	υP				·
North Chelsea	115	SC-1566 BKR.		uР				
North Chelsea	69	TV Line	SCADA	υP				
			3020	uP			· · · · · · · · · · · · · · · · · · ·	
North Chelsea	115	B-2651 BKR.		UP		1	<del>                                     </del>	
North Chelsea	115	B-2652 BKR.	****		**			
North Chelsea	115	B-2653 BKR.	4	UP			ļ	
North Chelsea	115	W-1572 BKR.		υP				
North Chelsea	115	, B1	SCADA	uΡ		*****		•
North Chelses	13.8	B1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP			
North Chelsea	115/69	Τ1	SCADA	υP				
North Cheisea	115/13.8	T2	SCADA	uP				<del></del>
North Chelsea	115/13.8	T3	SCADA	uP				
Ohioville		, <u>-</u>		<u> </u>		2100		Voils
Ohioville	13.8	5021 Ckt.	Charts - Amps		EM/uP	2100	<del>-</del>	751 25411 211
Ohioville					EM/uP	·		BE1-851H as BU and 79
	13.8	5022 Ckt.	Charts - Amps		<del></del>			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA		υP			
Ohioville	13.8	Com Equipment						Com
Ohioville	115	Cap Bank		EM		****		
Ohioville	69	O Line	None	υP				
Ohioville	69	OB Line	None	up.				
Ohioville	115	QR Line	None	EM				
Ohioville	115	OR-1075 BKR.		EM				
Ohioville	115	PX Line	SCADA	EM/uP				
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				· · · · · · · · · · · · · · · · · · ·
Ohiovitte						!	_+	
	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W - 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM	<u> </u>			Volts
Ohioville	69	69k Bus	SCADA	EM			**-=-	Volts
Ohioville	13.8	B1	None		EM		**	
Ohioville	13.8	B2	None		EM			
Ohioville	115/13.8	T1	50.5.	EM				Combine load value
Ohioville	115/13.		SCADA	EM				·
								95BU is SEL-251

	Electric Substation Upgrade Needs Assessment											
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment				
	Class (KV)			<u> </u>		2300		Grid owns Line				
Pleasant Valley			\$CADA**	\uP	·							
Pleasant Valley	115	8 Line	SCADA	UP				Grid owns Line				
Pleasant Valley	115	10 Line	SCADA**	υP				Grid owns Line				
Pleasant Valley	115	12 Line	SCADA**	υP				95BU is Optimho; in replacement plan				
Pleasant Valley	115	13 Line		EM/Gen-1				95BO IS OP(IIIII)				
Pleasant Valley	115	C Line	SCADA	EM								
Pleasant Valley	115	M Line	SCADA SCADA	UP				Com				
Pleasant Valley	115	X Line	3000					SEL-279				
Pleasant Valley	115	Com Equipment R-12 BKR.		u₱- 200		*****		SEL-279				
Pleasant Valley	115	R-12 BKR.		uP- 200				SEL-279				
Pleasant Valley	115	R-13 BKR.		uP- 200								
Pleasant Valley	115			EM			<del> </del>					
Pleasant Valley	115	RC-6 BKR.		EM								
Pleasant Valley	115	RM BKR.		UP				D. T. L. W. Dlee				
Pleasant Valley	115	RX-4 BKR.		EM			,	Con Ed owns the Bkr				
Pleasant Valley	115	R-61 BKR.	SCADA**	EM	7****		*****	Con Ed owns the Bkr				
Pleasant Valley	115	R-62 BKR.	SCADA**	EM								
Pleasant Valley	115	R-643 BKR.		EM								
Pleasant Valley	115	R-81 BKR.			<del>                                     </del>			Volts				
Pleasant Valley	115	81	SCADA	EM	<del></del>			Volts				
Pleasant Valley	115	B2	SCADA	EM				kW				
Pleasant Valley	69	E Line	SCADA*	υP		<u> </u>		kW				
Pleasant Valley	69	G Line	SCADA*	υP				kW				
Pleasant Valley	69	Q Line	SCADA*	uP		<u> </u>		Volts				
Pleasant Valley	69	81	SCADA	υP				1010				
Pleasant Valley	13.8	W-387		****	EM		<del></del>	Con Ed owns bank and protection				
Pleasant Valley	345/115	S1	SCADA		****			Con Ed Owns bank and protection				
Pleasant Valley	115/69	T10	SCADA	EM			<del></del>					
Pulvers Corners	<del>-  </del> -	<del></del> ,				D-20						
Pulvers Corners	13.8	7091 Ckt.	SCADA	*	EM		V4L	single phase; vac; hyd				
Pulvers Corners	13.8	7092 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd				
Pulvers Corners	34.5	7395 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd				
Pulvers Corners	13.8	Com Equipment					*****	Com				
	69	Cap Bank	*****	EM								
Pulvers Corners Pulvers Corners		B1	SCADA				****	Volts				
		B1	SCADA				****	Volts				
Pulvers Corners		B1	SCADA					Volts				
Pulvers Corners		71	SCADA	Fuse								
Pulvers Corners		T2	None	EM/uP		,		95P is SR-745				
Pulvers Corners	69/34.5	12	MOHE	Corre								

			Electric Subs	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1855 (NV)					2100		
Reynolds Hill					EM			
Reynolds Hill	13.8	6001 Ckt.	Charts - kW	4224	UP UP			
Reynolds Hill	13.8	6004 Ckt.	SCADA Charts - kW		EM			
Reynolds Hill	13.8	6005 Ckt.	SCADA		υP			
Reynolds Hill	13.8	6008 Ckt.	SCADA					Com
Reynolds Hill		Com Equipment		uP				
Reynolds Hill	115	DR-1418 BKR.	SCADA	UP.				·
Reynolds Hill Reynolds Hill	115	HR-1285 BKR.		EΜ	*****			
Reynolds Hill	115	HR Line	SCADA	υP			*****	
Reynolds Hill	115	IR Line	SCADA	υP				
Reynolds Hill	13.8	B Cable	SCADA		uP uP			<del></del>
Reynolds Hill	13.8	W Cable	SCADA		uP UP		1222	
Reynolds Hill	13.8	PD Cable	SCADA		UP UP	****		
Reynolds Hill	13.8	PH Line	SCADA		uP			
Reynolds Hill	13.8	PK Line	SCADA	*****	uP	<del></del>		
Reynolds Hill Reynolds Hill	13.8	PO Line PQ Line	SCADA SCADA		uP uP			
Reynolds Hill	13.8	PS Line	SCADA	<del></del>	uP	<del></del>	+	
Reynolds Hill	13.8	PU Cable	SCADA		υP			
Reynolds Hill	115	T-31 BKR.	SCADA	EM				
Reynolds Hill	115	B1	SCADA	EM EM	<del></del>	*****		
Reynolds Hill	115	B2	SCADA	EM				Volts
Reynolds Hill	13.8	81	SCAUA				****	Volts
Reynolds Hill	13.8	B2	SCADA		EM/uP			958U is SEL-501
Reynolds Hill	13.8	83	SCADA		υP			Volts
Reynolds Hill	115	W-1543 BKR.	30202	EM	uP		*****	Volts
Reynolds Hill	115/13.8	T3	SCADA	EM/uP				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Reynolds Hill	115/13.8	T4	SCADA	EM/up				95P is SEL-351A
Rhinebeck				· · · · · · · · · · · · · · · · · · ·		2300		95P is SEL-351A
Rhinebeck	13.8	7051 Ckt.	Charts - kW/SCADA		uP-200/ uP	2300		
Rhinebeck	13.8	7052 Ckt.	Charts - Amps		EM EM			95P is SEL-251, 95BU is SEL-501
Rhinebeck	13.8	7053 Ckt.	Charts - Amps		EM		*****	
Rhinebeck	13.8	7054 Ckt.	Charts - Amps	*****	EM			
Rhinebeck	13.8	7055 Ckt.	Charts - kW		EM/uP		<del></del>	
Rhinebeck	13.8	7056 Ckt.	SCADA	<u> </u>	UP- 200/ UP			BE1-851H as BU and 79
Rhinebeck		Com Equipment	****		2007 07			95P is SEL-251; 95BU is SEL-501
Rhinebeck	69	Cap Bank		EM				
Rhinebeck	115	ER Line	SCADA*	uP	*****			Amno
Rhinebeck	115	LR-830-MR BKR.		UP				Amps
Rhinebeck	115	MR Line	None	uP				
Rhinebeck	69	Q-1471 BKR.		EM				
Rhinebeck	13.8	W-1017 BKR.			EM			
Rhinebeck	13.8	W-1238 BKR.			EM			
Rhinebeck	69	W-258 BKR.		EM	****			
Rhinebeck Rhinebeck	13.8	W-367 BKR.			EM			
Rhinebeck	13.8	Q Line B1	SCADA*					Volts
Rhinebeck	13.8	B1 B2	SCADA		EM EM			Combine Bus Volts to one point
Rhinebeck	69	69kV Bus	none	*****	EM			<u> </u>
Rhinebeck	69/13.8	T1	SCADA				*****	Volts
Rhinebeck	69/13.8	T2	SCADA*	EM	****			Amps & Volts
Rhinebeck	115/13.8	T4	SCADA*	EM			*****	Amps & Volts
Rhinebeck	115/69	T3	SCADA SCADA	EM				
- KINHEDECK	11000	13	J SCAUA	CIVI				1

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			Electric Subst	ation Up.	್ರ Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
5 . 1. 7 24EbV								
Rock Tavern 345kV	345	311 Line A1	SCADA	uP				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV	345	3456 BKR.		EM				
Rock Tavern 345kV	345	3456 BF A1		uP				
Rock Tavern 345kV	345	3456 BF A2		up				
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345KV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345kV	345	Cap Bank 2 A1	<del> </del>	EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	UP UP			****	
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.	1	UP	*****		•	
Rock Tavern 345kV	345	37751 BF A1		EM				
Rock Tavern 345kV	345	37751 BF A2		EM				
Rock Tavern 345kV	345	37752 BKR.		UP UP			**-**	
Rock Tavern 345kV	345	37752 BF A1						
Rock Tavern 345kV	345	37752 BF A2		EM	1	<u> </u>		
Rock Tavern 345kV	345	377 Line A1	SCADA	uP_	<del></del>			
Rock Tavern 345kV	345	377 Line A2	00.01	EM		<del>                                     </del>		
Rock Tavern 345kV	345	4255 BKR.		EM				
Rock Tavern 345kV	345	4255 BF A1		EM	<u> </u>		****	
Rock Tavern 345kV	345	4255 BF A2		EM				· · · · · · · · · · · · · · · · · · ·
Rock Tavern 345kV	345	42 Line A1		\$\$		<u> </u>		
Rock Tavern 345kV	345	42 Line A2		EM				<del></del>
Rock Tavern 345kV	345	C3351 BKR.		EM				1
Rock Tavern 345kV	345	C3351 BF A1		EM				<del> </del>
Rock Tavern 345kV	345	C3351 BF A2		EM		****		ļ
Rock Tavern 345kV	345	C3352 BKR.		EM		<u> </u>		
Rock Tavern 345kV	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM			****	<u> </u>
Rock Tavern 345kV	345	C3353 BKR.		υP- 200	*****			
Rock Tavern 345kV	345	C3353 BF A1		υP				
Rock Tavern 345kV	345	C3353 BF A2		uP			*****	<u> </u>
Rock Tavern 345kV	345	31153 BKR.		EM				1
Rock Tavern 345kV	345	31153 BF A1		υP			****	<u> </u>
Rock Tavern 345kV	345	31153 BF A2		υP				1
Rock Tavern 345kV	345	31154 BKR.		EM				
Rock Tavern 345kV	345	31154 BF A1		EM				
Rock Tavern 345kV	345	31154 BF A2	*****	EM	*****			
Rock Tavern 345kV	345	Com Equipment						Com
Rock Tavern 345kV	345	B1 A1	*	EM				<u> </u>
Rock Tavern 345kV	345	B1 A2	*****	EM				
Rock Tavern 345kV	345	B2 A1	NAME:	EM		*****	3000	
Rock Tavern 345kV		B2 A2		EM				
Rock Tavern 345k\		T1 A1	SCADA	EM				
Rock Tavern 345k\		T1 A2	SCADA	EM				
Rock Tavern 345k\		T3 A1	SCADA	υP				
Rock Tavern 345k\	V 345/115	T3 A2	] SCADA	υP	****		*****	

			Flactric Sub	station Up.	, Needs As	sessment		
				Marginal Abr		<del></del>		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1833 (KT)					2400	<del></del>	
Sand Dock	<u> </u>		Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.	Ciracia		EM			
Sand Dock	13.8	BP-1296 BKR.	*****		EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM		<u> </u>	
Sand Dock	13.8	GB Line KC-1447-SC BKR.	SCAUA	EM			ļ	
Sand Dock	115	KC Line	None	EM				
Sand Dock	115	SC Line	None	UP	****			
Sand Dock	13.8	SH-886 BKR.			EM			
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock		TW-902 BKR.			EM			
Sand Dock	13.8	TW-909 BKR.			EM	<u> </u>		
Sand Dock	13.8	TW-910 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM	****		
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.						
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4				<del></del>		
Sand Dock	13.8	81			EM EM			Combine Bus Volts to one point
Sand Dock	13.8	B2	SCADA			-1		Commence Cos voice to one point
Sand Dock	13.8	B3	<u></u>		EN	*****		
Sand Dock	13.8	B4	SCADA		EM			
Sand Dock	13.8	T1	SCADA	EM				Combine load value
Sand Dock	13.8	T3		EM		*		
Sand Dock	13.8	T4	SCADA	EM	<u> </u>			
Saugertice						Orion	1	

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			Electic and	station Upgra	06 106600 106			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	01033 (1.17)					2400		·
henandoah				EM				Combine Bus Volts to one point
henandoah	115	East Bus	SCADA	EM				
henandoah	115	West Bus			EM		,	Combine Bus Volts to one point
henandoah	13.8	B1	SCADA		EM			
henandoah	13.8	B2			EM			Combine Bus Volts to one point
henandoah	13.8	B3	SCADA		EM			
henandoah	13.8	B4 B5			EΜ			Combine Bus Volts to one point
henandoah henandoah	13.8	96	SCADA		EM			
henandoah	13.8	B7	SCADA		EM .			Combine Bus Volts to one point
henandoah	13.8	₽8			EM EM			
henandoah	13.8	Cap Bank 1			EM			
Shenandoah	13.8	Cap Bank 2	****		EM			
henandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5			EM			
Shenandoah	13.8	Cap Bank 6 B-4451 BKR. (CB1)			UP			<del>                                     </del>
henandoah	13.8	8071 Ckt.	Charts - kW		EM	<del></del>		
Shenandoah Shenandoah	13.8	8071 Ckt.	Charts - KW		EM			
Shenandoah	115	EF Line	None	uP/Gen-1			*****	95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM				3350 is Optimio, in replacement plan
Shenandoah	115	EF-1514 BKR.	140116	EM		÷	<del>                                     </del>	
Shenandoah	115	FS-739 BKR.	***	EM				1
Shenandoah	115	FS-892-EF BKR.		EM			****	
Shenandoah	115	FS-959 BKR.		EM				ļ
Shenandoah	13.8	Feeder S1	None		EM			<del> </del>
Shenandoah	13.8	Feeder S2	None		EM		+	<del> </del>
Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None		EM	7227		
Shenandoah	13.8	Feeder S5	None		EM			
Shenandoah	13.8	Feeder \$6	None		EM			<del> </del>
Shenandoah	13.8	Feeder S7	None		EM		<del></del>	<del></del>
Shenandoah	13.8	Feeder S8	None		EM:	*****		<del></del>
Shenandoah	13.8	Feeder S9	None		EM			<del> </del>
Shenandoah	13.8	Feeder \$10	None		EM			
Shenandoah	13.8	Feeder S11	None		EM	*****		<del></del>
Shenandoah	13.8	Feeder S12	None		EM			<del>                                     </del>
Shenandoah	13.8	Feeder \$13	None		EM			·
Shenandoah	13.8	Feeder S14	None		EM			
Shenandoah	13.8	Feeder S15	None		EM			
Shenandoah Shenandoah	115/13.8	71	SCADA	EM				Combine lead upt
Shenandoah Shenandoah	115/13.8	T2		EM				Combine load value
Shenandoah	115/13.8	T3	SCADA	EM	<del></del>			Combine foad value
Shenandoah	115/13.8	T5		EM				Comoline idad value
Shenandoah	115/13.8	T6	SCADA	EM		*****	*****	Combine toad value
Shenandoah	115/13.8	T7	50.40.4	EM				Complife load value
Shenandoah	13.8	W-1266 BKR.	SCADA	EM				<u> </u>
Shenandoah	13.8	W-1279 BKR.			EM EM			
Shenandoah	13.8	W-1450 BKR.			EM			
Shenandoah	13.8	W-1593 BKR.			EM			<del></del>
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	****		EM		2000	····
Shenandoah	13.8	W-802 BKR.			EM			
	13.8	W-803 BKR.			EM			
Shenandoah					EM			
Shenandoah	13.8	W-805 BKR. W-807 BKR.			EM			
	13.8							

			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	,1					44-550		
Rock Tavern 115kV	ļ			EM				
Rock Tavern 115kV	115	B1		EM			*****	
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV	115	115-0,48kV SST		<del></del>				Com
Rock Tavern 115kV	115	Com Equipment		EM				Amps
Rock Tavern 115kV	115	D Line	\$CADA*	EM	****			
Rock Tavern 115kV	115	D-448 BKR.		_	<del> </del> "			95P is a DLP; identified in replacement
Rock Tavern 115kV	115	J Line	SCADA*	GEN-1/EM				program; Amps
Rock Tavern 115kV	115	J-788 BKR.		EM		****		Amps
Rock Tavern 115kV	115	RD Line	SCADA*	EM				Aditips
Rock Tavern 115kV	115	RD-809 BKR.		EM3				Amps
Rock Tavern 115kV	115	RJ Line	SCADA*	EM				Anps
Rock Tavern 115kV	115	RJ-818 BKR.		EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM	*****			
Rock Tavern 115kV	115	SL-684 BKR.		EM			*****	
Rock Tavern 115kV	115	W-467 BKR.		υP			****	
Rock Tavern 115kV	115	W-681 BKR.	****	EM			****-	
Rock Tavern 115kV	115	W-814 BKR.	****	EM/oP				SEL-351
Rock Tavern 115kV	115	WM Line	none	υP				
Rock Tavern 115kV	115/69	Ť2	SCADA	EM			T	<del></del>
Roseton Switchyard						2100	<del> </del>	
Roseton Switchyard	345	30356 (B6) BKR		EM				
Roseton Switchyard	345	30356 (B6) BF A1	*-*-	EM			†	<del></del>
Roseton Switchyard	345	30356 (B6) BF A2	-4	EM		<del></del>	+	
Roseton Switchyard		303 Line A1		uP		<del> </del>		- <del> </del>
Roseton Switchyard		303 Line A2	SCADA	EM		1		
Roseton Switchyard		30551 (B7) BKR		EM				
Roseton Switchvard		30551 (B7) BF A1			<u> </u>			
Roseton Switchyard		30551 (B7) BF A2		EM		<del> </del>	****	
Roseton Switchyard		30553 (B3) BKR		EM	Avens			
Roseton Switchyard		30553 (B3) BF A1		EM	*****	*****		
Roseton Switchyard		30553 (B3) BF A2		UP		*****		
Roseton Switchyard		305 Line A1	****	EM			****	<u> </u>
Roseton Switchyard		305 Line A2	SCADA	UP				
Roseton Switchyard			<del></del>	EM/uP				SEL-501 for DBC
Roseton Switchyard		31151 (B1) BKR	*	EM		*****	2000	
Roseton Switchyard		31152 (B1) BF A1		EM				
Roseton Switchyard		31152 (B1) BF A2	·	EM				
Roseton Switchyard		31152 (B4) BKR		EM				
Roseton Switchyard		31152 (B4) BF A1 .		EM				
Roseton Switchyard		31152 (B4) BF A2	***	EM	·			
		311 Line A1	SCADA	υP				<del></del>
Roseton Switchyard		311 Line A2		EM				
Roseton Switchyard		B1	*****	υP				
Roseton Switchyard		B2	**-*-	υP				
Roseton Switchyar		U1	SCADA	EM				
Roseton Switchyan	d 345	U2	SCADA	EM				

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			Electric Subs	iation Ups. 🛥	E IAGGOS WO	2622III.C.II.		
Substation	Voltage Class (kV)	Line/Ckt.	Wetering	T. Relaying	D. Relaying	RTU	Recloser	Comment Radio to INW
						2300		
Smith Street		222.014	Charts - kW		EM			·
Smith Street	4	631 Ckt.	Charts - kW		EM			
Smith Street	4	632 Ckt.	Charts - kW		EM			
Smith Street	4	633 Ckt.	Charts - kW		EM			
Smith Street	4	634 Ckt.			EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street	13.8	PQ Line	None		EM			
Smith Street	13.8	PS Line	None		EM			
Smith Street	13.8	W Line	None		EM			Volts
Smith Street	13.8	81	SCADA SCADA		EM			Volts
Smith Street	13.8	B2			υP			Volts
Smith Street	4	B1	SCADA		uР			Volts
Smith Street	4	82	SCADA	****	EM	**		
Smith Street	13.8/4	T1	None		EM			
Smith Street	13.8/4	Т2	None			8890		
Smithfield	1	·			T			
Smithfield	13.8	7095 Ckt.	SCADA		uP			Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP				
Smithfield	69	FV Line	SCADA*	uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	GE Line	SCADA*	EM				Amps
	69	S Line	SCADA*	EM		****		Amps
Smithfield	69	SA Line	SCADA*	EM				Volts & Amps
Smithfield		B2	SCADA					Volts
Smithfield	69	B3	SCADA					Volts
Smithfield	69						† <del></del>	Only one feeder; T1 = 7095 load
Smithfield	69/13.8	<u> </u>	None*			8890	<del> </del>	1 City one leeder, 11 - 1000 leed
South Cairo				<del></del>	<del></del>		-	DE4 05411 011 4 70
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP		<u> </u>	BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps	ļ <u></u>	EM/uP		****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			10701	Com
South Cairo	69	CF Line	None	EM/uP				79 done with NLR
South Cairo	69	CL Line	None	υP				
South Cairo	13.8	B1+G1	Charts - kW/SCADA		EM:			SCADA Volts
South Cairo	69/13.8	T1	Charts - Amps	EM/uP				95P is SEL-587
South Wall St.						None		
South Wall St.	4	111 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd
South Wall St.	4	112 Ckt.	Grid Sense		EM		Kyle L	Single Phase: Oil; Hyd; missing GS da
South Wall St.	13.8/4	71	Charts - kW/kVAr		EM		****	
Spackenkill	1			<del></del>				
	1					( Orion		
	13.8	6041 Ckt	SCADA		ыP	Orion	*****	
Spackenkill	13.8	6041 Ckt.	SCADA		uP			
Spackenkill Spackenkill	13.8	6042 Ckt.	SCADA		υP			
Spackenkill Spackenkill Spackenkill	13.8 13.8	6042 Ckt. 6043 Ckt.	SCADA SCADA		uP uP			
Spackenkill Spackenkill Spackenkill Spackenkill	13.8 13.8 13.8	6042 Ckt. 6043 Ckt. 6044 Ckt.	SCADA SCADA SCADA		บค นค นค		*****	
Spackenkill Spackenkill Spackenkill Spackenkill Spackenkill	13.8 13.8 13.8 13.8	6042 Ckt. 6043 Ckt. 6044 Ckt. 6045 Ckt.	SCADA SCADA SCADA SCADA		บค บค บค บค			
Spackenkill Spackenkill Spackenkill Spackenkill Spackenkill Spackenkill	13.8 13.8 13.8 13.8 13.8	6042 Ckt. 6043 Ckt. 6044 Ckt. 6045 Ckt. 6046 Ckt.	SCADA SCADA SCADA SCADA SCADA SCADA		บค ชค บค บค บค บค	344		
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Spackenkill Staatsburg Staatsburg Staatsburg	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	6042 Ckt. 6043 Ckt. 6044 Ckt. 6045 Ckt. 6046 Ckt. 6046 Ckt. 6048 Ckt. Com Equipment KR Line KS Line MC Line MC-200-SK BKR. B1 B2 T1 T2  7041 Ckt. 7042 Ckt.	SCADA SCADA		UP UP UP UP UP UP UP UP UP UP UP UP UP U			
Spackenkill Spackenkill	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	6042 Ckt. 6043 Ckt. 6044 Ckt. 6045 Ckt. 6046 Ckt. 6046 Ckt. 6048 Ckt. Com Equipment KR Line KS Line MC Line MC-200-SK BKR. B1 B2 T1 T2  7041 Ckt. 7042 Ckt.	SCADA SCADA		UP UP UP UP UP UP UP UP UP UP UP UP UP U	BM		

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			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<u> </u>					M~4000	<u> </u>	Single phase; vac; hyd
Standfordville	1	7071 Ckt.	MV-90		EM		V4L	Single phase, vac, nyo
Standfordville	13.8	7072 Ckt.	MV-90	**-**	EM	****		Volts
Standfordville	13.8	7072 CKI.	SCADA					
Standfordville	13.8		MV-90	Fuse				
Standfordville	69/13.8			<del></del>		2100		n i i i i i i i i i i i i i i i i i i i
Sturgeon Pool	<del>↓</del> ~	244 614	Grid Sense		EM	*****	Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	341 Ckt.	Grid Sense					Com
Sturgeon Pool	69	N Line	SCADA	uP				
Sturgeon Pool Sturgeon Pool	69	O Line	SCADA	uP				
Sturgeon Pool	69	P Line	SCADA	uP				V-li-
Sturgeon Pool	69	69k Bus	SCADA	EM				Volts
Sturgeon Pool		T5	None	Fuse				
Sugarloaf						44-500		
Sugarloaf	115	SD Line	SCADA	EM		+	*****	Combine load value
Sugarloaf	115	SJ Line	SCAUA	EM				
Sugarloaf	115	SL Line	None	EM				
Sugarloaf	115	B1	SCADA	EM				Volts
Sugarloaf	115/69	O & R Transformer	SCADA	EM				
Tinkertown	113/63	O & R Transformer		<u> </u>	<del></del>	2300	<del>                                     </del>	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	υP		**-**	110010 (8772
Tinkertown	13.8	7023 Ckt.	SCADA		UP UP	7		
Tinkertown	13.8	7023 Ckt.	SCADA		uP		<del></del>	<u> </u>
Tinkertown	13.8	7025 Ckt.	SCADA		uP	<del>+</del>		
Tinkertown	13.8	7023 CAL.	SCADA		UP			
Tinkertown	13.8	B2	SCADA			4-4	<del></del>	Volts
Tinkertown	13.8	Com Equipment			υP			Volts
Tinkertown	69/13.8	T1			*****			Com
Tinkertown	69/13.8	T2	SCADA	Fuse		*****		
Tioronda	03/13.8	12	SCADA	Fuse	*****			
Tioronda	13.8	8085 Ckt.		<u></u>		M-4000		
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Tioronda	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda		W-566 Ckt. Sw		EM				Agastat
	13.8	B1	SCADA		EM			Volts
Tioronda	115/13.8		Charts - kW/kVAr	EM				
Todd Hill		1				2200		~ ····
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
Todd Hill	13.8	6052 Ckt.	SCADA		υP			
Todd Hill	13.8	6053 Ckt.	SCADA	*****	υP			1
Todd Hill	13.8	6054 Ckt.	SCADA		υP			T
Todd Hill	13.8	6055 Ckt.	SCADA		EM			
Todd Hill	13.8	6056 Ckt.	SCADA		EM			
Todd Hill	13.8	6057 Ckt.	SCADA		EM	*****		
Todd Hill	13.8	Com Equipment	****					Com
Todd Hill	115	A Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	115	A-520-C BKR.		EM				vaca is optimio, in replacement plan
Todd Hill	115	C Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	13.8	W - 524 BKR.	11778		EM			
Todd Hill	115	B1	SCADA					Volts
Todd Hill	13.8	81	SCADA		EM/uP		-	95BU is SEL-351A; Volts
Todd Hill	13.8	B2	SCADA		UP			Volts
Todd Hill	115/13.8		SCADA	EM/uP				95P is SEL-587
Todd Hill	115/13.8		SCADA	uP				30F 18 3CL-301

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			Electric Subs	tation Us	Needs Assessment				
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment	
	Class (kV)		· · ·			2200			
Union Ave			SCADA UP					Volts	
Union Ave	115	81	SCADA	EM					
Union Ave	115	RJ Line	SCAUA	EM/uP			*****	SEL-351A for BF	
Union Ave	115	RJ-52 BKR. UB Line	SCADA	up					
Union Ave	115	UB-51 BKR		uР				Amno	
Union Ave	115	UN Line	SCADA*	EM				Amps Amps	
Union Ave	115	UW Line	SCADA*	EM			<del></del>	201.03	
Union Ave	115	W-1095 BKR.		EM	UP				
Union Ave	13.8	81			υP				
Union Ave	13.8	B2			υP			Volts	
Union Ave	13.8	B3	SCADA		uP			Volts	
Union Ave	13.8	B4	SCADA		uP	****			
Union Ave	13.8	B3-B2	*****		uP		,		
Union Ave	13.8	B4-B1	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4042 Ckt.			EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4043 Ckt.	MV-90 MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave	13.8	4044 Ckt. 4045 Ckt.	MV-90		EM/uP		****	BE1-851H as BU and 79	
Union Ave	13.8	4045 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79	
Union Ave Union Ave	13.8	4046 Ckt.	SCADA		uP				
Union Ave	13.8	4051 Ckt.	SCADA	V	uP				
Union Ave	13.8	4052 Ckt.	SCADA		υP				
Union Ave	13.8	4053 Ckt.	SCADA		uP				
Union Ave	13.8	4054 Ckt.	SCADA		υP			,	
Union Ave	13.8	4055 Ckt.	SCADA		uP				
Union Ave	13.8	Com Equipment				*****		Com	
Union Ave	115/13.8	T1	SCADA	EM/uP				95BU is SEL-387E	
Union Ave	115/13.8	T2	SCADA	EM/uP			*****	95BU is SEL-387E	
Union Ave	115/13.8	T3	SCADA	uP					
Van Wagner	<u> </u>					NONE			
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd	
Van Wagner	4	732 Ckt.	Charts - kW/GS			*****	Kyle L	Single phase; oil; hyd	
Vinegar Hill		<del></del>				M-4000	<u></u>		
Vinegar Hill	34.5	2389 Ckt.	MV-90		uP		RVE	3 phase; oil; hyd	
West Balmville	<del></del>					2300			
West Balmville	115	B2	SCADA	EM			*****	Volts	
West Balmville West Balmville	13.8	B1 B2	SCADA		uP			Combine Bus Volts to one point	
		+	00484		υP			<del>                                     </del>	
West Balmville West Balmville	115	B Line	SCADA	uP		<del> </del>	*****		
West Balmville West Balmville	13.8	4011 Ckt. 4012 Ckt.	MV-90 SCADA	*****	EM uP			MAY 90 SELIC	
West Balmville	13.8	4012 Ckt.	SCADA		uP uP	<del></del>		MV-90 still? MV-90 still?	
West Balmville	13.8	4013 Ckt.	SCADA		uP			MV-90 still?	
West Balmville	13.8	4015 Ckt.	MV-90	*****	EM			M14-20 2001	
West Balmville	13.8	Com Equipment	*****				*****	Com	
West Balmville	115	DB Line	SCADA	υP				50.0	
West Balmville	115	DB-875 BKR.		uΡ					
West Balmville	115	DW Line	SCADA	υP					
West Balmville	115	DW-662 BKR.		υP					
West Balmville	115	F Line	SCADA	υP			*****		
West Balmville	115	R Line	SCADA	υP					
West Balmville	115	W-478 BKR.	*****	υP					
West Balmville	115	W-855 BKR.		υP				1	
West Balmville	115	WN Line	SCADA	υP				<del> </del>	
West Balmville		T1	SCADA	EM.				Combine load value	
West Balmville		T2	JCADA	EM		•		1	
MARK DRIMAINE									

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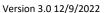
			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Mostorio	Westerlo							
	13.8	1091 Ckt.	SCADA		uP .			
Westerlo	13.8	1092 Ckt.	SCADA		UP			
Westerlo	13.8	1093 Ckt.	SCADA		uP			
Westerlo	13.8	B1	SCADA		υP			
Westerlo		Com Equipment						Only has one 13.8 bus; T1 = Bus load
Westerlo		T1	SCADA	uP		V		Othy has one 15.0 obs, 11 505 tous
Westerlo	69/13.8	Cap Bank		υP				
Westerlo	69	FW Line	SCADA	UP				
Westerlo Westerlo	69	NW Line	SCADA	υP		*		
Westerio	69	FW-1500-NW BKR.		uP				
Wiccopee					_ · · · · · · · · · · · · · · · · · · ·	L&N		
Wiccopee	115	FS Line	None	EM	*****			<u> </u>
Wiccopee	115	WP Line	None	uP				
Wiccopee	115	FS - 1652- WP BKR.		EM				
Wiccopee	13.8	F1-292 BKR			EM			<u> </u>
Wiccopee	13.8	F2-280 BKR			E₩			
Wiccopee	13.8	W-368 BKR.			EM			
Wiccopee	13.8	W-378 BKR.	****		EM			
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.			EM			
Wiccopee	13.8	Future (Unit #3)		4	EM			
Wiccopee	13.8	Future (Unit #9)			EM			
Wiccopee	13.8	B1			EM	· <del> </del>	+	<del> </del>
Wiccopee	13.8	B2		<del></del>				<u> </u>
Wiccopee	13.8		*****		EM			<u> </u>
Wiccopee	115/13.8	Com Equipment			*****	*	*****	Com
Wiccopee	115/13.8	T1 T2	SCADA	EM				
Woodstock	715/13.8	1 12	SCADA	EM				
	43.0	2014 014		,	<del></del>	M-4000		
Woodstock	13.8	3011 Ckt.	MV-90		EM			1.
Woodstock	13.8	3012 Ckt.	MV-90		EM			1
Woodstock	13.8	3013 Ckt.	MV-90		EM			<u> </u>
Woodstock	13.8	3014 Ckt.	MV-90		ĒM.			<del></del>
Woodstock	13.8	B1	SCADA		EM .			Volts
Woodstock	13.8	B2	SCADA		EM			Volts
Woodstock	69/13.8	T2+SR Line	*****	EM				1 232
Woodstock	69/13.8	T2 + B2	*****	EM				
Woodstock	69/13.8	T1	MV-90			*****		
Woodstock	69/13.8	T2	MV-90					<del></del>

## Attachment 6

Station	Cost
Dashville	\$190,000
East Walden	\$610,000
Tioronda	\$200,000
Coxsackie	\$130,000
South Cairo	\$160,000
East Park	\$200,000
Pleasant Valley	\$360,000
Todd Hill	\$160,000
Sand Dock	\$510,000
Fishkill Plains	\$480,000
South Wall St.	\$84,000
Manchester	\$340,000
Forgebrook	\$730,000
Rock Tavern	\$1,060,000
	Dashville East Walden Tioronda Coxsackie South Cairo East Park Pleasant Valley Todd Hill Sand Dock Fishkill Plains South Wall St. Manchester Forgebrook









Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Pleasant Valley 115 kV Modernization Work Order #: 0 7 9 0 - H

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2020 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

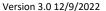
#### Describe the project objective and scope of work:

Much of the equipment at the Pleasant Valley 115 kV Substation has been identified for replacement on the following original programs that have been combined into a single project: Breaker Replacement Program, 115 kV Disconnect Replacement Program, and the ESP Infrastructure Replacement Program.

#### Describe specific scope exclusions, assumptions and constraints:

The various programs above have been combined into one 115 kV substation modernization project. Two 115 kV circuit breakers will be replaced along with Bus #1 and Bus #2 relays and all associated electromagnetic breaker relays. Twelve 115 kV Disconnect Switches will be replaced on Bus #1 and Bus #2. Lastly, the redundant North Bus will be retired.





N/A



**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

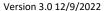
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

# **Budget Submittal Form**





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	•		All future year applicable				
	\$5,965,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	530,100	43,100	0	0	0	54,000	433,000	0
	Labor (Monthly Payroll)	264,550	21,550	0	0	0	27,000	216,000	0
A	Stock Materials	264,550	21,550	0	0	0	27,000	216,000	0
D	Non-Stock Material (A/P taxable)	1,060,200	86,200	0	0	0	108,000	866,000	0
Ĭ	Contractors (A/P tax exempt)	372,170	30,170	0	0	0	38,000	304,000	0
Т	Overheads	2,650,500	215,500	0	0	0	271,000	2,164,000	0
1	AFUDC*	158,930	12,930	0	0	0	16,000	130,000	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,301,000	431,000	0	0	0	541,000	4,329,000	0
R	Labor (Weekly Payroll)	99,150	150	0	0	0	16,000	83,000	0
E	Labor (Monthly Payroll)	199,300	300	0	0	0	33,000	166,000	0
1;	Contractors (A/P tax exempt)	34,050	50	0	0	0	6,000	28,000	0
R	Overheads	331,500	500	0	0	0	54,000	277,000	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	664,000	1,000	0	0	0	109,000	554,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

4,175,500

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 7,754,500

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nue 54' 5011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

## L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

#### Equipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact; 2) Customer conclusions to: System Operations as an information point of contact; 2) Customer conclusions to: System Operations as an information point of contact; 2) Customer services (Line Forces) to sid in fault locating and thereby limiting patrol time and area; 3) Operations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a centuit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

#### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

#### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

#### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

#### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

#### Attachment 1

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

aering Mr. P. Harpolis Furner Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

#### Re: Transmission & Distribution Protective Relay Review

#### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability. Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

#### **Discussion:**

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

#### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

## C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

#### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

<sup>&</sup>lt;sup>1</sup> Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

#### **Attachment 2**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

#### **Re: Substation Metering Review**

#### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

#### **Discussion:**

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

#### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

#### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

#### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

## Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti (Manl	Cost	
A	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

			Tin	ne			Cost		
Retrofit Options			Manh	ours		<u>Par</u>	ts	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	79 10
Grid Sense Meter	W / VAr	Hours are for the EOE and the Linemen.				\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	takes	the line	man an	d the	\$2,272			\$2,700
POT Line		Each	15 minu n data c	oncentr	ator	\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tin	ne and	15			\$430	\$430
Site Registration	per D/C	Trav	utes of el to ea	ch site	has	-waived-			
TOTAL GS Installation	i j	: beer !	n assum hou		e 1				\$9,000
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

#### **Attachment 3**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

#### Re: Remote Terminal Unit Review

#### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

#### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

#### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

#### B. Retrofit/Replacement Options:

Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

#### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

#### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

#### **Attachment 4**

Copy to:

Mr. P.E. Haering Mr. H.W.Turner

Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

#### Re: Substation Recloser Review

#### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

## **Discussion:**

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

#### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

#### **Conclusions:**

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

#### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

# Appendix 1: Estimated Costs of Retrofit Options

	Cost				
Retrofit Options	Parts	TOTAL	Ì		
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1		
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1		
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2		
R-Mag Breaker	\$25,000	\$90,000			

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

Voltage Voltage T Relaying D. Relaying RTU Recloser Comment				Electric Sub	station Upgra	ide Meeds Wa	Sessment		
Second   A	Substation	1	Line/Ckt.				į	Recloser	
Accord 4 RF CVI Company		0.000		C2		EM	NONE		
Ancertain   13.8   7965 CH   W1920   SADA	Accord	4					NONE		Only has a 13.8 Voltage Regulator
Spring	Ancram	13.8	7085 Ckt.	Grid Sense			NONE		
Samproville   4   411 CM   W. O.     EM   C.580   Matering Source?		T				EM			
Barringst		4							
Sampage		4	412 Ckt.	MV-90			C-300		
Berneget   115   CFD Line   ARTS   EM									Metering source?
Barriegal   115		115							
Barringst   115									
Emringat   11511.8   T.   SCADA   EM		115	KB-749-KC BKR						IPM Foods
Barringst   11971-8   72		115/13.8				+	<u> </u>		IBM reeds
Barregal   13.8   51   SCADA   EM		115/13.8							
Barnegat   13.8   S   S   S   S   S   S   S   S   S		· 13.8							IBM Feeds
Barrel   19   \$2,734 GR   \$CADA		13.8					Ļ		
D-20		13.8							IBM Feeds
Beacon   13.8   909.6 Cht   SCADA   EM			S2-734 BKR	SCADA		EM	<del></del>		
Seacon   13.8   8005 CM.   SCADA   EM							+		
Beacon   13.8   8015 Ckt   SCADA   EM		13.8	8006 Ckt.	SCADA		EM			
Beacon						EM			Previously 8087A?
Beacon									
Beacon   4   89.3 Ckt   SCADA   EM							+	<del>                                     </del>	<del> </del>
Beacon   4	Beacon							*****	ļ
Bescon	Beacon	4	803 Ckt.	SCADA			****	*****	
Beson	Beacon	4	W-414 BKR	SCADA		EM			
Bescon   4	Beacon	4	W-463 BKR	SCADA		EM			
Bescon   4	Beacon	4	Bus 1	SCADA					
Beacon   13.8/4   T1   SCADA   EM		4					<del></del>	<del></del>	
Bescon					<del></del>	<del></del>	+	<del>+</del>	<del>                                     </del>
Beson   13.8   BF Cable   SCADA   EM					<del></del>		<del> </del>	<del></del>	MDB has an entry with T1+T2 calculated
Beacon   13.8								*****	
Beacon   13.8   CM Cubis   SCADA   EM					****				
Bescon								*****	
Beston						EM			
Sethilehem Rd.   13.8   4093 Ckt.   MV-90   EM/UP     BE1-851H as BU and 79				SCADA		EM			†
Sethiehem Rd   13.8		13.8	Bus 2	SCADA		EM		<del></del>	<del> </del>
Bethiehem Rd.   13.8							2400	<del></del>	_ <del></del>
Bethlehem Rd. 13.8 4092 Ckt. MV-90			( 4091 Ckt.	MV-90		EM/uP		·	851-851H as Bill and 79
Bethlehem Rd. 13.8	Bethlehem Rd.	13.8	4092 Gkt.	MV-90		EM/uP		<del></del>	
Bethiehem Rd. 13.8 4094 Ckt. MV-90	Bethlehem Rd.	13.8	4093 Ckt.	MV-96				<del></del>	
Bethiehem Rd.   13.8   4095 Ckt.   MV-90									
Bethiehem Rd.   13.8   4096 Ckt.   MV-90     EM     EM							<del></del>		BE1-851H as BU and 79
Bethlehem Rd.   13.8   4097 Ckt   MV-90     EM									
Bethlehem Rd.         13.8         4098 Ckt.         MV-90         EM         EM           Bethlehem Rd.         13.8         Bus 1         EMS         EM            Bethlehem Rd.         113.8         Bus 2         EMS          EM            Bethlehem Rd.         115         RD Line         None         EM              Bethlehem Rd.         115         RD GO-00-UB BKR          EM  .									
Bethlehem Rd.   13.8   4098 Ckt.   MV-90     EM				MV-90		EM		*****	
Bethlehem Rd.         13.8         Bus 1         EMS         EM          EM           BM          BM           BM           BM		13.8	4098 Ckt.	MV-90	2.0	EM			
Bethlehem Rd.         13.8         Bus 2         EMS         —         EM         —         EM         —         Bethlehem Rd         115         RD Line         None         EM         —	Bethlehem Rd.	13.8	Bus 1	EMS					
Bethlehem Rd.   115		13.8	Bus 2						
Bethlehem Rd.	Bethlehem Rd.			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				<del></del>
Bethlehem Rd.				·				·	<del></del>
Bethlehem Rd.   115/13.8   T2   EMS   EM						<del></del>	<del></del>		·-
Bethlehem Rd.   115/13.8   T2   EMS   EM		<del></del>		<del></del>		<del></del>			
Bethlehem Rd.   13.8   W-613 BKR									Metering combined
Bethlehem Rd.   13.8   W-619 BKR     EM									motoring opinionies
Berthlehem Rd.   13.8   W-804 BKR     EM         EM									
Bordman Rd.   13.8   6081A Ckt.   EM       EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM     EM						EM			
Bordman Rd.   13.8   6081A Ckt.   EM		13.8	W-804 BKR			EM			
Bordman Rd.         13.8         6082A Ckt.         —         EM         —         —         EM         —         —         EM         —         —         EM         —         —         —         EM         —	Bordman Rd.						NONE		
Bordman Rd.         13.8         6082A Ckt.         EM          EM           EM	Bordman Rd.	13.8	6081A Ckt.			EM			
Bordman Rd.         13.8         Z-203 Ckt.          EM            Bordman Rd.         13.8         Z-204 Ckt.          EM            Bordman Rd.         13.8         Z-205 Ckt.          EM            Bordman Rd.         13.8         Z-206 Ckt.          EM            Bordman Rd.         13.8         Z-207 Ckt.          EM            Bordman Rd.         13.8         Z-208 Ckt.          EM	Bordman Rd.	13.8	6082A Ckt.						
Bordman Rd.   13.8   Z-204 Ckt.   EM									
Bordman Rd.         13.8         Z-204 Ckt.         EM	Boroman Rd	13.8							
Bordman Rd.   13.8   Z-205 Ckt.     EM	Bordman Rd	13.8	Z-204 Ckt.						
Bordman Rd.   13.8   Z-206 Ckt.     EM       Bordman Rd.   13.8   Z-207 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM       Bordman Rd.   13.8   Z-208 Ckt.     EM			Z-205 Ckt.						
Bordman Rd.         13.8         Z-206 Ckt.         EM            Bordman Rd.         13.8         Z-207 Ckt.          EM            Bordman Rd.         13.8         Z-208 Ckt.          EM						EM			
Bordman Rd.   13.8   Z-207 Ckt.   EM   EM   EM   EM   EM   EM   EM   E	Bordman Rd	i. 13.8							·
Bordman Rd. 13.8 Z-208 Ckt EM	Bordman Ro	13.8	Z-207 Ckt.					<del></del>	
						EM			
		J. 13.0				FM			

-	V
C	,,
C	

				Í		1	. 1	C *
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
Davisand					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2100		
Boulevard Boulevard	69	OB Line	SCADA	<u>uP</u>				
Boulevard	69	N Line	SCADA	uP uP				- 11/0/1
Boulevard	69	1 Line	SCADA	ur	υP			Line Amps & W/VAr
Boulevard	13.8	KO Line	SCADA		UΡ			
Boulevard	13.8	KK Line	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1012	SCADA		UΡ			
Boulevard	13.8	Ckt. 1013	SCADA SCADA		EM/uP	*****		
Boulevard	13.8	Ckt. 1014	SCADA		EM			
Boulevard	13.8	Bus 1	SCADA		EM			
Boulevard	13.8	Bus 2		EM				<u> </u>
Boulevard	69	Bus 1	SCADA	EM				
Boulevard	69	Bus 2	SCADA			*****		
Boulevard	69	Overall		EM				Manufacture
Boulevard	69/13.8	T1	SCADA	EM			-	Metering combined
Boulevard	69/13.8	T3	SCADA	EW		+		1
Boulevard	69/13.8	T2	SCADA	EM		M-4000		<u> </u>
Clinton Ave.						<del></del>	·	T
Clinton Ave.	4	395 Ckt.	MV-90		EM		*****	<del>                                     </del>
Clinton Ave.	4	396 Ckt.	MV-90		EM			<del></del>
Clinton Ave.	4	397 Ckt.	MV-90		EM			<del></del>
Clinton Ave.	4	Bus	SCADA		***			<del></del>
Clinton Ave.	13.8/4	T1	MV-90		Fuse			
Cold Spring						NONE		1 - 1 1 - 0 11 C D - 1 5 - 1 //
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two (2
Cold Spring	4	872 Ckt.	Charts - kW		EM			eircuits.
Coldenham						D-20	<u>.</u>	
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP - 200/ uP			95P is SEL-251
Coldenham	13.8	4024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		υP- 200/ υP	1		95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
Coldenham	13.8	4027 Ckt.	SCADA		υP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP		****	95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM		*****	
Coldenham	13.8	Bus 2	SCADA		EM		****	
Coldenham	13.8	B1-B2 Tie			EM			<u> </u>
Coldenham	115	J Line	SCADA	Gen 1				95P is DLP; 95BU is REL-301; part of
Coldenham	115	CW Line	SCADA	Gen 1				replacement program already.
Coldenham	115/13.8	Ti	SCADA	EM				
Coldenham	115/13.8	T2	SCADA	EM				
Coldenham	115	J-19-CW BKR	30.00.	SS				
Converse St.		, - :: -: -: · ·				NONE		
Converse St.	4	121 Ckt.	MV-90		EM			
Converse St.	4	122 Ckt.	MV-90		EM			
Converse St.	4	123 Ckt.	MV-90		EM			
Conway Place	<del></del>	_,_,_,_,_				NONE		
Conway Place	4	881 Ckt.	MV-90		EM			
Conway Place	- 4	882 Ckt.	MV-90		EM			
Coxsackie	<del></del>	, 00-0111		· <del></del>		8890		
	13.8	1071 Ckt.	Charts - Amps		EM			
Coxsackie	13.8	1072 Ckt.	SCADA/ Charts - kW		EM			Bitronics for the SCADA portion
Coxsackie			Charts - Amps		EM/uP			BE1-851H as BU and 79
Coxsackie	13.8	1074 Ckt.		-	EM			Bitronics for the SCADA portion
Coxsackie	13.8	1076 Ckt.	SCADA/ Charts - kW	<del></del>	EM			
Coxsackie	13.8	Bus 1 (T1+G1)	SCADA					
	13.8	Bus 2	???		EM			Metering data available through relay, b
Coxsackie	13.8		<del>                                     </del>		-		,	
Coxsackie	69	CN Line	None	uP				configured.
Cavasatria	69	NC Line	SCADA	u₽		<del>_   </del>		95P is SEL-587
Coxsackie	69/13.		Charts - Amps	uP/EM				301 13 005 000
Coxsackie								

	<u></u>		Electric Sub	station Upgra	de Needs As	sessment_		
Substation	Voltage Class (KV)	Line/Ckt.	Metering	T. Relaying	- D. Relaying	RTU 2100	Recloser	Comment
	<u> </u>							Siemens meters 485 to RTU Al
Danskammer	<u> </u>		SCADA - Amps	EM				Siemens meters 485 to RTU AJ
Danskammer	115	AC Line	SCADA - Amps	EM				Siemens meters 485 to RTU Al
Danskammer	115	DC Line	SCADA - Amps	υP				Siemens meters 485 to RTU Al
Danskammer	115	DB Line	SCADA - Amps	υP				Signification 405 to PTII Al
Danskammer	115	DR Line		uP				Siemens meters 485 to RTU Al
Danskammer	115	DW Line	SCADA - Amps	EM				Siemens meters 485 to RTU A
Danskammer	115	RS Line	SCADA - Amps	SS				
Danskammer	115	W - 323 8KR	SCADA - Volts	EM				
Danskammer	115	North Bus	SCADA - Volts	EM				
Danskammer	115	Middle Bus	SCADA - Volts	EM				
Danskammer	115	South Bus	SCADA - VOILS	uP				<u> </u>
Danskammer	115	DB-1171 BKR		υP				
Danskammer	115	DR-1421 BKR		υP			****	
Danskammer	115	DW-1061 BKR		EM			****	
Danskammer	115	T5&T6	SCADA	EM		2300	<del></del>	
Dashville				<del></del>	F-10		V4L	Single Phase; Vac; Hydr
Dashville	4	345 Ckt.	- M/V-90		EM			Single Fitase, Fac, cryof
Dashville	6.6	Bus			EM			
Dashville		T1	<b></b>	EM				Fused Transformer w/ CR 67 relay
Dashville		G1-G2	SCADA					<u> </u>
East Fishkill 345kV								
East Fishkill 345kV	345	C9751 Breaker A1 BR		EM				
East Fishkill 345kV	345	C9751 Breaker A2 BR		EM				
				EM		- <del></del>	<del></del>	<del> </del>
East Fishkill 345kV	115	Transformer #1 Alt. 1	SCADA					
East Fishkill 345kV	115	Transformer #1 Alt. 2		EM			*****	<u> </u>
East Fishkill						8890	<u> </u>	
East Fishkill	115	EF Line	SCADA	υP*				95P is MDAR; 95BU is Optimho - Replacing with 311C & D60.
East Fishkill	115	HF Line	SCADA	u₽*				95BU is Optimho - Replacing with D60,
East Fishkill	115	EF-672 BKR		EM				out to optimite inteplating with book
East Fishkill	115	EF-679 BKR		EM				<del></del>
East Fishkill	115	W-640 BKR		ÉM	*****			
East Fishkill	115	T1	SCADA	See EFB				
East Kingston		<del></del>				Orion	· · · · · · · · · · · · · · · · · · ·	<del>-,1,,</del>
East Kingston	13.8	Đus 1	SCADA		υP		<del></del>	<del></del>
East Kingston	13.8	Bus 2	SCADA		UP UP	<del></del>		
				N 10-10-1		<del></del>		
East Kingston	13.8	1021 Ckt.	SCADA		uP		/	
East Kingston	13.8	1022 Ckt.	SCADA		uP .			
East Kingston	13.8	1023 Ckt.	SCADA		uP			
East Kingston	13.8	1024 Ckt.	SCADA		υP			
East Kingston	13.8	1025 Ckt.	SCADA		uP			
East Kingston	13.8	1026 Ckt.	SCADA		υP			
East Kingston	13.8	1027 Ckt.	SCADA		uP			
East Kingston	13.8	1028 Ckt.	SCADA		uP			
East Kingston	115	ER Line	SCADA	₽				
East Kingston	115	LR Line	SCADA	υP				
East Kingston	115	LR-201-ER Breaker		uP				
East Kingston		Com Equipment						Com
	115/13.8		SCADA	υP				
East Kingston				UP UP				
East Kingston	115/13.8	Τ2	SCADA	UP		<del></del>		1
East Park				· · · · · · · · · · · · · · · · · · ·		8890		054.05411
	13.8	6073 Ckt.	SCADA		EM/uP			BE1-851H as BU and 79
East Park					\ EM/uP	*****		BE1-851H as BU and 79
East Park East Park	13.8	6074 Ckt.	SCADA					
East Park	13.8	6074 Ckt. 6075 Ckt.	SCADA SCADA		EM			
								95P is SEL-587

			Electric Subst		<u> </u>			
iubstation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	CISS (KY)					2400		3 phase; oil; electronic; GS not working
ast Walden					EM/uP		ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5041 Ckt.	Grid Sense		EM/uP		ES	GS not working
ast Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
ast Walden	13.8	5043 Ckt.	Grid Sense				<u> </u>	
ast Walden	13.8	Com Equipment			uP			95P is DLP; part of replacement program
ast Walden	13.8	81	SCADA		·———			already.
	115	CW Line	None	Gen1/uP				
ast Walden				EM			<del> </del>	
ast Walden	115	CW -712	None	EM				
ast Walden	115	D Line D-722 BKR		EM				
East Walden	115	DW Line	SCADA	υP				
East Walden	115	DW-1071 BKR		uP		<u> </u>		
East Walden	115	EM Line	SCADA	υP				
East Walden	115	EM-642 BKR		υP				Amps & Volts
East Walden	115	WM Line	SCADA	UP				<u> </u>
East Walden	69	W-644		EM				
East Walden	115	B1		EM				Combine Bus Volts to one point
East Walden	115		SCADA	EM				95P is SEL-587
East Walden	115	82	SCADA	uP/EM				
East Walden	69/13.8	T1	SCADA	EM/uP				95BU is SEL-587
East Walden	69/13.8	Т3	SUADA			D-20		
Fishkill Plains		0004 CH4	MV-90	1	EM/uP			BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90	T	EM			
Fishkill Plains	13.8	8092 Ckt.	\$CADA		uP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8093 Ckt.	SCADA		uP- 200			SEL-251 Relay; 95BU is SEL-501
Fishkill Plains	13.8	8094 Ckt.			υP			
Fishkill Plains	13.8	8095 Ckt.	SCADA		υP			
Fishkill Plains	13.8	8096 Ckt.	SCADA	<u> </u>	<del></del>	<del></del>		95BU is Optimho; part of replacemen
Fishkill Plains	115	HF Line	SCADA	uP/Gen 1				program.
Fishkill Plains	115	HF-703 BKR		EM				<del></del>
Fishkill Plains	115	NF Line	None	EM		****		
Fishkill Plains	115	A Line	SCADA	uP				279/2BFR relays
Fishkill Plains	115	A-1036-FP		uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498		uP- 200				Com
Fishkill Plains	115	Com Equipment FP Line	SCADA	uP/Gen 1				95P is DLP; part of replacement progr already; 95BU is SEL-321
Fishkill Plains					<del>                                     </del>			20003100000000
Fishkill Plains	115	81	SCADA	EM EM	530			
Fishkill Plains	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Fishkill Plains	13.8	₽2			EM			
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	95BU is SEL-587; metering is combin
Fishkill Plains	115/13.8	T2		EM/uP		2300		
Forgebrook			· · · · · · · · · · · · · · · · · · ·					
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM			
Forgebrook	13.8	Bus #2	55.5 7.7.7.7		EM			BE1-851H as BU and 79; No chart d
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8014 Ckt.	Charts - kW		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM/uP			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW	-17-1	EW.			Com
Forgebrook	115	Com Equipment						Coni
Forgebrook	115	FO Line	None	EM				
	115	FO-1430-FT		EM				
Forgebrook			None	EM				
Forgebrook	115			EM				
Forgebrook	115			EM				
Forgebrook	115			uP				
Forgebrook		~ <del></del> .	SCADA		EM			
			None					Amps
Forgebrook	<del> </del>		SCADA		EM_		<del></del>	
Forgebrook	k 13				EM			
Forgebroo	k 13	.8 W-1486			EM		*****	
								Metering combined
Forgebroo				EW			<del>`+</del> -	
Forgebroo	K 115/	13.8 ( 3.1	SCADA	EM	1			

200-2

120

Substation	Voltage  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8  13.8	2061 Ckt.  2061 Ckt.  2071 Ckt.  W-1155 BKR  T1  B1  B2  5030 Ckt.  5031 Ckt.	Metering  Grid Sense  Grid Sense  Charts - kW/kYAs  SCADA  SCADA	T. Relaying	D. Relaying  EM/up  EM/up	RTU M-4000 	Rectoser PR-560M PR-560M	Comment  3 phase; oil; electronic; 958U is 8E1-851H; GS not working 3 phase; oil; electronic; 958U is 8E1-851H;
Freehold Freehold Freehold Freehold Freehold Freehold Freehold Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	2071 Ckt.  W-1155 BKR  T1  B1  B1  B2  5030 Ckt.  5031 Ckt.	Grid Sense  Charts - kW/kVAr  SCADA  SCADA	fuse	EM/uP		PR-560M	GS not working 3 phase; oil; electronic; 958U is BE1-851H;
Freehold  Freehold  Freehold  Freehold  Freehold  Freehold  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville  Galeville	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	2071 Ckt.  W-1155 BKR  T1  B1  B1  B2  5030 Ckt.  5031 Ckt.	Grid Sense  Charts - kW/kVAr  SCADA  SCADA	fuse	EM/uP		PR-560M	GS not working 3 phase; oil; electronic; 958U is BE1-851H;
Freehold Freehold Freehold Freehold Freehold Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	2071 Ckt.  W-1155 BKR  T1  B1  B1  B2  5030 Ckt.  5031 Ckt.	Charts - kW/kVAr SCADA SCADA	fuse				3 phase; oil; electronic; 958U is BE1-851H;
Freehold Freehold Freehold Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13,8 13,8 13,8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	W-1155 BKR T1 B1 B2 5030 Ckt. 5031 Ckt.	Charts - kW/kVAr SCADA SCADA	fuse				GS not working
Freehold Freehold Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	T1 81 81 82 5030 Ckt. 5031 Ckt.	SCADA	<del></del>			PR-560M	3 phase; oil; electronic
Freehold Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8 13.8 13.8	81 82 5030 Ckt. 5031 Ckt.	SCADA			****		
Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8 13.8	B1 B2 5030 Ckt. 5031 Ckt.			EM	Orion .		
Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8 13.8	82 5030 Ckt. 5031 Ckt.				Unon .		
Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8 13.8	5030 Ckt. 5031 Ckt.	SCADA		uP uP			
Gateville Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8 13.8	5031 Ckt.			uP			
Galeville Galeville Galeville Galeville Galeville Galeville Galeville	13.8 13.8		SCADA		uP			
Galeville Galeville Galeville Galeville Galeville	13.8		SCADA		UP UP			
Galeville Galeville Galeville Galeville		5032 Ckt.	SCADA					
Galeville Galeville Galeville		5033 Ckt.	SCADA		υP			
Galeville Galeville	13.8	5034 Ckt.	SCADA		uP			<u></u>
Galeville	13.8	5035 Ckt.	SCADA		υP			
		Com Equipment			****			Com
	69	MG Line	SCADA	υP	4			
	69	MG-200-MK BKR		υP				
Galeville	69	MK Line	SCADA	υP				
Galeville	69/13.8	T1	SCADA	υP				
Galeville	69/13.8	Т2	SCADA	UP				
Greenfield Rd.					<u></u>	M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP	111 4000	ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP		ES	
Greenfield Rd.	4	375-376 Ckt.	Charts - kW		EM	<del> </del>	<del> </del>	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	4	377-378 Ckt.	Charts - kW		EM		ļ	<del>_</del>
Greenfield Rd.	13.8	W-1608	0,16,13 - 7,11		EM			
Greenfield Rd.	13.8/4	T2	Charts - kW		EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8	B1	SCADA				*****	
Greenfield Rd.	4	81	SCADA		******	*****	****	Volts
Greenfield Rd.	4	B3	SCADA		*****			Volts
Grimley Rd.			30808		mana to	NONE-Soon to		Volts
Grimley Rd.	4	385 Ckt.	Grid Sense		EM	*****	Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4	386 Ckt.	Grid Sense		EM		1,3,0,0	No DATA
Hibernia					<del>-  </del>	Micro 1C	1	122017
Hibernia	13.8	7011 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	7012 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	B1	SCADA		EM/gP			95BU is DFP-100
Hibernia	69/13.8	T1	SCADA	EM/uP			*****	95BU is DFP-100
Hibernia	13.8	Com Equipment						Com
High Falls					- 1	D-20	-	
High Falls	13.8	3021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3022 Ckt.	SCADA		uP- 200/ uP	****		95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3023 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3025 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	69	HK Line	SCADA		υP			95P is DLP
High Falls	69	HK-696-P BKR.			uP- 200			SEL-279
High Falls	69	P Line	SCADA		uP			95P is DLP
High Falls	13.8	W-998 BKR.	SCADA		uP - 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	B1	SCADA		uP/ uP - 200			95BU is SEL-251
	13.8	B2	SCADA		uPI uP- 200			95BU is SEL-251
HIGH Falls	13.8	Com Equipment						95P is \$R-745 & 95BU is \$EL-587; Volts
High Falls High Falls	69/13.8	T1	SCADA	υP				95P is SR-745 & 95BU is SEL-587; Volts
High Falls High Falls High Falls						1		ACD 1. OD TAE B GEDIT IS SET ESTI VAIN

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			Electric Subs	tation Up	Needs Ass	sessment	1	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Ciass (KV)					2300		95BU is BE1-IPS-100
Highland			SCADA		EM/uP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA		EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			
Highland	13.8	5083 Ckt. 5084 Ckt.	SCADA		uP			
Highland	13.8	5084 Ckt.	SCADA		υP			
Highland	13.8		SCADA	υP				
Highland	115	HR Line OR Line	SCADA	UP				
Highland	115	OR-761-HR BKR.		EM	EM			
Highland Highland	13.8	B1	SCADA	ļ	UP UP			
Highland	13.8	82	SCADA					Com
Highland	13.8	Com Equipment		7.544				958U is SEL-587
Highland	115/13.8	T1	SCADA	υP/EM				
Highland	115/13.8	T2	SCADA	uP		D-20	<del>                                     </del>	d
Honk Falls						D-20	WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA		EW		945	J pridoc, ou, cross-
Honk Falls	13.8	B1	SCADA	EM				79 Relay is EM
Honk Falls	69	GM Line	SCADA	EM/uP				75 (tela) 15 Em
Honk Falls	69	HG Line	SCADA	uP				79 Relay is EM
Honk Falls	69	HK Line	SCADA	uP/EM				13 Relay IS EM
Honk Falls	69	MK Line	SCADA	υP				79 Relay is EM
Honk Falls	69	WH Line	SCADA	uP/EM			*****	79 Relay IS 2M
Honk Falls	69	overall diff B1+T1	SCADA	EM			*****	<del></del>
Honk Falls	69/13.8	T1		fuse				<u> </u>
Hunter	T	T				N-4000	1/2 22	2 6
Hunter	34.5	Z-666					VR-3S	3 phase; vac; hyd
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase; oil; hyd
Hunter	13.8	Cap Bank			EM		4	<u> </u>
Hurley Ave. 345kV		1				2400		-
Hurley Ave. 345kV	345	30151 BKR.	****	EM				79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		υP		****	*****	<u> </u>
Hurley Ave. 345kV	345	30152 A2 BF	As a second	EM		<u></u>		<u> </u>
Hurley Ave. 345kV	345	301 Line A1	SCADA	uP		<u> </u>		
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				
Hurley Ave. 345kV	345	30353 BKR.	*****	EM*				79 Relay is EM; In process replacement wit SEL_451
Hurley Ave. 345kV	345	30353 A1 BF		up				
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement wit SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM				
Hurley Ave. 345kV	345	30354 A2 BF	wedne	EM*				In process replacement with GE C70
Hurley Ave. 345kV		303 Line A1	SCADA	uP				
Hurley Ave. 345kV	345	303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV		Bus A1		EM		*****		
Hurley Ave. 345kV		Bus A2	*****	EM				
Hurley Ave. 345kV		A2451 BKR.		EM		****		
Hurley Ave, 345kV		A2451 A1 BF		EM			*****	
Hurley Ave. 345kV		A2451 A2 BF	****	EM		*****		
Hurley Ave. 345kV		T1 A1 Out of Step	*****	EM				
Hurley Ave. 345kV		T1 A2 Out of Step		EM				<del></del>
Hurley Ave. 345kV	345	T1 A1		EM				<del></del>
			i	M3				
Hurley Ave. 345k\	√ \ 345	T1 A2	4			<del></del>		
		71 LS 81	SCADA	uP				Volts

			Electric Subst	anni ahaio	OC NOONO NO			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Marie Area	,,,,,					2400		BE1-851H as BU and 79
Hurley Ave.	13.8	2091 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2092 Ckt.	Charts - Amps	*****	EM/uP			BE1-851H as BU and 79
Hurley Ave.	13.8	2093 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Hurley Ave. Hurley Ave.	13.8	2094 Ckt.	Charts - Amps		CMITOF			
Hurley Ave.	115	Cap Bank		EM		*****		
Hurley Ave.	115	HP Line	SCADA	EM	<u> </u>			Quadramho part of the package; metering
	69	l line	SCADA	Gen1				Amp value only
Hurley Ave.			SCADA	EM				a destate and the package; metering
Hurley Ave.	115	OR Line						Quadramho part of the package; metering  Amp value only
Hurley Ave.	69	SB Line	SCADA	Gen1				Amp value only
	115	HP-1643 BKR.		EM				
Hurley Ave. Hurley Ave.	115	OR-1640 BKR.		EM				
Hurley Ave.	69	W-142 BKR.		uP			ļ	
Hurley Ave.	13.8	W-1575 BKR.			EM	****	ļ	<del> </del>
Hurley Ave.	115	W-389 BKR.		EM				<u> </u>
Hurley Ave.	115	B1	None	EM				
Hurley Ave.	115	B2	SCADA	EM				Volts
Hurley Ave.	69	B1	SCADA	EM	Auto			Volts
Hurley Ave.	13.8	81	SCADA		EM			Volts
Hurley Ave.	115/69	Т3	SCADA	€M			Ţ	
Hurley Ave.	115/13.9	T4	SCADA	EM				
Hurley Ave.	69/13.8	T5		EM				
inwood Ave.		·				3030		
Inwood Ave.	13.8	6061 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6062 Ckt.	SCADA	*****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6063 Ckt.	SCADA		EM/oP			BE1-IPS100 as BU and 79
Inwood Ave.	13.8	6064 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.	13.8	6065 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6066 Ckt.	SCADA		uP			
Inwood Ave.	13.8	6067 Ckt.	SCADA		υP			
Inwood Ave.	13.8	6068 Ckt.	SCADA		υP			
inwood Ave.	13.8	Com Equipment			**-**			Com
Inwood Ave.	115	IR Line	SCADA	υP				
Inwood Ave.	115	IR-201-X BKR		υP				
Inwood Ave.	115	X Line	SCADA	· uP				
	13.8	B1	SCADA		uP			<del></del>
Inwood Ave.	13.8	82	SCADA		υP			
Inwood Ave.	115/13.8	T1	SCADA	υP	**			
Inwood Ave.	115/13.8	Τ2	SCADA	υP		10.4000		
Jansen Ave. Jansen Ave.	130	1001 011	807 00		] · · · · · · · · · · · · · · · · · · ·	M-4000		
Jansen Ave. Jansen Ave.	13.8	1001 Ckt. 1002 Ckt.	MV-90 MV-90		UP EM			· · · · · · · · · · · · · · · · · · ·
				*****				
Jansen Ave. Jansen Ave.	13.8	1003 Ckt. 1004 Ckt.	MV-90 MV-90		uP EM			
Jansen Ave.	13.8	KL Line	MV-90		EM			
Jansen Ave.	13.8	KO Line	MV-90		EM			<u> </u>
Jansen Ave.	13.8	B1	SCADA		EM			
Jansen Ave.	13.8	B2	SCADA		EM		- 10-410-5	
Jansen Ave.	13.8	Com Equipment	SCADA	<del></del>				Com
Jansen Ave.	13.8	T - Grounding	MV-90		υP			, , , , , , , , , , , , , , , , , , , ,
Kerhonkson		, c. ounding	10.4.00	· · · · · · · · · · · · · · · · · · ·		8890		
Kerhonkson	13.8	3081 Ckt.	Grid Sense	-1	EM		Kyle D	Single phase; oil; hyd; No GS Dat:
Kerhonkson	13.8	3082 Ckt.	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Dat
	69	MK-929 MOS		EM				
Kerhonkson		MK-930 MOS	*****	EM				
Kerhonkson	69		1	fuse				Amps for each Transformer
Kerhonkson	69/13.8		Charts - kW/kVAr /GS					701100 101 00011 1701013
Kerhonkson	69/13.8			fuse				Volts & Amps
Kerhonkson	69	HK	SCADA					
(Common)	69	MK	SCADA					Volts & Amps

			Electric Substa	illou eba.				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						2100	*****	Not sure if charts were removed
Knapps Corners	13,8	8021 Ckt.	Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners	13.8	8022 Ckt.	Charts - Amps		EM/UP UP/EM			Not sure if charts were removed
Knapps Corners Knapps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		EM/uP			BE1-851H as BU and 79
Chapps Corners	13.6	8024 Ckt.	Charts - kW		EM			
Chapps Corners	13.8	8025 Ckt.	Charts - kW					Com
Cnapps Corners	13.8	Com Equipment	None	EM				SEL-279
Knapps Corners	115	KB Line KB-1558-MC BKR.		uP- 200		******		
Knapps Corners Knapps Corners	115	SK Line	SCADA	<u>uP</u>				Amps
Knapps Comers	13.8	KN Line	SCADA*	M3 M3				Amps
Knapps Corners	13.8	KR Line	SCADA*	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				
Knapps Corners	69	KM Line TR Line	SCADA	EM				
Knapps Corners	69	G Line	SCADA	υP				
Knapps Corners	69	W-1215 BKR.			EM			
Knapps Corners	13.8	W-1409 BKR.		uΡ				
Knapps Corners	13.8	W-1462 BKR.			EM			
Knapps Corners Knapps Corners	13.8	B1			EM		****	Combine Bug Volta to and paint
Knapps Corners	13.8	82	SCADA	****	EM			Combine Bus Volts to one point
Knapps Corners	13.8	B3			EM			Volts
Knapps Corners	69	69k Bus	SCADA	EM				
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		EM		·		
Knapps Corners	115/69	T2	SCADA	υP		M-4000		
Lawrenceville		2205 014	Grid Sense	EM/uP		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	CXE-400A	3 phase; oil; hyd
Lawrenceville Lawrenceville	34.5	2385 Ckt. B1	SCADA*					Volts
Lawrenceville	69/34.5	T1	MV90/Grid Sense/SCADA	EM				Amps.
Lincoln Park	00/04.0	<u> </u>				2300		
Lincoln Park	13.8	Com Equipment			,,,,,,,		Aured	Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps	****	EM		V-4P4	
Lincoln Park	13.8	2012 Ckt.	Charts - kW	*****	EM		· · · · · · · · · · · · · · · · · · ·	DE4 05411 - DI4 4 70
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2014 Ckt	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2015 Ckt. 2016 Ckt.	Charts - kW Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM		H1-	
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1			EM		****	
Lincoln Park.	13.8	Cap Bank 2			EM			
Lincoln Park	115	HP Line	None	EM				Relay Replacement Progam in proce
Lincoln Park	115	HP-1318 BKR.		EM				1 2000
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				Amps to SCADA
Lincoln Park	115_	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uP	EM			<del> </del>
Lincoln Park	13.8	W -1321 BKR. W-45 BKR.			EW			
Lincoln Park Lincoln Park	13.8	W-534 BKR.			EM			
Lincoln Park	13.8	W-554 BKR.			EM			<u> </u>
Lincoln Park	13.8	WT-206 BKR.			E₩			
Lincoln Park	13.8	WT-207 BKR.	*****		EM			
Lincoln Park	13.8	WT-525 BKR.	•1		EM.			<del></del>
Lincoln Park	13.8	WT-528 BKR.			EM			Outline Bury Valle to and acid
Lincoln Park	13.8	B1	SCADA		EM EM			Combine Bus Volts to one poin
Lincoln Park						<del></del>		Volts
Lincoln Park			SCADA		EM			
			None		EM			Volts
			SCADA	EM				
Lincoln Park				E BO		1		Combine load value
Lincoln Park			20101	EM		<del></del>		
Lincoln Park	k 115/1	3.8 T1	SCADA	EM		****	*****	

			Electric Subs	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	7. Relaying	D. Relaying	RTU	Recloser	Comment
· .	Class (K)					2400		BE1-851H as BU and 79
Manchester		<u></u>			EM/uP			
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6092 Ckt.	MV-90		EM/uP			BE1-851H as 8U and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6094 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.	MV-90		EM			
Manchester	13.8	6096 Ckt.	MV-90		EM			
Manchester	13.8	6097 CKI.	MV-90					Com
Manchester	13.8	Com Equipment		<del></del>				95BU is REL-301; part of replacement
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA	UP	EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EW			
Manchester	13.8	W-650 BKR.			EM			
Manchester	13.8	B1	SCADA					Combine Bus Volts to one point
Manchester	13.8	82			EM	Ļ		<del> </del>
Manchester	115/13.8	T1	SCADA	EM				Combine load value
Manchester	115/13.8	т2		EM		0000		7777
Marlboro	T					8890		
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Mariboro	13.8	5003 Ckt.	SCADA		EM/u₽	****		BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP			
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		υP			Volts
Mariboro	115/13.8	T1	SCADA	uP/EM*	****	1		95P is SEL-587
Marlboro	115/13.8	T2	SCADA	υP				30. 000200
Maryland Ave.						M-4000		
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			
Maryland Ave.	4	622 Ckt.	Charts - kW		EM			
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Ckt.	Charts - kW		EM		*	·
Maryland Ave.	13.8	MS Line			EM			
Maryland Ave.	13.8	PH-284 BKR.			EM			<u></u>
Maryland Ave.	13.8	PH-286 BKR.			EM	<del></del>		
Maryland Ave.	4	W-1032 BKR.			EM			····
Maryland Ave.	Δ	W-1033 BKR.			EM		<del> </del>	**
Maryland Ave.	4	W-1034 BKR.	A # 10 April		EM			
Maryland Ave.	13.8	B1	SCADA		EM			Volts
Maryland Ave.	13.8	82	SCADA		EM			Volts
Maryland Ave.	4	81			EM			<del></del>
Maryland Ave.	4	B2	SCADA		EM	**-*-		Volts
Maryland Ave.	13.8/4	T1			EM			<del></del>
Maryland Ave.	13.8/4	T2		*	EM	*****		1
Maybrook	1	· · · · · · · · · · · · · · · · · · ·				M-4000	1	
Maybrook	13.8	5051 Ckt.	MV-90		EM		RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	MV-90		uP			Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90		EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Maybrook	13.8	82	SCADA					Volts
Maybrook	69/13.8	T1	None					
Maybrook	69/13.8	T2	None					
	05/75.0	1,2	ivone			NONE		
McKinley St.	<del></del>	DAE CU	MV-90		EM			
McKinley St.	4	845 Ckt.	MA - 20	<del></del>				

			Electric Subs	Ration obdia	8 (40000) 140	T		
ubstation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	0.000					BM		
Aerritt Park					uP			
Rerritt Park	13.8	8061 Ckt.	SCADA		υP			
erritt Park	13.8	8062 Ckt.	SCADA		uР			<del>, , , , , , , , , , , , , , , , , , , </del>
erritt Park	13.8	8063 Ckt.	SCADA	ļ	υP			
	13.8	8064 Ckt.	SCADA		UP			
lerritt Park		8065 Ckt.	SCADA			<del></del>		
ferritt Park	13.8	8066 Ckt.	SCADA		υP	<del></del>		
lerritt Park	13.8	8067 Ckt.	SCADA		uP			
Rerritt Park	13.8	8068 Ckt.	SCADA		uP			Com
Merritt Park	13.8							
Aerritt Park	13.8	Com Equipment	SCADA	υP				
Werritt Park	115	WF Line	SCADA	UP				SEL-279
Merritt Park	115	WP Line		uP-200				SEL-2/9
Merritt Park	115	WF-439-WP BKR.			uP			
Vierritt Park	13.8	B1	SCADA			<del></del>		
	13.8	B2	SCADA		uP			
Merritt Park	115/13.8	<u>T1</u>	SCADA	uP				
Merritt Park			SCADA	UP				
Merritt Park	115/13.8	T2	JUAUA			ВМ		
Milan	<u> </u>			-r	uP			
Milan	13.8	7061 Ckt.	SCADA		uP		7	
Milan	13.8	7062 Ckt.	SCADA				*****	Com
Milan	13.8	Com Equipment						
Milan	115	B-4561 Ckt Sw		uP				
	115	MR Line	SCADA	uP				
Milan		MR-501 BKR.	SCADA	υP				
Milan	115			uP				·
Milan	115	RT-7 BKR.		uP				
Milan	115	R-10 BKR.						
Milan	115	T-7 Line	SCADA	υP		<del></del>		
Milan	115	10 Line	SCADA		uР			
Milan	115	B1	SCADA	υ¢		· <del></del>		
Milan	13.8	B1	SCADA		υP			
	115/13.8	Ti	SCADA	υP				
Milan	115/13.6	11	3CADA_			L&N	<del>                                     </del>	<del></del>
Millerton			20101	1	EM		*****	1
Millerton	13.8	7081 Ckt.	SCADA					1
Millerton	69	GE-823 MOS		EM				Only one feeder; T1 = 7081 load
Millerton	69/13.8	T1	SCADA	EM				
Millerton	69	Line to SMI	SCADA					Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV	<del></del>					BM		
	13.8	81	SCADA		υP			
Modena 115kV			SCADA		υP			T
Modena 115kV	13.8	C-1651 BKR.			UP			
Modena 115kV	13.8	5011 Ckt.	\$CADA				****	
Modena 115kV	13.8	5012 Ckt.	SCADA		uP			<del> </del>
Modena 115kV	13.8	5013 Ckt.	SCADA		uР			<del></del>
Modena 115kV	13.8	Com Equipment						Com
Modena 115kV	115	EM Line	SCADA	υP				
Modena 115kV	115	EM-201-PX BKR.		υP				<u> </u>
	115	PX Line	SCADA	₩P				<u> </u>
Modena 115kV			SCADA	υP				Only has one 13.8 bus; T3 = Bus lo
Modena 115kV	115/13.8	T3	SUAUA	1 05		8890	<del></del> -	
Modena 69kV						6030		volts
Modena 69kV	69	B1	SCADA	EM				10/10
Modena 69kV	69	MG Line	SCADA	uР				
Modena 69kV	69	W-941 BKR.		EM				
Modena 69kV	69	MG-380 BKR.		EM				
			SCADA	EM/uP				
Modena 69kV	115/69			Fuse/uP				GE F35 is installed
Modena 69kV	69/13.	72	None	Fuseior		NONE		
						- NONE	V4L	Single phase; Vac; Hyd
Montgomery	4	571 Ckt.	Charts - kW		EM	*****	V4L	Single phase; Vac; Hyd
Montgomery					EM.			

			Electric Subs	tation Upgra	ige Needs 42	2622HLCH		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RŤU	Recloser	Comment
	Class (KV)					NI-4000		volts
ontgomery St.	<u> </u>		SCADA		EM			Volts
ontgomery St.	13.8	B1 B2	SCADA	****	EM			volts
ontgomery St.	13.8	B3	SCADA		EM			
ontgomery St.	13.8	B Line	None		EM			
ontgomery St.	13.8	4001 Ckt.	Charts - kW/kVAr		EM			
ontgomery St.	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
ontgomery St.	13.8	4003 Ckt.	Charts - kW/kVAr		EM EM			
ontgomery St.	4	401 Ckt.	Charts - kW demand		EM			
iontgomery St.	4	402-3 Ckt.	Charts - kW demand Charts - kW demand	·	EM			
ontgomery St.	4 4	404 Ckt. 406A/B Ckt.	Charts - kW demand		EM			
ontgomery St.	4 +	407A/B Ckt.	Charts - kW demand		EM			
ontgomery St.	4	410A/8 Ckt.	Charts - kW demand		EM			
ontgomery St.	4	81	SCADA		EM			Volts
ontgomery St.	4	B2	SCADA		EM		****	volts
ontgomery St.	13.8	F Line	None		EM			
ontgomery St.	13.8	NB Line	None		EM		*****	
Iontgomery St.	13.8	NM Line	None		EM			<u></u>
Aontgomery St.	13.8	R Line	None		EM			
fontgomery St.	13.8	W-507 BKR.			EM			
Montgomery St.	13.8	W-508 BKR.			EM		····	
Montgomery St.	13.8	W-509 BKR.	****	*****	EM			
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1 T2	Charts - kW/kVAr		EM			Combine load value
Montgomery St. Myers Corners	13.6/4	32			EMI	44-550	<del> </del>	
Myers Corners	13.8	8041 Ckt.	Charts - kW	7	uP		<del> </del>	
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM			·
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8046 Ckt.	SCADA		UP		*	
Myers Corners	69	KM Line	None	EM				······································
Myers Corners	69	TV Line	None	EM				
Myers Corners	69	TV-399-KM BKR.		EM				
Myers Corners	13.8	W-63 BKR.	*****	****	EM			
Myers Corners	13.8	W-66 BKR.			EM			·
Myers Corners Myers Corners	13.8	Feeder M1-75 Feeder M2-76	*****	*****	EM			
Myers Corners	13.8	Feeder M3-91			EM EM			
Myers Corners	13.8	Feeder M4-90			EM			
Myers Corners	13.8	B1			EM			
Myers Corners	13.8	B2	SCADA		EM	7774		Combine Bus Volts to one point
Myers Corners	69/13.8	T1	ECADA.	EM				
Myers Corners	69/13.8	T2	SCADA	EM				Combine load value
Neversink						2200		
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense		EM.		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM			2.14.44	Amps
Neversink Neversink	69	WH Line W-1128 BKR.	SCADA*	EM	EM		*****	Amps
Neversink	69	69k Bus	SCADA	uP/EM				Volts
New Baltimore	1		· · · · · · · · · · · · · · · · · · ·	4		2300		
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			κW
New Baltimore		1082 Ckt.	\$CADA*		EM			kW
New Baltimore		1083 Ckt.	SCADA*		EM			kW
New Baltimore		Cap Bank		EM/uP				Com
		Com Equipment					****	Com
New Baltimore		CN Line	None	υP				
New Baltimor				υP				1
New Baltimor		NW Line	None	<del></del>	EM			Volts
New Baltimo	re   13.8	B1	SCADA	EM/:+D		<del></del>	<del></del>	95P is SEL-587
1	re 69/13.	8 71	SCADA					

					Needs As	socemon?		
			Electric Subs	station Ups	Neeus As	<u> </u>		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)			<u> </u>		NONE		N- DATA
New Windsor					EM	•		No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	463 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	464 Ckt.	Grid Sense		υP			
New Windsor	13.8	UN & UW ATC	None		υP			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kVAr		UP			
New Windsor	13.8/4	Т2			1	D-20		
North Catskill					uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.	SCADA		uP-200/ uP	•		95P is SEL-251
North Catskill	13.8	2003A Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA		uP-200/ uP			95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA	*****	uP-200/ uP			95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA		+			Com
North Catskill	13.8	Com Equipment				<del> </del>		
North Catskill	115	2 Line	SCADA	EM				
North Catskill	115	R-2 BKR	-10-5	EM				
North Catskill	115	RT-7 BKR.		EM			•	
	115	T-7 Line	SCADA*	EM				Amps
North Catskill	69	Cap Bank		EM				
North Catskill		<del></del>	SCADA	uР				
North Catskill	69	CL Line H Line	SCADA	uP				
North Catskill	69		SCADA	ыP	*****			
North Catskill	69	NC Line W-1107 BKR.	SCADA	EM/uP*	<del> </del>			` check on TD-5
North Catskill	69	W-269 BKR.		EM/uP*			†	check on TD-5
North Catskill	69		,	uP- 200		<del></del>		SEL-2BFR
North Catskill	115	W-791 BKR.			EM			IJS
North Catskill	69	W-269 & W-1107 BKR			<del></del>	<del></del>		
North Catskill	115	B1	SCADA	EM	****	ļ		Volts
North Catskill	69	B1	SCADA	EM/uP				Volts
North Catskill	69	B2	SCADA	EM/uP	*****			Volts
North Catskill	13.8	B1	SCADA		EM/uP			Volts; 95BU is DFP-100
North Catskill	13.8	B2	SCADA	4=	EM/uP			Volts; 95BU is DFP-100
North Catskill	115/69	T4	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	77	SCADA	EM/uP				95BU is DFP-100

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			Electric Subs	tation Upgra	de Needs As	sessment		The state of the s
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
North Chelsea	<del> </del>							
	13.8	8051 Ckt.	SCADA		UP _			
North Chelsea	13.8	8052 Ckt.	SCADA		uP			
North Chelsea	13.8	8053 Ckt.	SCADA		υP			
North Chelsea		8054 Ckt.	SCADA		uP ,			
North Chelsea	13.8		SCADA		υP			
North Chelsea	13.8	8055 Ckt.	SCADA		υP			
North Chelsea	13.8	8056 Ckt. 8057 Ckt.	SCADA		uP			
North Cheisea	13.8	8057 Ckt.	SCADA		uP			Com
North Cheises	13.8	Com Equipment					<del></del>	
North Chelses	115	AC Line	SCADA	uP				
North Chelsea North Chelsea	115	AC-1086 BKR.		UP				
North Chelsea	115	DC Line	SCADA	υP		,		<u> </u>
North Chelsea	115	DC-1414 BKR.		υP		*****		
North Chelsea	115	FO-1482 BKR.		UP.				
	115	FO Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.	SCADA	υP				
North Chelsea				υP		<del></del>		
North Chelsea	115	SC Line	SCADA				<del>                                     </del>	
North Chelsea	115	SC-1566 BKR.		uP	<del>                                       </del>	<del> </del>	<del></del>	
North Chelsea	69	TV Line	SCADA	υP		<u> </u>	<u> </u>	
North Chelsea	115	B-2651 BKR.	****	uP		*****	*****	
North Chelsea	115	B-2652 BKR.	2.4.4	υP	**			
North Chelsea	115	B-2653 BKR.	44141	υP				
North Chelsea	115	W-1572 BKR.	*****	υP				
North Chelsea	115	B1	SCADA	υP				
North Chelses	13.8	B1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP		<del></del>	<del></del>
North Chelsea	115/69	71	SCADA	υP			<del></del>	<u></u>
North Chelsea	115/13.8	T2	SCADA	uP uP				<del></del>
North Chelsea	115/13.8	†3 †3	SCADA	UP				
Ohioville	775715.0	11	GCADA	<u> </u>		2400		Volls
Ohioville	42.0	5021 Ckt.	Objects Acres	<del></del>	ENTL-D	2100	<del>-</del>	
	13.8	·	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5022 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/qP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA	<u> </u>	υP			
Ohioville	13.8	Com Equipment						Com
Ohioville	115	Cap Bank		EM				
Ohioville	69	O Line	None	υP				
Ohioville	69	OB Line	None	υP				
Ohioville	115	QR Line	None	EM	*****			
Ohioville	115	OR-1075 BKR.		EM				
Ohioville	115	PX Line	SCADA	EM/uP			~~~~	
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				
Ohiovitte	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM				Volts
Ohioville	69	69k Bus	SCADA	EM				Volts
		B1		CAI	EM			VOIS
Ohioville	13.8		None				<del></del>	<del></del>
Ohioville	13.8	B2	None		EM			
	115/13.8	T1	50454	EM				Combine load value
Ohioville			- SCAUA					
Ohioville Ohioville	115/13.8		SCADA SCADA	EM/uP-200				95BU is SEL-251

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			Electric Sub	station Upgra	Te Needs AS	sessmem		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2300	Recloser	Comment
	<u> </u>							Grid owns Line
Pleasant Valley		8 Line	\$CADA**	uP				
Pleasant Valley	115	10 Line	SCADA	UP				Grid owns Line
Pleasant Valley	115	12 Line	SCADA**	UP				Grid owns Line
Pleasant Valley		13 Line	SCADA**	uP				95BU is Optimho; in replacement plan
Pleasant Valley	115	C Line	SCADA	EM/Gen-1				
Pleasant Valley	115	M Line	SCADA	EM				
Pleasant Valley	115	X Line	SCADA	UP				Com
Pleasant Valley	115	Com Equipment				****		SEL-279
Pleasant Valley	115	R-12 BKR.		ut- 200				SEL-279
Pleasant Valley	115	R-13 BKR.		uP- 200		<del> </del>		\$EL-279
Pleasant Valley	115	R-8 BKR.		uP- 200	<del> </del>			
Pleasant Valley	115	RC-6 BKR.		EM				
Pleasant Valley	115	RM BKR.		EM		<del> </del>		
Pleasant Valley	115	RX-4 BKR.		υP	****		<del></del>	Con Ed owns the Bkr
Pleasant Valley		R-61 BKR.	SCADA**	EM				Con Ed owns the Bkr
Pleasant Valley	115	R-62 BKR.	SCADA**	EM .		<u> </u>		CONTENTION
Pleasant Valley	115	R-643 BKR.		EM				
Pleasant Valley	115			EM			****	
Pleasant Valley	115	R-81 BKR.	SCADA	EM				Volts
Pleasant Valley	115	81	SCADA	EM				Volts
Pleasant Valley	115	B2	SCADA*	uP				kW
Pleasant Valley	69	E Line	SCADA*	UP				kW
Pleasant Valley	69	G Line		uР	<del></del>	· · · · · · · · · · · · · · · · · · ·		kW
Pleasant Valley	69	Q Line	SCADA*	uP				Volts
Pleasant Valley	69	81	SCADA	UP	EM			
Pleasant Valley	13.8	W-387						Con Ed owns bank and protection
Pleasant Valley	345/115	S1	SCADA		<del></del>		<del></del>	
Pleasant Valley	115/69	T10	SCADA	EM		D-20	<del> </del>	
Pulvers Corners							1/41	single phase; vac; hyd
Pulvers Corners	13.8	7091 Ckt.	SCADA		EM		V4L	
Pulvers Corners	13.8	7092 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd
Pulvers Corners	34.5	7395 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd
Pulvers Comers	13.8	Com Equipment			****			Com
Pulvers Corners	69	Cap Bank	*****	EM				Votte
Pulvers Corners	69	B1	SCADA		*****			Volts Volts
Pulvers Corners	34.5	B1	SCADA				****	
Pulvers Corners		B1	SCADA					Volts
Pulvers Corners		T1	SCADA	Fuse				
Pulvers Corners		Τ2	None	EM/uP		,		95P is SR-745

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Comment				Electric Subs	tation Upgra	ide Needs As	sessment		
Reynolds Hill	Substation		Line/Ckt.				RTU		Comment
Reynolds Hill   13.8   6001 CH   Charts - KW   P   P   P   P   P   P   P   P   P		<del></del>					2100		
Reynolds Hill		<del></del>		Charle WW		EM			
19.5   6000 CRL   Charts - WY						υP			
Reynolds Hill						EM			
Permidde Hill		<del></del>				υP			
Reynolds Hill					****				Com
Remotes Hill   115									
Reymolds Hill 115 NR.1255 BYR.						<del></del>			
Symples Hill									
Reynolds Hill   13.8   R Line   SCADA   UP				SCADA	υP			!	
Reynolds Hill   13.8   8 Cable   SCADA				SCADA	υP	J	****		
Reynolds Hill   13.8   PC Gable   SCADA   UP		13.8	B Cable	SCADA				<del></del>	
Reynolds Hill   13.8   PD Cable   SCADA     UP			W Cable	SCADA				<del> </del>	
Reynolds Hill   13.8			PD Cable	SCADA		<u> </u>			
Reynolds Hill   13.8			PH Line	SCADA		υP	***		
Reynolds Hill   13.8		13.8	PK Line	SCADA	*****	uP			
Reynolds Hill   13.8						uP			
Reynolds Hill			PQ Line	SCADA		υP			
Reynolds Hill						υP			
Reynolds Hill		13.8	PU Cable	SCADA		υĖ			
Reynolds Hill				<del> · · · · · · · · ·</del>	EM			1	<del></del>
Reynolds Hill   115   B2   SCADA   EM				SCADA				<del></del>	
Reynolds Hill   13.8   81   958U is SEL-501					<del></del>	†	+		
Reynolds Hill   13.8   B2   SCADA   UP	··							<del></del>	
Reynolds Hill   13.8   B3   SCADA				SCADA			<del> </del>		
Reynolds Hill				SCADA		<del></del>	<del></del>	<del></del>	
Reynolds Hill							·	<del></del>	Volts
Reynolds Hill	Reynolds Hill			·····			·	<del></del>	
Rhinebeck	Reynolds Hill	115/13.8				-	<del></del>	+	
Rhinebeck   13.8   7051 Ckt.   Charts - Amps     EM	Rhinebeck			33,25	<u> </u>		+ <del></del>		95P is SEL-351A
Rhinebeck	Rhinebeck	13.8	7051 Ckt.	Charte , kW/SCADA	T	0001 5	<del></del>		
Rhinebeck	Rhinebeck	13.8							95P is SEL-251, 95BU is SEL-501
Rhinebeck   13.8   7054 Ckt.   Charts - Amps	Rhinebeck				<del> </del>		<del></del>	10	
Rhinebeck   13.8   7055 Ckt   Charts - kW					<del></del>				
Rhinebeck   13.8   7056 Ckt   SCADA   UP-200/ UP   SPP is SEL-251; 958U is SEL-501					· · · · · · · · · · · · · · · · · · ·		*****		
Rhinebeck   G9									BE1-851H as BU and 79
Rhinebeck   69					<del></del>				95P is SEL-251; 95BU is SEL-501
Rhinebeck			<u></u>		<del></del>				
Rhinebeck   115	<del></del>					<u> </u>			
Rhinebeck									Amps
Rhinebeck   69   Q-1471 BKR.     EM									
Rhinebeck   13.8   W-1017 BKR.								-44.14	
Rhinebeck   13.8   W-1238 BKR     EM     Volts   EM     EM     EM     Volts   EM       EM     EM     EM     EM     EM     EM									
Rhinebeck   69   W-258 BKR     EM     Combine Bus Volts to one point Rhinebeck   13.8   B2   none     EM     EM     Combine Bus Volts to one point Rhinebeck   69   69kV Bus   SCADA     EM     Volts     Volts     EM     Amps & Volts   Rhinebeck   69/13.8   T1   SCADA   EM       Amps & Volts     Amps & Volts     Amps & Volts     Amps & Volts     EM       Amps & Volts       Amps & Volts     EM       Amps & Volts								* <b>-</b>	
Rhinebeck   13.8   W.367 BKR.   EM						EM			
Rhinebeck   69									
Rhinebeck									
Rhinebeck				····	<del></del>				Volts
Rhinebeck         69         69kV Bus         SCADA									·, · · · · · · · · · · · · · · · · · ·
Rhinebeck         69/13.8         T1         SCADA*         EM									Comoine ous voits to one point
Rhinebeck         69/13.8         T2         SCADA?         EM          Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM								*****	Volts
Rhinebeck         69/13.8         T2         SCADA*         EM           Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM						**			
Rninebeck 115/3.8 14 SCADA EM								*****	
Rhinebeck 115/69 T3 SCADA EM									
	Rhinebeck	115/69	T3	) SCADA	EM				

( )	· · · · · · · · · · · · · · · · · · ·		Electric Subst	ation Up.	Needs As	sessment		
			Electic annace	acton ops				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
5 3 7 3 4 E W								
Rock Tavern 345kV	345	311 Line A1	SCADA	υP				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV   Rock Tavern 345kV	345	3456 BKR.		EM				
Rock Tavern 345kV	345	3456 BF A1		UP				
Rock Tavern 345kV	345	3456 BF A2		UP I				
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345kV	345	Cap Bank 1 A2	SCADA*	EM _				
Rock Tavern 345kV	345	Cap Bank 2 A1	<del> </del>	EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	UP			****	
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.	1	uP				
Rock Tavern 345kV	345	37751 BF A1		EM		*****		
Rock Tavern 345kV	345	37751 BF A2		EM				· · · · · · · · · · · · · · · · · · ·
Rock Tavern 345kV	345	37752 BKR.		UP P			*****	
Rock Tavern 345kV	345	37752 BF A1						
Rock Tavern 345kV	345	37752 BF A2		EM				· · · · · · · · · · · · · · · · · · ·
Rock Tavern 345kV	345	377 Line A1	SCADA	uP				
Rock Tavern 345kV	345	377 Line A2		EM				
Rock Tavern 345kV	345	4255 BKR.		EM				
Rock Tavern 345kV	345	4255 BF A1		EM				
Rock Tavern 345kV	345	4255 BF A2		EM				<del></del>
Rock Tavern 345kV	345	42 Line A1		SS		<del></del>		
Rock Tavern 345kV	345	42 Line A2		EM				
Rock Tavern 345kV	345	C3351 BKR.		EM				
Rock Tavern 345kV	345	C3351 BF A1		EM		1		
Rock Tavern 345kV	345	C3351 BF A2		EM		*****		
Rock Tavern 345kV	345	C3352 BKR.		EM				
Rock Tavern 345kV	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM			*****	
Rock Tavern 345kV	345	C3353 BKR.		uP- 200	**		<u> </u>	
Rock Tavern 345kV	345	C3353 BF A1		υP				
Rock Tavern 345kV	345	C3353 BF A2		uP			*****	<u> </u>
Rock Tavern 345kV	345	31153 BKR.		EM				· · · · · · · · · · · · · · · · · · ·
Rock Tavern 345kV	345	31153 BF A1		υP				<u> </u>
Rock Tavern 345kV	345	31153 BF A2		υP				
Rock Tavern 345kV	345	31154 BKR.		EM				
Rock Tavern 345kV	345	31154 BF A1		EM	<u> </u>			
Rock Tavern 345kV	345	31154 BF A2		EM				
Rock Tavern 345kV		Com Equipment						Com
Rock Tavern 345kV		B1 A1	*	EM				<u> </u>
Rock Tavern 345kV		B1 A2	*****	EM				
Rock Tavern 345kV		B2 A1		EM		*****		
Rock Tavern 345kV		B2 A2		EM.				
Rock Tavern 345kV		T1 A1	SCADA	EM				
Rock Tavern 345kV		T1 A2		EM			·	<u> </u>
Rock Tavern 345kV		T3 A1	SCADA	υP				
Rock Tavern 345kV	345/115	T3 A2	1 3757	υP				

´			Flantin Cul	station Up.	, Needs As	sessment		
			Flectlic and	Station ob.	1000000		·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KT)					2400	<del>1</del>	
Sand Dock	<u> </u>		Charts - kW		EM			
Sand Dock	13.8	6011 Ckt.	CHARTO		EW			
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3	SCADA		EM			
Sand Dock	13.8	GB Line KC-1447-SC BKR.	3020	EM				
Sand Dock	115 115	KC Line	None	EM				
Sand Dock	115	SC Line	None	υP				
Sand Dock	13.8	SH-886 BKR			EM			<u> </u>
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock		TW-902 BKR			EM			
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8				EM			
Sand Dock	13.8	TW-910 BKR.	*		EM		*****	
Sand Dock	13.8	W-116 BKR.			EM			
Sand Dock	13.8	W-1449 BKR.			EM	7		
Sand Dock	13.8	W-1453 BKR.			EM			
Sand Dock	13.8	W-1467 BKR.					+	
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4				<del></del>	<del></del>	
Sand Dock	13.8	81			EM			Combine Bus Volts to one point
Sand Dock	13.8	B2	SCADA			1		Sometime substitute for the point
Sand Dock	13.8	B3			EW	*****		
Sand Dock	13.8	84	SCADA		EM			
Sand Dock	13.8	T1	SCADA	EM			*****	Combine load value
Sand Dock	13.8	73		EM		*****		
Sand Dock	13.8	T4	SCADA	EM			*****	
Saugerties						Orion	1	

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			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Shenandoah	<del> </del>	,				2400		
Shenandoah	115	East Bus	SCADA	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	SCADA	EM			,	
Shenandoah	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	B2	3020		EM		*****	
Shenandoah	13.8	<b>B</b> 3	SCADA		EM EM			Combine Bus Volts to one point
Shenandoah	13.8	B4			EM EM			Carabia - Dua Vatta ta ana point
Shenandoah	13.8	B5	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	86			EM.			Combine Bus Volts to one point
Shenandoah	13.8	B7	SCADA		EM			COMMUNE BOS TORIS TO COMPLETE
Shenandoah	13.8	E8 Cap Bank 1			EM			
Shenandoah Shenandoah	13.8	Cap Bank 2	****		EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5	****		EM			
Shenandoah	13.8	Cap Bank 6			EM		****	
Shenandoah	13.8	B-4451 BKR. (CB1)			UP			
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			
Shenandoah	13.8	8072 Ckt.	Charts - kW		EM			
Shenandoah	115	EF Line	None	uP/Gen-1			*****	95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM				
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah	115	FS-892-EF BKR.		EM				
Shenandoah	115	FS-959 BKR.		EM				
Shenandoah	13.8	Feeder S1	None		EM			
Shenandoah	13.8	Feeder S2	None		EM			
Shenandoah Shenandoah	13.8	Feeder S3	None		EM			
Shenandoah	13.8	Feeder S4	None		EM			
Shenandoah	13.8	Feeder S5 Feeder S6	None		EM			
Shenandoah	13.8	Feeder S7	None		EM			<u> </u>
Shenandoah	13.8	Feeder S8	None None		EM	~****		
Shenandoah	13.8	Feeder S9	None		EM			<del> </del>
Shenandoah	13.8	Feeder S10	None		EM EM			
Shenandoah	13.8	Feeder S11	None			<del></del>		<u> </u>
Shenandoah	13.8	Feeder S12	None		EM	*****		<u> </u>
Shenandoah	13.8	Feeder \$13	None		EM			<del> -</del>
Shenandoah	13.8	Feeder S14	None		EM	<del></del>		<del>                                     </del>
Shenandoah	13.8	Feeder S15	None		EM			•
Shenandoah	115/13.8	71		EM				
Shenandoah	115/13.8	T2	SCADA	EM				Combine load value
Shenandoah	115/13.8	Т3	60404	EM				<del> </del>
Shenandoah	115/13.8	T4	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5	. 60404	EM			·	
Shenandoah	115/13.8	T6	SCADA	EM				Combine load value
Shenandoah	115/13.8	<b>T</b> 7	SCADA	EM				
Shenandoah	13.8	W-1266 BKR.	*****		EM			*
Shenandoah	13.8	W-1279 BKR.			EM			
Shenandoah	13.8	W-1450 BKR.			EM		*****	
Shenandoah	13.8	W-1593 BKR.			EM			
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	****		EM			
Shenandoah	13.8	W-802 BKR.			EM			
Shenandoah	13.8	W-803 BKR.			EM			
Shenandoah	13.8	W-805 BKR.			EM			
Shetianiovan	13.8	W-807 BKR.			EM			

			Electric Sub	station Upgra	de Needs As	sessment	i	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Rock Tavern 115kV						44-550		
	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV		115-0,48kV SST		EM				
Rock Tavern 115kV	115	Com Equipment					****	Com
Rock Tavern 115kV	+	D Line	\$CADA*	EM				Amps
Rock Tavern 115kV	115			EM	****			
Rock Tavern 115kV	115	D-448 BKR. J Line	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
		J-788 BKR.		EM				
Rock Tavern 115kV	115 115	RD Line	SCADA*	EM				Amps
Rock Tavern 115kV Rock Tavern 115kV	115	RD-809 BKR.		EM				
Rock Tavern 115kV	115	RJ Line	SCADA*	EM				Amps
Rock Tavern 115kV	115	RJ-818 BKR.		EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM				
Rock Tavern 115kV	115	SL-684 BKR.		EM				
Rock Tavern 115kV	115	W-467 BKR.		υP			*****	
Rock Tavern 115kV	115	W-681 BKR.	****	EM		<u> </u>	****	<del> </del>
Rock Tavern 115kV	115	W-814 BKR.	****	EM/oP		21277		OF1 254
Rock Tavern 115kV	115	WM Line	none	uP				\$EL-351
Rock Tavern 115kV	115/69	T2	SCADA	EM	<del></del>	··		<u> </u>
Roseton Switchyard	113/03	14	SCADA	EN		2400		
Roseton Switchyard	345	30356 (B6) BKR	<del></del>		<del> </del>	2100	ļ	
Roseton Switchyard	345	30356 (B6) BF A1	****	EM				
Roseton Switchyard	345	30356 (B6) BF A2	*-*	EM				
Roseton Switchyard	345			EM			*****	
Roseton Switchyard	345	303 Line A1	SCADA	υP				
Roseton Switchyard	345	303 Line A2		EM				
Roseton Switchyard		30551 (B7) BKR		EM EM				
Roseton Switchyard	345	30551 (B7) BF A1		Ė₩			****	1
Roseton Switchyard	345	30551 (B7) BF A2		E₩	*****			
Roseton Switchyard		30553 (B3) BKR		EM	****			
Roseton Switchyard	345	30553 (B3) BF A1		υP				<del> </del>
Roseton Switchyard	345 345	30553 (B3) BF A2	****	EM			*****	<del> </del>
	<del></del>	305 Line A1	SCADA	uP		*****		<u> </u>
Roseton Switchyard	345	305 Line A2		EM/uP				SEL-501 for DBC
Roseton Switchyard	345	31151 (B1) BKR		EM			3	
Roseton Switchyard		31152 (B1) BF A1		EM				
Roseton Switchyard		31152 (B1) BF A2		EM			<del>                                     </del>	<del> </del>
Roseton Switchyard		31152 (B4) BKR		EM			*****	<del></del>
Roseton Switchyard		31152 (B4) BF A1		EM	*****			<del> </del>
Roseton Switchyard		31152 (B4) BF A2	***	EM				<del></del>
Roseton Switchyard		311 Line A1	50.404	υP	*			<del>- </del>
Roseton Switchyard		311 Line A2	SCADA	EM			<del></del>	<del> </del>
Roseton Switchyard	345	B1	*****	uP				<del> </del>
Roseton Switchyard	345	B2		uP				
Roseton Switchyard	345	U1	SCADA	EM				
Roseton Switchyard		U2	00000			·		· · · · · · · · · · · · · · · · · · ·

			Electric Subs	tation Ups	Needs As	Sessineiii	<del></del>	
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)			_,	<u> </u>	2300		Radio to INW
Smith Street			Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			······································
Smith Street	4	632 Ckt.	Charts - KW		EM			
Smith Street	4	634 Ckt	Charts - kW		EM			
Smith Street	13.8	MS Line	None		EM			
Smith Street Smith Street	13.8	PQ Line	None		EM			
Smith Street	13.8	PS Line	None		EM			
Smith Street	13.8	W Line	None SCADA		EM			Volts
Smith Street	13.8	B1 B2	SCADA		EM			Volts
Smith Street	13.8	B1	SCADA		υP			Volts
Smith Street Smith Street	4	B2	SCADA		uP			
Smith Street	13.8/4		None	***	EM			
Smith Street	13.8/4	Т2	None		EM	8890		·
Smithfield				<del></del>		<del></del>		
Smithfield	13.8	7095 Ckt.	SCADA		uP			Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	EM				Amps
Smithfield	69	GE Line	SCADA* SCADA*	EM			<b></b>	Amps
Smithfield	69	S Line SA Line	SCADA*	EM				Volts & Amps
Smithfield	69	B2	SCADA					Volts
Smithfield Smithfield	69	B3	SCADA					Volts
Smithfield	69/13.8	T1	None*					Only one feeder; T1 = 7095 load
South Cairo	1 03/13/0 [					8890	1	
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps		EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			*****	Com
South Cairo	69	CF Line	None	EM/uP				79 done with NLR
South Cairo	69	CL Line	None	uP				
South Cairo	13.8	B1+G1	Charts - kW/SCADA		EM			SCADA Volts 95P is SEL-587
South Cairo	69/13.8	T1	Charts - Amps	EM/uP		None		33F IS 3EL-367
South Wall St. South Wall St.	4	111 Ckt.	Grid Sense		EM	HOITE	Kyle L	Single Phase; Oil; Hyd
South Wall St.	4	112 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd; missing GS of
South Wall St.	13.8/4	71	Charts - kW/kVAr		EM		*****	
Spackenkill						Orion		
Spackenkill	13.8	6041 Ckt.	SCADA		uР		****	
Spackenkill	13.8	6042 Ckt.	SCADA		υP			
Spackenkill	13.8	6043 Ckt.	SCADA		uР		*****	
Spackenkill	13.8	6044 Ckt.	\$CADA	*****	uP uP			
Spackenkill	13.8	6045 Ckt.	SCADA	*****	υP			
Spackenkill	13.8	6046 Ckt.	SCADA		υP			
Spackenkill	13.8	6047 Ckt. 6048 Ckt.	SCADA SCADA		UP UP			
Spackenkill Spackenkill	13.8	Com Equipment	JOADA			*****		~ 1
Spackenkill	13.8	KR Line	\$CADA		uP			
Spackenkili	13.8	KS Line	SCADA	****	υP			
Spackenkill	13.8	MC Line	SCADA		uP			
Spackenkill	13.8	MC-200-SK BKR.	ŞCADA		υP			
Spackenkill	13.8	B1	SCADA		uP			
Spackenkill	13.8	B2			uP			
	115/13.8		SCADA	u₽			<del></del>	
Spackenkill	115/13.8			υP				
Spackenkill	113/13.0					BM		
Staatsburg		70.44 Cb+	SCADA		uР			
Staatsburg	13.8	7041 Ckt.			uР			
Staatsburg	13.8	7042 Ckt.	SCADA		uP			
Staatsburg	13.8	7043 Ckt.	SCADA					
		Com Equipment		*****				
Staatshirn	1 13.8	Out Edablina						
Staatsburg Staatsburg	13.8	B1	SCADA		qu			

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			Electric Subs	tation Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	<u> </u>					M~4000	<u> </u>	Single phase; vac; hyd
Standfordville	1 T	7071 Ckt.	MV-90		EM		V4L	Single phase, vac, nyo
Standfordville	13.8	7072 Ckt.	MV-90	**-**	EM	****		Volts
Standfordville	13.8	7072 CKI.	SCADA					
Standfordville	13.8		MV-90	Fuse				
Standfordville	69/13.8			·		2100		n i i i i i i i i i i i i i i i i i i i
Sturgeon Pool	<del>↓</del> ~	244 614	Grid Sense		EM	*****	Kyle W	3 phase; oil; hyd; missing data
Sturgeon Pool	4	341 Ckt.	Grid Sense					Com
Sturgeon Pool	69	N Line	SCADA	uP				
Sturgeon Pool Sturgeon Pool	69	O Line	SCADA	uP				
Sturgeon Pool	69	P Line	SCADA	uP				V-li-
Sturgeon Pool	69	69k Bus	SCADA	EM				Volts
Sturgeon Pool		T5	None	Fuse				
Sugarloaf						44-500		
Sugarloaf	115	SD Line	SCADA	EM		+	*****	Combine load value
Sugarloaf	115	SJ Line	SCAUA	EM				
Sugarloaf	115	SL Line	None	EM				
Sugarloaf	115	B1	SCADA	EM				Volts
Sugarloaf	115/69	O & R Transformer	SCADA	EM				
Tinkertown	113/63	O & R Transformer		<u> </u>	<del></del>	2300	<del>                                     </del>	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	υP		**-**	11001010111
Tinkertown	13.8	7023 Ckt.	SCADA		UP UP	7		
Tinkertown	13.8	7023 Ckt.	SCADA		uP		<del></del>	<u> </u>
Tinkertown	13.8	7025 Ckt.	SCADA		uP	<del>+</del>		
Tinkertown	13.8	7023 CAL.	SCADA		UP			
Tinkertown	13.8	B2	SCADA			4-4	<del></del>	Volts
Tinkertown	13.8	Com Equipment			υP			Volts
Tinkertown	69/13.8	T1			*****			Com
Tinkertown	69/13.8	T2	SCADA	Fuse		*****		
Tioronda	03/13.8	12	SCADA	Fuse	*****			
Tioronda	13.8	8085 Ckt.		<u></u>		M-4000		
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Tioronda	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda		W-566 Ckt. Sw		EM				Agastat
	13.8	B1	SCADA		EM			Volts
Tioronda	115/13.8		Charts - kW/kVAr	EM				
Todd Hill		1				2200		~ ····
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
Todd Hill	13.8	6052 Ckt.	SCADA		υP			
Todd Hill	13.8	6053 Ckt.	SCADA	*****	υP			1 .
Todd Hill	13.8	6054 Ckt.	SCADA		υP			T
Todd Hill	13.8	6055 Ckt.	SCADA		EM			
Todd Hill	13.8	6056 Ckt.	SCADA		EM			
Todd Hill	13.8	6057 Ckt.	SCADA		EM	*****		
Todd Hill	13.8	Com Equipment	****					Com
Todd Hill	115	A Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	115	A-520-C BKR.		EM				Too to optimio, in replacement plan
Todd Hill	115	Cline	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	13.8	W - 524 BKR.	11778		EM			
Todd Hill	115	B1	SCADA					Volts
Todd Hill	13.8	81	SCADA		EM/uP		-	95BU is SEL-351A; Volts
Todd Hill	13.8	B2	SCADA		UP			Volts
Todd Hill	115/13.8		SCADA	EM/uP				95P is SEL-587
Todd Hill	115/13.8		SCADA	uP				30F 18 3CL-301

785

			Electric Subs	tation Ut	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	5.665 ()					2200		Volts
Union Ave	115	81	SCADA	υP				70.03
Union Ave	115	RJ Line	SCADA	EM				SEL-351A for BF
Union Ave	115	RJ-52 BKR.		EM/uP				
Union Ave	115	UB Line	SCADA	up				
Union Ave	115	UB-51 BKR		uP				Amps
Union Ave	115	UN Line	SCADA*	EM EM				Amps
Union Ave	115	UW Line	SCADA*	EM			*****	
Union Ave	115	W-1095 BKR. 81		****	UP			
Union Ave Union Ave	13.8	B2			υP			Volts
Union Ave	13.8	B3	SCADA		uP			Volts
Union Ave	13.8	B4	SCADA		uP			4 OitS
Union Ave	13.8	B3-B2			uP	*****		
Union Ave	13.8	84-61			UP CM/-D			BE1-851H as BU and 79
Union Ave	13.8	4041 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4042 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4043 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4045 Ckt.	MV-90	44400	EM/uP			BE1-851H as BU and 79
Union Ave	13.8	4046 Ckt.	MV-90		EM/uP			BE 1-03 IN as BU allO 19
Union Ave	13.8	4047 Ckt.	SCADA	<del> </del>	uP uP	<del></del>		
Union Ave	13.8	4051 Ckt.	SCADA		שר			
Union Ave	13.8	4052 Ckt.	SCADA SCADA		uP			
Union Ave	13.8	4053 Ckt. 4054 Ckt.	SCADA		υP			
Union Ave Union Ave	13.8	4055 Ckt.	SCADA		uP			
Union Ave	13.8	Com Equipment						Com
Union Ave	115/13.8	T1	SCADA	EM/uP				95BU is SEL-387E
Union Ave	115/13.8	Т2	SCADA	EM/uP			*****	95BU is SEL-387E
Union Ave	115/13.8	T3	SCADA	uP				
Van Wagner	Ì					NONE		
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd
Van Wagner	4	732 Ckt.	Charts - kW/GS			*****	Kyle L	Single phase; oil; hyd
Vinegar Hill		<del>,,,,</del>	····			M-4000		
Vinegar Hill	34.5	2389 Ckt.	MV-90	-A	uP	*	RVE	3 phase; oil; hyd
West Balmville						2300		
West Balmville	115	B2	SCADA	EM	<del></del>		*****	Volts
West Balmville West Balmville	13.8	B1 B2	SCADA		uP uP		<u> </u>	Combine Bus Volts to one point
West Balmville	115	B Line	SCADA	uP				<del>                                     </del>
West Balmville	13.8	4011 Ckt.	MV-90	ur	EM			
West Balmville	13.8	4012 Ckt	SCADA		uP			MV-90 still?
West Balmville	13.8	4013 Ckt.	SCADA		uP			MV-90 still?
West Balmville	13.8	4014 Ckt.	SCADA		uP			MV-90 still?
West Balmville	13.8	4015 Ckt.	MV-90		EM			
West Balmville	13.8	Com Equipment	****				*****	Com
West Balmville	115	DB Line	SCADA	υP				
West Balmville	115	DB-875 BKR.		υP			*****	
West Balmville	115	DW Line	SCADA	uP				
West Balmville	115	DW-662 BKR.		uP	re-work -	*****		
West Balmville West Balmville	115	FLine	SCADA	UP			*****	<del></del>
West Balmville	115	R Line W-478 BKR.	SCADA	υP υP				
West Balmville	115	W-855 BKR.	*****	uP				<u> </u>
		WN Line	SCADA	uP				
West Balmville	115		SCAUA	EM		****		Cambina hand water
West Balmville		T1 T2	SCADA	EM				Combine load value
West Balmville								

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			Clectur ann	station Upgra			T	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Refaying	RTU	Recloser	Comment
						BM	<u> </u>	
Westerlo	ļ. <u></u>	1091 Ckt.	SCADA		uP .			
Westerlo	13.8		SCADA		UP			
Westerlo	13.8	1092 Ckt.	SCADA		uP			
Westerlo	13.8	1093 Ckt.	SCADA		υP			
Westerlo	13.8	B1	SCAUA			****		
Westerlo		Com Equipment		uP		****		Only has one 13.8 bus; T1 = Bus load
Westerlo	69/13.8	T1	SCADA	υP				
Westerlo	69	Cap Bank	SCADA	UP				
Westerlo	69	FW Line NW Line	SCADA	υP		*****		
Westerlo	69	FW-1500-NW BKR.	30,00	uP				
Westerio	69	F44-1300-1444 BKK.				L&N		
Wiccopee		FS Line	None	EM				
Wiccopee	115	WP Line	None	uP				
Wiccopee	115	FS - 1652- WP BKR.	110116	EM				
Wiccopee	115	F1-292 BKR			EM			
Wiccopee		F2-280 BKR			EM		F	
Wiccopee	13.8	W-368 BKR.		*****	EM		****	
Wiccopee	13.8				EM			
Wiccopee	13.8	W-378 BKR.					1	
Wiccopee	13.8	W-632 BKR.			EM			<del> </del>
Wiccopee	13.8	W-636 BKR.			EM			<u> </u>
Wiccopee	13.8	Future (Unit #3)			EM			
Wiccopee	13.8	Future (Unit #9)			EM			
Wiccopee	13.8	, B1		- 50 5	EM			
Wiccopee	13.8	62			EM			
Wiccopee	13.8	Com Equipment			****		*****	Com
Wiccopee	115/13.8	T1	SCADA	EM				
Wiccopee	115/13.8	T2	SCADA	EM				<del> </del>
Woodstock						M-4000	<del>                                     </del>	·
Woodstock	13.8	3011 Ckt.	MV-90		EM		<del></del>	<del></del>
Woodstock	13.8	3012 Ckt.	MV-90		EM			<del></del>
Woodstock	13.8	3013 Ckt.	MV-90		EM	<del></del>		<u> </u>
Woodstock	13.8	3014 Ckt.	MV-90		EM			<del></del>
Woodstock	13.8	B1	SCADA		EM			11-14-
Woodstock	13.8	B2	SCADA		EM	1		Volts
Woodstock	69/13.8	T2+SR Line		EM	-4	7		Volts
Woodstock	69/13.8	T2 + B2	*****	EM		3		<del> </del>
Woodstock	69/13.8	T1	MV-90					<del> </del>
Woodstock	69/13.8	T2	MV-90		+	*****		<del></del>

## Attachment 6

Station   Cost   Dashville   \$190,000     East Walden   \$610,000     Tioronda   \$200,000     Coxsackie   \$130,000     South Cairo   \$160,000     South Cairo   \$160,000     Pleasant Valley   \$360,000     Todd Hill   \$160,000     Sand Dock   \$510,000     Fishkill Plains   \$480,000     South Wall St.   \$84,000     South Wall St.   \$84,000     Forgebrook   \$730,000     Subs   Subs   \$1,060,000     Subs   Su			<del></del>
2012 East Walden \$610,000 Tioronda \$200,000 Coxsackie \$130,000 South Cairo \$160,000 East Park \$200,000 Pleasant Valley \$360,000 Todd Hill \$160,000 Sand Dock \$510,000 Fishkill Plains \$480,000 South Wall St. \$84,000 South Wall St. \$84,000 Forgebrook \$730,000 Rock Tavern \$1,060,000		Station	Cost
Tioronda \$200,000 Coxsackie \$130,000 South Cairo \$160,000 East Park \$200,000 Pleasant Valley \$360,000 Todd Hill \$160,000 Sand Dock \$510,000 Fishkill Plains \$480,000 South Wall St. \$84,000 South Wall St. \$84,000 Forgebrook \$730,000 Rock Tavern \$1,060,000		Dashville	\$190,000
Coxsackie \$130,000     South Cairo \$160,000     East Park \$200,000     Pleasant Valley \$360,000     Todd Hill \$160,000     Sand Dock \$510,000     Fishkill Plains \$480,000     South Wall St. \$84,000     South Wall St. \$84,000     Forgebrook \$730,000     Rock Tavern \$1,060,000	2012	East Walden	\$610,000
South Cairo   \$160,000     East Park   \$200,000     Pleasant Valley   \$360,000     Todd Hill   \$160,000     Todd Hill   \$160,000     Sand Dock   \$510,000     Fishkill Plains   \$480,000     South Wall St.   \$84,000     South Wall St.   \$40,000     Forgebrook   \$730,000     Rock Tavern   \$1,060,000		Tioronda	\$200,000
2013 East Park \$200,000 Pleasant Valley \$360,000 Todd Hill \$160,000 Sand Dock \$510,000 Fishkill Plains \$480,000 South Wall St. \$84,000 Manchester \$340,000 Forgebrook \$730,000 Rock Tavern \$1,060,000		Coxsackie	\$130,000
Pleasant Valley \$360,000 Todd Hill \$160,000 Sand Dock \$510,000 Fishkill Plains \$480,000 South Wall St. \$84,000 Manchester \$340,000 Forgebrook \$730,000 Rock Tavern \$1,060,000		South Cairo	\$160,000
Todd Hill \$160,000 Sand Dock \$510,000 Fishkill Plains \$480,000 South Wall St. \$84,000 Manchester \$340,000 Forgebrook \$730,000 Rock Tavern \$1,060,000	2013	East Park	\$200,000
Sand Dock   \$510,000     Fishkill Plains   \$480,000     South Wall St.   \$84,000     Manchester   \$340,000     Forgebrook   \$730,000     Rock Tavern   \$1,060,000		Pleasant Valley	\$360,000
2014 Fishkill Plains \$480,000 South Wall St. \$84,000  2015 Manchester \$340,000 Forgebrook \$730,000  2016 Rock Tavern \$1,060,000	·	Todd Hill	\$160,000
South Wall St. \$84,000  2015		Sand Dock	\$510,000
2015 Manchester \$340,000 Forgebrook \$730,000 2016 Rock Tavern \$1,060,000	2014	Fishkill Plains	\$480,000
Forgebrook \$730,000  2016 Rock Tavern \$1,060,000		South Wall St.	\$84,000
Forgebrook \$730,000 2016 Rock Tavern \$1,060,000	2015	Manchester	\$340,000
7	2013	Forgebrook	\$730,000
	2016	Rock Tavern	\$1,060,000
Subs			
Subs			
	Sans		





## **Budget Submittal Form**

Version 3.0 12/9/2022

Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Roseton 345 kV Relay Upgrade Work Order #:

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-98-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2029

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

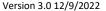
#### Describe the project objective and scope of work:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. This equipment is at the end of its useful life and must be upgraded to current standards.

### Describe specific scope exclusions, assumptions and constraints:

Part of the original ESP Infrastructure Replacement Program that has been broken out into individual projects. All remaining electromechanical relays at Roseton 345 kV Substation will be upgraded to current microprocessor relay standards.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction. See file "SR#2011-07 Substation Relays, Meters, Controls and Communications Infrastructure Oppor.pdf".

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

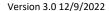
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

## **Budget Submittal Form**





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$4,161,000	TOTAL	Prior Years Actuals +	Year 1	Year 2	Year 3	Year 4	Year 5	Future Years
			Projections	2024	2025	2026	2027	2028	
ADDITIONS	Labor (Weekly Payroll)	391,000	0	0	0	0	11,000	325,000	55,000
	Labor (Monthly Payroll)	195,000	0	0	0	0	5,000	162,000	28,000
	Stock Materials	195,000	0	0	0	0	5,000	162,000	28,000
	Non-Stock Material (A/P taxable)	781,000	0	0	0	0	22,000	649,000	110,000
	Contractors (A/P tax exempt)	274,000	0	0	0	0	8,000	229,000	37,000
	Overheads	1,953,000	0	0	0	0	54,000	1,623,000	276,000
	AFUDC*	117,000	0	0	0	0	3,000	97,000	17,000
	Journal Vouchers (JVs)	0							
	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,906,000	0	0	0	0	108,000	3,247,000	551,000
R E T I R E M E N T S	Labor (Weekly Payroll)	38,000	0	0	0	0	0	8,000	30,000
	Labor (Monthly Payroll)	77,000	0	0	0	0	0	17,000	60,000
	Contractors (A/P tax exempt)	13,000	0	0	0	0	0	3,000	10,000
	Overheads	127,000	0	0	0	0	0	27,000	100,000
	Journal Vouchers (JVs)	0							
	Odivage Official	0							
	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
		255,000	0	0	0	0	0	55,000	200,000
* AFUDC may require adjustment after Finance Department review.									
	Expense \$ (if applicable):								
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

2,912,700 **Maximum (\$):** 5,409,300

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

**Cost Estimate Range:** 

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-07

Mr. P.E. Haering Mr. H.W. Turner Mr. P. Harpolis

Copy to:

1 nuc 54, 2011

Mr. J.J. Borchert

# Re: Substation Relays, Meters, Controls and Communications Infrastructure Opportunities

## L. Introduction:

A variety of equipment exists in Central Hudson substations, including protective relays, meters, reclosers, and controls and communications instruments such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function. Various departments rely on information from these devices in order to perform their jobs, including Operations Services, Customer Services' line forces, Electric System Planning, Distribution Planning, System Operations, Energy Accounting, and Electric System Protection. Brief summaries of these components are included in Attachments I Electric System Protection. Brief summaries of these components are included in Attachments I dentified outdated equipment, detail the benefits of combining functions when replacing identified outdated equipment, establishing a policy for substation relaying, control, & monitoring functions, and laying out a plan to incorporate these components into a comprehensive substation renovation program.

### Eduipment and Functions:

- Relays The relays protect the electric transmission and distribution systems and can provide oscillography, targets, and phasor data. Electric System Protection (ESP) uses the relays to gather information on faults, including fault characteristics, fault locations, and phasor data. ESP interprets the oscillography data and then communicates our conclusions to: System Operations as an information point of contact, 2) Customer Genvices (Line Forces) to aid in fault locating and thereby limiting patrol time and area; 3) ©perations Services for cases where there may be equipment issues.
- Meters The meters provide AC system quantities that are used to operate safely and to plan effectively for future system needs. The Electric Planning & Reliability area uses meter information for day-to-day operations (c.g., switching) and to aid in identifying and addressing locations requiring system reinforcements. System Operations (Sys Ops) uses meter data to monitor and operate the CH transmission system within the ratings of those facilities.
- 3. Centrols and Communications The RTUs, PLCs, and data concentrators provide status feedback and remote control capability; they also act as a cenduit for meter and relay data. Sys Ops relies on the data provided by the RTUs and PLCs to monitor the status of the system from a centralized location, enabling them to respond quickly to system abnormalities. Also, Sys Ops has the ability to perform control operations through the RTUs and PLCs.

### Waste Reduction:

New equipment can be utilized in an integrated fashion to eliminate or minimize the following tasks and unnecessary equipment (Excerpts are taken from the attached memos):

- o Reading chart meters and manually entering data into the Meter Database (MDB).
  - o Chart meters cost CH at least \$275,000 annually in labor expense (1130 manhours), which can be devoted to other work.
- o MV-90 circuits not for revenue or interchange metering purposes.
  - MV-90 circuits from Verizon cost CH approximately \$24,000 annually in expense.
- o Running fault studies manually to determine fault locations.
  - Manual fault locating costs CH approximately \$15,000 annually in labor expenses.
- Metering transducers, auxiliary relays, timing relays, reclosing relays, and coil monitors.

### Supporting the Future State:

New equipment, properly implemented and integrated, will better support current functions and create flexibility for added future functions as follows:

- o Provide continuous metering data for the entire system, eliminating information "gaps" as a result of non-continuous and non-contiguous metering.
- o Provide for robust planning capabilities and switching operations through use of trending and real-time data.
- Enable more accurate forecasting of area loads to increase risk tolerance, possibly resulting in deferral of substation and distribution projects.
- o Offer flexibility for Distribution Automation and Smart Grid initiatives.
- Improve reliability and reduce CAIDI through automated event reporting and fault location.

### II. Current State:

This section describes the mix of equipment by component, system wide, and the limitations of the non-digital devices.

### 1. Relays

There are 3500 active protection relays on the system, excluding LORs, SPRs, Regulator Controls, Recloser Controls, and Communication equipment.

### Attachment 1

Copy to:

Mr. P.E. Haering Mr. H.W. Turner

Mr. P. Harpolis Mr. J. M. May S.R. #2011-03

June 23, 2011

Mr. J.J. Borchert

### Re: Transmission & Distribution Protective Relay Review

### **Introduction:**

Protective Relays represent a vital component for the reliable operation of the Central Hudson Electric Transmission and Distribution Systems. CH substations contain a generational mix of protective relay equipment that differs in capability, ease of use, and reliability. Relay technology has advanced; microprocessor-based (digital) relays not only offer numerous protection functions, but they provide metering capability as well in a compact footprint. This memo summarizes the existing transmission and distribution protective relay equipment, as well as recommendation for replacement options.

### **Discussion:**

Relays perform various functions aimed at timely isolation of faulted areas and rapid restoration once the fault has been cleared. Some of the functions that relays provide include zone distance protection, high-speed pilot protection, overcurrent protection, differential protection, and automatic reclosing.

#### A. Outdated Devices:

The majority of substations contain a group of single-component electromechanical relays for each protected facility; these relays are responsible for protection functions exclusively. At these locations, metering is performed separately, also often in a single-function fashion. There are also stations that have more recent (but still outdated) types of relays, including solid state and early microprocessor relays. These relays have been failing recently, and a replacement program was created last year to address the concern with these relays. The following is a list (in order of decreasing replacement priority) of common relay types found in substations along with the reason that they have been superseded:

- o Electromechanical Relays: These relays are obsolete for the reasons previously described (i.e.; physical size, calibration drift, single-function capabilities, etc).
- o Solid State Relays: Like electromechanical relays, the relays on the CH system typically are single function. They have advanced technologically past the electromechanical relays, but not quite to the level of digital relays. They monitor current and voltage waveforms through analog circuits, which then are compared through potentiometers to user defined settings. They generally are unsupported, spare parts are hard to locate, and they contain components that deteriorate over time.

- o 1<sup>st</sup> Generation Microprocessor Relays: Please see the 2010 Budget Memo, Re: Relay Replacement Program for Upgrade of 1<sup>st</sup> Generation Microprocessor Relays Remaining on the Central Hudson System, dated July 1, 2010, for the existing program.
- O Schweitzer Engineering Laboratories (SEL) 200 Series Relays (SEL-251/267/279/2BFR): These relays are digital, but they make use of early logic processing methods, in which creating settings isn't as user-friendly as in modern digital relays. SEL has discontinued manufacturing parts for most of these relays, and limited service is provided with them.
- o Basler BE1-79M Relays: These relays are multi-shot reclosing relays; they only provide the reclosing function. There are more recently developed relays that provide numerous protection functions and also perform reclosing operations and metering functions.
- Basler BE1-851 (H) Relays: These relays are multifunction, digital relays; however, they only receive current inputs. So, the only meter data available is Amps. Multifunction relays exist that receive current and voltage inputs and provide MW & MVAr data as well as a much larger variety of protection options.

### B. Retrofit/Replacement Options:

Digital relays offer multiple protection functions as well as metering and substation equipment diagnostics. The use of multifunction digital relays greatly reduces the required panel space. Also, with few moving parts, digital relays do not need recalibration to remain accurate. Additionally, digital relays and digital relay controls offer the ability to have longer durations between maintenance cycles due to the combination of their internal error checking and their constantly monitored alarm outputs to SCADA.

Digital relays can be specified to offer equipment diagnostics for the devices they protect. For example, digital transformer relays have the ability to monitor the through-fault history of the transformers and to make determinations on the required maintenance as a result. The same case is true for feeder breakers protected by distribution relays.

O Digital Relays: A collection of proven products exists by a variety of manufacturers. These relays are microprocessor-based, multi-function relays that provide a large variety of protection, metering, and equipment diagnostic capability; they can be used for various protective functions. Some manufactures include SEL, GE, and Basler\*. Electric System Design (ESD) has standardized the design to use SEL as primary protection and either GE or Basler relays for backup protection.

<sup>\*</sup> Basler provides a BE1-951 relay, which conveniently fits into electromechanical relay panel cutouts.

### C. Additional Considerations:

- O Data Concentrator (SEL-2032); This relay has 16 ports and can act as a data concentrator, a phone switch, and a basic logic processor. The 2032 connects to the RTU, acting as a slave device; it connects to other digital relays, polling them for meter information as a master. Once in the 2032, the meter data can be mathematically manipulated to maintain integrity and precision before it is transferred to a compatible RTU. The 2032 also is connected to a phone line to provide dial-in remote access for trained personnel, enabling event retrieval and relay interrogation.
- Time Synchronization Devices: Various devices exist on the market that provides a means of time synchronization, including satellite clocks. These clocks provide a unified signal based on a sole source located at zero time offset. To avoid confusion between time zones, UTC time is used as a standard. Sequence of events reconstruction truly realizes the value of having all of the station relays linked to a universal source.

### Conclusions:

Upgrading to digital relays provides the following benefits:

- They offer a more compact footprint and much more capability than their large, single-function predecessors.
- They provide digital metering capability. With proper SCADA infrastructure in place<sup>1</sup>, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB/eDNA with little human intervention.
- The diagnostic capabilities of digital relays should be used to help in the condition assessment of substation equipment.
- They have a proven track record of good quality and high availability, along with excellent manufacturer support for current models.
- They provide oscillography, targets, and phasor data that can be accessed from a remote location through a modem. This capability assists in timely and accurate fault analysis.
- They have lower maintenance costs because they rarely fail and allow for an increased maintenance cycle (i.e. an increase of 50%; from 4 yrs. to 6 yrs.).

Eric A. Loeven

Full integration requires a DMP compatible Remote Terminal Unit described in the "RTU Review" memo.

### **Attachment 2**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-04

June 23, 2011

Mr. J.J. Borchert

### **Re: Substation Metering Review**

### **Introduction:**

Substation metering data is used to plan and operate the Central Hudson Transmission and Distribution Systems. These metering data are necessary for the safe operation of existing facilities as well as the cost effective planning and design of new facilities. Many transmission lines, substation transformers, and distribution circuits have their MW & MVAr flows monitored by the Energy Management System (EMS) and have the resultant data stored in the Meter Data Base (MDB) and Historian (eDNA). Many other circuits either are not metered or utilize local indicating metering, such as graphic charts or drag hands, to register data.

Technology has advanced; there are much more reliable and efficient means of measuring and transmitting metered load data, including by means of digital relays. This memo summarizes the existing meter equipment and the replacement options, as well as provides recommendations on the best option to gain appropriate metering data in the most efficient manner.

### Discussion:

A large number of substations contain transducer-based meters, which register and report their data directly to a Remote Terminal Unit (RTU) by means of an analog signal. A handful of other stations contain chart meters, which provide local indication. In the stations that have chart meters, the metering is often registered in single function fashion, with circuit current measured in Amps and transformer load measured in Kilowatts and Kilovars. The meter data that is most useful for planning and operating the system is provided in the form of Watts and Vars. Additionally, the panel space taken up by the charts can be reduced greatly with the installation of digital relays, which offer protection functions as well as metering functions.

Technological advances have led to multi-function, digital relays with the capability to meter accurately. The digital relays can transfer instantaneously metered values to EMS. Once there, the data is stored in the Historian, integrated, and the peak hourly values are calculated and transferred to the MDB with little human intervention.

### A. Outdated Devices:

The following is a list of common metering methods used in CH substations along with the reason that they have been superseded:

o Chart Meters: Graphic charts monitor single values such as MW, MVAr, or circuit Amps. These charts rely on diligent maintenance practices to ensure that they function

as designed. Many of the charts run out of ink between maintenance cycles or fail mechanically, leaving "gaps" in data. Even the charts that record properly pose difficulty in capturing their data. The process of going to the substations to collect the charts, reviewing the charts and interpreting the data, and entering the data manually into the MDB is time consuming. Due to the cumbersome nature of the process, the charts are only interpreted for the annual system peaks, which leaves 2-4 data points in the MDB for that circuit or station element to use in planning.

- Other Local Indication Metering: Charts are not the only method of local metering. There are also substation Ammeters, Voltmeters, etc. that are remnants of a time when stations were manned and operated manually. Many of these devices are unsupported and have limited parts available.
- o MV-90: An alternative method to metering by charts is to meter through MV-90. MV-90 is a system that uses a recorder to receive metered data directly from the instrument transformers and relies upon a dedicated telephone line to transmit that data to the master station collector; it is used for revenue metering as well as substation metering. Once the master has the data, it is transferred to the MDB. This method requires a dedicated line and the associated expenses.
- o No Metering: Locations exist on the system where there are no methods of capturing load data. Some of these locations rely on grouped metering; they do not provide the granularity of individual circuit load data. At other locations, it hasn't been cost justified to install/repair any metering.
- o Transducers: The transducers are wired directly to secondary AC quantities from current transformers and potential transformers. They convert the input quantities into an analog output signal, which is wired to the analog inputs of an RTU.
- O Load checks: On a heavily loaded day, load checks are performed on circuits without automatic metering by having a worker physically go to a point on a circuit and manually perform a metering check.

### B. Retrofit/Replacement Options:

- Digital Relays: Microprocessor-based relays not only offer protection functions; they provide metering capability as well in a compact footprint. The digital metering data provided by the digital relays is extremely accurate and has the ability to be entered into the MDB through Supervisory Control and Data Acquisition (SCADA) automatically once proper infrastructure is in place. The relays offer the ability to register numerous metering values simultaneously and in comm. format so that individual wires aren't needed for each metered point; rather, a single cable can be used to transmit multiple data points. Also, a separate phone line is not required for this method.
- o Bitronics Power Meters: These meters provide bi-directional Watt and Var meter values as well as Volt and Amp values. They are capable of transmitting data through analog signal or through communication protocol to an RTU. They are cheaper alternatives, but do not provide any protection functions.

O Grid Sense: These are clip-on meters that report to a nearby data concentrator via radio. The data concentrator is linked to a POTs line outside of the station (no need for a Positron). The newest models provide directional Watt and Var metering, and they have the ability to report data in selectable time increments to the meter database. They represent a lower cost option and provide limited fault recording capabilities, but they do not provide protection functions.

### **Conclusions:**

- Reading chart meters takes a great deal of time, and many of the charts are unsupported and are labor intensive to maintain. Data "gaps" exist when using chart meters, and the meters provide only a few, data points to the MDB each year, which need manual entry. The materials to repair and/or replace the charts are in short supply.
- ♦ Digital relays provide digital metering capability. With proper SCADA infrastructure in place, the digital relays can transfer instantaneously metered values to EMS, and ultimately to the MDB with little human intervention.
- ♦ The AC quantities that the digital relays require for protection can be used for metering as well; therefore, there is no need for additional wiring from the instrument transformers to meters. Additionally, transducer equipment, which is susceptible to drift and requires regular maintenance, is no longer needed.
- ♦ The MV-90 system is a fully functional system, and it is an efficient method of collecting meter data in stations that do not have the relay and/or RTU capability to transmit data. MV-90 metering requires a dedicated phone line to transmit the meter data; this reoccurring expense can be eliminated with digital relaying and a proper RTU.
- Grid Sense meters can be installed relatively inexpensively and quickly to provide stopgap metering data until upgrades can be completed. They require a phone line and the monthly expenses associated with the line.

Eric A. Loeven

### Appendix 1: Estimated Costs of Current Methods and Retrofit Options

Current Methods	Ti (Manl	Cost	
A	Field	Eng	TOTAL
MV-90 yearly (per station on average)			\$1,200
Chart Meter maintenance & data retrieval	1	10	\$1,250

Note 1

Note 1: This cost is to retrieve the circular chart, review it, and enter it into the database. This process takes place on a suspected system peak day. At minimum, there are two times a year that this process is performed (Summer Peak and Winter Peak); however, there may be four or more times depending on when the actual peak occurs.

			Tin	ne			Cost		
Retrofit Options			Manh	ours		<u>Par</u>	<u>ts</u>	<u>Labor</u>	TOTAL
		Tech	Elect	Draft	Eng	Device	Test Sw., Steel, etc.	(w/OH)	9 9 9
Grid Sense Meter	W / VAr	•	are for the Line		E and	\$4,775			\$5,700
Data Concentrator	1 for every 4 ckts.	takes	the line	man an	d the	\$2,272			\$2,700
POT Line		10 m	15 minu n data co			\$100			\$110
Labor (including travel time)	per Station	line	ires 20 man tim	ne and	15			\$430	\$430
Site Registration	per D/C	Trav	utes of el to ea	ch site l	has	-waived-			1
TOTAL GS Installation	) 	beer !	n assum hou		e 1				\$9,000
Bitronics (Comm)		40		40	8	\$2,000	\$1,000	\$11,400	\$15,000
Bitronics (HW- W/VAr/V)		40		40	12	\$1,100	\$1,000	\$12,000	\$14,500

### **Attachment 3**

Copy to:

Mr. P.E. Haering

Mr. H.W. Turner Mr. P. Harpolis

Mr. J. M. May Mr. D. J. Dittmann S.R. #2011-05

June 23, 2011

Mr. J.J. Borchert:

### **Re: Remote Terminal Unit Review**

### **Introduction:**

Real-time control and status feedback are vital components of a properly functioning substation. Without someone at the substation 24/7, a means of providing feedback and control operations is required; that means is a Remote Terminal Unit (RTU). This memo will describe the current state of the RTUs on the system, as well as the opportunity areas for retrofits and justification for the upgrades.

### Discussion:

RTUs provide a means of transmitting important data in a substation to a master station via Supervisory Control and Data Acquisition (SCADA). The RTUs collect status and metering data and transmit it to a master station when polled. Also, they perform control operations that are initiated from the master station in a remote location. The RTUs can be dedicated line or dial-up depending on the application. RTUs have evolved with technology; existing CDC RTUs (protocol and provider) have been replaced with new flash ROM RTUs that utilize protocol suites including, but not limited to, CDC and the utility standard, DNP.

### A. Outdated Devices:

- o CDC 44-500 & CDC 88-90: These are different versions of dedicated line RTUs provided by CDC, a company that no longer exists. Retrofits have been performed to eliminate the CDC RTUs on the system because of the inability to get spare parts and due to their incompatibility with the digital relays. These RTUs utilize CDC protocol, which is an outdated protocol incapable of communicating with digital relays/data concentrators and is unable to receive digital metering data. They rely on analog signals and pulse accumulators sent from transducers to transmit meter information.
- o G.E. M-4000: This is a smaller version of the G.E. Harris D20 RTU. It is used mainly in dial-up applications and is polled twice daily for SCADA data. It will report unsolicited if there is a change of status or if a metered point's dead band is exceeded. Based on the frequency that dial-up RTUs are polled, they cannot be used as sources to the meter database. Also, dial-up RTUs are not reliable because they rely on a plain old telephone (POT) line for communication. Due to this lack of reliability, control operations typically are not performed with dial-up RTUs. As a plus, the M-4000 has the capability to communicate through CDC or DNP protocol, and it also can be configured as a dedicated unit.

o G.E. D20: The functionality and hardware of this RTU are consistent with many modern RTUs; however, the configuration software is not user-friendly and uses a complicated, layered architecture. Additionally, with retiring technicians, the available workforce skilled in working with the configuration software is dwindling. This fact is of concern because emergency fixes will take longer to complete.

### B. Retrofit/Replacement Options:

• Telvent Sage 2400¹: Telvent offers an RTU that fits into existing CDC RTU cabinets, and it has peripheral cards that resemble the CDC RTU cards. For these reasons, Telvent is the vendor of choice, providing the most seamless retrofit option. Telvent also offers a protocol suite for communications, including DNP and CDC. The DNP Master protocol allows direct communication with SEL-2020/2030/2032 data concentrators to transfer metering data from numerousdigital relays in a substation.

### C. Additional Considerations:

- Radio linked RTUs: As previously stated, the M-4000 can be polled as a dedicated RTU or as a dial-up unit. If there is a nearby, dedicated RTU, it is sometimes possible to install a radio link between the two stations and poll the M-4000 from the other station. In this configuration, there is access to real-time information and the ability to perform control operations at both stations. The need for the Positron Box at the radio-linked station is eliminated, and there is no extra cost incurred by installing a phone line and a Positron Box. The radio links require a clear line of site from one station to the next in order for the signal to be transmitted clearly. As such, the reliability of the circuits is largely dependent upon the terrain. Radio signals are also susceptible to interference from other mobile devices such as CB Radios.
- Positron Boxes: One major cost associated with RTUs, dedicated or dial-up, is the phone company's requirement of a Positron Box to isolate the outside phone line from the electric substation. This requirement is in place to provide a level of comfort for the phone company technician working in our substations, many of the existing stations have been allowed to function without this isolation in a grandfathered manner. However, any time that RTU retrofits are performed at these stations, the installation of a Positron Box is required. They are an expensive piece of equipment and have long lead times that may impact project schedules. There also is continued reliance on the phone company for maintenance and repairs.

<sup>&</sup>lt;sup>1</sup> Telvent has been chosen as the preferred RTU for retrofits due to ease of configuration/use and the techs' familiarity with the units. All RTU cost estimates in this report are based on using this RTU.

### **Conclusions:**

Upgrading old CDC, M-4000, and D-20 RTUs to Telvent RTUs provides the following benefits:

- ◆ Telvent RTUs are reliable and parts are available readily.
- The Telvent configuration software is user-friendly, making configuration and testing faster.
- ♦ DNP RTUs, of which Telvent is one, can receive communication-based metering & status and transmit it to the SCADA master.
- ♦ The Telvent RTU retrofits for the CDC 44-500's utilize the existing RTU cabinet and high powered tripping relays. The Telvent replaces the equipment susceptible to failure and makes use of the existing equipment that is less prone to failure.
- ♦ Using Telvent RTUs provides timesavings through standardization, and the engineers and technicians alike prefer to work with the Telvent for RTU retrofits.

Consideration also should be given to converting dialup RTUs to dedicated line RTUs. Dialup RTUs rely on POT lines, which have notoriously poor reliability; additional steps and equipment are required to perform the control operations safely. In contrast, dedicated line RTUs offer signal reliability, which provides the ability to perform control operations safely without added equipment and procedure steps.

Eric A. Loeven

### **Attachment 4**

Copy to:

Mr. P.E. Haering Mr. H.W.Turner

Mr. P. Harpolis

Mr. D. J. Dittmann Mr. J. M. May S.R. #2011-06

June 23, 2011

Mr. J.J. Borchert

### Re: Substation Recloser Review

### Introduction:

Substation reclosers provide an alternate method of interrupting fault current on distribution and sub-transmission circuits. They are a convenient way to provide circuit protection in locations where it is not cost effective to install a circuit breaker and associated conduit to a control house. One disadvantage of using a recloser rather than a circuit breaker is that the recloser has reduced interrupting capability.

Recloser technology has advanced; hydraulic, oil-filled devices have given way to vacuum-interrupted, microprocessor-based (digital) recloser controls. This memo summarizes the existing substation recloser equipment, as well as replacement options. Also, this memo provides recommendations on the best retrofit options.

### Discussion:

"An automatic circuit recloser is a self-contained device, which can sense and interrupt fault currents as well as reclose automatically in an attempt to re-energize a line." The existing hydraulic reclosers, a kin to electromechanical relays, have single component capability with limited flexibility in setting pickup curves, very little intelligence, and minimal ability to report feedback. New, digital recloser controls provide a wide range of pickup curves, are self-monitoring, grant instant notification of operations, offer desired metering capabilities, and require less frequent routine maintenance.

#### A. Outdated Devices:

Reclosers were installed in substations as a cost effective alternative to a distribution (15kV) or sub-transmission (34.5kV) circuit breaker combined with a reclosing relay. They can be single-phase or three-phase, be controlled mechanically (hydraulic) or digitally, and they have interrupting mediums of oil or vacuum. They make use of a series of fast and slow curves, providing coordination versatility and protection flexibility. A brief summary of the outdated reclosers on the CH system, specifically the hydraulically controlled type and the oil-interrupted type, is as follows:

o Hydraulically controlled reclosers: These reclosers are self-contained and self-controlled; they have oil or vacuum interrupters. They are outdated due to their

<sup>\*</sup> Page 124. Power Distribution Engineering; Fundamentals and Applications, James J. Burke, 1994.

### C. Additional Considerations:

- Telemetric Interface: The Telemetric RTM II device can be installed to provide status and control of the SEL-651R DNP3 points. These data travel via cellular network and are displayed via a secure web interface. In addition, data travel to a SCADA Xchange server and then over frame relay to our SCADA system.
- R-Mag Circuit Breakers: As the most direct comparison to the substation recloser, these
  circuit breakers are a packaged breaker and relay combination. They are relatively
  inexpensive to install and there is familiarity with them by the techs, electricians, and
  engineers alike. These breakers provide a higher interrupting capability than the
  reclosers.

### **Conclusions:**

Upgrading to vacuum interrupted, digitally controlled Viper reclosers provides the following benefits:

- ♦ Vacuum Interruption
  - The speed of operation on these reclosers is not compromised by temperature.
  - o The maintenance on these reclosers is not as labor-intensive as the oil-filled reclosers. They can operate up to 10,000 times before requiring an overhaul, with only the battery requiring simple in-field replacement in the meantime.

### ♦ Digital Control –

- These recloser controls provide a wide range of pickup curves, which makes coordination easier and much more flexible than the hydraulically controlled reclosers.
- o These recloser controls offer digital metering capability and fault notification. The recloser can transmit its information through SCADA if the proper infrastructure is in place, or through Telemetric in stations with under-developed SCADA infrastructure.
- o These recloser controls can be interrogated to gather oscillography, targets, and phasor data from a remote location through a modem. This capability assists in timely and accurate fault analysis.

Some of the lower cost is lost when the recloser is installed in a substation if it is connected to the RTU in the control house, rather than through the Telemetric Unit. In this case, the added cost of conduit, steel work, and/or foundation needs to be considered. Regardless of the method of reporting to SCADA, installing the recloser in a substation comes with the added costs associated with technician time to commission and test the recloser and digital control over the cost of an installation on a distribution circuit.

Eric A. Loeven

## Appendix 1: Estimated Costs of Retrofit Options

	Cost					
Retrofit Options	Parts	TOTAL				
Viper Reclosers with control relay and PT (on dist circuit)	\$21,000	\$33,500	Note 1			
Viper Reclosers with control relay (in a substation – Telemetric communication)	\$20,500	\$33,000	Note 1			
Viper Reclosers with control relay (in a substation – RTU communication)	\$20,500	\$86,000*	Note 2			
R-Mag Breaker	\$25,000	\$90,000				

Note 1: These represent one-time costs. There are additional annual costs for the SCADA Frame relay and the SCADA X-Change to Telemetric. The SCADA Frame Relay costs \$5200/yr. The SCADA X-Change to Telemetric costs \$2000/yr for 100 devices and \$1500 for each 50 devices after that.

Note 2: This cost is estimated based on proposed work to bring the data through the RTU. No installations exist at this time in this manner.

			Electric Sub	station Upgra	OG MAGOZ WZ	26221116111		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment  Retired as part of P/MK Upgrade
	<del> </del>	361 Ckl.	Charts - kW		EM	NONE	<del></del>	Only has a 13.8 Voltage Regulator
Accord	4		Grid Sense		EM	NONE		Othy has a tolo tollege to
Ancram	13.8	7085 Ckt.	Gra Serise			NONE		
Balmville			MV-90		€M			
Balmville	4	411 Ckt.	MV-90		EM			
Balmville	4	412 Ckt.	WIV-90			C-300		
Barnegat	T			538				Metering source?
Barnegat	115	KB Line	Amps	EM				
Barnegat	115	KC Line	None	EM EM				
Barnegat	115	KB-749-KC BKR		EM				IBM Feeds
Barnegat	115/13.8	T1	SCADA		<del> </del>			IOM r Eeus
Barnegat	115/13.8	T2	SCADA	EM				
Barnegat	· 13.8	S1	SCADA		EM			IBM Feeds
Barnegat	13.8	52	SCADA		EM			
Barnegat	13.8	\$1-706 BKR	SCADA		EM	*****	*****	IBM Feeds
Barnegat	13.8	S2-734 BKR	SCADA		EM			
Beacon	<del>                                     </del>					D-20		
Beacon	13.8	8006 Ckt.	SCADA		EM			1
					EM		T	Previously 8087A?
Beacon	13.8	8015 Ckt.	SCADA			<del> </del>	<del></del>	Treviously overAt
Beacon	4	801 Gkt.	SCADA		EM			
Beacon	4	802 Ckt.	SCADA		EM.			
Beacon	4	803 Ckt.	SCADA		EM			
Beacon	4	W-414 BKR	SCADA		EM			
Beacon	4	W-463 BKR	SCADA		EM			
Beacon	4	Bus 1	SCADA					
Beacon	4	Bus 2	SCADA		- <del></del>		<del></del>	
Beacon	13.8/4	T1			====			
			SCADA		EM			MDB has an entry with T1+T2 calculate
Beacon	13.8/4	T2	SCADA		EM	hodes		moo has an entry with 11412 cascorate
Beacon	13.8	BF Cable	SCADA		EM			
Beacon	13.8	NM Cable	SCADA		EM		*****	·
Beacon	13.8	CM Cable	SCADA		EM			<del></del>
Beacon	13.8	Bus 1	SCADA		EM	<del></del> -	<del></del>	<del></del>
Beacon	13.8	Bus 2	SCADA		EM			<u> </u>
Bethlehem Rd.								<del></del>
Bethlehem Rd.	13.8	4091 Ckt.	MV-90		EM/uP	2400		· · · · · · · · · · · · · · · · · · ·
Bethlehem Rd.	13.8	4092 Ckt.						BE1-851H as BU and 79
			MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4093 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4094 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Bethlehem Rd.	13.8	4095 Ckt.	MV-90		EM			1 22 20 11 25 25 21 21
Bethlehem Rd.	13.8	4096 Ckt.	MV-90		EM			<del></del>
Bethlehem Rd.	13.8	4097 Ckt.	MV-90		EM		<del> </del>	<del></del>
Bethlehem Rd.	13.8	4098 Ckt.	MV-90					<del>-</del>
Bethlehem Rd.	13.8	Bus 1		<del></del>	EM		****	
Bethlehem Rd.		<del></del>	EMS		EM			
Bethlehem Rd.	13.8	Bus 2	EMS		EM.			
	115	RD Line	None	EM				
Bethlehem Rd.	115	UB Line	None	EM	*****			
Bethlehem Rd.	115	RD-604-UB BKR		EM				
Bethlehem Rd.	115/13.8	T1	EMS	EM				
Bethlehem Rd.	115/13.8	T2	EMS	EM				Metering combined '
Bethlehem Rd.	13.8	W-613 BKR			EM			
Bethlehem Rd.	13.8	W-619 BKR			EM			···
Bethlehem Rd.	13.8	W-804 BKR			EM			·- <del> </del>
Bordman Rd.	13.3	1 00-000			CIAI	NONE		<u> </u>
		E0044 CH				NONE		
Bordman Rd.	13.8	6081A Ckt.			EM			
Bordman Rd.	13.8	6082A Ckt.			EM			
Bordman Rd.	13.8	Z-203 Ckt.			EM	****		
				*	EM			
Bordman Rd.		Z-204 Ckt.	<del></del>		EM			
Bordman Rd	13.8	Z-205 Ckt.						
Bordman Rd		Z-206 Ckt.			EM			
		Z-207 Ckt.		****	EM			
Bordman Rd			<del></del>	<del></del>	EM			
Bordman Ro	13.8	Z-208 Ckt.						<del></del>
	3. 13.8				EM			T .

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Coxsackie

			Electric Substa	ation Upgra	GE MEEDS AS	9622IIIGIII		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
						2100		
Boulevard	69	OB Line	SCADA	<u>uP</u>				
Boulevard	69	N Line	SCADA	uP				
Boulevard		1 Line	SCADA	<u>uP</u>				Line Amps & W/VAr
Boulevard	69	KO Line	SCADA		qu			
Boulevard	13.8		SCADA		υP			BE1-851H as BU and 79
Boulevard	13.8	KK Line	SCADA		EM/uP			BE1-851H as BU and 79
Boulevard	13.8	Ckt. 1011 Ckt. 1012	SCADA		EM/uP			<u> </u>
Boulevard	13.8	Çkt. 1013	SCADA		uP			
Boulevard	13.8	Ckt. 1014	SCADA	·	EM/uP	*****		
Boulevard	13.8	Bus 1	SCADA		EM			
Boulevard		Bus 2	SCADA		EM			
Boulevard	13.8		SCADA	EM				
Boulevard	69	Bus 1		EM				
Boulevard	69	Bus 2	SCADA					
Boulevard	69	Overall		EM	<u> </u>			
Boulevard	69/13.8	Ť1	SCADA	EM				Metering combined
	69/13.8	T3	SCADA	E₩				1
Boulevard		T2	SCADA	EM			****	1
Boulevard	69/13.8					M-4000		
Clinton Ave.	<del>                                     </del>	205 Cleb	MV-90		EM		****	
Clinton Ave.	4	395 Ckt.			EM			
Clinton Ave.	4	396 Ckt.	MV-90		EM			
Clinton Ave.	4	397 Ckt.	MV-90		<del></del>			
Clinton Ave.	4	Bus	SCADA		***		<del></del>	<del> </del>
Clinton Ave.	13.8/4	T1	MV-90	****	Fuse			
Cold Spring						NONE		1 - 7 - 7 - 7 - 7 - 7 - 7
Cold Spring	4	871 Ckt.	Charts - kW		EM			Install a Grid Sense Package for two (2
Cold Spring	4	872 Ckt.	Charts - kW		EM			eircuits.
Coldenham						D-20		
Coldenham	13.8	4021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4022 Ckt.	SCADA	*****	uP- 200/ uP			95P is SEL-251
Coldenham	13.8	4023 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
·					uP- 200/ uP	<del></del>	<del></del>	
Coldenham	13.8	4024 Ckt.	SCADA					95P is SEL-251
Coldenham	13.8	4025 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251
Coldenham	13.8	4026 Ckt.	SCADA		uP- 200/ uP		***	95P is SEL-251
Coldenham	13.8	4927 Ckt.	SCADA		υP- 200/ uP			95P is SEL-251
Coldenham	13.8	4028 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
Coldenham	13.8	Bus 1	SCADA		EM		****	
Coldenham	13.8	Bus 2	SCADA		EM		****	<u> </u>
Coldenham	13.8	B1-B2 Tie			EM			
Coldenham	115	J Line	SCADA	Gen 1				95P is DLP; 95BU is REL-301; part of
			SCADA	Gen 1		<b>-</b>		replacement program already.
Coldenham	115	CW Line			<del></del>			
Coldenham	115/13.8	T1	SCADA	EM				
Coldenham	115/13.8	T2	SCADA	EM				
				SS				
Coldenham	115	J-19-CW BKR		<u> </u>				
Coldenham Converse St.						NONE		
Coldenham	4	121 Ckt.	M∨-90		EM	NONE	- up to Aprop	
Coldenham Converse St.		121 Ckt. 122 Ckt.	MV-90 MV-90		EM EM	NONE		
Coldenham Converse St. Converse St.	4	121 Ckt.	M∨-90		EM	NONE	- up to Aprop	
Coldenham Converse St. Converse St. Converse St. Converse St.	4	121 Ckt. 122 Ckt.	MV-90 MV-90		EM EM	NONE		
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place	4 4 4	121 Ckt. 122 Ckt. 123 Ckt.	MV-90 MV-90		EM EM	NONE		
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place	4 4	121 Ckt. 122 Ckt. 123 Ckt. 881 Ckt.	MV-90 MV-90 MV-90		EM EM EM EM	NONE	and the state of t	
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place	4 4 4	121 Ckt. 122 Ckt. 123 Ckt.	MV-90 MV-90		EM EM EM	NONE NONE		
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place	4 4 4	121 Ckt. 122 Ckt. 123 Ckt. 881 Ckt. 882 Ckt.	MV-90 MV-90 MV-90 MV-90		EM EM EM EM EM	NONE		
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie	4 4 4 4 13.8	121 Ckt. 122 Ckt. 123 Ckt. 123 Ckt. 881 Ckt. 882 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90 Charts - Amps	### #### #############################	EM EM EM EM EM	NONE		Bitronics for the SCADA portion
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place	4 4 4	121 Ckt. 122 Ckt. 123 Ckt. 123 Ckt. 881 Ckt. 882 Ckt. 1071 Ckt. 1072 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90 Charts - Amps SCADA/ Charts - kW		EM EM EM EM EM	NONE	######################################	Bitronics for the SCADA portion BE1-851H as BU and 79
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie	4 4 4 4 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt. 123 Ckt. 881 Ckt. 882 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90 MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps		EM EM EM EM EM EM EM EM EM EM EM	NONE	100 Mg	
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie Coxsackie	4 4 4 4 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt. 123 Ckt. 881 Ckt. 882 Ckt. 1071 Ckt. 1072 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90 MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps		EM EM EM EM EM EM EM EM EM	NONE		BE1-851H as BU and 79
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	4 4 4 4 13.8 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt.  881 Ckt. 882 Ckt. 1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90  MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW		EM EM EM EM EM EM EM EM EM EM EM	NONE	100 Mg	BE1-851H as BU and 79
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie Coxsackie	4 4 4 4 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt.  881 Ckt. 882 Ckt.  1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1)	MV-90 MV-90 MV-90 MV-90 MV-90  MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW SCADA/ Charts - kW	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EM EM EM EM EM EM EM EM EM EM EM EM EM E	NONE		BE1-851H as BU and 79 Bitronics for the SCADA portion
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt.  881 Ckt. 882 Ckt. 1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt.	MV-90 MV-90 MV-90 MV-90 MV-90  MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW		EM EM EM EM EM EM EM EM EM	NONE		BE1-851H as BU and 79 Bitronics for the SCADA portion
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Cossackie Coxsackie	13.8 13.8 13.8 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt. 881 Ckt. 882 Ckt. 1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1) Bus 2	MV-90 MV-90 MV-90 MV-90 MV-90  MV-90 Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW SCADA/ Charts - kW	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EM EM EM EM EM EM EM EM EM EM EM EM EM E	NONE		BE1-851H as BU and 79
Coldenham Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Goxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt.  881 Ckt. 882 Ckt.  1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1)	MV-90 MV-90 MV-90 MV-90 MV-90  Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW SCADA/ Charts - kW NORDA/ Charts - kW NORDA/ Charts - kW NORDA/ Charts - kW	uP	EM EM EM EM EM EM EM EM EM EM EM EM EM E	NONE NONE 88890		BE1-851H as BU and 79 Bitronics for the SCADA portion  Metering data available through relay, b configured.
Coldenham Converse St. Converse St. Converse St. Converse St. Converse St. Conway Place Conway Place Conway Place Conway Place Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie Coxsackie	13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	121 Ckt. 122 Ckt. 123 Ckt.  881 Ckt. 882 Ckt.  1071 Ckt. 1072 Ckt. 1074 Ckt. 1076 Ckt. Bus 1 (T1+G1) Bus 2  CN Line NC Line	MV-90 MV-90 MV-90 MV-90 MV-90  Charts - Amps SCADA/ Charts - kW Charts - Amps SCADA/ Charts - kW SCADA/ Charts - kW		EM EM EM EM EM EM EM EM EM EM EM EM EM E	NONE		BE1-851H as BU and 79 Bitronics for the SCADA portion  Metering data available through relay, b

#### Electric Substation Upgrade Needs Assessment Comment Recloser RTU D. Relaying Voltage T. Relaying Metering Line/Ckt. Substation Class (kV) 2100 Siemens meters 485 to RTU AJ Danskammer Siemens meters 485 to RTU AJ ΕM SCADA - Amps 115 AC Line -----**....** Danskammer EM Siemens meters 485 to RTU Al SCADA - Amps DC Line 115 -----Danskammer υP Siemens meters 485 to RTU Al SCADA - Amps 115 DB Line ----Danskammer ---υP Siemens meters 485 to RTU AI SCADA - Amps 115 **DR** Line .... Danskammer uР ----Siemens meters 485 to RTU Al SCADA - Amps DW Line 115 ----------Danskammer EΜ ----RS Line SCADA - Amps 115 Danskammer SS W - 323 8KR 115 Danskammer SCADA - Volts EM North Bus 115 Danskammer -----EM SCADA - Volts Middle Bus Danskammer 115 ----ΕM SCADA - Volts 115 South Bus Danskammer υP ...-**DB-1171 BKR** 115 Danskammer υP DR-1421 BKR 115 Danskammer ----υP 115 DW-1061 BKR ----Danskammer ~~~~ EM SCADA 115 T5&T6 Danskammer 2300 Dashville V4L Single Phase; Vac; Hydr ĔΜ 345 Ckt. MV-90 4 Dashville EM 6.6 Bus Dashville ----Fused Transformer w/ CR 67 relay ΕM --------Dashville T1 SCADA ------------G1-G2 Dashville East Fishkill 345kV C9751 Breaker A1 BR EM .... -----345 -----East Fishkill 345kV C9751 Breaker A2 BR EΜ East Fishkill 345kV 345 --------East Fishkill 345kV Transformer #1 Alt. 1 EM 115 SCADA Transformer #1 Alt. 2 EМ East Fishkill 345kV 115 ..... ----.... East Fishkill 8890 95P is MDAR; 95BU is Optimho - Replacing East Fishkill 115 **EF** Line SCADA υP\* -------with 311C & D60. East Fishkill 115 HF Line SCADA uP\* --------95BU is Optimho - Replacing with D60. East Fishkill 115 EF-672 BKR EΜ -----East Fishkill 115 EF-679 BKR ΕM ----East Fishkill 115 W-640 BKR ÉM East Fishkill 115 T1 SCADA see EFB ----------East Kingston Orion 13.8 Đus 1 SCADA East Kingston υP ---------East Kingston 13.8 Bus 2 SCADA υP -----East Kingston 13.8 1021 Ckt. SCADA υP .... East Kingston 13.8 1022 Ckt. SCADA υP 13.8 1023 Ckt. East Kingston пР SCADA East Kingston 13.8 1024 Ckt. ψP SCADA ----East Kingston 13.8 1025 Ckt. SCADA uΡ East Kingston 13.8 1026 Ckt. SCADA ---υP ----------East Kingston 13.8 1027 Ckt. SCADA uΡ --------East Kingston 13.8 1028 Ckt. SCADA uР East Kingston 115 **ER Line** SCADA υP East Kingston 115 LR Line SCADA υP 115 LR-201-ER Breaker uΡ East Kingston East Kingston Com Com Equipment ..... East Kingston 115/13.8 SCADA υP T1 East Kingston 115/13.8 72 SCADA υP --------8890 East Park EM/uP BE1-851H as BU and 79 East Park 13.8 6073 Ckt. SCADA SCADA -----BE1-851H as BU and 79 East Park 13.8 6074 Ckt. EM/uP ΕM ----6075 Ckt. SCADA 13.8 East Park --------EM Q Line None 69 95P is SEL-587 East Park uP/EM --------SCADA 69/13.8 ₹1 East Park

			Electric Subs	tation up	veeds As			
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
ļ	C1233 (KV)					2400	ES	3 phase; oil; electronic; GS not working
ast Walden			Crid Sanco		EM/UP		ES	3 phase; oil; electronic; GS not working
ast Walden	13.8	5041 Ckt.	Grid Sense Grid Sense		EM/uP			GS not working
East Walden	13.8	5042 Ckt.	Grid Sense		EM			Com
East Walden	13.8	5043 Ckt.	Grid Geriss					
East Walden	13.8	Com Equipment	SCADA		uP		<del>                                     </del>	95P is DLP; part of replacement program
East Walden	13.8	81	30,404	2 46.0				already.
	115	CW Line	None	Gen1/uP	L			
East Walden		CW -712		EM				
East Walden	115	D Line	None	EM				
East Walden	115	D-722 BKR		EM				
East Walden	115 115	DW Line	SCADA	UP				
East Walden	115	DW-1071 BKR		UP		1		
East Walden	115	EM Line	SCADA	UP				
East Walden	115	EM-642 BKR		uP				Amps & Volts
East Walden	69	WM Line	SCADA	uP				
East Walden	115	W-644		EM		<del></del>		D
East Walden	115	B1	SCADA	EM				Combine Bus Volts to one point
East Walden	115	82	SCADA	EM		ļ	<del></del>	95P is SEL-587
East Walden	69/13.8	T1	SCADA	uP/EM				95BU is SEL-587
East Walden	69/13.8	T3	SCADA	EM/uP				3350 is \$500.
East Walden	05113,0	1				D-20		BE1-851H as BU and 79
Fishkill Plains	13.8	8091 Ckt.	MV-90		EM/uP			BE1-031H as BO and 79
Fishkill Plains	13.8	8092 Ckt.	MV-90		EM			
Fishkill Plains	13.8	8093 Ckt.	SCADA		uP- 200			SEL-251 Relay: 95BU is SEL-501
Fishkill Plains Fishkill Plains	13.8	8094 Ckt.	SCADA		uP-200			SEL-251 Relay; 95BU is SEL-501
	13.8	8095 Ckt.	SCADA	****	υP	i		
Fishkill Plains	13.8	8096 Ckt.	SCADA		υP			
Fishkill Plains Fishkill Plains	115	HF Line	SCADA	uP/Gen 1				95BU is Optimho; part of replacement program.
	<del></del>	115 703 5155		EM				
Fishkill Plains	115	HF-703 BKR	None	EM		****		
Fishkill Plains	115	NF Line	None SCADA	υP				
Fishkill Plains	115	A Line	SCADA	uP- 200				279/2BFR relays
Fishkill Plains	115	A-1036-FP		uP- 200				279/2BFR relays
Fishkill Plains	115	A-1498		- di 200				Com
Fishkill Plains Fishkill Plains	115	Com Equipment FP Line	SCADA	uP/Gen 1				95P is DLP; part of replacement programmed already; 95BU is SEL-321
			SCADA	EM			****	
Fishkill Plains	115	81	SCADA		EM			Our bire Bus Valte to one point
Fishkill Plains	13.8	81	SCADA		EM			Combine Bus Volts to one point
Fishkill Plains	13.8	82		EM/uP				osput in CEL 597; metering is combit
Fishkill Plains	115/13.8		SCADA	EM/uP			*****	95BU is SEL-587; metering is combine
Fishkill Plains	115/13.8	T2	<u> </u>	I EM/UF		2300		
Forgebrook	<del></del>	n			EM			
Forgebrook	13.8	Bus #1	Charts - kW/kVAr		EM			
Forgebrook	13.8	Bus #2	Charte Anna		EM/uP		*****	BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8011 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13,8	8012 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8013 Ckt.	Charts - Amps		uP/EM			BE1-851H as BU and 79; No chart of
Forgebrook	13.8	8014 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79; No chart
Forgebrook	13.8	8015 Ckt.	Charts - kW		EM			No Chart Data
Forgebrook	13.8	8016 Ckt.	Charts - kW					Com
Forgebrook	115	Com Equipment	Name -	EM				
Forgebrook	115	FO Line	None	EM				
Forgebrook	115			EM				
Forgebrook	115	FT Line	None					
	115			EM				
Forgebrook				EM				
Forgebrook	11!		SCADA	uР				
Forgebrook	11				EM	====		Amps
Forgebrook		8 CM Line	None		EM			Auba
Forgebrook	<del></del>		SCADA		EM			
				*****	· · · · · · · · · · · · · · · · · · ·		****	<del></del> -
Forgebroo					EM	*****		
	L 1	3.8 W-994						Metering combined
Forgebroo		13.8 T1		EW	l l			L .

200-2

120

			Electric Sub	station Upgra	de Needs As	sessment		T
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	1					M-4000		3 phase; oil; electronic; 958U is BE1-851H;
Freehold	120	2061 Ckt.	Grid Sense		EM/cP		PR-560M	GS not working
Freehold	13.8				EM/uP		PR-560M	3 phase; oil; electronic; 95BU is BE1-851H; GS not working
Freehold	13.8	2071 Ckt.	Grid Sense				PR-560M	3 phase; oil; electronic
Freehold	13.8	W-1155 BKR	Charts - kW/kVAr	fuse				
Freehold	13.8	T1	SCADA	1035	EM			<u> </u>
Freehold	13.8	81	30,20,2			Orion .		T
Galeville Galeville	13.8	B1	SCADA		UP			
Galeville	13.8	82	SCADA		uP			
Galeville	13.8	5030 Ckt.	SCADA		uP		*****	
Galeville	13.8	5031 Ckt.	SCADA		υP	ļ— <del>-</del>		
Galeville	13.8	5032 Ckt.	SCADA		UP			
Galeville	13.8	5033 Ckt.	SCADA		υ <u>Ρ</u>			<del></del>
Galeville	13.8	5034 Ckt.	SCADA		UP UP			<del></del>
Galeville	13.8	5035 Ckt.	SCADA		UP			Com
Galeville		Com Equipment						Com
Galeville	69	MG Line	\$CADA	υP				
Galeville	69	MG-200-MK BKR		υP			••••	
Galeville	69	MK Line	SCADA	υP				
Galeville	69/13.8	Ţ1	SCADA	υ۶				
Galeville	69/13.8	т2	SCADA	ŲΡ	<u> </u>		****	
Greenfield Rd.	<del></del>					M-4000		
Greenfield Rd.	13.8	3076 Ckt.	Grid Sense		EM/uP		ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd.	13.8	3078 Ckt.	Grid Sense		EM/uP	****	ES	3 phase; oil; electronic; 95BU is BE1-851
Greenfield Rd. Greenfield Rd.	4	375-376 Ckt.	Charts - kW		EM	*****		
Greenfield Rd.	13.8	377-378 Ckt.	Charts - kW		EM			
Greenfield Rd.	13.8/4	W-1608 T2	Ch - d - 1201		EM		ES	3 phase; oil; electronic
Greenfield Rd.	13.8	B1	Charts - kW		EW			
Greenfield Rd.	4	81	SCADA SCADA		******	****		Volts
Greenfield Rd.	4	B3	SCADA		*****			Volts
Grimley Rd.		- 03	SCADA			NONE-Soon to		Volts
Grimley Rd.	4	385 Ckt.	Grid Sense		EM		Kyle Ł	Single Phase; Oil; Electronic
Grimley Rd.	4	386 Ckt.	Grid Sense		EM		17,16 2	No DATA
Hibernia			,	<del></del>		Micro 1C		NO DATA
Hibernia	13.8	7011 Ckt.	SCADA		uP- 200/ ∪P			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	7012 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
Hibernia	13.8	B1	SCADA		EM/uP			958U is DFP-100
Hibernia	69/13.8	Τ1	SCADA	EM/uP			*****	958U is DFP-100
Hibernia	13.8	Com Equipment			=			Com
High Falls						D-20		
High Falls	13.8	3021 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3022 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3023 Ckt.	SCADA		υP- 200/ υP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3024 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	3025 Ckt.	SCADA		uP- 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	69	HK Line	SCADA		UP			95P is DLP
High Falls	69	HK-696-P BKR.			uP- 200			SEL-279
High Falls	69	P Line	SCADA		uP	*****		95P is DLP
High Falls	13.8	W-998 BKR.	SCADA		uP - 200/ uP			95P is SEL-251; 95BU is SEL-501
High Falls	13.8	B1	SCADA		UP/ uP - 200		*****	95BU is SEL-251
High Falls	13.8	B2	SCADA		uPI uP- 200			95BU is SEL-251 Com
High Falls	13.8	Com Equipment	****					95P is \$R-745 & 95BU is SEL-587; Vol
High Falls	69/13.	8 T1	SCADA	UP _				95P is SR-745 & 95BU is SEL-587; Vol
1000.00	69/13.	<u> </u>	SCADA	uP				33F IS 3R-140 & 33DU IS 3CC-361, 40R

_				station Up				
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	C1833 (R1)					2300		95BU is BE1-IPS-100
Highland	<del> </del>		SCADA		EM/UP			958U is BE1-IPS-100
Highland	13.8	5081 Ckt.	SCADA	*****	EM/uP			95BU is BE1-IPS-100
Highland	13.8	5082 Ckt.	SCADA		EM/uP			3000.000
Highland	13.8	5083 Ckt.	SCADA		υP			
Highland	13.8	5084 Ckt.	SCADA		υP			
Highland	13.8	5085 Ckt.	SCADA	υP				
Highland	115	HR Line OR Line	SCADA	υP				
Highland	115	OR-761-HR BKR.		EM				
Highland	13.8	B1	SCADA		EM			
Highland Highland	13.8	B2	SCADA		uP			Com
Highland	13.8	Com Equipment						958U is SEL-587
Highland	115/13.8	T1	SCADA	υP/EM				
Highland	115/13.8	T2	SCADA	υP		<u> </u>		
Honk Falls	1					D-20	WE	3 phase; oil; electronic
Honk Falls	13.8	3071 Ckt.	SCADA		EM		WE	3 phase; oil; electronic
Honk Falls	13.8	3072 Ckt.	SCADA		EM		<del></del>	3 priase, on, cree o orne
Honk Falls	13.8	B1	SCADA	EM				79 Relay is EM
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Honk Falls	69/13.8	T1		fuse				<u> </u>
Hunter	T					N-4000		<del></del>
Hunter	34.5	Z-666			_		VR-35	3 phase; vac; hyd
Hunter	13.8	2081 Ckt.	MV-90				Kyle W	3 phase; oil; hyd
Hunter	13.8	Cap Bank			EM		4	<u> </u>
turtey Ave. 345kV		L				2400	ļ	
Hurley Ave. 345kV	345	30151 BKR.	****	EM	****			79 Relay is EM
Hurley Ave. 345kV	345	30151 A1 BF		υP		*****	*****	<u> </u>
lurley Ave. 345kV	345	30152 A2 BF	A manual	EM				
Hurley Ave. 345kV	345	301 Line A1	SCADA	uΡ				
Hurley Ave. 345kV	345	301 Line A2	SCADA	EM				
Hurley Ave. 345kV	345	30353 BKR.	*****	EM*				79 Relay is EM; in process replacement v SEL-451
Hurley Ave. 345kV	345	30353 A1 BF		up				
Hurley Ave. 345kV	345	30353 A2 BF		EM*				In process replacement with GE C70
Hurley Ave. 345kV	345	30354 BKR.		EM*				79 Relay is EM; In process replacement SEL-451
Hurley Ave. 345kV	345	30354 A1 BF		EM				
Hurley Ave. 345kV	345	30354 A2 BF		EM*	****			In process replacement with GE C70
Hurley Ave. 345kV	345	303 Line A1	SCADA	uP				
Hurley Ave. 345kV	345	303 Line A2	SCADA	EM*				In process replacement with GE D90
Hurley Ave. 345kV	345	Bus A1		EM				
Hurley Ave. 345kV	345	Bus A2		EM				
Hurley Ave. 345kV	115	A2451 BKR.		EM		****		
Hurley Ave. 345kV	115	A2451 A1 BF		EM			**	
Hurley Ave. 345kV	115	A2451 A2 BF	****	EM				
Hurley Ave. 345kV	345	T1 A1 Out of Step	*****	EM				
Hurley Ave. 345kV	345	T1 A2 Out of Step		EM				
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Substation	2091 Ckt. 2092 Ckt. 2093 Ckt. 2093 Ckt. 2094 Ckt. Cap Bank HP Line I line OR Line SB Line HP-1643 BKR. OR-1640 BKR. W-1575 BKR. W-389 BKR. B1 B1 B1 B1 T3 T4 T5	Metering  Charts - Amps Charts - Amps Charts - Amps Charts - Amps Charts - Amps SCADA	T. Relaying  T. Relaying  T. Relaying  T. Relaying	D. Relaying  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP  EM/UP	RTU 2400	Recloser	Comment  8E1-851H as BU and 79  BE1-851H as BU and 79  Quadramho part of the package; metering Amp value only  Quadramho part of the package; metering Amp value only  Volts  Volts  Volts  Volts
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Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 14.5 Inwood Ave. 14.5 Inwood Ave. 14.5 Inwood Ave. 14.5 Inwood Ave. 15.1 Inwood Ave. 15.1 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8	6061 Ckt.	CCADA			3030		
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8 Jansen Ave. 13.8				EM/uP			BE1-IPS100 as BU and 79
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 15/13.8 Jansen Ave. 13.8	6062 Ckt.	SCADA	****	EM/uP			BE1-IPS100 as BU and 79
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8	6063 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 13.8 Jansen Ave. 115/13.8 Jansen Ave. 13.8	6064 Ckt.	SCADA		EM/uP			BE1-IP\$100 as BU and 79
Inwood Ave.   13.8     Inwood Ave.   13.8     Inwood Ave.   13.8     Inwood Ave.   115     Inwood Ave.   115     Inwood Ave.   115     Inwood Ave.   13.8     Inwood Ave.   13.8     Inwood Ave.   115/13.8     Inwood Ave.   115/13.8     Inwood Ave.   115/13.8     Jansen Ave.   13.8	6065 Ckt.	SCADA		uP uP		*****	
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 15/13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8	6066 Ckt.	SCADA		uP			
Inwood Ave. 13.8 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8	6067 Ckt.	SCADA		uP		****	
Inwood Ave.   115     Inwood Ave.   115     Inwood Ave.   115     Inwood Ave.   13.8     Inwood Ave.   13.8     Inwood Ave.   13.8     Inwood Ave.   115/13.8     Inwood Ave.   115/13.8     Jansen Ave.   13.8		SCADA		υP		<del></del>	
Inwood Ave. 115 Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8	Com Equipment	00101		*****			Cơm
Inwood Ave. 115 Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8	IR Line IR-201-X BKR.	SCADA	υP		*****		
Inwood Ave. 13.8 Inwood Ave. 13.8 Inwood Ave. 115/13.8 Inwood Ave. 115/13.8 Jansen Ave. 13.8 Jansen Ave. 13.8	X Line	SCADA	uP	*****			
Inwood Ave.   13.8	B1	SCADA		uP		*****	
Inwood Ave.   115/13.8	B2	SCADA		ŰΡ			<del></del>
Inwood Ave.   115/13.8     Jansen Ave.   13.8	T1	SCADA	υP				
Jansen Ave.  Jansen Ave.	τ2	SCADA	uP				
Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8	. ,4	JUADA	U+		M-4000	+	
Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8  Jansen Ave. 13.8	1001 Ckt.	MV-90		υP			
Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8	1002 Ckt.	MV-90		EM			
Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8       Jansen Ave.     13.8	1003 Ckt.	MV-90		uP			
Jansen Ave.       13.8         Jansen Ave.       13.8         Jansen Ave.       13.8         Jansen Ave.       13.8	1004 Ckt.	MV-90		EM			
Jansen Ave.       13.8         Jansen Ave.       13.8         Jansen Ave.       13.8	KL Line	MV-90		EM			
Jansen Ave.         13.8           Jansen Ave.         13.8	KO Line	MV-90		EM			
Jansen Ave. 13.8	81	SCADA		EM			
	82	SCADA		EM	4. ***		
Jansen Ave. 13.8							Com
Jansen Ave. 13.8	Com Equipment	MV-90		υÞ		**	
Kerhonkson					8890		
Kerhonkson 13.8	Com Equipment T - Grounding	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Data
Kerhonkson 13.8	Com Equipment	Grid Sense		EM		Kyle D	Single phase; oil; hyd; No GS Data
Kerhonkson 69	Com Equipment T - Grounding 3081 Ckt. 3082 Ckt.		EM				
Kerhonkson 69	Com Equipment T - Grounding 3081 Ckt.		EM				
	Com Equipment T - Grounding 3081 Ckt. 3082 Ckt.	*****	fuse				Amps for each Transformer
110111111111111111111111111111111111111	Com Equipment T - Grounding  3081 Ckt. 3082 Ckt. MK-929 MOS MK-930 MOS	~		,			
Kerhonkson 69/13.1	Com Equipment T - Grounding  3081 Ckt. 3082 Ckt. MK-929 MOS MK-930 MOS 8 T1	Charts - kW/kVAr /GS	use				Volts & Amps
Kerhonkson 69 Kerhonkson 69	Com Equipment T - Grounding  3081 Ckt. 3082 Ckt. MK-929 MOS MK-930 MOS 8 T1	~	fuse				Volts & Amps

			Electric Substa	mon upg. a	INCEUS PIS	111111111111111111111111111111111111111		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	1					2100		Not sure if charts were removed
Knapps Corners	<del> </del>	8021 Ckt.	Charts - Amps/SCADA		uP			BE1-851H as BU and 79
Knapps Corners	13.8	8022 Ckt.	Charts - Amps		EM/uP			Not sure if charts were removed
Knapps Corners	13.8	8023 Ckt.	Charts - Amps/SCADA		UP/EM			BE1-851H as BU and 79
Knapps Corners	13.8	8024 Ckt.	Charts - kW		EM/uP			
Knapps Corners	13.8	8025 Ckt.	Charts - kW		EM			Com
Knapps Corners	13.8	Com Equipment						
Knapps Corners Knapps Corners	115	K8 Line	None	EM		*****		SEL-279
Knapps Corners	115	KB-1558-MC BKR.		υΡ- 200 <b>υ</b> Ρ				
Knapps Corners	115	SK Line	SCADA	EM	† — — — ·			Amps
Knapps Corners	13.8	KN Line	SCADA*	EM				Amps
Knapps Corners	13.8	KR Line	SCADA*	EM				Amps
Knapps Corners	13.8	KS Line	SCADA	υP				·
Knapps Corners	69	KM Line	SCADA	EM				
Knapps Corners	69	TR Line		uР				
Knapps Corners	69	G Line	SCADA		EM			
Knapps Corners	13.8	W-1215 BKR.			L_F91			
Knapps Corners	69	W-1409 BKR.		<u>uP</u>	EM			
Knapps Corners	13.8	W-1462 BKR.			EM		****	
Knapps Corners	13.8	B1						Combine Bus Volts to one point
Knapps Corners	13.8	82	SCADA		EM			• • • • • • • • • • • • • • • • • • • •
Knapps Corners	13.8	B3			EM			Volts
Knapps Corners	69	69k Bus	SCADA	EM		+		
Knapps Corners	115/13.8	T1	SCADA	EM				Combine load value
Knapps Corners	115/13.8	T3		EM		Ļ		
Knapps Corners	115/69	T2	SCADA	υP		M-4000		<u> </u>
Lawrenceville		<del></del>		510/-5		WI-4000	CXE-400A	3 phase; oil; hyd
Lawrenceville	34,5	2385 Ckt.	Grid Sense	EM/uP		<del></del>	CAETOOA	Volts
Lawrenceville	34.5	<u>B1</u>	SCADA*					
Lawrenceville	69/34.5	T1	MV90/Grid Sense/SCADA	EM				Amps.
Lincoln Park						2300		Com
Lincoln Park	13.8	Com Equipment	Charles Assess		EM	+	1	Com
Lincoln Park	13.8	2011 Ckt.	Charts - Amps		EM		*****	1
Lincoln Park	13.8	2012 Ckt.	Charts - kW			+		BE1-851H as BU and 79
Lincoln Park	13.8	2013 Ckt.	Charts - kW		EM/uP EM			BET-03TH as CO and 13
Lincoln Park	13.8	2014 Ckt.	Charts - kW		EM/uP			BE1-851H as BU and 79
Lincoln Park	13.8	2015 Ckt.	Charts - kW		EM/uP*			GE F60 installed HiZ pilot
Lincoln Park	13.8	2016 Ckt.	Charts - kW		EM		р	OCTOMISMING THE PROT
Lincoln Park	13.8	2017 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	2018 Ckt.	Charts - kW		EM			
Lincoln Park	13.8	Cap Bank 1 Cap Bank 2			EM			
Lincoln Park.		HP Line	None	EM				Relay Replacement Progam in proc
Lincoln Park	115			EM				1000
Lincoln Park	115	HP-1318 BKR.						Amps to SCADA
Lincoln Park	13.8	KL Line	Charts - kW/kVAr/SCADA	EM				74.100 to 00.101
Lincoln Park	115	LR-1219-HP BKR.		EM				
Lincoln Park	115	LR Line	SCADA	uP	EM			<del></del>
Lincoln Park	13.8	W -1321 BKR.	2-4-4		EW			
Lincoln Park	13.8	W-45 BKR. W-534 BKR.			EM			1
Lincoln Park	13.8	W-554 BKR.			EM			·
Lincoln Park	13.8	WT-206 BKR.			EM			
Lincoln Park			77-7-		EM			
Lincoln Park	13.8	WT-207 BKR.			EM			
Lincoln Park	13.8	WT-525 BKR.	*****		EM			
Lincoln Park	13.8	WT-528 BKR.			EM			Combine Bus Volts to one poi
Lincoln Park	13.8	B1	SCADA		EN			Combine Bos voits to one por
Lincoln Park	13.8	B2	<u> </u>					Volts
		B3	SCADA		EM			
			None		EM			Volts
Lincoln Park	13.0		SCADA	EM				- VOICO
Lincoln Park								Combine load value
Lincoln Park	( 115			\ EM				COMPINE 1080 14:00
Lincoln Park Lincoln Park	115	3.8 T1	SCADA	EM	<del></del>			Combine load 14.55
Lincoln Park Lincoln Park Lincoln Park	k 115/13	3.8 T1		EM EM			****	COMBINE 1000 1000

			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
· ·	Class (KV)					2400		BE1-851H as BU and 79
Manchester			201/ 00	T	EM/uP			8E1-851H as BU and 79
Manchester	13.8	6091 Ckt.	MV-90		EM/uP			
Manchester	13.8	6092 Ckt.	MV-90 MV-90		EM/uP			BE1-851H as BU and 79 BE1-851H as BU and 79
Manchester	13.8	6093 Ckt.	MV-90		EM/uP			
Manchester	13.8	6094 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79
Manchester	13.8	6095 Ckt.			EM			
Manchester	13.8	6096 Ckt.	MV-90 MV-90		EM			
Manchester	13.8	6097 CKI.	Mv-30					Com 95BU is REL-301; part of replacement
Manchester	13.8	Com Equipment						
Manchester	115	M Line	None	EM/Gen-1				program.
Manchester	115	MC Line	SCADA		EM			Amps
Manchester	13.8	MS Line	SCADA*		EM			
Manchester	13.8	W-1458 BKR.			EW			
Manchester	13.8	W-650 BKR.			EM			Combine Bus Volts to one point
Manchester	13.8	B1	SCADA		EM			Compine Bus voits to one point
Manchester	13.8	B2		EM				
Manchesler	115/13.8	T1	SCADA					Combine load value
Manchester	115/13.8	т2	<u> </u>	EM		8890	-	. ????
Mariboro							<u> </u>	
Mariboro	13.8	5001 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5002 Ckt.	SCADA		EM/uP	*****	*****	BE1-IP\$100 as 80 and 79
Marlboro	13.8	5003 Ckt.	SCADA		EM/uP			BE1-IPS100 as BU and 79
Mariboro	13.8	5004 Ckt.	SCADA		υP	<u> </u>		
Marlboro	13.8	Com Equipment						Com
Mariboro	13.8	B1	SCADA		UP UP			Volts
Mariboro	115/13.8	T1	SCADA	uP/EM*		1		95P is SEL-587
Martboro	115/13.8	T2	SCADA	υP				
Maryland Ave.						M-4000		
Maryland Ave.	4	621 Ckt.	Charts - kW		EM			
Maryland Ave.	4	622 Ckt.	Charts - kW		EM			
Maryland Ave.	4	623 Ckt.	Charts - kW		EM			
Maryland Ave.	4	624 Çkt.	Charts - kW		EM			~ <del>-</del>
Maryland Ave.	13.8	MS Line			EM			
Maryland Ave.	13.8	PH-284 BKR.			EM	*****		
Maryland Ave.	13.8	PH-286 BKR.			EM			
Maryland Ave.	4	W-1032 BKR.			EM			
Maryland Ave.	4	W-1033 BKR.			EM			
Maryland Ave.	4	W-1034 BKR.			EM			
Maryland Ave.	13.8	B1	SCADA		EM			Volts
Maryland Ave.	13.8	B2	SCADA		EM			Volts
Maryland Ave.	4	81		****	EM			<del></del>
Maryland Ave.	4	82	SCADA		EM	**-*-		Volts
Maryland Ave.	13.8/4	T1			EM			
Maryland Ave.	13.8/4	T2			EM			1
Maybrook		····				M-4900		
Maybrook	13.8	5051 Ckt.	MV-90		EM		RXE	3 phase; oil; electronic
Maybrook	13.8	5052 Ckt.	MV-90		uP			Previously 5081-83?
Maybrook	13.8	5053 Ckt.	MV-90	*****	EM	+	RXE	3 phase; oil; electronic
Maybrook	13.8	B1	SCADA					Volts
Mayorook	13.8	82	SCADA					Volts
Maybrook	69/13.8		None					
Maybrook	69/13.8		None					
McKinley St.	32,10.0		<u> </u>		<del></del>	NONE		
MULTINEY OL.	4	845 Ckt.	MV-90		EM		*****	

			Electric Subs	tation Upgi's	Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T, Relaying	D. Relaying	RTU BM	Recloser	Comment
Merritt Park	<del>                                     </del>				uP			
Merritt Park	13.8	8061 Ckt.	SCADA		υP			
Merritt Park	13.8	8062 Ckt.	SCADA	<del></del>	uP			
Merritt Park	13.8	8063 Ckt.	SCADA		υP			
Merritt Park	13.8	8064 Ckt.	SCADA		υP			
Merritt Park	13.8	8065 Ckt.	SCADA		uP			
Merritt Park	13.8	8066 Ckt.	SCADA		uP uP			
Merritt Park	13.8	8067 Ckt.	SCADA SCADA	<u> </u>	uP		+	Com
Merritt Park	13.8	8068 Ckt.	SCADA					
Merritt Park	13.8	Com Equipment	SCADA	uP				
Merritt Park	115	WF Line	SCADA	uP				SEL-279
Merritt Park	115	WP Line	3000	uP-200				366-213
Merritt Park	115	WF-439-WP BKR.	SCADA		uP			
Merritt Park	13.8	B1	SCADA		uP			
Merritt Park	13.8	B2	SCADA	uP				
Merritt Park	115/13.8	<u>T1</u>	SCADA	UP				
Merritt Park	115/13.8	T2	SCAUA	<u></u>	<del></del>	BM		
Milan					uP			
Milan	13.8	7061 Ckt.	SCADA		uP			
Milan	13.8	7062 Ckt.	SCADA	<del></del>			*****	Com
Milan	13.8	Com Equipment						
Milan	115	B-4561 Ckt Sw	.,	uP uP				
Milan	115	MR Line	SCADA			<del></del>		
Milan	115	MR-501 BKR	SCADA	υP				-
Milan	115	RT-7 BKR.		uP		1		
Milan	115	R-10 BKR.		UP O				
Milan	115	T-7 Line	SCADA	υP		·		
Milan	115	10 Line	SCADA		uP			
Milan	115	B1	SCADA	uP				
Milan	13.8	B1	SCADA		. UP			
Milan	115/13.8	T1	SCADA	υP			<u> </u>	<u> </u>
Millerton						L&N	<del>- </del>	}
Millerton	13.8	7081 Ckt.	SCADA		EM		*****	1
Millerton	69	GE-823 MOS		EM				O-1: fooder: 71 - 7091 load
Millerton	69/13.8	T1	SCADA	EM				Only one feeder; T1 = 7081 load
Millerton	69	Line to SMI	SCADA					Volts Volts
Millerton	69	Line to PUL	SCADA					Volts
Modena 115kV					<u>-</u>	ВМ	_ <del>_</del>	· · · · · · · · · · · · · · · · · · ·
Modena 115kV	13.8	B1	SCADA		uP			<u> </u>
Modena 115kV	13.8	C-1651 BKR.			υP			
Modena 115kV	13.8	5011 Ckt.	\$CADA	4	UP			·
Modena 115kV	13.8	5012 Ckt.	SCADA		uP			<del>                                     </del>
Modena 115kV	13.8	5013 Ckt.	SCADA		uP			
Modena 115kV	13.8	Com Equipment						Com
Modena 115kV	115	EM Line	SCADA	υP				
Modena 115kV	115	EW-201-PX BKR.		UP				<del>                                     </del>
Modena 115kV	115	PX Line	SCADA	υP				Only has one 13.8 bus; T3 = Bus lo.
Modena 115kV	115/13.8	T3	SCADA	UP		9990		Umy has one 15.0 005, 15 - 005 to
Modena 69kV						8890		volts
Modena 69kV	69	B1	SCADA	EM				40/13
Modena 69kV	69	MG Line	SCADA	uP				
Modena 69kV	69	W-941 BKR.		EM				<del> </del>
Modena 69kV	69	MG-380 BKR.		EM				<del>-  </del>
Modena 69kV	115/69	T1	SCADA	EM/uP				GE F35 is installed
Modena 69kV			None	Fuse/uP		NONE		
	05, 13.					NONE	V4L	Single phase; Vac; Hyd
Montgomery		571 Ckt.	Charts - kW		EM			Single phase; Vac; Hyd
Montgomery	4	1 JIFUNG	Charts - kW		EM.	1	V4L	Single priase, vac, riye

Volts

95P is SEL-587

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	Voltage		84-A-ring	T. Relaying	D. Relaying	RTU	Recloser	Comment
Substation.	1 - 1	Line/Ckt.	Metering	1. Itelaying		!		
Odbotomorr.	Class (kV)					M-4000		
Montgomery St.					F14			volts
	13.8	B1	SCADA		EM			Volts
Montgomery St.	13.8	B2	SCADA	*****	EM			volts
Montgomery St.	13.8	B3	SCADA		EM			
Montgomery St.	13.8	B Line	None		€M .			
Montgomery St.		4001 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4002 Ckt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	4002 CKt.	Charts - kW/kVAr		EM			
Montgomery St.	13.8	401 Ckt.	Charts - kW demand	194-1	EM			
Montgomery St.  Montgomery St.	4	402-3 Ckt.	Charts - kW demand		EM			
Montgomery St.	4	404 Ckt.	Charts - kW demand	***	EM			
Montgomery St.	4	406A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	407A/B Ckt.	Charts - kW demand		EM			
Montgomery St.	4	410A/B Ckt.	Charts - kW demand		EM			N-16-
Montgomery St.	4	81	SCADA		EM			Volts
Montgomery St.	4	B2	SCADA		EM_		*****	volts
Montgomery St.	13.8	F Line	None		EM			
	13.8	NB Line	None		EM		*****	
Montgomery St.	13.8	NM Line	None		EM			
Montgomery St.		RLine	None		EM			
Montgomery St.	13.8		None		EM			
Montgomery St.	13.8	W-507 BKR.		<del></del>	EM		·	
Montgomery St.	13.8	W-508 BKR.						<del></del>
Montgomery St.	13.8	W-509 BKR.		*****	EM			<u> </u>
Montgomery St.	13.8	WN Line	None		EM			
Montgomery St.	13.8/4	T1	Charts - kW/kVAr		EM			Combine load value
Montgomery St.	13.8/4	T2			EM			
Myers Corners						44-550		
Myers Corners	13.8	8041 Ckt.	Charts - kW		uP		*****	
Myers Corners	13.8	8043 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8044 Ckt.	Charts - kW		EM	****	T	
Myers Corners	13.8	8045 Ckt.	Charts - kW		EM			
Myers Corners	13.8	8046 Ckt.	SCADA		υP			
Myers Corners	69	KM Line	None	EM	*****			······································
Myers Corners	69	TV Line	None	EM				· · · · · · · · · · · · · · · · · · ·
Myers Corners	69	TV-399-KM BKR.		EM!				
Myers Corners	13.8	W-63 BKR	****		EM		<del></del>	; 
Myers Corners	13.8	W-66 BKR.			EM			<del> </del>
Myers Corners	13.8	Feeder M1-75	*****		EM		<del></del>	
Myers Corners	13.8	Feeder M2-76			EM			
Myers Corners	13.8	Feeder M3-91			EM			
Myers Corners	13.8	Feeder M4-90		·	EM			
Myers Corners	13.8	B1	SCADA		EM			Combine Bus Volts to one point
Myers Corners	13.8	B2	<del></del>		EM			
Myers Corners	69/13.8	T1	SCADA	EM				Combine load value
Myers Corners	69/13.8	T2		EM				Domeste to ad value
Neversink		,		,		2200		
Neversink	4	391 Ckt.	Charts - kW		EM			
Neversink	13.8	3091 Ckt.	Grid Sense	*****	EM		Kyle W	3 phase; Oil; Hyd
Neversink	69	HG Line	SCADA*	EM			6-14-14-14	Amps
Neversink	69	WH Line	\$CADA*	EM	*****		**	Amps
Neversink	4	W-1128 BKR.			EM		****	
Neversink	69	69k Bus	SCADA	uP/EM				Volts
New Baltimore						2300		······································
New Baltimore	13.8	1081 Ckt.	\$CADA*		EM			kW
New Baltimore	13.8	1082 Ckt.	SCADA*		EM			kW
			SCADA*		EM			kW
New Baltimore		1083 Ckt.		EM/uP				
New Baltimore	69	Cap Bank						Com
New Baltimore	13.8	Com Equipment						
		CN Line	None	υP				<del> </del>
New Baltimore				υP				
New Baltimor	e 69	NW Line	None	UI UI		<del></del>		Volts

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EM/4D

EM

Electric Substation Upgrade Needs Assessment

B1 T1

13.8

69/13.8

New Baltimore

New Baltimore

New Baltimore

SCADA

SCADA

А

			Electric Subs	station Ups	Needs As	sessment	· · · · · · · · · · · · · · · · · · ·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	0,000 ()					NOME		No DATA
New Windsor			Grid Sense		EM	****		No DATA
New Windsor	4	461 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	462 Ckt.	Grid Sense		EM			No DATA
New Windsor	4	463 Ckt.	Grid Sense		EM			NODALA
New Windsor	4	464 Ckt.			υP			
New Windsor	13.8	UN & UW ATC	None		υP			Combine load value
New Windsor	13.8/4	T1	Charts - kW/kVAr		UP			
New Windsor	13.8/4	T2				D-20	<u> </u>	000 :- 001 251
North Catskill		2222	SCADA		uP-200/ uP			95P is SEL-251
North Catskill	13.8	2001A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2002A Ckt.			uP- 200/ uP	****		95P is SEL-251
North Catskill	13.8	2003A Ckt.	SCADA		uP- 200/ uP			95P is SEL-251
North Catskill	13.8	2004 Ckt	SCADA		uP-200/uP	·		95P is SEL-251
North Catskill	13.8	2005 Ckt.	SCADA	<del></del>	uP-200/ uP			95P is SEL-251
North Catskill	13.8	2006 Ckt.	SCADA		ur - 200/ ur		- <del></del>	Com
North Catskill	13.8	Com Equipment			<del>                                       </del>	<del> </del>		
North Catskill	115	2 Line	SCADA	EM			<del></del>	······································
North Catskill	115	R-2 BKR.		EM	,,,,,,			<del>,,,,,,,,,,,,,</del>
North Catskill	115	RT-7 BKR.		EM			•	
North Catskill	115	T-7 Line	SCADA*	EM				Amps
North Catskill	69	Cap Bank		EM				<u> </u>
North Catskill	69	CL Line	SCADA	υP				
North Catskill	69	H Line	SCADA	uP				
North Catskill	69	NC Line	SCADA	υP	****	****		
North Catskill	69	W-1107 BKR.		EM/uP*			va	` check on TD-5
North Catskill	69	W-269 BKR.	****	EM/uP*				check on TD-5
North Catskill	115	W-791 BKR.		uP- 200				SEL-2BFR
North Catskill	69	W-269 & W-1107 BKR			EM			IJŞ
North Catskill	115	B1	SCADA	EM				Volts
North Catskill	69	81	SCADA	EM/uP		·	<del></del>	Volts
North Catskill	69	B2	SCADA	EM/uP				Volts
North Catskill	13.8	B2 B1	SCADA	CM/UP	EM/uP			Volts: 95BU is DFP-100
North Catskill	13.8	B2	SCADA		EM/UP	+		
	115/69	74	SCADA	EM/uP*	EW/UP			Volts: 95BU is DFP-100 Check on 64 relay
North Catskill								
North Catskill	115/69	T5	SCADA	EM/uP*				Check on 64 relay
North Catskill	115/13.8	T6	SCADA	EM/uP				95BU is DFP-100
North Catskill	115/13.8	T7	SCADA	EM/uP				95BU is DFP-100

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			Electric Subs	tation Upgra	de Needs As	sessment		The state of the s
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
North Chelsea	<del> </del>							
	13.8	8051 Ckt.	SCADA		UP _			
North Chelsea	13.8	8052 Ckt.	SCADA		uP			
North Chelsea	13.8	8053 Ckt.	SCADA		υP			
North Chelsea		8054 Ckt.	SCADA		uP ,			
North Chelsea	13.8		SCADA		υP			
North Chelsea	13.8	8055 Ckt.	SCADA		υP			
North Chelsea	13.8	8056 Ckt. 8057 Ckt.	SCADA		UP			
North Cheisea	13.8	8057 Ckt.	SCADA		uP			Com
North Cheises	13.8	Com Equipment					<del></del>	
North Chelses	115	AC Line	SCADA	uP				
North Chelsea North Chelsea	115	AC-1086 BKR.		UP				
North Chelsea	115	DC Line	SCADA	υP		,		<u> </u>
North Chelsea	115	DC-1414 BKR.		υP		*****		
North Chelsea	115	FO-1482 BKR.		UP.				
	115	FO Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF Line	SCADA	υP				95P is LCB-II
North Chelsea	115	NF-1116 BKR.	SCADA	υP				
North Chelsea				υP		<del></del>		
North Chelsea	115	SC Line	SCADA				<del>                                     </del>	
North Chelsea	115	SC-1566 BKR.		uP	<del>                                       </del>	<del> </del>	<del></del>	
North Chelsea	69	TV Line	SCADA	υP		<u> </u>	<u> </u>	
North Chelsea	115	B-2651 BKR.	****	uP		*****	*****	
North Chelsea	115	B-2652 BKR.	2.4.4	υP	**			
North Chelsea	115	B-2653 BKR.	44141	υP				
North Chelsea	115	W-1572 BKR.	*****	υP				
North Chelsea	115	B1	SCADA	υP				
North Chelses	13.8	B1	SCADA		υP			
North Chelsea	13.8	B2	SCADA		υP		<del></del>	<del></del>
North Chelsea	115/69	71	SCADA	υP			<del></del>	<u></u>
North Chelsea	115/13.8	T2	SCADA	uP uP				<del></del>
North Chelsea	115/13.8	13	SCADA	UP				
Ohioville	775715.0	11	GCADA	<u> </u>		2400		Volls
Ohioville	42.0	5021 Ckt.	Objects Acres	<del></del>	ENTL-D	2100	<del>-</del>	
	13.8		Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5022 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Ohioville	13.8	5023 Ckt.	Charts - Amps		EM/UP			BE1-851H as BU and 79
Ohioville	13.8	5024 Ckt.	Charts - kW		EM/qP			BE1-851H as BU and 79
Ohioville	13.8	5025 Ckt.	SCADA	<u> </u>	υP			
Ohioville	13.8	Com Equipment						Com
Ohioville	115	Cap Bank		EM				
Ohioville	69	O Line	None	υP				
Ohioville	69	OB Line	None	υP				
Ohioville	115	QR Line	None	EM	*****			
Ohioville	115	OR-1075 BKR.		EM				
Ohioville	115	PX Line	SCADA	EM/uP			~~~~	
Ohioville	115	PX - 1659 BKR.		UP				
Ohioville	69	W - 1511 BKR.		EM				
Ohiovitte	13.8	W - 1537 BKR.			EM			
Ohioville	13.8	W 1600 BKR.			EM			
Ohioville	115	B1	SCADA	EM				Volts
Ohioville	69	69k Bus	SCADA	EM				Volts
		B1		CAI	EM			VOIS
Ohioville	13.8		None				<del></del>	<del></del>
Ohioville	13.8	B2	None		EM			
	115/13.8	T1	50454	EM				Combine load value
Ohioville			- SCAUA					
Ohioville Ohioville	115/13.8		SCADA SCADA	EM/uP-200				95BU is SEL-251

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			Electric Sub	station Upgra	rue Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (KV)					2300		Grid owns Line
Pleasant Valley			SCADA**	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	·			
Pleasant Valley	115	8 Line	SCADA	UP				Grid owns Line
Pleasant Valley	115	10 Line	SCADA**	υP				Grid owns Line
Pleasant Valley	115	12 Line	SCADA**	uP	T			95BU is Optimho; in replacement plan
Pleasant Valley	115	13 Line		EM/Gen-1				93BO 18 Optimisor 18 19 19
Pleasant Valley	115	C Line	SCADA SCADA	EM				
Pleasant Valley	115	M Line	SCADA	UP		ļ		Com
Pleasant Valley	115	X Line	3000					SEL-279
Pleasant Valley	115	Com Equipment		u₱- 200		****		SEL-279
Pleasant Valley	115	R-12 BKR.		uP- 200				SEL-279
Pleasant Valley	115	R-13 BKR.		uP- 200		ļ		
Pleasant Valley	115	R-8 BKR.		EM				
Pleasant Valley	115	RC-6 BKR.		EM				
Pleasant Valley	115	RM BKR.		UP UP				5 Ft P. She
Pleasant Valley	115	RX-4 BKR.		EM			,	Con Ed owns the Bkr
Pleasant Valley	115	R-61 BKR.	SCADA**	EM			*****	Con Ed owns the Bkr
Pleasant Valley	115	R-62 BKR.	SCADA**	EM				
Pleasant Valley	115	R-643 BKR.		EM				
Pleasant Valley	115	R-81 BKR.		EM	<del>                                     </del>	*****		Volts
Pleasant Valley	115	81	SCADA					Volts
Pleasant Valley	115	B2	SCADA	EM				kW
Pleasant Valley	69	E Line	SCADA*	UP				kW
Pleasant Valley	69	G Line	SCADA*	υP			-	kW
Pleasant Valley	69	Q Line	SCADA*	ъP		<del></del>		Volts
Pleasant Valley	69	81	SCADA	uP		<u> </u>		
Pleasant Valley	13.8	W-387			EM		<del></del>	Con Ed owns bank and protection
Pleasant Valley	345/115	S1	SCADA		****			Con Ed Owns Dank and protection
Pleasant Valley	115/69	T10	SCADA	EM			<del> </del>	<u> </u>
Pulvers Corners	<del>-  </del> -					D-20		
Pulvers Corners	13.8	7091 Ckt.	SCADA		EM		V4L	single phase; vac; hyd
Pulvers Corners	13.8	7092 Ckt.	SCADA		EM		Kyle L	single phase; oil; hyd
Pulvers Corners	34.5	7395 Ckt.	SCADA	EM			RVE	3 phase; oil; hyd
Pulvers Corners	13.8	Com Equipment						Com
Pulvers Corners	69	Cap Bank	*****	EM				
Pulvers Corners		B1	SCADA					Voits
Pulvers Corners		B1	SCADA				****	Volts
Pulvers Corners		B1	SCADA					Volts
		71	SCADA	Fuse				
Pulvers Corners Pulvers Corners		T2	None	EM/uP		\		95P is SR-745

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Comment				Electric Subs	tation Upgra	ide Needs As	sessment		
Reynolds Hill	Substation		Line/Ckt.				RTU		Comment
Reynolds Hill   13.8   6001 CH   Charts - KW   P   P   P   P   P   P   P   P   P		<del></del>					2100		
Reynolds Hill		<del></del>		Charle WW		EM			
19.5   6000 CRL   Charts - WY						υP			
Reynolds Hill						EM			
Permidde Hill		<del></del>				υP			
Reynolds Hill					****				Com
Remotes Hill   115									
Reymolds Hill 115 NR.1255 BYR.						<del></del>			
Symples Hill									
Reynolds Hill   13.8   R Line   SCADA   UP				SCADA	υP			!	
Reynolds Hill   13.8   8 Cable   SCADA				SCADA	υP	J	****		
Reynolds Hill   13.8   PC Gable   SCADA   UP		13.8	B Cable	SCADA				<del></del>	
Reynolds Hill   13.8   PD Cable   SCADA     UP			W Cable	SCADA				<del> </del>	
Reynolds Hill   13.8			PD Cable	SCADA		<u> </u>			
Reynolds Hill   13.8			PH Line	SCADA		υP	***		
Reynolds Hill   13.8		13.8	PK Line	SCADA	*****	uP			
Reynolds Hill   13.8						uP			
Reynolds Hill   13.8   PU Cable   SCADA			PQ Line	SCADA		υP			
Reynolds Hill   13.8   PU Cable   SCADA						υP			
Reynolds Hill		13.8	PU Cable	SCADA		υĖ			<del></del>
Reynolds Hill				<del> · · · · · · · · ·</del>	EM			1	<del></del>
Reynolds Hill   115   B2   SCADA   EM				SCADA				<del></del>	
Reynolds Hill   13.8   81   958U is SEL-501					<del></del>	†	+		
Reynolds Hill   13.8   B2   SCADA   UP	··							<del></del>	
Reynolds Hill   13.8   B3   SCADA				SCADA			<del> </del>		
Reynolds Hill				SCADA		<del></del>	<del></del>	<del></del>	
Reynolds Hill							·	<del></del>	Volts
Reynolds Hill	Reynolds Hill			·····			·	<del></del>	
Rhinebeck	Reynolds Hill	115/13.8				-	<del></del>	+	
Rhinebeck   13.8   7051 Ckt.   Charts - Amps     EM	Rhinebeck			33,25	<u> </u>		+ <del></del>		95P is SEL-351A
Rhinebeck	Rhinebeck	13.8	7051 Ckt.	Charte , kW/SCADA	T	0001 5	<del></del>		
Rhinebeck	Rhinebeck	13.8							95P is SEL-251, 95BU is SEL-501
Rhinebeck   13.8   7054 Ckt.   Charts - Amps	Rhinebeck				<del> </del>		<del></del>	10	
Rhinebeck   13.8   7055 Ckt   Charts - kW				<u></u>	<del></del>				
Rhinebeck   13.8   7056 Ckt   SCADA   UP-200/ UP   SPP is SEL-251; 958U is SEL-501					· · · · · · · · · · · · · · · · · · ·		*****		
Rhinebeck   G9									BE1-851H as BU and 79
Rhinebeck   69					<del></del>				95P is SEL-251; 95BU is SEL-501
Rhinebeck			<u></u>		<del></del>				
Rhinebeck   115	<del></del>					<u> </u>			
Rhinebeck									Amps
Rhinebeck   69   Q-1471 BKR.     EM									
Rhinebeck   13.8   W-1017 BKR.								-44.14	
Rhinebeck   13.8   W-1238 BKR     EM     Volts   EM     EM     EM     Volts   EM       EM     EM     EM     EM     EM     EM									
Rhinebeck   69   W-258 BKR     EM     Combine Bus Volts to one point Rhinebeck   13.8   B2   none     EM     EM     Combine Bus Volts to one point Rhinebeck   69   69kV Bus   SCADA     EM     Volts     Volts     EM     Amps & Volts   Rhinebeck   69/13.8   T1   SCADA   EM       Amps & Volts     Amps & Volts     Amps & Volts     Amps & Volts     EM       Amps & Volts       Amps & Volts           Amps & Volts								* <b>-</b>	
Rhinebeck   13.8   W.367 BKR.   EM						EM			
Rhinebeck   69									
Rhinebeck									
Rhinebeck				····	<del></del>				Volts
Rhinebeck         69         69kV Bus         SCADA									·, · · · · · · · · · · · · · · · · · ·
Rhinebeck         69/13.8         T1         SCADA*         EM									Comoine ous voits to one point
Rhinebeck         69/13.8         T2         SCADA?         EM          Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM								*****	Volts
Rhinebeck         69/13.8         T2         SCADA*         EM           Amps & Volts           Rhinebeck         115/13.8         T4         SCADA         EM						**			
Rninebeck 115/3.8 14 SCADA EM									
Rhinebeck 115/69 T3 SCADA EM									
	Rhinebeck	115/69	T3	) SCADA	EM				

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			Electric Subst	ation Up.	್ರ Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2100	Recloser	Comment
5 . 1. 7 24EbV								
Rock Tavern 345kV	345	311 Line A1	SCADA	uP				
Rock Tavern 345kV	345	311 Line A2		EM				
Rock Tavern 345kV	345	3456 BKR.		EM				
Rock Tavern 345kV	345	3456 BF A1		uP				
Rock Tavern 345kV	345	3456 BF A2		up				
Rock Tavern 345kV	345	Cap Bank 1 A1		EM				Combined MVArs
Rock Tavern 345KV	345	Cap Bank 1 A2	SCADA*	EM				
Rock Tavern 345kV	345	Cap Bank 2 A1	<del> </del>	EM				
Rock Tavern 345kV	345	Cap Bank 2 A2		uP				
Rock Tavern 345kV	345	34 Line A1	SCADA	UP UP			****	
Rock Tavern 345kV	345	34 Line A2		EM				
Rock Tavern 345kV	345	37751 BKR.	1	UP	*****		•	
Rock Tavern 345kV	345	37751 BF A1		EM				
Rock Tavern 345kV	345	37751 BF A2		EM				
Rock Tavern 345kV	345	37752 BKR.		UP UP			**-**	
Rock Tavern 345kV	345	37752 BF A1						
Rock Tavern 345kV	345	37752 BF A2		EM	1	<u> </u>		
Rock Tavern 345kV	345	377 Line A1	SCADA	uP_	<del></del>			
Rock Tavern 345kV	345	377 Line A2	00.01	EM		<del>                                     </del>		
Rock Tavern 345kV	345	4255 BKR.		EM				
Rock Tavern 345kV	345	4255 BF A1		EM	<u> </u>		****	
Rock Tavern 345kV	345	4255 BF A2		EM				· · · · · · · · · · · · · · · · · · ·
Rock Tavern 345kV	345	42 Line A1		\$\$		ļ		
Rock Tavern 345kV	345	42 Line A2		EM				<del></del>
Rock Tavern 345kV	345	C3351 BKR.		EM				1
Rock Tavern 345kV	345	C3351 BF A1		EM				<del> </del>
Rock Tavern 345kV	345	C3351 BF A2		EM		****		ļ
Rock Tavern 345kV	345	C3352 BKR.		EM		<u> </u>		
Rock Tavern 345kV	345	C3352 BF A1		EM				
Rock Tavern 345kV	345	C3352 BF A2		EM			****	<u> </u>
Rock Tavern 345kV	345	C3353 BKR.		υP- 200	*****			
Rock Tavern 345kV	345	C3353 BF A1		υP				
Rock Tavern 345kV	345	C3353 BF A2		uP			*****	<u> </u>
Rock Tavern 345kV	345	31153 BKR.		EM				1
Rock Tavern 345kV	345	31153 BF A1		υP			****	<u> </u>
Rock Tavern 345kV	345	31153 BF A2		υP				1
Rock Tavern 345kV	345	31154 BKR.		EM				
Rock Tavern 345kV	345	31154 BF A1		EM				
Rock Tavern 345kV	345	31154 BF A2	*****	EM	*****			
Rock Tavern 345kV	345	Com Equipment						Com
Rock Tavern 345kV	345	B1 A1	*	EM				<u> </u>
Rock Tavern 345kV	345	B1 A2	*****	EM				
Rock Tavern 345kV	345	B2 A1	NAME:	EM		*****	3000	
Rock Tavern 345kV		B2 A2		EM				
Rock Tavern 345k\		T1 A1	SCADA	EM				
Rock Tavern 345k\		T1 A2	SCADA	EM				
Rock Tavern 345k\		T3 A1	SCADA	υP				
Rock Tavern 345k\	V 345/115	T3 A2	] SCADA	υP	****		*****	

			Flectric Sub	station Up.	Needs As:	sessment		
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Sapstation.	Class (kV)	·				2400	†	
Sand Dock				<del></del>	EM.			
Sand Dock	13.8	6011 Ckt.	Charts - kW		EM			
Sand Dock	13.8	BP-1296 BKR.			EM			
Sand Dock	13.8	BP-1570 BKR.			EM			
Sand Dock	13.8	Cap Bank 1			EM			
Sand Dock	13.8	Cap Bank 2			EM			
Sand Dock	13.8	Cap Bank 3			EM			
Sand Dock	13.8	GB Line	SCADA	EM				
Sand Dock	115	KC-1447-SC BKR.	None	EM				
Sand Dock	115	KC Line	None	UP				
Sand Dock	115	SC Line	740116		EM			
Sand Dock	13.8	SH-886 BKR.			EM			
Sand Dock	13.8	SH-911 BKR.			EM			
Sand Dock	13.8	TW-902 BKR.			EM			·
Sand Dock	13.8	TW-909 BKR.			EM			
Sand Dock	13.8	TW-910 BKR.			EM			·
Sand Dock	13.8	W-116 BKR.				<del> </del>		
Sand Dock	13.8	W-1449 BKR.			EM			
Sand Dock	13.8	W-1453 BKR.			EM		<del></del>	
Sand Dock	13.8	W-1467 BKR.			EM			
Sand Dock	115	B1	SCADA					Combine Bus Volts to one point
Sand Dock	115	B4	SCADA					
Sand Dock	13.8	81			EM			
Sand Dock	13.8	B2	SCADA		EM			Combine Bus Volts to one point
Sand Dock	13.8	B3			EM	*****		
Sand Dock	13.8	B4	SCADA		EM			
Sand Dock	13.8	T1		EM				Combine load value
Sand Dock	13.8	T3	SCADA	EM				Combine load value
Sand Dock	13.8	T4	SCADA	EM				
Saucertice	13.5	_ <del></del>				Orion	1	

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			Electric Sub	station Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU 2400	Recloser	Comment
Shenandoah	<del></del>					2400		
Shenandoah	115	East Bus	SCADA	EM				Combine Bus Volts to one point
Shenandoah	115	West Bus	30202	EM	EM			
Shenandoah	13.8	B1	SCADA		EM EM			Combine Bus Volts to one point
Shenandoah	13.8	B2			EM			Sampling Burn Velta to one point
Shenandoah	13.8	<b>B</b> 3	SCADA		EM			Combine Bus Volts to one point
Shenandoah	13.8	84			EM EM			Combine Bus Votts to one point
Shenandoah	13.8	B5	SCADA		EM			Combine 803 Forts to one point
Shenandoah	13.8	96 B7		T	EM.			Combine Bus Volts to one point
Shenandoah Shenandoah	13.8	- B8	SCADA		EM			
Shenandoah	13.8	Cap Bank 1			EM	<u> </u>		
Shenandoah	13.8	Cap Bank 2			EM			
Shenandoah	13.8	Cap Bank 3			EM			
Shenandoah	13.8	Cap Bank 4			EM			
Shenandoah	13.8	Cap Bank 5	*****		ĒM EM			
Shenandoah	13.8	Cap Bank 6			EM		*****	<u> </u>
Shenandoah	13.8	B-4451 BKR. (CB1)	1. grana		UP			<u></u>
Shenandoah	13.8	8071 Ckt.	Charts - kW		EM			ļ
Shenandoah	13.8	8072 Ckt.	Charts - KW		EM	*		
Shenandoah	115	EF Line	None	υP/Gen-1				95BU is Optimho; in replacement plan
Shenandoah	115	FS Line	None	EM				
Shenandoah	115	EF-1514 BKR.		EM				
Shenandoah	115	FS-739 BKR.	***	EM				
Shenandoah Shenandoah	115	FS-892-EF BKR.		- EM				
Shenandoah	13.8	FS-959 BKR. Feeder S1		EM				
Shenandoah	13.8	Feeder S2	None		EM			
Shenandoah	13.8	Feeder S3	None None		EM			
Shenandoah	13.8	Feeder S4	None	<del></del>	EM			
Shenandoah	13.8	Feeder S5	None		EM			
Shenandoah	13.8	Feeder \$6	None		EM			
Shenandoah	13.8	Feeder S7	None		EM			
Shenandoah	13.8	Feeder S8	None		EM	*****		<del> </del>
Shenandoah	13.8	Feeder S9	None		EM			· <del> </del>
Shenandoah	13.8	Feeder \$10	None		EM			
Shenandoah	13.8	Feeder S11	None		EM	*****		<del> </del>
Shenandoah	13.8	Feeder S12	None		EM			<del>                                     </del>
Shenandoah	13.8	Feeder \$13	None		EM			<u> </u>
Shenandoah	13.8	Feeder S14	None		EM			
Shenandoah	13.8	Feeder S15	None		EM			
Shenandoah	115/13.8	T1	SCADA	EM				C
Shenandoah Shenandoah	115/13.8	T2		EM				Combine load value
Shenandoah	115/13.8	T3	SCADA	EM				Combine load value
Shenandoah	115/13.8	T5		EM				Comonie idad value
Shenandoah	115/13.8	T6	SCADA	EM		*****	/	Combine toad value
Shenandoah	115/13.8	T7	SCADA	EM				25
Shenandoah	13.8	W-1266 BKR.	SCADA	EM				· <del> </del>
Shenandoah	13.8	W-1279 BKR.			EM EM			<del></del>
Shenandoah	13.8	W-1450 BKR.			EM			
Shenandoah	13.8	W-1593 BKR.			EW			
Shenandoah	13.8	W-664 BKR.			EM			
Shenandoah	13.8	W-665 BKR.	y-4		EM			
Shenandoah	13.8	W-802 BKR.			EM			
Shenandoah	13.8	W-803 BKR.			EM			
		W-805 BKR.			EM			
Shenandoah	13.8				EM			
Shenandoah	13.8	W-807 BKR.						

			Electric Sub	station Upgra	de Needs AS	sessment	; • · · · · · · · · · · · · · · · · · ·	
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Rock Tavern 115kV						44-550		
	115	B1		EM				
Rock Tavern 115kV	115	82		EM				
Rock Tavern 115kV		115-0,48kV SST		EM				
Rock Tavern 115kV	115	Com Equipment					****	Com
Rock Tavern 115kV	+	D Line	\$CADA*	EM				Amps
Rock Tavern 115kV	115			EM	*****			
Rock Tavern 115kV	115	D-448 BKR. J Line	SCADA*	GEN-1/EM				95P is a DLP; identified in replacement program; Amps
		J-788 BKR.		EM				
Rock Tavern 115kV	115 115	RD Line	SCADA*	EM				Amps
Rock Tavern 115kV	115	RD-809 BKR.		EM				
Rock Tavern 115kV	115	RJ Line	SCADA*	EM				Amps
Rock Tavern 115kV	115	RJ-818 8KR.		EM				
Rock Tavern 115kV	115	SL Line	SCADA	EM	*			
Rock Tavern 115kV	115	SL-684 BKR.		EM				
Rock Tavern 115kV	115	W-467 BKR.		υP			****	
Rock Tavern 115kV	115	W-681 BKR.	*****	EM				<del></del>
Rock Tavern 115kV	115	W-814 BKR.	*****	EM/uP			1	OF1 264
Rock Tavern 115kV	115	WM Line	····	up	1	<del></del>		\$EL-351
Rock Tavern 115kV	115/69	T2	none	<del></del>	<del></del>	ļ		
Roseton Switchyard	115/69	14	SCADA	EM			<del></del>	
Roseton Switchyard	345	30356 (B6) BKR	<del></del>			2100	·	
Roseton Switchyard	345		****	EM				
Roseton Switchyard		30356 (B6) BF A1	*-*	EM		****		
	345	30356 (B6) BF A2		EM			*****	
Roseton Switchyard	345	303 Line A1	SCADA	υP				
Roseton Switchyard	345	303 Line A2		EM				
Roseton Switchyard	345	30551 (B7) BKR		EM			· · · · · · · · · · · · · · · · · · ·	
Roseton Switchyard	345	30551 (B7) BF A1		€M			1177-	
Roseton Switchyard	345	30551 (B7) BF A2		E₩	*****			<del>                                     </del>
Roseton Switchyard	345	30553 (B3) BKR		EM	*****			
Roseton Switchyard	345	30553 (B3) BF A1		υP				<del></del>
Roseton Switchyard	345	30553 (B3) BF A2	****	EM				<del>                                     </del>
Roseton Switchyard	345	305 Line A1	SCADA	υP				<del> </del>
Roseton Switchyard	345	305 Line A2		EM/uP				SEL-501 for DBC
Roseton Switchyard	345	31151 (B1) BKR	*	EM	*****		7	355-301 101 080
Roseton Switchyard		31152 (B1) BF A1		EM				<del> </del>
Roseton Switchyard		31152 (B1) BF A2		EM				<del> </del>
Roseton Switchyard		31152 (B4) BKR		EM				<del></del>
Roseton Switchyard		31152 (B4) BF A1		EM				<del></del>
Roseton Switchyard		31152 (B4) BF A2	*****	EW				<del></del>
Roseton Switchyard		311 Line A1	50.01	υP				<del> </del>
Roseton Switchyard		311 Line A2	SCADA	EM				<del> </del>
Roseton Switchyard	345	B1		uP				<del></del>
Roseton Switchyard		B2		uP				
Roseton Switchyard		U1	SCADA	EM				
Roseton Switchyard		U2	SCADA					

			Electric Subs	tation Ups	Needs As	<u>sessineiii</u>		
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
	Class (kV)			_,	<u> </u>	2300		Radio to INW
Smith Street			Charts - kW		EM			
Smith Street	4	631 Ckt. 632 Ckt.	Charts - kW		EM			
Smith Street	4	632 Ckt.	Charts - KW		EM			
Smith Street	4	634 Ckt	Charts - kW		EM			
Smith Street	13.8	MS Line	None		EM	<u> </u>		
Smith Street Smith Street	13.8	PQ Line	None		EM			
Smith Street	13.8	PS Line	None		EM			
Smith Street	13.8	W Line	None SCADA		EM			Volts
Smith Street	13.8	B1 B2	SCADA		EM			Volts
Smith Street	13.8	B1	SCADA		υP			Volts
Smith Street Smith Street	4	B2	SCADA		uP			
Smith Street	13.8/4		None	***	EM	*****		
Smith Street	13.8/4	Т2	None		EM	8890		
Smithfield				<del></del>		<del></del>		
Smithfield	13.8	7095 Ckt.	SCADA		uP			Com
Smithfield	13.8	Com Equipment						95P is SEL-267
Smithfield	69	E Line	None	uP- 200/uP uP- 200/uP				95P is SEL-267; Volts & Amps
Smithfield	69	FV Line	SCADA*	EM				Amps
Smithfield	69	GE Line	SCADA* SCADA*	EM			†	Amps
Smithfield	69	S Line SA Line	SCADA*	EM				Volts & Amps
Smithfield	69	B2	SCADA					Volts
Smithfield Smithfield	69	B3	SCADA					Volts
Smithfield	69/13.8	Y1	None*					Only one feeder; T1 = 7095 load
South Cairo	05/15/0					8890		
South Cairo	13.8	2041 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
South Cairo	13.8	2042 Ckt.	Charts - Amps		EM/uP		*****	BE1-851H as BU and 79
South Cairo	13.8	2043 Ckt.	Charts - kW		EM			
South Cairo	13.8	Com Equipment	*****	*****			*****	Com
South Cairo	69	CF Line	None	EM/uP				79 done with NLR
South Cairo	69	CL Line	None	uP				20174114
South Cairo	13.8	B1+G1	Charts - kW/SCADA		EM			SCADA Volts 95P is SEL-587
South Cairo	69/13.8	T1	Charts - Amps	EM/uP		None		33F IS 3EL-307
South Wall St. South Wall St.	4	111 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd
South Wall St.	4	112 Ckt.	Grid Sense		EM		Kyle L	Single Phase; Oil; Hyd; missing GS
South Wall St.	13.8/4	71	Charts - kW/kVAr		EM		****	
Spackenkill						Orion		
Spackenkill	13.8	6041 Ckt.	SCADA		uР		****	
Spackenkill	13.8	6042 Ckt.	SCADA		υP			
Spackenkill	13.8	6043 Ckt.	SCADA		uР		*****	
Spackenkill	13.8	6044 Ckt.	\$CADA	*****	uP uP	****		
Spackenkill	13.8	6045 Ckt.	SCADA	*****	υP			
Spackenkill	13.8	6046 Ckt.	SCADA		υP			
Spackenkill	13.8	6047 Ckt. 6048 Ckt.	SCADA SCADA		UP UP			
Spackenkill Spackenkill	13.8	Com Equipment	JOADA					~
Spackenkill	13.8	KR Line	\$CADA		uP			
Spackenkili	13.8	KS Line	SCADA	****	uP			
Spackenkill	13.8	MC Line	SCADA		uP			
Spackenkill	13.8	MC-200-SK BKR.	ŞCADA		υP			
Spackenkill	13.8	B1	SCADA		uP			
Spackenkill	13.8	B2			uP			
Spackenkill	115/13.8		SCADA	uP		*		
	115/13.8			υP		500		
Spackenkill	113/13.0					BM		
Staatsburg	<del></del>	70.44 CU+	SCADA		uР			<del></del>
Staatsburg	13.8	7041 Ckt.			uР			
Staatsburg	13.8	7042 Ckt.	SCADA		uP			
Staatsburg	13.8	7043 Ckt.	SCADA					
		Com Equipment		*****				
Staatshurn	10.0							
Staatsburg Staatsburg	<del></del>	B1	SCADA		uP	,	*****	<u> </u>

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			Electric Subst	tation Upgra	de Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
Standfordville	<del></del>					M-4000	V4L	Single phase; vac; hyd
	13.8	7071 Ckt.	MV-90		EM		V4C	Olitora Bridge
Standfordville	13.8	7072 Ckt.	MV-90	**-**	EM			Volts
Standfordville Standfordville	13.8	B1	SCADA					
Standfordville	69/13.8	T1 .	MV-90	Fuse				
	03/13.0					2100	46 1 106	3 phase; oil; hyd; missing data
Sturgeon Pool	4.	341 Ckt.	Grid Sense		EM		Kyle W	Com
Sturgeon Pool Sturgeon Pool	4	Com Equipment						
Sturgeon Pool	69	N Line	SCADA	uP		44		
Sturgeon Pool	69	O Line	SCADA	uP				
Sturgeon Pool	69	P Line	SCADA	u₽				Volts
Sturgeon Pool	69	69k Bus	SCADA	EM				
Sturgeon Pool		T5 ·	None	Fuse				
Sugarloaf						44-500		
Sugarloaf	115	SD Line	SCADA	EM		+	*****	Combine load value
Sugarloaf	115	SJ Line	00,00	EM				<u> </u>
Sugarloaf	115	SL Line	None	EM				
Sugarloaf	115	B1	SCADA	EM				Volts
Sugarloaf	115/69	O & R Transformer	SCADA	E₩				
Tinkertown	1,0,00			<del></del>	1	2300	1	Radio to PVL
Tinkertown	13.8	7022 Ckt.	SCADA	*****	υP		****	
Tinkertown	13.8	7023 Ckt.	SCADA	4	υP	7		
Tinkertown	13.8	7024 Ckt.	SCADA		uP			
Tinkertown	13.8	7025 Ckt.	SCADA		uP			
Tinkertown	13.8	81	SCADA		UP	*****	<del>+</del>	
Tinkertown	13.8	B2	SCADA		UP	<del>+</del>		Volts
Tinkertown	13.8	Com Equipment			<del></del>			Volts
Tinkertown	69/13.8	T1	SCADA	<del></del>				Com
Tinkertown	69/13.8	T2	SCADA	Fuse		*****		
Tioronda	00/10.0	1.2	SCADA	Fuse	*****			
Tioronda	13.8	8085 Ckt.	Charle Amar	T		M-4000		
Tioronda	13.8	8085 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	13.8	8087 Ckt.	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	115	W-566 Ckt. Sw	Charts - Amps		EM/uP			BE1-851H as BU and 79
Tioronda	13.8	<del></del>		EM				Agastat
Tioronda		B1	SCADA		EM			Volts
Todd Hill	115/13.8		Charts - kW/kVAr	EM				
Todd Hill	42.0	T	· · · · · · · · · · · · · · · · · · ·			2200		
Todd Hill	13.8	6051 Ckt.	SCADA		υP			
	13.8	6052 Ckt.	SCADA		υÞ	b- /		
Todd Hill	13.8	6053 Ckt.	SCADA		uР			· "
Todd Hill	13.8	6054 Ckt.	SCADA		υP			
Todd Hill	13.8	6055 Ckt.	SCADA		EM			
Todd Hill	13.8	6056 Ckt.	SCADA	****	EM			
Todd Hill	13.8	6057 Ckt.	SCADA		EM	*****	*	T
Todd Hill	13.8	Com Equipment						Com
Todd Hill	115	A Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	115	A-520-C BKR.		EM				The printing in reproductive plan
Todd Hill	115	C Line	None	EM/Gen-1				958U is Optimho; in replacement plan
Todd Hill	13.8	W - 524 BKR.			EM			
Todd Hill	115	B1	SCADA					Volts
Todd Hill	13.8	81	SCADA		EM/uP			95BU is SEL-351A; Volts
	10.0	B2	00454	<del></del>	UP			
Todd Hill	13.8		SCADA	]	1 00			Volts
Todd Hill	115/13.8		SCADA	EM/uP				Volts 95P is SEL-587

			Electric Subs	tation Us	Needs Assessment					
Substation	Voltage	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment		
	Class (kV)					2200				
Union Ave			SCADA	υP				Volts		
Union Ave	115	81	SCADA	EM				251.51.51.75		
Union Ave	115	RJ Line	SCAUA	EM/uP			*****	SEL-351A for BF		
Union Ave	115	RJ-52 BKR. UB Line	SCADA	up						
Union Ave	115	UB-51 BKR	30.50.	uР				A		
Union Ave	115	UN Line	SCADA*	EM				Amps		
Union Ave	115	UW Line	SCADA*	EM				Amps		
Union Ave	115 115	W-1095 BKR.		EM						
Union Ave	13.8	81		*****	uP uP					
Union Ave	13.8	B2			uP UP			Volts		
Union Ave	13.8	B3	SCADA		up			Volts		
Union Ave	13.8	84	SCADA		uP					
Union Ave	13.8	B3-B2			uP		,			
Union Ave	13.8	B4-B1			EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4041 Ckt.	MV-90	<u> </u>	EM/uP			8E1-851H as BU and 79		
Union Ave	13.8	4042 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4043 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4044 Ckt.	MV-90		EM/uP		****	BE1-851H as BU and 79		
Union Ave	13.8	4045 Ckt.	MV-90		EM/uP			BE1-851H as BU and 79		
Union Ave	13.8	4046 Ckt.	MV-90		uP			BE1-03117 83 00 8110 73		
Union Ave	13.8	4047 Ckt.	SCADA	· <del> </del>	UP UP					
Union Ave	13.8	4051 Ckt.	SCADA		שט					
Union Ave	13.8	4052 Ckt. 4053 Ckt.	SCADA SCADA		uP					
Union Ave	13.8	4053 CKt.	SCADA		υP			· · · · · · · · · · · · · · · · · · ·		
Union Ave	13.8	4054 Ckt.	SCADA		uP					
Union Ave	13.8	Com Equipment						Com		
Union Ave	115/13.8	T1	SCADA	EM/uP				95BU is SEL-387E		
Union Ave	115/13.8	T2	SCADA	EM/uP			*****	95BU is SEL-387E		
Union Ave	115/13.8	Т3	SCADA	uP				3000 13 322-3072		
Van Wagner		·				NONE	<del></del>			
Van Wagner	4	731 Ckt.	Charts - kW/GS				Kyle L	Single phase; oil; hyd		
Van Wagner	4	732 Ckt.	Charts - kW/GS			*****	Kyle L	Single phase; oil; hyd		
Vinegar Hill						M-4000	1	3 2 2 3 3 7 3 7 7 7 7 7		
Vinegar Hill	34.5	2389 Ckt.	MV-90	74*	uP	*****	RVE	3 phase; oil; hyd		
West Balmville						2300				
West Balmville	115	B2	SCADA	EM				Volts		
West Balmville	13.8	B1	SCADA	****	υP			Combine Bus Volts to one point		
West Balmville	13.8	B2			υP			oomonic ood void to one point		
West Balmville	115	B Line	SCADA	uP			*****			
West Balmville	13.8	4011 Ckt.	MV-90	*****	EM					
West Balmville	13.8	4012 Ckt.	SCADA		uP		ļ	MV-90 still?		
West Balmville	13.8	4013 Ckt.	SCADA					MV-90 still?		
West Balmville West Balmville	13.8	4014 Ckt.	SCADA		uP uP			MV-90 still?		
West Balmville	13.8	4015 Ckt.	MV-90	*****	E₩					
West Balmville	115	Com Equipment DB Line	SCADA	uP				Com		
West Balmville	115	DB-875 BKR.	SCADA	uP uP				<u> </u>		
West Balmville	115	DW Line	SCADA	uP						
West Balmville	115	DW-662 BKR.	SCADA	uP			<del></del>	1		
West Balmville	115	F Line	SCADA	UP				<del></del>		
West Balmville	115	R Line	SCADA	UP						
West Balmville	115	W-478 BKR.	******	υP						
West Balmville	115	W-855 BKR.		uP						
West Balmville	115	WN Line	SCADA	uР						
West Balmville		T1		EM		****		Combine load value		
		T2	SCADA	EM		•				
West Balmville			<u> </u>	<u></u>						

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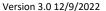
			Electric Sub	station Upgra	ide Needs As	sessment		
Substation	Voltage Class (kV)	Line/Ckt.	Metering	T. Relaying	D. Relaying	RTU	Recloser	Comment
						BM_		
Westerlo		1004 (514	SCADA		uP .			
Westerlo	13.8	1091 Ckt.	SCADA		UP			
Westerlo	13.8	1092 Ckt.	SCADA		uP			
Westerlo	13.8	1093 Ckt.	SCADA		υP			
Westerlo	13.8	B1	SCAUA			*****		
Westerlo		Com Equipment	SCADA	υP		****		Only has one 13.8 bus; T1 = Bus load
Westerlo	69/13.8	T1	SCADA	υP				
Westerlo	69	Cap Bank FW Line	SCADA	υP				
Westerlo	69	NW Line	SCADA	υP				
Westerlo Westerlo	69	FW-1500-NW BKR.		uP				
Wiccopee						L&N	<u> </u>	
Wiccopee	115	FSLine	None	EM				
Wiccopee	115	WP Line	None	υP				
Wiccopee	115	FS - 1652- WP BKR.		EM				
Wiccopee.	13.8	F1-292 BKR			EM			
Wiccopee	13.8	F2-280 BKR			EM			
Wiccopee	13.8	W-368 BKR.		*****	EM		****	
Wiccopee	13.8	W-378 BKR.			EM EM			
Wiccopee	13.8	W-632 BKR.			EM			
Wiccopee	13.8	W-636 BKR.			EM			
Wiccopee	13.8	Future (Unit #3)			EM			
Wiccopee	13.8	Future (Unit #9)			EM			
Wiccopee	13.8	, B1			EM			<del></del>
Wiccopee	13.8	82			ÉM			<del>                                     </del>
Wiccopee	13.8	Com Equipment			*****		*****	<del> </del>
Wiccopee	115/13.8	Tt	SCADA	EM				Com
Wiccopee	115/13.8	T2	SCADA	EM				<del>                                     </del>
Woodstock		<del></del>				M-4000	<del></del>	<u> </u>
Woodstock	13.8	3011 Ckt.	MV-90		EM		<del></del>	<del></del>
Woodstock	13.8	3012 Ckt.	MV-90		EM			<del> </del>
Woodstock	13.8	3013 Ckt.	MV-90		EM	<del>+</del> -		<u> </u>
Woodstock	13.8	3014 Ckt.	MV-90		EM			<u> </u>
Woodstock	13.8	B1	SCADA		EM			<del>                                     </del>
Woodstock	13.8	B2	SCADA		EM			Volts
Woodstock	69/13.8	T2+SR Line		EM				Volts
Woodstock	69/13.8	T2 + B2		EM	<del></del>			<del> </del>
Woodstock	69/13.8	T1	MV-90	2.11	<del></del>	<del> </del>		<del> </del>
Woodstock	69/13.8	T2	MV-90			*****		<u> </u>

## Attachment 6

	Station	Cost				
	Dashville	\$190,000				
2012	East Walden	\$610,000				
	Tioronda	\$200,000				
	Coxsackie	\$130,000				
	South Cairo	\$160,000				
2013	East Park	\$200,000				
	Pleasant Valley	\$360,000				
	Todd Hill	\$160,000				
	Sand Dock	\$510,000				
2014	Fishkill Plains	\$480,000				
	South Wall St.	\$84,000				
2015	Manchester	\$340,000				
2013	Forgebrook	\$730,000				
2016	Rock Tavern	\$1,060,000				
Subs						









Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Woodstock Switchgear Upgrade Work Order #: 1 3 6 1 - I

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-31-15

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2015 In-Service: 12/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The existing external switchgear and control house switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. Maintenance issues have been experienced with racking the 1947 vintage breakers in the external switchgear. Replacement parts for the racking mechanisms are no longer available. The external switchgear and control house switchgear have separate DC voltage supplies, a 24 volt and a 48 volt battery system, respectively. There is no room to upgrade either battery system, and maintenance of the system is problematic.

#### Describe specific scope exclusions, assumptions and constraints:

It is recommended that the external switchgear and control house switchgear be replaced with a new Power Control Center (PCC). The PCC will contain two bus's with a normally open tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, station service transformers, RTU, and DC battery system. The PCC will contain provisions for future expansion.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Woodstock Substation Switchgear Replacement Justification.docx

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

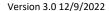
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? N/A: Infrastructure Replacements

What are the risks and consequences of not completing this project? Risk of equipment failure possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



**Current Approved Rate Case Funding (\$):** 

## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	,		•	r cost estimates sh e adjustments for i			
	\$3,539,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	335,700	20,700	10,000	305,000	0	0	0	0
	Labor (Monthly Payroll)	167,350	10,350	5,000	152,000	0	0	0	0
Α	Stock Materials	167,350	10,350	5,000	152,000	0	0	0	0
D	Non-Stock Material (A/P taxable)	671,400	41,400	21,000	609,000	0	0	0	0
	Contractors (A/P tax exempt)	236,490	14,490	8,000	214,000	0	0	0	0
Т	Overheads	1,677,500	103,500	51,000	1,523,000	0	0	0	0
I	AFUDC*	100,210	6,210	3,000	91,000	0	0	0	0
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,356,000	207,000	103,000	3,046,000	0	0	0	0
R	Labor (Weekly Payroll)	27,000	0	0	27,000	0	0	0	0
E	Labor (Monthly Payroll)	55,000	0	0	55,000	0	0	0	0
H	Contractors (A/P tax exempt)	10,000	0	0	10,000	0	0	0	0
R	Overheads	91,000	0	0	91,000	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	183,000	0	0	183,000	0	0	0	0
	* AFUDC may require adjustment after Finance Department <b>Expense \$ (if applicable):</b>								
	Expense \$ (ii applicable):	U							

2021-2023 2024

1,516

Prior years funding; not actuals.

1,516

0



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

2,477,300

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

**Maximum (\$):** 4,600,700

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

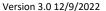
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Modena Complete Ring Bus

Work Order #: 2 4 9 2 - G

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-52-17

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2017 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Based on a review of the Ellenville Transmission Area, following the retirement of the Modena 115kV/69 kV autotransformers, new autotransformers must be installed at Kerhonkson Substation. This work will need to be completed in conjunction with the upgrade of the P & MK Lines to 115 kV operation. To meet our current protection standards, remaining work for the upgrade of the P & MK Lines to 115 kV will include protection upgrades, including pilot protection (high speed coverage of 100% of the line) and direct transfer trip for the lines upgrading to 115 kV operation.

#### Describe specific scope exclusions, assumptions and constraints:

Install a third 115 kV breaker at Modena Substation to complete the ring bus. Install relay pilot schemes at Modena Substation for primary line protection and direct transfer trip. Retire the old 115/69 kV Modena transformer and substation after conversion to 115 kV.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Chan, R.: "P & MK Area Study". E.P. #2010-008. May 2, 2011.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Ring Bus functionality at Modena will provide isolation of faults while allowing other lines to be in service resulting in high reliability.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

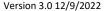
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Project aligns with the 115 kV conversion of the Kerhonkson loop.

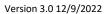
What are the risks and consequences of not completing this project?

Lack of a ring bus at Modena would result in lower reliability during maintenance or faults possibly increasing SAIFI or CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes





**Current Approved Rate Case Funding (\$):** 

## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu	,			cost estimates she adjustments for in			
	\$3,527,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	319,300	2,300	40,000	120,000	157,000	0	0	0
	Labor (Monthly Payroll)	159,150	1,150	20,000	60,000	78,000	0	0	0
A	Stock Materials	159,150	1,150	20,000	60,000	78,000	0	0	0
D	Non-Stock Material (A/P taxable)	638,600	4,600	80,000	240,000	314,000	0	0	0
l	Contractors (A/P tax exempt)	225,610	1,610	29,000	84,000	111,000	0	0	0
Т	Overheads	1,596,500	11,500	201,000	600,000	784,000	0	0	0
1	AFUDC*	94,690	690	12,000	35,000	47,000	0	0	0
N N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,193,000	23,000	402,000	1,199,000	1,569,000	0	0	0
R	Labor (Weekly Payroll)	50,150	150	0	24,000	26,000	0	0	0
E	Labor (Monthly Payroll)	100,300	300	0	47,000	53,000	0	0	0
H	Contractors (A/P tax exempt)	17,050	50	0	8,000	9,000	0	0	0
R	Overheads	166,500	500	0	78,000	88,000	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	334,000	1,000	0	157,000	176,000	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

222 2021-2023 2024

Prior years funding; not actuals.

222

0



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

2,468,900

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 4,585,100

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

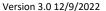
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: April 11, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Brett Arteta Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Tilcon - Tap Station Work Order #: 4 8 1 4 - F

Budget Group: Electric Budget Category: 13 Funding Project Number: 1-1312-52-16
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2016 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Installation of a new 115 kV breaker at the Sand Dock Substation to limit exposure to IBM resulting from a fault at the new tap on the SC Line.

#### Describe the project objective and scope of work:

Based on infrastructure issues determined by inspections and a condition based assessment, the 69 kV TR Line needs to be rebuilt. This line is the sole supply to a quarry limiting the ability to obtain outages during a rebuild of the line. A review has determined that the most economical solution is to build a new substation tapped off the 115 kV SC Line to supply the quarry and to retire the TR Line.

#### Describe specific scope exclusions, assumptions and constraints:

Install a new 115/69 kV Substation to serve Tilcon. Additionally, install a new 115 kV breaker at the Sand Dock Substation to limit exposure to IBM resulting from a fault at the new tap on the SC Line.





N/A



**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: System Enhancements Investment Type: New Business

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure; Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Risk Reduction.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A: Infrastructure Replacements

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

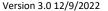
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

An alternative considered was to rebuild the TR Line in kind. Construction would be costly and lengthy due to the restrictions from the quarry on the allowable outage durations to perform the work.

Why was the proposed project scope chosen over other alternatives? More cost effective solution.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

N/A: Infrastructure Replacements

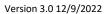
What are the risks and consequences of not completing this project?

N/A: Infrastructure Replacements

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process? None





**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu	,		•	r cost estimates sh e adjustments for i			
	\$6,542,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	654,600	23,600	6,000	51,000	314,000	260,000	0	0
	Labor (Monthly Payroll)	326,800	11,800	3,000	25,000	157,000	130,000	0	0
A	Stock Materials	326,800	11,800	3,000	25,000	157,000	130,000	0	0
D	Non-Stock Material (A/P taxable)	1,308,200	47,200	12,000	102,000	627,000	520,000	0	0
l i	Contractors (A/P tax exempt)	459,520	16,520	5,000	36,000	220,000	182,000	0	0
Т	Overheads	3,271,000	118,000	31,000	254,000	1,569,000	1,299,000	0	0
1	AFUDC*	195,080	7,080	2,000	15,000	93,000	78,000	0	0
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,542,000	236,000	62,000	508,000	3,137,000	2,599,000	0	0
R	Labor (Weekly Payroll)	0	0	0	0	0	0	0	0
E	Labor (Monthly Payroll)	0	0	0	0	0	0	0	0
Hi	Contractors (A/P tax exempt)	0	0	0	0	0	0	0	0
R	Overheads	0	0	0	0	0	0	0	0
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Department   Expense \$ (if applicable):								

2021-2023 2024

1,004

Prior years funding; not actuals.

4,210

3,206



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

4,579,400 **Maximum (\$):** 8,504,600

No explanation on confidence level required.

Minimum (\$):

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical Proforma Pricing

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Victor Narkaj Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Category 14 Electric New Business Work Order #:

Budget Group: Electric Budget Category: 14 Funding Project Number: N/A

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Overall Budget Planning for Category 14

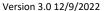
Describe the project objective and scope of work:

All electric new business

Describe specific scope exclusions, assumptions and constraints:

Tariff obligation to provide electric service







**B. JUSTIFICATION** 

Load Based/Infrastructure: Load-Based Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Non-Discretionary Investment Type: Growth

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: New Business

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Category 14 electric new business category consists of funding to provide new electric service to non-discretionary customer requested residential and commercial projects. This includes new multi-family and Underground Residential Distribution (URD) projects, new individual residential homes, street and area lighting installations, and commercial/industrial electric new business. Work orders types can be specific (>\$15,000), local work orders

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Monetary benefits through increased revenue.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve customer experience
Which <u>Strategic Initiative</u> does project most align with? Seamless Customer Experience

Which Team Goal does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

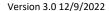
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None. Category 14 is non-discretionary

Why was the proposed project scope chosen over other alternatives? Obligation to serve is non-discretionary

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? New customer service must be provided in a timely manner

What are the risks and consequences of not completing this project? Customer complaints

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? None

Yes



**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates sl le adjustments for			
	\$70,754,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	6,963,000		1,289,000	1,355,000	1,375,000	1,435,000	1,509,000	
	Labor (Monthly Payroll)	11,608,000		2,149,000	2,259,000	2,292,000	2,393,000	2,515,000	
A	Stock Materials	24,765,000		4,586,000	4,819,000	4,889,000	5,105,000	5,366,000	
D	Non-Stock Material (A/P taxable)	3,511,000		650,000	683,000	693,000	724,000	761,000	
li	Contractors (A/P tax exempt)	5,556,000		1,029,000	1,081,000	1,097,000	1,145,000	1,204,000	
Т	Overheads	7,892,000		1,461,000	1,536,000	1,558,000	1,627,000	1,710,000	
1	AFUDC*	9,042,000		1,524,000	1,568,000	1,862,000	1,997,000	2,091,000	
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	69,337,000	0	12,688,000	13,301,000	13,766,000	14,426,000	15,156,000	0
R	Labor (Weekly Payroll)	530,000		100,000	103,000	106,000	109,000	112,000	
E	Labor (Monthly Payroll)	530,000		100,000	103,000	106,000	109,000	112,000	
Hi	Contractors (A/P tax exempt)	133,000		25,000	26,000	27,000	27,000	28,000	
R	Overheads	224,000		31,000	37,000	44,000	52,000	60,000	
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	1,417,000	0	256,000	269,000	283,000	297,000	312,000	0
	* AFUDC may require adjustment after Finance Depa Expense \$ (if applicable):								
	Expense \$ (ii applicable):	U							

2021-2023 2024

20,057

Prior years funding; not actuals.

28,449

8,392



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

56,603,200

No further estimate range is required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

84.904.800

The Category 14 - Electric New Business budget is established using historic customer additions and spending run rates. Budget dollars are allocated to specific and blanket categories, but can be reallocated within the category as actual spending varies from projections.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Distribution Improvement Blankets (15BL-01)

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-151L-01-08
Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Development of work orders to address emerging operational work.

Describe specific scope exclusions, assumptions and constraints:

N/A





N/A



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Newly emerging, operational work on the distribution system must be addressed on a routine basis, such as emergency work and compliance related

issues.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Distribution improvement projects typically reduce operating and maintenance costs.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To allow for the completion of emergent operational work and compliance related issues.

What are the risks and consequences of not completing this project? Increased impacts on SAIFI and CAIDI

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



Current Approved Rate Case Funding (\$):

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				r cost estimates sl e adjustments for			
	\$251,600,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	167,300,000		14,700,000	18,900,000	18,900,000	18,900,000	18,900,000	77,000,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	71,700,000		6,300,000	8,100,000	8,100,000	8,100,000	8,100,000	33,000,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	239,000,000	0	21,000,000	27,000,000	27,000,000	27,000,000	27,000,000	110,000,000
R	Labor (Weekly Payroll)	12,600,000		2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000
E	Labor (Monthly Payroll)	0							
Hi	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т.	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	12,600,000	0	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

26,862,000

36,595,000

9,733,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increasing material costs for non-discretionary work could result in overages for this program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Annual Estimates developed based off Rate Case Settlement.	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Relocation Blankets (15BL-02)

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-152L-02-08
Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Create work orders to relocate facilities to a new location. The new location should be designed for optimal present and future operation.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson commonly experiences unforeseen issues with the location of existing infrastructure. Some examples are interference with new construction and new business and minor road and bridge rebuilds. These issues require Central Hudson to relocate its facilities.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve customer experience

Which <u>Strategic Initiative</u> does project most align with? Cybersecurity Culture
Which <u>Team Goal</u> does project most align with? PSC Complaint Rate

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

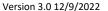
### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Cases often arise where Central Hudson is required to relocate our facilities in a timely manner.

What are the risks and consequences of not completing this project?

Customer needs will not be met and compliance will not be adhered to

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A

Yes





**Current Approved Rate Case Funding (\$):** 

## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,			cost estimates sho adjustments for ir			
	\$2,310,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	1,470,000		147,000	147,000	147,000	147,000	147,000	735,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	630,000		63,000	63,000	63,000	63,000	63,000	315,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
ı	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,100,000	0	210,000	210,000	210,000	210,000	210,000	1,050,000
R	Labor (Weekly Payroll)	210,000		21,000	21,000	21,000	21,000	21,000	105,000
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	210,000	0	21,000	21,000	21,000	21,000	21,000	105,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

617,000

833,000

216,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs and the number of requests for infrastructure relocations drive the expenditures within this blanks.	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Annual estimates developed based off Rate Case Settlement	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you make the second of the secon	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Distribution Improvement Conversions (1521-0X)

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1521-00-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Conversion from 4kV to 13.2kV operation often is recommended where customers are experiencing low or errant voltage or a step-down transformer is overloaded. Polyphasing, reconductoring, or installation of mitigating equipment also are examples of projects that could fall under this line item on an emerging basis.

Describe specific scope exclusions, assumptions and constraints:

N/A





No



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Growth

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Customers fed from a lower than standard distribution voltage class (13.2kV) can often have low or errant voltages. Hosting capacity for distributed energy resources is also limited. Despite significant planning efforts, some of these problems emerge based upon changes in customer behaviors.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Seamless Customer Experience Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

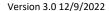
#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

What are the risks and consequences of not completing this project? Increased impacts on SAIFI, CAIDI and power quality.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,		,	cost estimates sho adjustments for in			
	\$3,564,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	2,268,000		226,800	226,800	226,800	226,800	226,800	1,134,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	972,000		97,200	97,200	97,200	97,200	97,200	486,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,240,000	0	324,000	324,000	324,000	324,000	324,000	1,620,000
R	Labor (Weekly Payroll)	324,000		32,400	32,400	32,400	32,400	32,400	162,000
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	324,000	0	32,400	32,400	32,400	32,400	32,400	162,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

924,000

1,248,000

324,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increasing material costs could result in overages for this program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ny add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Road/Bridge Rebuild Relocation Projects (1531-0X)

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1531-00-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

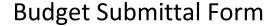
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Central Hudson coordinates with the local municipalities and the Department of Transportation for highway rebuild and road paving projects. The highway rebuilds and road paving projects usually consist of relocation and replacement of existing infrastructure. The infrastructure is optimally designed for both present and projected use through engineering studies.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

**Growth/Sustaining/Retirement: Distribution Sustaining** Load Based/Infrastructure: Infrastructure

**Discretion Level:** Non-Discretionary **Investment Type:** Compliance

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44):

Needs Assessment: Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson commonly experiences unforeseen issues with the location of existing infrastructure. These issues require Central Hudson to relocate its facilities.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Operational Excellence Which Strategic Theme does project most align with?

Which Strategic Objective does project most align with? Improve customer experience Which Strategic Initiative does project most align with? Seamless Customer Experience

Which Team Goal does project most align with? **PSC Complaint Rate** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

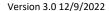
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

**Social Component:** Yes **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Scenarios arise in which Central Hudson is required to relocate infrastructure to accommodate road/bridge construction or relocation.

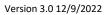
What are the risks and consequences of not completing this project?

Customer needs will not be met and compliance will not be adhered to.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





**Current Approved Rate Case Funding (\$):** 

## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,			cost estimates sho adjustments for ir			
	\$3,645,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	2,268,000		378,000	378,000	189,000	189,000	189,000	945,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	972,000		162,000	162,000	81,000	81,000	81,000	405,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,240,000	0	540,000	540,000	270,000	270,000	270,000	1,350,000
R	Labor (Weekly Payroll)	405,000		54,000	54,000	54,000	54,000	54,000	135,000
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	405,000	0	54,000	54,000	54,000	54,000	54,000	135,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

2,516,000

3,435,000

919,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Material costs and the number of requests for infrastucture relocations drive the expenditures within this program.  Basis for estimate: Historical Unit Pricing	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Annual estimates developed based off Rate Case Settlement.	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	y add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: CATV Make-ready Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-01-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Develop work orders to address any emerging CATV work.

Describe specific scope exclusions, assumptions and constraints:

N/A







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction; Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As the communication companies continue to expand their infrastructure, the proper NESC clearances between communication and electric facilities must be maintained and the poles must have sufficient capability to carry the additional facilities. If the infrastructure is aged, the utility is responsible for the cost of the upgrades. With the governor's broadband initiative, the volume of these projects is increasing significantly.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

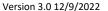
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







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What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to maintain the proper NESC clearances between communication and electric facilities, infrastructure must be upgraded continuously.

What are the risks and consequences of not completing this project? Failure to be in compliance with NESC code.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





**Current Approved Rate Case Funding (\$):** 

## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for ii			
	\$6,600,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	4,200,000		420,000	420,000	420,000	420,000	420,000	2,100,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,800,000		180,000	180,000	180,000	180,000	180,000	900,000
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,000,000	0	600,000	600,000	600,000	600,000	600,000	3,000,000
R	Labor (Weekly Payroll)	600,000		60,000	60,000	60,000	60,000	60,000	300,000
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	600,000	0	60,000	60,000	60,000	60,000	60,000	300,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

2,047,000

2,588,000

541,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Material Costs and number of CATV make-ready requests drive the expenditures for this program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	y add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Overhead Secondary Replacement Program

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-04-19
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

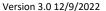
### Describe the project objective and scope of work:

The overhead secondary replacement program was developed to begin to phase out all of the antiquated, open wire secondary. The wire is typically replaced with new, triplex cable. The conductors are stronger, more resistant to contact faults and can handle additional loading.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Many secondary wires serving older homes in the Central Hudson service territory are open, bare conductor. This design is antiquated and prone to failure. Also, the bare conductors provide no insulation from foreign contact and contribute to decreased reliability. There is a tendency for one leg or the neutral to fail, resulting in partial power or voltage swings that damage customer equipment.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Improved SAIFI & CAIDI performance.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

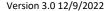
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

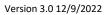
This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project? Increased impacts on SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,			cost estimates sho adjustments for ir			
	\$2,415,600	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	1,537,200		151,200	154,000	154,000	154,000	154,000	770,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	658,800		64,800	66,000	66,000	66,000	66,000	330,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
ı	AFUDC*	0							
N N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,196,000	0	216,000	220,000	220,000	220,000	220,000	1,100,000
R	Labor (Weekly Payroll)	219,600		21,600	22,000	22,000	22,000	22,000	110,000
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	219,600	0	21,600	22,000	22,000	22,000	22,000	110,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

617,000

833,000

216,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Potential project deferrals & re-prioritization; material shortages	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ıy add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Distribution Pole Replacement Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-08-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

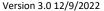
### Describe the project objective and scope of work:

The facility inspections program helps determine if poles are in need of replacement due to conditions such as broken poles, severe pole lean, pole rot, wash out, evidence of flashover and woodpecker holes. Recent improvements in Central Hudson's testing procedures helped identify over four times as many defective poles from years past.

Describe specific scope exclusions, assumptions and constraints:

N/A







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson currently owns over 211,000 distribution poles. All but a few are made of wood materials. Much of this pole plant is antiquated and undersized. The average age of the pole plant is over 40 years old with nearly 100,000 poles installed in the 1960's and earlier (50+ years old). Many of these poles have been exposed to rot, woodpeckers and other weather related decay. As the poles weaken, their likelihood of failure increases.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved SAIFI & CAIDI performance

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

As aged/at-risk poles are discovered within the infrastructure, they must be replaced as soon as possible to mitigate any potential safety & reliability risks.

Yes

What are the risks and consequences of not completing this project? Increased impacts on SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	•	All future year cost estimates should include applicable adjustments for inflation.					
	\$11,000,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	7,000,000		700,000	700,000	700,000	700,000	700,000	3,500,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	3,000,000		300,000	300,000	300,000	300,000	300,000	1,500,000
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	10,000,000	0	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
R	Labor (Weekly Payroll)	1,000,000		100,000	100,000	100,000	100,000	100,000	500,000
E	Labor (Monthly Payroll)	0							
ľ	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Daivage ONLDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	1017(21(20)	1,000,000	0	100,000	100,000	100,000	100,000	100,000	500,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

 Current Approved Rate Case Funding (\$):
 34,939,000
 26,088,000
 8,851,000

 2021-2023
 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Distribution Automation - Other

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 10461
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

There is a small annual allowance for new locations that were not identified as part of the Grid Modernization plan (DA-Major Program) and replacement equipment as it arises.

### Describe specific scope exclusions, assumptions and constraints:

Funding for this program has already been accounted for as part of the 2022-2024 Category 15 Budget. Once approved, funds will be re-allocated from Funding Project # 1-1551-19-18 (Distribution Automation - Major Program).





N/A



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? Yes

Needs Assessment: Infrastructure; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

An aging infrastructure, inefficient grid, rising energy costs, increased demand for uninterrupted service, and increased adoption of distributed energy resources, as well as availability of more sophisticated technology, have driven the need for a reformation of the electric distribution system.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The Electric Distribution Automation program was developed in order to address these growing concerns. Through the implementation of a Distribution Management System (DMS), Central Hudson will be able to implement programs such as Volt-Var optimization (VVO), Conservation

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

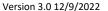
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project?

Increased impacts on SAIFI and CAIDI; Increased risk of power quality issues

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary		ear 1 = 1st year of the  All future year cost estimates should include 5-year budget plan  applicable adjustments for inflation.						
	\$5,500,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	3,500,000		350,000	350,000	350,000	350,000	350,000	1,750,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,500,000		150,000	150,000	150,000	150,000	150,000	750,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,000,000	0	500,000	500,000	500,000	500,000	500,000	2,500,000
R	Labor (Weekly Payroll)	500,000		50,000	50,000	50,000	50,000	50,000	250,000
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	500,000	0	50,000	50,000	50,000	50,000	50,000	250,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

1,434,000

1,975,000

541,000



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

3,850,000

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

Minimum (\$):

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

7.150.000

Annual estimates developed based off Rate Case Settlement

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Distribution Automation - Major Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-19-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

The Electric Distribution Automation program was developed in order to address these growing concerns. Through the implementation of a Distribution Management System (DMS), Central Hudson will be able to implement programs such as Volt-Var optimization (VVO), Conservation Voltage Reduction (CVR), and Fault Location Isolation and Service Restoration (FLISR). Programs such as these are aimed to lower customer energy usage, defer transmission investments, replace aging assets, incorporate modern technology, improve customer reliability, and facilitate integration of

### Describe specific scope exclusions, assumptions and constraints:

All expenditures within this program derive from reccomendations in DA E.P. Memos. All incremental DA devices installed along with expenditures for repairs to existing DA equipment are considered part of the "Distribution Automation - Other" Program (Funding Project #10461)







#### **B. JUSTIFICATION**

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure Distribution Sustaining

**Discretion Level: System Enhancements Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? Yes

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

An aging infrastructure, inefficient grid, rising energy costs, increased demand for uninterrupted service, and increased adoption of distributed energy resources, as well as availability of more sophisticated technology, have driven the need for a reformation of the electric distribution system.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Business Modernization** 

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** Yes **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





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What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program conincides with the Grid Mod Program

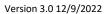
What are the risks and consequences of not completing this project?

Elevated risks on overall SAIFI and CAIDI performance; Increased risk of power quality issues; Failure to adhere to Grid Mod Program milestones

Yes

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$5,948,800	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	3,785,600		3,449,600	336,000				
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,622,400		1,478,400	144,000				
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,408,000	0	4,928,000	480,000	0	0	0	0
R	Labor (Weekly Payroll)	540,800		492,800	48,000				
E	Labor (Monthly Payroll)	0							
l:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	540,800	0	492,800	48,000	0	0	0	0
	* AFUDC may require adjustment after Finance Depar								
	Expense \$ (if applicable):	0							

 Current Approved Rate Case Funding (\$):
 18,652,000
 13,875,000
 4,777,000

 2021-2023
 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

<b>D. I.</b> (10)	
Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increases in material costs could result in overages within this program	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. Y applicable cost estimating files as appropriate.  N/A	ou may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Distribution Improvement - Reliability (1551-0X)

Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-10-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Projects are developed and prioritized according to a 5 year historical average \$/COA (customer outage avoided), but ancillary benefits to customer satisfaction and resiliency also are considered. Examples of improvement projects include relocating circuitry from off-road to on-road, closing gaps (i.e., new circuit ties), installing electronic reclosers, and replacing failure prone equipment.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

One of the primary focuses of the Category 15 Capital Budget plan is to improve the reliability of electric service for Central Hudson's customers.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

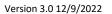
Yes

What are the risks and consequences of not completing this project?

Elevated risks to SAIFI and CAIDI performance.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





**Current Approved Rate Case Funding (\$):** 

## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$6,820,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	4,340,000		756,000	892,500	962,500	752,500	976,500	
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,860,000		324,000	382,500	412,500	322,500	418,500	
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,200,000	0	1,080,000	1,275,000	1,375,000	1,075,000	1,395,000	0
R	Labor (Weekly Payroll)	620,000		108,000	127,500	137,500	107,500	139,500	
ΙĘ	Labor (Monthly Payroll)	0							
ľ	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	620,000	0	108,000	127,500	137,500	107,500	139,500	0
	* AFUDC may require adjustment after Finance Department review.								
	Expense \$ (if applicable):	0							

 4,590,000
 3,407,000
 1,183,000

 2021-2023
 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: CEMI-Worst Circuit Reliability Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-18-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

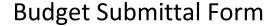
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The CEMI (customers experiencing multiple interruptions) and Worst Performing Circuits program have been designed to help identify and develop reliability improvements for these customers. Projects are similar to projects identified in the Reliability program. The customers experiencing the poorest of reliability are identified, and improvement projects are developed annually.

Describe specific scope exclusions, assumptions and constraints:

N/A





N/A



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson maximizes its reliability improvement efforts through continuous analysis and planning. Reliability improvement projects are generally prioritized using a \$/Customer Outage Avoided (COA) criteria. This program allows us to address specific circuits and "pockets" of customers that tend to experience a higher frequency of outages than average or are fed from a Worst Performing Circuit, where \$/COA criteria is used as an

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project?

Elevated risks on SAIFI and CAIDI performance; Unfavorable customer satisfaction results due to repeated outages.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





**Current Approved Rate Case Funding (\$):** 

# E. COST ESTIMATE

	Capital Estimate Summary	t year of the dget plan							
	\$6,862,900	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	4,367,300		792,400	753,900	710,500	858,200	762,300	490,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,871,700		339,600	323,100	304,500	367,800	326,700	210,000
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,239,000	0	1,132,000	1,077,000	1,015,000	1,226,000	1,089,000	700,000
R	Labor (Weekly Payroll)	623,900		113,200	107,700	101,500	122,600	108,900	70,000
ΙĘ	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	623,900	0	113,200	107,700	101,500	122,600	108,900	70,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

7,109,000 5,609,000 1,500,000 2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Resiliency Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 10404

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Examples of projects which would fit into this program may include any of the following:

• Use of technology: Microgrids, R&D, resiliency studies, weather early-warning systems

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? Yes

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Resilient capital expenditures are investments made to reduce the probability, magnitude and/or duration of disruptive outage events. The effectiveness of resilient infrastructure depends on its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Improved SAIFI & CAIDI performance.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with?

Improve system performance and resilience

Which Strategic Initiative does project most align with?

**Business & Operations Modernization** 

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

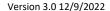
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

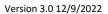
Yes

What are the risks and consequences of not completing this project?

Elevated risks to SAIFI and CAIDI

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu							
	\$3,528,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	2,352,000				1,176,000			1,176,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,008,000				504,000			504,000
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,360,000	0	0	0	1,680,000	0	0	1,680,000
	Labor (Weekly Payroll)	168,000				168,000			
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	168,000	0	0	0	168,000	0	0	0
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

 Current Approved Rate Case Funding (\$):
 1,749,000
 1,100,000
 649,000

 2021-2023
 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you make the second of the secon	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Distribution Improvement (1551-0X) - Operating/ Infrastructure Condition Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-03-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

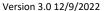
#### Describe the project objective and scope of work:

Operating projects are developed with the primary goal of reducing the duration of outages. Typical projects involve developing a tie between feeders, or reconductoring the lines to make the tie stronger so more load can be reenergized through switching. Many of these projects also address failing infrastructure that does not fall under a specific program.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

One of the primary focuses of the Category 15 Capital Budget plan is to improve the reliability of the Central Hudson customers. Operational limitations in the distribution circuitry is a primary driver in the overall duration that the average customer experiences. In addition, aged infrastructure in poor condition may create operational limitations and/or future risk of an increase in outages.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

**Business Modernization** 

Which <u>Strategic Objective</u> does project most align with?

Improve system performance and resilience

Which Strategic Initiative does project most align with?

**Business & Operations Modernization** 

Which Team Goal does project most align with?

PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

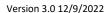
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

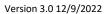
This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project? Elevated risks to SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





**Current Approved Rate Case Funding (\$):** 

# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu							
	\$18,341,400	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	11,671,800		1,965,600	1,298,500	1,050,000	2,668,400	2,802,800	1,886,500
	Labor (Monthly Payroll)	0							
A	Stock Materials	5,002,200		842,400	556,500	450,000	1,143,600	1,201,200	808,500
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	16,674,000	0	2,808,000	1,855,000	1,500,000	3,812,000	4,004,000	2,695,000
	Labor (Weekly Payroll)	1,667,400		280,800	185,500	150,000	381,200	400,400	269,500
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	1,667,400	0	280,800	185,500	150,000	381,200	400,400	269,500
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

 9,000,000
 6,500,000
 2,500,000

 2021-2023
 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Copper Wire Replacement Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-11-18

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

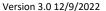
#### Describe the project objective and scope of work:

The copper wire replacement program was developed to begin to phase out all of the undersized, antiquated, copper conductors. The wire is typically replaced with new, higher capacity ACSR wire. The new conductors are rated for 13.2kV operation, are stronger, and can handle additional loading.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

There is a proliferation of primary copper wire on Central Hudson's distribution system. These conductors are not only antiquated and prone to failure; they are frequently undersized (#4 and #6) for modern operational needs, such as CVR and FLISR. They are also susceptible to burndown during reclose operations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved SAIFI & CAIDI performance

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

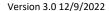
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

What are the risks and consequences of not completing this project? Increased impacts on SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



**Current Approved Rate Case Funding (\$):** 

# E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the 5-year budget plan  All future year cost estimates should include applicable adjustments for inflation.						
	\$3,300,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	2,100,000				612,500	437,500		1,050,000
	Labor (Monthly Payroll)	0							
A	Stock Materials	900,000				262,500	187,500		450,000
D	Non-Stock Material (A/P taxable)	0							
1	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
N N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,000,000	0	C	0	875,000	625,000	0	1,500,000
R	Labor (Weekly Payroll)	300,000				87,500	62,500		150,000
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	300,000	0	C	0	87,500	62,500	0	150,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

2,326,000

2,975,000

649,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM									
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence									
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges								
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Potential project deferrals & re-prioritization; material shortages.									
Basis for estimate: Historical Data + Job Specific Adjustments									
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to								
F. ADDITONAL INFORMATION									
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):								



Version 3.0 12/9/2022

Submission Date: January 30, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Joseph Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: 4800 V Conversion/Infrastructure Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-12-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

A conversion program was developed to the eliminate 4800V aging infrastructure. The program focuses on upgrading 4800V mainline circuitry to 13.2kV operational voltage. A particular focus is placed on developing projects that eliminate overloaded step-down transformer banks in order to mitigate thermal and infrastructure concerns, as well as remove any of the other potential hazards associated with 4800V circuitry.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

An infrastructure concern in the Central Hudson territory is the 4800V circuitry. These 4800V pockets limit the operational flexibility, load serving capability, and hosting capacity for DERs. 4800V circuitry is also outdated; Central Hudson abandoned the practice of installing 4800V circuitry in the 1940s. Much of the area infrastructure is over 70 years old and has exceeded its useful life. Central Hudson has over 200 miles of 4800V circuitry

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Busin

Business Modernization

Which <u>Strategic Objective</u> does project most align with?

Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which Team Goal does project most align with?

PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project?

Elevated risks on SAIFI and CAIDI performance

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A



# E. COST ESTIMATE

	Capital Estimate Summary	t year of the dget plan							
	\$14,900,900	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	9,482,500		2,826,600	1,916,600	1,743,300	1,526,000	1,470,000	
	Labor (Monthly Payroll)	0							
A	Stock Materials	4,063,800		1,211,400	821,400	747,000	654,000	630,000	
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	13,546,300	0	4,038,000	2,738,000	2,490,300	2,180,000	2,100,000	0
R	Labor (Weekly Payroll)	1,354,600		403,800	273,800	249,000	218,000	210,000	
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	1,354,600	0	403,800	273,800	249,000	218,000	210,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

8,412,000

**Current Approved Rate Case Funding (\$):** 12,197,000

3,785,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Potential project deferrals & re-prioritization; material shortages	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Network Cable and Equipment Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-15-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

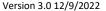
#### Describe the project objective and scope of work:

Eliminate paper-insulated lead covered (PILC) cables on network feeders by installing new rubber insulated (EPR) cables for underground facilities. EPR cable, spacer cable, or open-wire construction can be utilized in overhead applications to eliminate PILC self-supporting aerial cable. Inspection-related repairs, oil switch replacement, and the replacement of the legacy CE Mesh monitoring system with network protector relays are included as part of this program as well.

#### Describe specific scope exclusions, assumptions and constraints:

All secondary network upgrades and inspection-related repairs are excluded from this program (see Secondary Network Upgrade Program Budget Form for more details).







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Network Cable and Equipment program was initiated in 2009 to address the 14.4 kV PILC network feeder cables and associated underground infrastructure, both of which are close to 100 years old and in need of regular maintenance and repairs due to failures. Underground inspections have consistently identified numerous locations in the underground network system in need of cable replacement and infrastructure repair.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

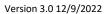
This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project? Increased impacts on SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





**Current Approved Rate Case Funding (\$):** 

# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu							
	\$7,611,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	4,571,000		1,263,500	1,435,000	1,382,500	245,000	245,000	
	Labor (Monthly Payroll)	0							
A	Stock Materials	1,959,000		541,500	615,000	592,500	105,000	105,000	
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,530,000	0	1,805,000	2,050,000	1,975,000	350,000	350,000	0
R	Labor (Weekly Payroll)	1,081,000		180,500	205,000	197,500	35,000	35,000	428,000
E	Labor (Monthly Payroll)	0							
ľ	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	1,081,000	0	180,500	205,000	197,500	35,000	35,000	428,000
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

2021-2023 2024

Prior years funding; not actuals.

5,356,000

7,432,000

2,076,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Potential project deferrals & re-prioritization; material shortages	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Secondary Network Upgrade Program Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 10462
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Annual inspection-related repairs of the secondary network underground cables and associated infrastructure, including duct banks, pull boxes and manholes identify projects requiring immediate upgrades. In addition, project portfolios have been developed for each network system.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The secondary network infrastructure in Poughkeepsie, Kingston, and Newburgh is nearly 100 years old. Many of the ducts in the secondary network system have either collapsed or have been abandoned. Pull box and manholes are in poor condition and are in need of new roofs and in some cases, need to be completely rebuilt.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved SAIFI and CAIDI performance; Reduction of emergent-based repairs.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project?

Elevated risks to SAIFI and CAIDI performance.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





# **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1si 5-year bu		All future year cost estimates should include applicable adjustments for inflation.						
	\$7,326,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
A D D I T I O N S	Labor (Weekly Payroll)	4,662,000		1,004,500	913,500	1,239,000	1,225,000	280,000		
	Labor (Monthly Payroll)	0								
	Stock Materials	1,998,000		430,500	391,500	531,000	525,000	120,000		
	Non-Stock Material (A/P taxable)	0								
	Contractors (A/P tax exempt)	0								
	Overheads	0								
	AFUDC*	0								
	Journal Vouchers (JVs)	0								
	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	6,660,000	0	1,435,000	1,305,000	1,770,000	1,750,000	400,000	0	
R	Labor (Weekly Payroll)	666,000		143,500	130,500	177,000	175,000	40,000		
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	0								
R E M	Overheads	0								
	Journal Vouchers (JVs)	0								
	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T S	Joint Utility Payments CREDIT	0								
	TOTAL REMOVALS:	666,000	0	143,500	130,500	177,000	175,000	40,000	0	
	* AFUDC may require adjustment after Finance Department review.									
	Expense \$ (if applicable):	0								

Expense \$ (ii applicable).

**Current Approved Rate Case Funding (\$):** 1,989,000 1,286,000 703,000

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

5,128,200

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

**Maximum (\$):** 9,523,800

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

Minimum (\$):

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Annual estimates developed based off Rate Case Settlement.

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: URD Replacement Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 1-1551-16-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

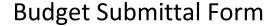
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Targeted and wholesale replacement of URDs that have been identified to be in extremely poor condition as result of repeated equipment-failure outages over the years. This program also includes for IMCORP testing which detects partial discharge in cables and pinpoints the location of defects that will eventually result in a fault and a customer interruption. This testing, when applicable, allows for cable health assessment that would help target specific problems and coordinate repairs, rather than replace or rejuvenate older cable wholesale.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson's underground residential development (URD) cables are aging and are experiencing failures. Although the impact to reliability so far has been relatively small, the utility industry as a whole recognizes the potential larger impact these aging cables will have on reliability in the future. Pro-active measures are needed to curb these failures and mitigate the inevitable larger impact to system reliability.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

PSC CAID! Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

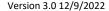
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $N\!/\!A$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

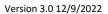
Yes

What are the risks and consequences of not completing this project?

Increased impacts on SAIFI and CAIDI; Unfavorable customer satisfaction results due to repeated outages.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A





**Current Approved Rate Case Funding (\$):** 

### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan							
	\$57,779,700	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	36,768,900		920,500	4,558,400	3,675,000	3,850,000	4,375,000	19,390,000	
	Labor (Monthly Payroll)	0								
A	Stock Materials	15,758,100		394,500	1,953,600	1,575,000	1,650,000	1,875,000	8,310,000	
D	Non-Stock Material (A/P taxable)	0								
ī	Contractors (A/P tax exempt)	0								
Т	Overheads	0								
1	AFUDC*	0								
O N	Journal Vouchers (JVs)	0								
s	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	52,527,000	0	1,315,000	6,512,000	5,250,000	5,500,000	6,250,000	27,700,000	
R	Labor (Weekly Payroll)	5,252,700		131,500	651,200	525,000	550,000	625,000	2,770,000	
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	0								
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	5,252,700	0	131,500	651,200	525,000	550,000	625,000	2,770,000	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								

2021-2023 2024

Prior years funding; not actuals.

1,958,000

3,039,000

1,081,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: January 31, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Kisch Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Storm Hardening Work Order #:

Budget Group: Electric Budget Category: 15 Funding Project Number: 10403
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Circuit Hardening - Harden mainline zones of protection that impact 500 customers or more and are identified on the 25 Worst Performing circuits list when storm-related interruptions are considered by performing additional vegetation management, replacing failure-prone equipment, ensuring proper fusing/animal/lightning protection and verifying that all equipment is built to the current Electric Construction Standards.

Describe specific scope exclusions, assumptions and constraints:

N/A



Version 3.0 12/9/2022

B. JUSTIFICATION

A FORTIS COMPANY

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

In response to the New York State Public Service Commission's Order Instituting Proceeding and to Show Cause issued April 18, 2019 in Case 19-E-0109 ("Storm Order"), Central Hudson filed an Implementation Plan addressing recommendations within the Order to institute storm hardening measures and improve reliability to critical facilities that counties consider essential. The areas commonly impacted by storms may not always be

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC SAIFI Outage Frequency

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

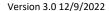
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This program supports efforts to eliminate legacy infrastructure and rebuild circuitry to modern-day construction, reliability, and operational flexibility standards.

Yes

What are the risks and consequences of not completing this project? Elevated risks to SAIFI and CAIDI.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu		All future year cost estimates should include applicable adjustments for inflation.					
	\$28,689,100	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	18,256,700		5,586,700	2,747,500	2,625,000	3,335,500	3,962,000	
	Labor (Monthly Payroll)	0							
A	Stock Materials	7,824,300		2,394,300	1,177,500	1,125,000	1,429,500	1,698,000	
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	26,081,000	0	7,981,000	3,925,000	3,750,000	4,765,000	5,660,000	0
R	Labor (Weekly Payroll)	2,608,100		798,100	392,500	375,000	476,500	566,000	
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	2,608,100	0	798,100	392,500	375,000	476,500	566,000	0
	* AFUDC may require adjustment after Finance Depa								
	Expense \$ (if applicable):	0							

4,500,000 2021-2023 2024

Prior years funding; not actuals.

9,000,000

**Current Approved Rate Case Funding (\$):** 13,500,000



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Increased material costs could result in overages within the program	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. N/A	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 7, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Domenick D'Addona Current Life-Cycle Phase: 4 Construction

A. GENERAL

Project/Program Name: Transformer Budget (Category 16) Work Order #:

Budget Group: Electric Budget Category: 16 Funding Project Number: NA

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 1/1/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

To purchase Transformers, Capacitors, Regulators, and Network Protectors to ensure an adequate stock of operational inventories to facilitate planned field work, smart grid components and emergency restoration operations.

Describe specific scope exclusions, assumptions and constraints:

None





N/A



**B. JUSTIFICATION** 

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure Distribution Sustaining

**Discretion Level:** Non-Discretionary **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Compliance: Infrastructure: New Business: Quality: Regulatory: Reliability Needs Assessment:

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Transformers, Regulators, Capacitors and Network Protectors are requisite Electric Distribution Infrastructure Components

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Transformers, Regulators, Capacitors and Network Protectors are requisite Electric Distribution Infrastructure Components.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Energy Leadership** 

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC SAIFI Outage Frequency** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** No **Governance Component:** No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?  $\ensuremath{\text{N/A}}$ 

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

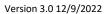
Why do we need to complete this project in the period requested?  $\ensuremath{\text{N/A}}$ 

What are the risks and consequences of not completing this project?  $\ensuremath{\text{N/A}}$ 

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu		All future year cost estimates should include applicable adjustments for inflation.					
	\$83,781,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	83,781,000		17,640,000	16,443,000	16,255,000	16,564,000	16,879,000	
D	Non-Stock Material (A/P taxable)	0							
ľ	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	83,781,000	0	17,640,000	16,443,000	16,255,000	16,564,000	16,879,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

 Current Approved Rate Case Funding (\$):
 36,347,000
 18,707,000
 17,640,000

 2021-2023
 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

← per estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Projections based on current unit pricing and OEM and Vendor Estimates for future unit costs.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 5, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: David McGowan Current Life-Cycle Phase: 4 Implementation (IT/OT)

A. GENERAL

Project/Program Name: Electric Meters Work Order #:

Budget Group: Electric Budget Category: 17 Funding Project Number:

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: In-Service:

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

X041A,X042A, X043A

#### Describe the project objective and scope of work:

Meter Services is required to purchase and install metering equipment to support regulatory requirements, as well as new business initiatives.

### Describe specific scope exclusions, assumptions and constraints:

Meters and related material are rquired to support regulatory and new business requirements.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Regulatory and new business

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Maintaining accurate metering.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with? Group Expense

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

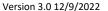
Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







	ΑI	TEI	D N I	٩TI١	/EC
U.	AL		N/I/		

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Requirements are yearly

What are the risks and consequences of not completing this project?

Variations in the number of new installs, equipment failure, cost increases, and material lead times.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for i			
	\$17,314	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	17,261	2,842	2,768	2,827	2,886	2,941	2,997	
ı	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	17,261	2,842	2,768	2,827	2,886	2,941	2,997	0
R	24561 (116614) 1 4J1611/	53		10	10	11	11	11	
E	Labor (Monthly Payroll)	0							
T	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		53	0	10	10	11	11	11	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	11,025	8,183	2,842					

2021-2023 2024

Prior years funding; not actuals.



**Budget Status:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Cost Estimate Level: Conceptual
Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

Not included in current PSC-approved budget plan

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 12,120 Maximum (\$): 22,508 Formulas give standard ranges overwritten if desired.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Previous material costs and trending needs.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

**GAS PROGRAM INDIVIDUAL PROJECT SUBMITTAL** 



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 2 Design

### A. GENERAL

**Project/Program Name: Class Location Line Valves** 

Work Order #:

- 1

**Budget Group:** Gas

**Budget Category:** 22

Funding Project Number:

2-2212-00-18

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 11/30/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Install additional transmission line valves.

### Describe specific scope exclusions, assumptions and constraints:

Outage duration on the transmission main must be kept to a minimum.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Additional line valves must be installed in accordance with NYCRR 255.179(a) requirements.

https://centralhudson.sharepoint.com/:w:/r/sites/GasMech/Budgets/Capital/5%20Year%20Forecast/2024-

2028%20Capital%20Budget/supporting%20docs/Class%203%20Location%20Valve%20Spacing%20Beyond%202%20Miles%20Memo%20(12-8-

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

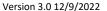
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Reclassification/assessment of High Consequence Areas along the pipe corridor in order to make existing valve spacing acceptable. But this was not successful.

Why was the proposed project scope chosen over other alternatives? N/A.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Compliance with TIMP program.

What are the risks and consequences of not completing this project? N/A.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$3,912,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	3,220,000		609,000	634,000	645,000	665,000	667,000	
Т	Overheads	667,000						667,000	
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,887,000	0	609,000	634,000	645,000	665,000	1,334,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	25,000		5,000	5,000	5,000	5,000	5,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	25,000	0	5,000	5,000	5,000	5,000	5,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used actual labor and material costs for completing project of similar scope on the same property the year prior. Used historical pricing for piping, equipment, and peripherals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 2 Design

### A. GENERAL

Project/Program Name: Remote Operated Valves

Work Order #:

Budget Group: Gas Budget Category: 22 Funding Project Number: 2-2212-00-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 11/30/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Install remotely operated gear operators on gas transmission main line valves.

### Describe specific scope exclusions, assumptions and constraints:

Assumption - the valves being installed will accept a remotely capable gear operator.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Due to recommendations and changes set forth in PHMSA-2013-0255 that necessitated amendments to 49CFR192 and 195, Central Hudson will incorporate these capabilities into current and future main line valve projects. These installations will reduce the response time to a potential incident on the transmission line and will bring the pipelines into current industry standards of operation.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

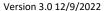
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

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### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Remote operation of valves requires hardware and software installation, no alternatives were explored.

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To minimize impacts to the transmission system and also to maximize the capability of the newly constructed transmission line valves.

What are the risks and consequences of not completing this project? Increased risk of longer response to incidents.

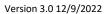
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$3,440,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	3,340,000		209,000	742,000	761,000	854,000	774,000	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,340,000	0	209,000	742,000	761,000	854,000	774,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	100,000		20,000	20,000	20,000	20,000	20,000	
R	Overheads	0							
E	( )	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		100,000	0	20,000	20,000	20,000	20,000	20,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	414,000	0	414,000					

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

 Cost Estimate Range:
 Minimum (\$):
 2,752,000
 Maximum (\$):
 4,128,000

 per estimate level, but may be overwritten if desired.

Formulas give standard ranges

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used actual labor and material costs for completing project of similar scope on the same property the year prior. Used historical pricing for piping, equipment, and peripherals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 2 Design

### A. GENERAL

Project/Program Name: AH Line Valve Replacements

Work Order #:

Budget Group: Gas Budget Category: 22 Funding Project Number: 2-2212-00-18
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 11/30/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Remove and replace the existing gas transmission line valves on the 10" steel AH Line. New installations shall allow for passage of internal inspection tools and be easily operable by field crews.

### Describe specific scope exclusions, assumptions and constraints:

Outage duration on the transmission main must be minimized. Assumes available parcel/property for installation.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson performs an annual inspection of all gas transmission line valves. The replacement schedule for line valves may change in priority due to the annual inspection findings. AH Line valves have been identified for scheduled replacement due to service design as well as age.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

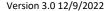
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

None, in order to allow for the passage of internal inspection tools and be easily operable by a mechanic, the valves must be replaced.

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Central Hudson performs an annual inspection of all gas transmission line valves. The replacement schedule for line valves may change in priority due to the annual inspection findings. AH Line valves have been identified for scheduled replacement due to service design as well as age. Also to What are the risks and consequences of not completing this project?

Failure or inoperability of a line valve, leading to safety concerns and/or regulatory liabilities and violations.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$4,057,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	3,807,000		523,000	814,000	829,000	784,000	857,000	
Т	Overheads	0							
	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,807,000	0	523,000	814,000	829,000	784,000	857,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	250,000		50,000	50,000	50,000	50,000	50,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		250,000	0	50,000	50,000	50,000	50,000	50,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
(	Current Approved Rate Case Funding (\$):	382,000		382,000					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

• per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used actual labor and material costs for completing project of similar scope on the same property the year prior. Used historical pricing for piping, equipment, and peripherals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 2 Design

#### A. GENERAL

Project/Program Name: Poughkeepsie Receival MP-TP Interconnect Work Order #:

Budget Group: Gas Budget Category: 22 Funding Project Number: 2-2212-00-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Replace the existing piping, valves, and peripherals that function as the interconnect between the TP and MP gas transmission systems. The new installation shall add functionality and system reliability by allowing the supply to the Poughkeepsie Receival Regulator Station to be sourced from either the TP or MP system. The new project shall incorporate a new R5-24 control valve, PLC/RTU electronics, and an overpressure protection monitor valve.

### Describe specific scope exclusions, assumptions and constraints:

Assumption - replacement of the Poughkeepsie Receival Regulator station has been completed prior to beginning this project. Constraint - as this project is directly on the route of gas capacity delivery to electric generators and is the main source of capacity for the City of Poughkeepsie, the outage duration must be minimized.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The MP-TP gas transmission interconnect is a primary source of gas capacity for the PN, PMP, and PLP gas distribution systems. The existing piping and equipment is antiquated, some with over 70yrs in service. The replacement of this infrastructure will increase reliability while adding additional operational flexibility by allowing the three distribution systems to be fed from either the TP or the MP transmission system.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

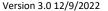
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

**Social Component:** Yes **Governance Component:** Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Partial replacements, such as piping only, or equipment only. Deferment of the electrical/PLC/RTU work was considered. Also replacement in kind versus the recommended upgrades to provide for operational flexibility.

#### Why was the proposed project scope chosen over other alternatives?

This interconnect is located at a critical location in the gas transmission system on the East side of the Hudson River Crossing of the TP Line, the interconnect with the MP line, and at the source of gas for the City of Poughkeepsie's three distribution systems. The proposed scope was chosen because of the criticality of the station, the need to minimize outage duration (multiple year projects), and also to improve safety and reliability by adding redundancy to the inlet of the regulator station.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

To minimize impacts to the transmission system and also to maximize the capability of the newly constructed Poughkeepsie Receival Regulator Station the year prior.

#### What are the risks and consequences of not completing this project?

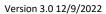
Increased risk of losing functionality of the remote operated valve that controls the flow of gas between MP and TP, due to the obsolescence of some of the PLC/RTU components that are recommended to be replaced during this project.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? N/A





### E. COST ESTIMATE

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	ital Estimate Summary  Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$1,556,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	205,000		205,000						
	Labor (Monthly Payroll)	23,000		23,000						
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	458,000		458,000						
ī	Contractors (A/P tax exempt)	102,000		102,000						
Т	Overheads	718,000		718,000						
ı	AFUDC*	0								
О	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,506,000	0	1,506,000	0	0	0	0	0	
	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	50,000		50,000						
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	50,000	0	50,000	0	0	0	0	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								

0 0 0 0 2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 1,244,800 Maximum (\$): 1,867,200

No explanation on confidence level required.

Formulas give standard ranges per

 estimate level, but may be overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used actual labor and material costs for completing project of similar scope on the same property the year prior. Used historical pricing for piping, equipment, and peripherals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 2 Design

#### A. GENERAL

**Project/Program Name: Pig Launching Stations for Internal Line Inspection** 

Work Order #:

In-Service: 12/31/2028

Budget Group: Gas Budget Category: 22 Funding Project Number: 2-2212-00-18

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

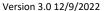
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Install site(s) where internal inspection tools can be inserted into the pipeline.

### Describe specific scope exclusions, assumptions and constraints:

Scope may vary greatly for work considering factors such as ROW accessibility, specialized service pricing, length and size of piping affected.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Internal inspection of transmission piping is required for compliance with Pipeline Integrity mandates and inspection schedules. Due to the complexity and logistics involved in launching an internal inspection tool into the pipeline, there is a need to build launching valve sets at various locations throughout the transmission system. The current pipelines are not able to accommodate this type of inspection in all locations.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

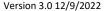
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

**Governance Component:** Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Installing in-situ specialized tap points on the transmission mains. These are costly and cannot always be re-used due to variations in ROW conditions.

#### Why was the proposed project scope chosen over other alternatives?

These installations will allow for efficient installation and removal of inspection tools using above grade piping and valves, typical for the task. Repeatabilty and re-use is an important advantage due to their permanent installations.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

To maintain access points for the inspection needs of the Transmission Integrity Department schedules and compliance requirements.

#### What are the risks and consequences of not completing this project?

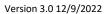
Compliance violations, if no other inspection method other than internal inspection is possible.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 





### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$1,954,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	0								
ī	Contractors (A/P tax exempt)	1,929,000		240,000	619,000	349,000	360,000	361,000		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,929,000	0	240,000	619,000	349,000	360,000	361,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	25,000		5,000	5,000	5,000	5,000	5,000		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	25,000	0	5,000	5,000	5,000	5,000	5,000	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								
C	<b>Current Approved Rate Case Funding (\$):</b>	205,000	0	205,000						

2021-2023 2024

Prior years funding; not actuals.



Formulas give standard ranges

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used actual labor and material costs for completing project of similar scope on the same property the year prior. Used historical pricing for piping, equipment, and peripherals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By:** S. Spehalski

#### A. GENERAL

Project/Program Name: TP Line Identified Segment 1 Replacement Work Order #:

**Funding Project Number:** 2-2212-00-18

22 **Budget Group: Budget Category:** Gas Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Replace 4800ft, 2528ft, and 967ft (total 1.571mi) of the 10" steel TP Gas Transmission main over multiple projects in order to comply with the requirements of 49 CFR 192.624. This project represents Segment 5.1, 5.2, and 6 that has been identified for replacement on the TP Line, and accounts for 92% of the total identified footage requiring replacement on the TP Line. Please reference "Plan to Address Testing/Replacement Requirements of 49 CFR 192.624" document.

### Describe specific scope exclusions, assumptions and constraints:

In order to minimize customer impact, this project will be done in two steps. Step 1 would be to replace Segment 5.1 in 2024 and 2025. Step 2 would be to replace Segment 5.2 and 6 in 2026. Additional detailed scoping and schedule to be determined to project commencement.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Modifications to CFR 49 192.624 require that Central Hudson replace approximately 1.791 miles of its gas transmission system prior to July 2, 2035. This 1.571 mile project represents a large portion of this footage.

https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Budgets/Capital/5%20Year%20Forecast/2024-

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP); Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

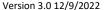
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Previously, a plan was put forward to re-pressure test the existing mains rather than replace them. Since that time, for various reasons, this proposal has been dismissed in favor of full replacement.

#### Why was the proposed project scope chosen over other alternatives?

Overall, replacement is the much more realistic and feasible option. Not only does it make project planning and logistics easier, but also decreases downtime, eliminates derating, avoids unknown cost and risk associated with pre/post assessments and pressure testing, and satisfies all material and pressure requirements (traceable, verifiable, and complete records for all newly installed pipe). For these reasons, method 4 (replacement) will be implemented to comply with the Mega Rule.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Code requires 50% of the total identified footage to be replaced by July 3, 2028. The replacement of this section is the only possible way for Central Hudson to meet this regulatory requirement.

No

What are the risks and consequences of not completing this project? Compliance violations.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Compliance requirements.

What other factor were considered during the prioritization process? N/A.



## E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the  5-year budget plan  All future year cost estimates should include applicable adjustments for inflation.						
	\$7,699,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	240,000		20,000	100,000	120,000			
	Labor (Monthly Payroll)	260,000		30,000	200,000	30,000			
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,200,000		100,000	500,000	600,000			
l	Contractors (A/P tax exempt)	4,700,000		500,000	2,000,000	2,200,000			
Т	Overheads	1,199,000		334,000	316,000	549,000			
	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0		0	0	0			
	TOTAL ADDITIONS:	7,599,000	0	984,000	3,116,000	3,499,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	100,000				100,000			
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	100,000	0	0	0	100,000	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Surrent Approved Rate Case Funding (\$):	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Budgets/Capital/5%20Year%20Forecast/2024-2028%20Capital%20Budget/supporting%20docs/Plan%20to%20Replace%20Transmission%20Lines%20in%20Accordance%20with%2049CFR192.624%20(1).pdf?csf=1&web=1&e=R3jqC5

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

May 12, 2023 Submission Date: First Year of 5-Year Budget Period: 2024

Current Life-Cycle Phase: 1 Planning **Submitted By:** S. Spehalski

### A. GENERAL

Project/Program Name: TP Line Identified Segment 2,3,4,5 Replacement

Work Order #: **Budget Category:** 22 **Funding Project Number:** 2-2212-00-18

**Budget Group:** Target Schedule - Start: 1/1/2024 Is this a Specific Project, Program or Blanket? In-Service: 12/31/2028 Specific

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

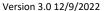
Gas

Replace 739 feet (0.14mi) of the 10" steel TP Gas Transmission main in order to comply with the requirements of 49 CFR 192.624. This project represents the remaining three of five segments that have been identified for replacement on the TP Line, and accounts for 8% of the total identified footage requiring replacement on the TP Line.

### Describe specific scope exclusions, assumptions and constraints:

Pre-project assessment to be completed to determine detailed scoping and schedule.







**B. JUSTIFICATION** 

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Modifications to CFR 49 192.624 require that Central Hudson replace approximately 1.791 miles of its gas transmission system prior to July 2, 2035. https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Budgets/Capital/5%20Year%20Forecast/2024-

2028%20Capital%20Budget/supporting%20docs/Plan%20to%20Replace%20Transmission%20Lines%20in%20Accordance%20with%2049CFR192.624

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Article VII - Gas

#### ESG (Environmental, Social and Governance) and Sustainability:

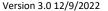
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Previously, a plan was put forward to re-pressure test the existing mains rather than replace them. Since that time, for various reasons, this proposal has been dismissed in favor of full replacement.

#### Why was the proposed project scope chosen over other alternatives?

Overall, replacement is the much more realistic and feasible option. Not only does it make project planning and logistics easier, but also decreases downtime, eliminates derating, avoids unknown cost and risk associated with pre/post assessments and pressure testing, and satisfies all material and pressure requirements (traceable, verifiable, and complete records for all newly installed pipe). For these reasons, method 4 (replacement) will be implemented to comply with the Mega Rule.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

Code requires 50% of the total identified footage to be replaced by July 3, 2028, with the balance by July 2, 2035. The replacement of these TP sections on the TP Line must happen right after Segment 1 project so that the remaining replacements in our territory can be completed by 2035.

No

What are the risks and consequences of not completing this project? Compliance violations.

Was this project included in a prior 5-year forecast?
If No, why should this project be completed instead of a planned project?
Compliance requirements.

What other factor were considered during the prioritization process? N/A.



### **E. COST ESTIMATE**

	Capital Estimate Summary  Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$2,721,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	250,000					100,000	150,000	
	Labor (Monthly Payroll)	55,000					30,000	25,000	
A	Stock Materials	35,000					20,000	15,000	
D	Non-Stock Material (A/P taxable)	1,005,000					455,000	550,000	
Ī	Contractors (A/P tax exempt)	916,000					270,000	646,000	
Т	Overheads	400,000					200,000	200,000	
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0		0	0	0	0	0	
	TOTAL ADDITIONS:	2,661,000	0	0	0	0	1,075,000	1,586,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	60,000					30,000	30,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Ϊ́	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	60,000	0	0	0	0	30,000	30,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							

Expense \$ (if applicable): 0 Current Approved Rate Case Funding (\$): 0 0

2021-2023 2024

Prior years funding; not actuals.

0



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 1,904,700 Maximum (\$): 3,537,300

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

https://centralhudson.sharepoint.com/:b:/r/sites/GasMech/Budgets/Capital/5%20Year%20Forecast/2024-2028%20Capital%20Budget/supporting%20docs/Plan%20to%20Replace%20Transmission%20Lines%20in%20Accordance%20with%2049CFR192.624%20(1).pdf?csf=1&web=1&e=R3jqC5

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Current Life-Cycle Phase: 2 Design **Submitted By:** S. Spehalski

#### A. GENERAL

**Project/Program Name: Gate Station PLC Replacement** 

Work Order #:

**Budget Group:** Gas

22 **Budget Category:** 

**Funding Project Number:** 

2-2212-00-18

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 11/30/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Replace the existing PLC/RTU SCADA systems at each gate station.

### Describe specific scope exclusions, assumptions and constraints:

Assumption - outage at the gate station is available during the proposed construction window.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The current control systems at the gate stations are now obsolete and unsupported by the manufacturer. There are no spare parts available. In order to maintain reliability of the gas transmission system, they must be replaced with fully supported units.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

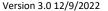
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

994





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Obtain new old stock replacement parts. This method was dismissed since it would only prolong the project and increase risk.

Why was the proposed project scope chosen over other alternatives? Lowest risk option

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To reduce the risk of losing remote control functionality of 1 or more gate stations due to component failure.

What are the risks and consequences of not completing this project?

Increased risk of losing functionality of the gate station.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



## E. COST ESTIMATE

	Capital Estimate Summary	t year of the Idget plan								
	\$2,316,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	0								
I	Contractors (A/P tax exempt)	2,236,000			543,000	553,000	569,000	571,000		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	2,236,000	0	0	543,000	553,000	569,000	571,000	0	
	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	80,000			20,000	20,000	20,000	20,000		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	80,000	0	0	20,000	20,000	20,000	20,000	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								
	Surrent Approved Rate Case Funding (\$):	0	0	0						

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 1,852,800 Maximum (\$): 2,779,200 No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments; Vendor Generated Cost Estimate

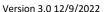
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

During the planning process, met with vendors who provided high level estimates for their solutions. Used pro-forma pricing for labor and ancillary materials.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

**Budget Group:** 

Project/Program Name: Pressure Control Improvements

vements Work Order #: Use Sudget Category: 23 Funding Project Number: 2-2312-00-18

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 11/30/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Possible solutions vary greatly as each situation is unique. Common solutions have been to adjust the regulator's travel stop, cage, or throttle plate. A different model of regulator might be required as different models of regulators are better suited to control in some situations than others. Sense lines might need to be lengthened to a non-turbulent zone. Sense line sizes might need to be increased. A filter may need to be installed to remove grit, fines, and liquids affecting diaphragm performance.

### Describe specific scope exclusions, assumptions and constraints:

The performance of all natural gas regulator stations is constantly being monitored. Should a station be exhibiting signs of great outlet pressure variations and field technicians cannot correct the problem, the station's capacity load is analyzed, equipment selection is studied and possible solutions are evaluated.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

NYCRR 255 Code requires the operator to keep delievery pressures stable and maintain system pressures within certain limits. In order to accomplish this, capital improvements sometimes need to be made to the station. Each situation is unique and is assessed independently to others.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Avoidance of maintenance cost of an unreliable or poor performing piece of equipment.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

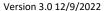
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete <u>Sustainability</u> status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.

governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Depending on the situation, alternatives are numerous.

Why was the proposed project scope chosen over other alternatives?

Most cost effective and reliable solution is chosen for each situation/location.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To maintain system reliability and code compliance at poor performing stations.

What are the risks and consequences of not completing this project?

Risk of slower response to incidents, risk of compliance violations, inability to analyze system performance.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$1,166,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	0								
l	Contractors (A/P tax exempt)	1,141,000		227,000	286,000	291,000	168,000	169,000		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,141,000	0	227,000	286,000	291,000	168,000	169,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	25,000		5,000	5,000	5,000	5,000	5,000		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	25,000	0	5,000	5,000	5,000	5,000	5,000	0	
	* AFUDC may require adjustment after Finance Depa	rtment review.								
	Expense \$ (if applicable):	0								
C	Surrent Approved Rate Case Funding (\$):	164,000	0	164,000						

2021-2023

Prior years funding;
not actuals.

2024



Version 3.0 12/9/2022

Budget Status: Included in	current PSC-approve	ed budget plan und	er a PROGRAM		
Cost Estimate Level: Prelin Cost Estimate Confidence:	minary (that final cost wil	l be within +/-20%	of the estimate):	High Confidence	
No further estimate range is req	quired.				Formulas give standard ranges
Cost Estimate Range: Mi No explanation on confidence		932,800 <b>Maxi</b>	mum (\$):	1,399,200	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>
Basis for estimate: Historica	ત્રી Data + Job Specific	Adjustments			
For your conceptual/prelimina applicable cost estimating file Historic data from different situal more significant and costly.	les as appropriate. ations and issues thre	-	•		
F. ADDITONAL INFORMAT	ION				
If there is any additional infor	rmation that you wo	ould like to add tha	at is not covered e	elsewhere in this form, you	ı may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By:** S. Spehalski

#### A. GENERAL

**Project/Program Name: Pressure Recording Chart Replacements** Work Order #:

23 **Budget Group:** Gas **Budget Category: Funding Project Number:** 2-2312-00-18 Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Install electronic pressure recording charts at gas regulator stations to replace unreliable, unsupported, or outdated units.

### Describe specific scope exclusions, assumptions and constraints:

Does not include funding for gate station SCADA or regulator station SCADA electronic installations.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Required by code, recording charts must be installed at each pressure control station where one or more pressure control stations contribute to the load of a single system. For a low pressure system, a pressure recording must be installed at any point where the lowest pressure may occur. Charts must be compatible with Central Hudson's Network Strategy or cellular communication. Verizon is terminating many phone line connections each year, so we must replace with new.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Avoid the cost of multiple repairs to a single unit by simply replacing with a more robust, newer unit.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which Strategic Objective does project most align with?

Improve system performance and resilience

Which Strategic Initiative does project most align with?

**Business & Operations Modernization** 

Which <u>Team Goal</u> does project most align with?

**PSC Gas Safety** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

### ESG (Environmental, Social and Governance) and Sustainability:

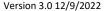
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None. Code required.

Why was the proposed project scope chosen over other alternatives? Most cost effective and reliable solution.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Due to the termination of connections by Verizon and others, we must stay ahead of their schedule in order to maintain compliance with code.

What are the risks and consequences of not completing this project?

Risk of slower response to incidents, risk of compliance violations, inability to analyze system performance.

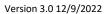
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year applicable				
	\$1,056,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	1,031,000		154,000	212,000	216,000	224,000	225,000	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,031,000	0	154,000	212,000	216,000	224,000	225,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
Hi	Contractors (A/P tax exempt)	25,000		5,000	5,000	5,000	5,000	5,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	25,000	0	5,000	5,000	5,000	5,000	5,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	164,000	0	164,000					

0 2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included	in current PSC-approv	ved budget pla	an under a PROGRA	AM	
Cost Estimate Level: Pre	eliminary : (that final cost w	vill be within -	⊦/-20% of the estim	nate): High Conf	idence
No further estimate range is	required.				Formulas give standard ranges
Cost Estimate Range: No explanation on confide	Minimum (\$): nce level required.	844,800	Maximum (\$):	1,267,200	per estimate level, but may be overwritten if desired.
Basis for estimate: Contra	actor/Vendor Bids For	Certain Work			
applicable cost estimating Historical pricing for same wo	files as appropriate. ork scope in the year	•	on or details for ho	w your cost estimate v	was derived. You may add link(s) to
F. ADDITONAL INFORM	ATION				
If there is any additional in	formation that you w	vould like to a	add that is not cov	ered elsewhere in this	form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By:** S. Spehalski

#### A. GENERAL

**Project/Program Name: Regulator Station Coatings** 

Work Order #:

**Budget Group: Budget Category:** 23 **Funding Project Number:** 2-2312-00-18 Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

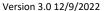
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Install a coating system on above grade transmission regulator station piping and structures in order to increase asset life by a minimum of 15 years. The program targets five stations per year for a five year period.

### Describe specific scope exclusions, assumptions and constraints:

Does not include distribution assets. Prioritization of projects is based on coating condition and asset age.





### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Transmission Sustaining** Load Based/Infrastructure:

Maintain System Standards Infrastructure Discretion Level: **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value? N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Installing a coating system in order to extend the useful life of the asset would prolong its service life and avoid the cost of a replacement. There are precendents of this type of installation being approved by regulators as capital investments.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Cost avoidance and delay of a replacement project.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Operational Excellence** 

Which Strategic Objective does project most align with? Increase commitment to sustainability in planning/performance processes

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC Gas Safety** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

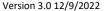
> **Social Component:** Yes

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Full or partial replacement of the identified transmission regulator stations.

Why was the proposed project scope chosen over other alternatives?

Cost avoidance, ability to redirect capital investments to other initiatives.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Due to the age of existing infrastructure, the coatings program is needed in order to avoid imminent and costly replacement projects.

What are the risks and consequences of not completing this project?

Continued deterioration of above grade transmission assets, higher cost of replacement and repair.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

This program would offset planned projects and allow for significant cost savings to direct funding to other initiatives.

What other factor were considered during the prioritization process?

Age, condition, criticality to the transmission system.





## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for i			
	\$1,223,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
I	Contractors (A/P tax exempt)	1,198,000		103,000	265,000	269,000	279,000	282,000	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,198,000	0	103,000	265,000	269,000	279,000	282,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
Hi	Contractors (A/P tax exempt)	25,000		5,000	5,000	5,000	5,000	5,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	25,000	0	5,000	5,000	5,000	5,000	5,000	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):								
C	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not inclu	uded in current PSC-ar	oproved budg	et plan						
Cost Estimate Level: P Cost Estimate Confidence	•	vill be within	+/-20% of the estir	nate): High Conf	ïdence				
No further estimate range is	s required.				Formulas give standard ranges				
Cost Estimate Range: No explanation on confide	Minimum (\$): ence level required.	978,400	Maximum (\$):	1,467,600	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>				
Basis for estimate: Cont	tractor/Vendor Bids For	r Certain Wor	k						
ost Estimate Level: Preliminary ost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence of further estimate range is required.  Formulas give standard ranges ost Estimate Range: Minimum (\$): 978,400 Maximum (\$): 1,467,600  Formulas give standard ranges optimate Pange: Minimum (\$): 978,400 Maximum (\$): 1,467,600									
F. ADDITONAL INFORM	MATION								
If there is any additional i	nformation that you v	vould like to	add that is not cov	vered elsewhere in this	form, you may add it here (optional):				



Version 3.0 12/9/2022

May 12, 2023 First Year of 5-Year Budget Period: Submission Date: 2024

S. Spehalski **Current Life-Cycle Phase: 1 Planning Submitted By:** 

### A. GENERAL

Project/Program Name: Saugerties Regulator Station Rebuild

Work Order #:

**Budget Group:** Gas

23 **Budget Category:** 

**Funding Project Number:** 

2-2312-00-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Replace the Saugerties Regulator Station.

## Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the AH618# into the CS/SB40# system, the replacement of this station is paramount to the reliability of the distribution system. The station piping and peripherals are degraded and corroded and the equipment is antiquated and obsolete. Many components of the station monthly and annual inspections are reporting to be increasingly difficult to fix such as stiffening of valves etc. It shall be rebuilt as a dual run, monitor station to allow for increased overpressure protection and brought up to current standards and communications. Equipment counts will be reduced, reducing maintenance costs.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

**Social Component:** Yes **Governance Component:** Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

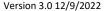


Is complete **Sustainability** status achieved by this project?\* Yes

# **Budget Submittal Form**

Version 3.0 12/9/2022

governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Partial rebuild and/or relocation was considered.

Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? To minimize the risk to the system.

What are the risks and consequences of not completing this project? Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu				cost estimates s e adjustments for			
	\$1,207,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,157,000		1,157,000					
1	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,157,000	0	1,157,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	50,000		50,000					
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	50,000	0	50,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	515,000	515,000	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level: Preliminary Cost Estimate Confidence:** (that final cost will be within +/-20% of the estimate): **High Confidence** No further estimate range is required. Formulas give standard ranges ← per estimate level, but may be Maximum (\$): 1,448,400 **Cost Estimate Range:** Minimum (\$): 965,600 overwritten if desired. No explanation on confidence level required. Basis for estimate: Historical Data + Job Specific Adjustments For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. Recent project completion of similar scope and schedule offers relatively reliable insight into costs. F. ADDITONAL INFORMATION If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: North Cornwall Regulator Station Rebuild

Work Order #:

- -

**Budget Group:** Gas

Budget Category: 23

Funding Project Number: 2-

2-2312-00-18

Is this a Specific Project, Program or Blanket? Specific

Specific

Target Schedule - Start: 1/1/2025

In-Service: 12/31/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Replace the North Cornwall Regulator Station.

## Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the TPC512# into the WP120# system and the CW30# system, the replacement of this station is paramount to the reliability of the distribution system. The station piping and peripherals are degraded and corroded and the equipment is antiquated and obsolete. Many components of the station monthly and annual inspections are reporting to be increasingly difficult to fix such as stiffening of valves etc. It shall be rebuilt as a dual run, monitor station to allow for increased overpressure protection and brought up to current standards and communications.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

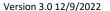
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Partial rebuild was considered.

Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? To minimize the risk to the system.

What are the risks and consequences of not completing this project?

Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		,	cost estimates sl adjustments for			
	\$1,236,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	1,186,000			1,186,000				
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,186,000	0	0	1,186,000	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	50,000			50,000				
R	Overheads	0							
E	Journal Vouchers (JVs)	0						-	
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	50,000	0	0	50,000	0	0	0	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

not actuals.

2021-2023

Prior years funding;

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT **Cost Estimate Level: Preliminary Cost Estimate Confidence:** (that final cost will be within +/-20% of the estimate): **High Confidence** No further estimate range is required. Formulas give standard ranges ← per estimate level, but may be Maximum (\$): **Cost Estimate Range:** Minimum (\$): 988,800 1,483,200 overwritten if desired. No explanation on confidence level required. Basis for estimate: Historical Data + Job Specific Adjustments For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. Recent project completion of similar scope and schedule offers relatively reliable insight into costs. F. ADDITONAL INFORMATION If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Titusville Regulator Station Rebuild

Work Order #:

Budget Group: Gas Budget Category: 23

Funding Project Number: 2-2312-00-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 1/1/2027

In-Service: 11/30/2027

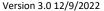
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Replace the Titusville Regulator Station.

Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the MP750# into the TV 120# system, the replacement of this station is paramount to the reliability of the system. The station piping and peripherals are degraded and the equipment is antiquated and obsolete. There have been numerous repairs necessary on old valves and equipment in recent years. It shall be rebuilt as a dual run, monitor station to allow for increased overpressure protection and brought up to

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

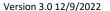
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Partial rebuild and/or relocation was considered.

Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To minimize the risk to the system.

What are the risks and consequences of not completing this project?

Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

This is considered a planned project that replaces an unidentified project that was previously approved in the 5 year forecast.

What other factor were considered during the prioritization process?

N/A



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,		,	r cost estimates si e adjustments for			
	\$1,292,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	1,242,000					1,242,000		
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,242,000	0	0	0	0	1,242,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	50,000					50,000		
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	50,000	0	0	0	0	50,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023

Prior years funding; not actuals.

2024



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 1,033,600 Maximum (\$): 1,550,400

No explanation on confidence level required.

Formulas give standard ranges

← per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Recent project completion of similar scope and schedule offers relatively reliable insight into costs.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Hughsonville Regulator Station Rebuild Work Order #:

/ork Order #:

Budget Group: Gas Budget Category: 23 Funding Project Number: 2-2312-00-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/31/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Replace the Hughsonville Regulator Station.

Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the HH 120# into the PN 60# system, the replacement of this station is paramount to the reliability of the system pressure in the constrained PN Line. The station has poor workability by crews due to location, and the equipment is antiquated. It shall be rebuilt as a dual run, monitor station to allow for increased overpressure protection and brought up to current standards and communications.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

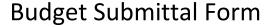
Checklist Fully Completed: Yes Environmental Component: Yes

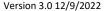
Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Partial rebuild and/or relocation was considered.

Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To minimize the risk to the system.

What are the risks and consequences of not completing this project?

Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

This is considered a planned project that replaces an unidentified project that was previously approved in the 5 year forecast.

What other factor were considered during the prioritization process?

N/A



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			r cost estimates s le adjustments for			
	\$1,056,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	1,006,000					1,006,000		
Ţ	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,006,000	0	0	0	0	1,006,000	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	50,000					50,000		
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т.	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	50,000	0	0	0	0	50,000	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not includ	led in current PSC-ap	proved budge	t plan		
Cost Estimate Level: Pre Cost Estimate Confidence:	eliminary (that final cost w	ill be within +	-/-20% of the estir	nate): High	Confidence
No further estimate range is r	required.				Formulas give standard ranges
Cost Estimate Range: No explanation on confiden	Minimum (\$): ace level required.	844,800	Maximum (\$):	1,267,200	per estimate level, but may be overwritten if desired.
Basis for estimate: Historic	cal Data + Job Specif	ic Adjustments	S		
For your conceptual/prelimi applicable cost estimating f Recent project completion of	files as appropriate.	•		•	nate was derived. You may add link(s) to
E ADDITONAL INCORMA	ATION				
F. ADDITONAL INFORMA	ATION				
If there is any additional inf	ormation that you w	ould like to a	add that is not cov	vered elsewhere in	this form, you may add it here (optional):



Version 3.0 12/9/2022

May 12, 2023 First Year of 5-Year Budget Period: Submission Date: 2024

S. Spehalski **Current Life-Cycle Phase: 1 Planning Submitted By:** 

### A. GENERAL

Project/Program Name: Violet Avenue Regulator Station Rebuild Work Order #:

2-2312-00-18

23 **Budget Group:** Gas **Budget Category: Funding Project Number:** Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/31/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Replace the Violet Avenue Regulator Station.

Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction.





### **B. JUSTIFICATION**

**Growth/Sustaining/Retirement: Distribution Sustaining** Load Based/Infrastructure: Infrastructure

Maintain System Standards Infrastructure Discretion Level: **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the MP750# into the HV 120# system, the replacement of this station is paramount to the reliability of the system. The station piping and peripherals are degraded and the equipment is antiquated and obsolete. There have been numerous repairs necessary on old valves and equipment in recent years. It shall be rebuilt as a dual run, monitor station to allow for increased overpressure protection and brought up to current standards and communications.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with?

Operational Excellence

Which <u>Strategic Objective</u> does project most align with?

Improve system performance and resilience

Which Strategic Initiative does project most align with?

**Business & Operations Modernization** 

Which Team Goal does project most align with?

**PSC Gas Safety** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

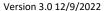
**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** Yes **Governance Component:** Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Partial rebuild and/or relocation was considered.

Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To minimize the risk to the system.

What are the risks and consequences of not completing this project?

Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

This is considered a planned project that replaces an unidentified project that was previously approved in the 5 year forecast.

What other factor were considered during the prioritization process?

N/A



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the udget plan			cost estimates she adjustments for			
	\$1,369,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	1,319,000					1,319,000		
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,319,000	0	0	0	0	1,319,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	50,000					50,000		
•									
R	Overheads	0							
R E	Overheads Journal Vouchers (JVs)	0							
E M									
	Journal Vouchers (JVs)	0							
E M	Journal Vouchers (JVs) Salvage CREDIT	0							
E M E N T	Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT	0 0 0	0		0		50,000		
E M E N T	Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT Joint Utility Payments CREDIT TOTAL REMOVALS: * AFUDC may require adjustment after Finance Depart	0 0 0 0 50,000	0						0
E M E N T	Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT Joint Utility Payments CREDIT TOTAL REMOVALS:	0 0 0 0 50,000	0						0

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 1,095,200 Maximum (\$): 1,642,800 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Recent project completion of similar scope and schedule offers relatively reliable insight into costs.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



2-2312-00-18

Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: S. Spehalski Current Life-Cycle Phase: 1 Planning

### A. GENERAL

**Budget Group:** 

Project/Program Name: Fullers Corners Regulator Station Rebuild

or Station Rebuild Work Order #:

Budget Category: 23 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2028 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Replace the Fullers Corners Regulator Station.

Gas

## Describe specific scope exclusions, assumptions and constraints:

Assumes there is adequate property/parcel for construction, assumes the Glasco Low Pressure system will not be upgraded.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

As a main feed from the KS 9.5# into the Glasco Low Pressure 12" w.c system, the replacement of this station is paramount to the reliability of the system. The station currently has below average pressure control, poor workability by crews due to location, and is not designed to meet current company or industry standards for redundancy or capacity. It is a single run station that shall be rebuilt as a dual run and brought up to current standards and communications.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Operational Excellence

Which Strategic Objective does project most align with?

Improve system performance and resilience

Which Strategic Initiative does project most align with?

**Business & Operations Modernization** 

Which Team Goal does project most align with?

**PSC Gas Safety** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

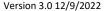
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Partial rebuild and/or relocation was considered.

### Why was the proposed project scope chosen over other alternatives?

Due to the criticality of the station to the reliability of the system, the station shall be fully replaced.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To minimize the risk to the system.

What are the risks and consequences of not completing this project?

Poor pressure control, equipment failure, increase costs of maintenance.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

This is considered a planned project, as it is a new project in 2028, as 2028 was not included in previous forecasts.

### What other factor were considered during the prioritization process?

The plan to uprate the GLP system was changed significantly, originally this station would be retired. Now that it is not the case, it has a high priority for replacement.



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		,	r cost estimates s e adjustments for			
	\$1,065,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	1,015,000						1,015,000	
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,015,000	0	0	0	0	0	1,015,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	50,000						50,000	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	50,000	0	0	0	0	0	50,000	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	urrent Approved Rate Case Funding (\$):	0	0	0					

2024

2021-2023

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan **Cost Estimate Level: Preliminary Cost Estimate Confidence:** (that final cost will be within +/-20% of the estimate): **High Confidence** No further estimate range is required. Formulas give standard ranges ← per estimate level, but may be Maximum (\$): **Cost Estimate Range:** Minimum (\$): 852,000 1,278,000 overwritten if desired. No explanation on confidence level required. Basis for estimate: Historical Data + Job Specific Adjustments For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. Recent project completion of similar scope and schedule offers relatively reliable insight into costs. F. ADDITONAL INFORMATION If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Victor Narkaj Current Life-Cycle Phase: 1 Planning

### A. GENERAL

**Project/Program Name: Category 24 Gas New Business** 

Is this a Specific Project, Program or Blanket? Program

Work Order #:

- 1

**Budget Group:** Gas

**Budget Category: 24** 

Funding Project Number: Target Schedule - Start: 1/1/2024 In-Se

nber: N/A In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Overall Budget Planning for Category 24

Describe the project objective and scope of work:

All Gas New Business

Describe specific scope exclusions, assumptions and constraints:

Tariff obligation to provide electric service





### **B. JUSTIFICATION**

Load Based/Infrastructure: Load-Based Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Non-Discretionary Investment Type: Growth

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component?

Needs Assessment: New Business

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Category 24 gas new business category consists of funding to provide new gas service to non-discretionary customer requested residential and commercial projects. This includes new multi-family and Underground Residential Distribution (URD) projects, new individual residential homes, and commercial/industrial gas new business. Work orders types can be specific (>\$15,000), local work orders (<\$15,000) and limited term service work

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Monetary benefits through increased revenue.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve customer experience Which <u>Strategic Initiative</u> does project most align with? Seamless Customer Experience

Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

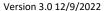
Checklist Fully Completed: Yes Environmental Component: No

Environmental Component: No Social Component: No

Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None. Category 24 is non-discretionary

Why was the proposed project scope chosen over other alternatives? Obligation to serve is non-discretionary

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? New customer service must be provided in a timely manner

What are the risks and consequences of not completing this project? Customer Complaints

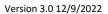
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? None

Yes





## **E. COST ESTIMATE**

**Current Approved Rate Case Funding (\$):** 

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			uture year cost estimates should include applicable adjustments for inflation.				
	\$45,420,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	4,436,000		1,038,000	1,042,000	776,000	778,000	802,000		
	Labor (Monthly Payroll)	7,396,000		1,731,000	1,736,000	1,294,000	1,298,000	1,337,000		
A	Stock Materials	15,780,000		3,693,000	3,705,000	2,761,000	2,769,000	2,852,000		
D	Non-Stock Material (A/P taxable)	2,235,000		524,000	525,000	391,000	391,000	404,000		
ı	Contractors (A/P tax exempt)	3,539,000		828,000	831,000	619,000	621,000	640,000		
Т	Overheads	5,029,000		1,177,000	1,181,000	880,000	882,000	909,000		
I	AFUDC*	5,872,000		964,000	1,353,000	1,017,000	1,169,000	1,369,000		
O N	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	44,287,000	0	9,955,000	10,373,000	7,738,000	7,908,000	8,313,000	0	
	Labor (Weekly Payroll)	424,000		80,000	82,000	85,000	87,000	90,000		
E	Labor (Monthly Payroll)	434,000		80,000	82,000	85,000	87,000	100,000		
H	Contractors (A/P tax exempt)	121,000		20,000	21,000	21,000	32,000	27,000		
R	Overheads	154,000		25,000	30,000	35,000	32,000	32,000		
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	1,133,000	0	205,000	215,000	226,000	238,000	249,000	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								

2021-2023
Prior years funding;
not actuals.

29,260

39,343

10,083

2024



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

The Category 24 - Gas New Business budget is established using historic customer additions and spending run rates. Budget dollars are allocated to specific and blanket categories, but can be reallocated within the category as actual spending varies from projections.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Gas Distribution Improvement - Locals Work Order #:

Blanket

Funding Project Number:

-

Budget Group: Gas Budget Category: 25

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Is this a Specific Project, Program or Blanket?

Various local WO's that occur in the district for service and main work; planned and emergent.

Describe specific scope exclusions, assumptions and constraints:

Local WO's only.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Blanket program to capture costs for local WO's

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Operational need, scenario dependent.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

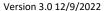
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

governance.





## C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? Operational need of the district.

What are the risks and consequences of not completing this project? Safety, customer satisfaction, growth, etc.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu			All future year cost estimates should include applicable adjustments for inflation.				
	\$1,943,870	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	97,180		18,630	18,990	19,440	19,820	20,300	
	Labor (Monthly Payroll)	58,310		11,180	11,400	11,660	11,890	12,180	
A	Stock Materials	155,510		29,810	30,390	31,100	31,720	32,490	
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	1,555,110		298,120	303,910	311,040	317,170	324,870	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVS)	0							
S	0140 D	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,866,110	0	357,740	364,690	373,240	380,600	389,840	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	77,760		14,910	15,200	15,550	15,860	16,240	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	I I// Pa//mente ( PEI II I	0							
'\	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	77,760	0	14,910	15,200	15,550	15,860	16,240	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 1,360,709 Maximum (\$): 2,527,031

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used historical spends and prfoforma pricing to extrapolate and calculate need for new budget estimates.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Highway Relocation Non LPP Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2521-00

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

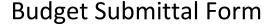
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

This program encompasses all main relocations that are not LPP due to municipality work (paving, beautification, road rebuilds, etc.)

## Describe specific scope exclusions, assumptions and constraints:

These projects are emergent and require Central Hudson to work with the municipalities to coordinate efforts.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This program is required to accommodate municipality work when Central Hudson infrstructure has project interference. Planning and prioritization is only achievable when communication from the municipalities is had, otherwise these are emergent projects.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Avoids any interference issues, dig ins, and allows municipalities to continue with their work.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

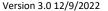
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

on place the 200 chooking on the 30 parate worksheet (tab). Results of your answers will be accompanied to be a second and the

Checklist Fully Completed: No Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Alternatives such as rerouring in different areas, or retiring all together, where applicable.

Why was the proposed project scope chosen over other alternatives?

Requirement of downstream systems to operate properly generally dictate that the replacement must be completed.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Maintain gas service where it has already been established.

What are the risks and consequences of not completing this project?

Hinders municipality work, and exposes the company to higher risk of dig in and or damage.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$5,384,760	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	269,240		51,610	52,620	53,850	54,910	56,250		
	Labor (Monthly Payroll)	161,550		30,970	31,570	32,310	32,950	33,750		
A	Stock Materials	430,780		82,580	84,190	86,160	87,860	89,990		
D	Non-Stock Material (A/P taxable)	0								
l	Contractors (A/P tax exempt)	4,307,800		825,810	841,870	861,590	878,600	899,930		
Т	Overheads	0								
	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	5,169,370	0	990,970	1,010,250	1,033,910	1,054,320	1,079,920	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
	Contractors (A/P tax exempt)	215,390		41,290	42,090	43,080	43,930	45,000		
R	Overheads	0								
E	( )	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	215,390	0	41,290	42,090	43,080	43,930	45,000	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								
	Current Approved Rate Case Funding (\$):	0								

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM **Cost Estimate Level:** Conceptual (that final cost will be within +/-30% of the estimate): **High Confidence Cost Estimate Confidence:** No further estimate range is required. Formulas give standard ranges ← per estimate level, but may be Maximum (\$): **Cost Estimate Range:** Minimum (\$): 7,000,188 3,769,332 overwritten if desired. No explanation on confidence level required. Basis for estimate: Historical Proforma Pricing For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. Historical project actuals are extrapolated to determine future budget needs. F. ADDITONAL INFORMATION If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By:** J. Mead

### A. GENERAL

Project/Program Name: West Point and Highland Falls Gas Reinforcement Work Order #: **Budget Group: Budget Category:** 25

**Funding Project Number:** 10360

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

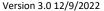
#### Describe the project objective and scope of work:

Gas

The village of Highland Falls currently recieves natural gas from the 60 PSIG WP line at the Homestead Avenue regulator station via a connection through West Point Military Academy (West Point). The 60 PSIG gas pipeline within the federal owned property is owned and operated by West Point. This limits Central Hudson's ability to mitigate outage risk and reliability to the Village of Highland Falls gas system. The purpose of this project is to provide an alternate source supplying Highland Falls is the West Point system goes offline and/or is locked down. The goal is to mitigate

### Describe specific scope exclusions, assumptions and constraints:

Install a new 120 PSIG 6" plastic gas distribution line which reroutes from the north beginning at Crows Nest regulator station extending around West Point campus to serve Highland Falls. This alternative would largely follow NYS road/highway taking on federal land, such as Route 218 and/or portions of Route 9W.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Please see attached alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%20Highland%20Falls%20Gas%20Reinforcement%20Alternatives%20Analysis.doc?d=w4bd311d592794e4cb34c2d3a4bbb6908&csf=1&web=1&e=pGiuZb

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Please see attached alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%20Highland%20Falls%20Gas%20Reinforcement%20Alternatives%20Analysis.doc?d=w4bd311d

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Seamless Customer Experience

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

**ESG** (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for

environmental, social and

governance.



Version 3.0 12/9/2022

### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Please see the link to the alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%20Highland%20Falls%20Gas%20Reinforcement%20Alternatives%20Analysis.doc?d=w4bd311d592794e4cb34c2d3a4bbb6908&csf=1&web=1&e=p

### Why was the proposed project scope chosen over other alternatives?

Please see the link to the alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%20Highland%20Falls%20Gas%20Reinforcement%20Alternatives%20Analysis.doc?d=w

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

Please see the link to the alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%

### What are the risks and consequences of not completing this project?

Please see the link to the alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%

## Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?

### What other factor were considered during the prioritization process?

Please see the link to the alternative analysis.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20an



## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu							
	\$10,473,830	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	503,550					109,830	393,720	
	Labor (Monthly Payroll)	302,130					65,900	236,230	
A	Stock Materials	805,670					175,720	629,950	
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	8,459,650					1,845,550	6,614,100	
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	10,071,000	0	0	0	0	2,197,000	7,874,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	402,830					87,860	314,970	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	402,830	0	0	0	0	87,860	314,970	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 7,331,681 Maximum (\$): 13,615,979

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Please see the alternative analysis link attached.

https://centralhudson.sharepoint.com/:w:/r/sites/EngPMO/Construction%20%20Rebuild%20Projects/Active/West%20Point/West%20Point%20and%20Highland%20Falls%20Gas%20Reinforcement%20Alternatives%20Analysis.doc?d=w4bd311d592794e4cb34c2d3a4bbb6908&csf=1&web=1&e=p

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

**Current Life-Cycle Phase: 1 Planning Submitted By:** J.Mead

## A. GENERAL

Project/Program Name: Compression Coupling Neighborhood Replacements

Work Order #:

N/A

**Budget Group:** Gas **Budget Category:** 

**Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 7/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

25

W/O and/or funding project not created yet, new incremental rate case project

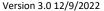
## Describe the project objective and scope of work:

Replace all mains and services in areas known to have had compression couplings installed during construction.

## Describe specific scope exclusions, assumptions and constraints:

Replacing only known areas that contain compression couplings and/or areas that have had an extensive history of compression coupling leaks.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The DIMP committee has identified compression coupling leaks as one of the major threats to the distribution system given their prevelant leak history.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacing these known areas will reduce the risk of leaking mains/services and subsequently reduce the likelihood of an incident. This will also reduce the emission of natural gas due to leaks and improve system reliability and resiliency.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

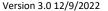
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

No other options are available other than repairing the leaks, which Central Hudson has been doing. The only permanent repair to a compression coupling is full replacement with plastic distribution piping.

Why was the proposed project scope chosen over other alternatives? N/A

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Will allow the company to reduce overall risk by reducing leak inventory, and any chance of future leaks due to the couplings.

What are the risks and consequences of not completing this project?

Possible consequences are more leaks, more repairs, more expense money spent, and potential for an incident.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$9,697,990	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	3,925,550			559,060	876,270	1,214,060	1,276,160		
	Labor (Monthly Payroll)	279,750			39,930	62,590	86,720	90,510		
A	Stock Materials	746,010			106,490	166,910	231,250	241,360		
D	Non-Stock Material (A/P taxable)	0								
١ĭ	Contractors (A/P tax exempt)	4,373,690			625,520	980,230	1,358,970	1,408,970		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	9,325,000	0	0	1,331,000	2,086,000	2,891,000	3,017,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
	Contractors (A/P tax exempt)	372,990			53,240	83,450	115,620	120,680		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	372,990	0	0	53,240	83,450	115,620	120,680	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								
C	Surrent Approved Rate Case Funding (\$):	0								

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 6,788,593 Maximum (\$): 12,607,387

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical install prices for replacements were analyzed and extrapolated to determine required budgets.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

### A. GENERAL

**Project/Program Name: Transmission Service to Distribution** 

Distribution Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2025 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

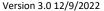
### Describe the project objective and scope of work:

This program will run distribution main to areas containing transmission pressure services, to be able to remove them from the transmission system.

## Describe specific scope exclusions, assumptions and constraints:

Areas addressed first will be those that are most risky (higher density areas) and are close to distribution main.







### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Growth

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Transmission services inherently have more risk associated with them due to being fed from high pressure transmission main. This pressure is sometimes up against the building wall where the meter is, and sometimes occurs in highly populated residential areas.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Reduce the risk of having an incident due to high pressure at the building.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve safety and security culture

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

## ESG (Environmental, Social and Governance) and Sustainability:

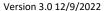
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Maybe - Requires further scope development

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To effectively manage the risk associated with high pressure transmission services.

What are the risks and consequences of not completing this project?

Reduce the likelihood of an incident resulting from high pressure transmission service. Reducing and/or eliminating this inventory is the most effective way of accomplishing this.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Reduce risk and increase safety and reliability.

What other factor were considered during the prioritization process? Safety

No



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$6,499,980	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	2,624,900			418,340	577,010	681,350	948,200		
	Labor (Monthly Payroll)	187,500			29,880	41,220	48,670	67,730		
A	Stock Materials	564,610			79,680	109,910	194,410	180,610		
D	Non-Stock Material (A/P taxable)	0								
l	Contractors (A/P tax exempt)	2,872,990			468,100	645,860	697,570	1,061,460		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	6,250,000	0	0	996,000	1,374,000	1,622,000	2,258,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
	Contractors (A/P tax exempt)	249,980			39,840	54,950	64,890	90,300		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	249,980	0	0	39,840	54,950	64,890	90,300	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								
C	Current Approved Rate Case Funding (\$):	0								

2021-2023 2024

Prior years funding; not actuals.



Formulas give standard ranges

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 4,549,986 Maximum (\$): 8,449,974 ← per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical proforma install costs extrapolated and adjusted for future install costs.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: Leak Prone Pipe Services Replacement

Work Order #: Funding Project Number:

- 1

Budget Group: Common: Non-I.T./O.T. Budget Category: Is this a Specific Project, Program or Blanket? Program

: 25

Target Schedule - Start: 7/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Replace all of the isolated and cathodically unprotected services that will not be addressed with the Leak Prone Pipe Elimination Program.

## Describe specific scope exclusions, assumptions and constraints:

Includes all isolated services that fall outside of the scope of any DIP that is a part of the LPP program.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Leak prone pipe is the single biggest threat to the distribution system, the most effective way to manage this risk is to eliminate it.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Reduces the likelihood of leaks which could then lead to an incident.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

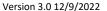
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To replace all remaining leak prone services to get the distribution system to a completely plastic or protected steel system.

What are the risks and consequences of not completing this project?

Not replacing the leak prone pipe will increase the likelihood of a leak, especially over time, which could lead to more releases of gas and potential incidents.

Was this project included in a prior 5-year forecast?

No

If No, why should this project be completed instead of a planned project?

To align with the current LPP elimination program goal of getting rid of all leak prone pipe.

What other factor were considered during the prioritization process?

N/A



## **E. COST ESTIMATE**

	Capital Estimate Summary		t year of the Idget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$9,468,200	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	3,824,150		733,090	747,350	764,860	779,960	798,890		
	Labor (Monthly Payroll)	273,140		52,360	53,380	54,630	55,710	57,060		
A	Stock Materials	728,410		139,640	142,350	145,690	148,560	152,170		
D	Non-Stock Material (A/P taxable)	0								
l	Contractors (A/P tax exempt)	4,278,300		819,910	835,920	855,820	872,770	893,880		
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	9,104,000	0	1,745,000	1,779,000	1,821,000	1,857,000	1,902,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	364,200		69,820	71,180	72,840	74,280	76,080		
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
s	TOTAL REMOVALS:	364,200	0	69,820	71,180	72,840	74,280	76,080	0	
	* AFUDC may require adjustment after Finance Department									
	Expense \$ (if applicable):	0								
	<b>Current Approved Rate Case Funding (\$):</b>	0								

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Proforma Pricing; Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Use historical unit pricing for service replacements and adjust for future budget requirements.

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

### A. GENERAL

Project/Program Name: River/Creek Crossing Remediation

Work Order #:

-

**Budget Group:** Gas

**Budget Category:** 

Funding Project Number: Target Schedule - Start: 1/1/2025 In-Se

In-Service: 12/31/2028

Is this a Specific Project, Program or Blanket? Program

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Remediate or reinforce any water crossing that may be subject to damage due to natural forces during extreme weather events (ex. Erosion due to heavy water flow in stream/creeks).

25

## Describe specific scope exclusions, assumptions and constraints:

This program will include approximately the top 100 areas where transmission and/or distribution main crosses a water way and could be subject to damage with heavy rain, snow, flooding, etc.





### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Reduce and mitigate any risk associated with a leak or release of gas due to an extreme weather event.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Will reinforce the system to be able to handle extreme weather events without the risk of it cauing leaks or releases.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No; Local municipality (1); Local municipalities (>1)

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

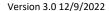
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

With weather event becoming more frequent and more extreme in nature, this will mitigate the risk of a potential gas incident as a result.

What are the risks and consequences of not completing this project?

Potential gas leak and/or release of gas leading to an incident.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

This should not displace any planned project and should happen concurrently

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

No



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates she adjustments for i			
	\$6,237,140	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	2,619,600			417,490	575,850	679,970	946,290	
	Labor (Monthly Payroll)	187,110			29,820	41,130	48,570	67,590	
A	Stock Materials	498,980			79,520	109,690	129,520	180,250	
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	2,681,970			427,430	589,560	696,160	968,820	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,987,660	0	0	954,260	1,316,230	1,554,220	2,162,950	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
11	Contractors (A/P tax exempt)	249,480			39,760	54,840	64,760	90,120	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	249,480	0	0	39,760	54,840	64,760	90,120	0
	* AFUDC may require adjustment after Finance Depart	rtment review.							
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 4,365,998 Maximum (\$): 8,108,282

No explanation on confidence level required.

Formulas give standard ranges

ref per estimate level, but may be

overwritten if desired.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used historical unit pricing for similar work and extrapolated to adjust for future budget estimates.

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Cast Iron Undermines Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2551-03

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

This blanket captures the cost for all required main replacements due to cast iron undermines.

### Describe specific scope exclusions, assumptions and constraints:

This is a blanket program as these are unidentified scenarios, and are handled as they arise throughout the year.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

**Discretion Level:** Non-Discretionary **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Replacement of cast iron mains after undermine is required due to the brittle nature of the pipe and the settling of the ground. This is done to mitigate any risk from cracking cast iron mains that may lead to leaks.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Avoidance of leaks from cracked cast iron mains.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete Sustainability status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Completed as required. This is an unidentified timeline as they cannot be anticipated, but come in artbitrarily throughout the year.

What are the risks and consequences of not completing this project? Major leaks, potentially leading to a gas incident.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			cost estimates sh adjustments for i			
	\$841,300	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	686,560		131,610	134,170	137,320	140,030	143,430	
	Labor (Monthly Payroll)	57,820		11,000	11,200	11,760	11,790	12,070	
A	Stock Materials	64,620		12,390	12,630	12,920	13,180	13,500	
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	809,000	0	155,000	158,000	162,000	165,000	169,000	0
R	Labor (Weekly Payroll)	32,300		6,190	6,310	6,460	6,590	6,750	
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	32,300	0	6,190	6,310	6,460	6,590	6,750	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM  Cost Estimate Level: Conceptual  Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence  No further estimate range is required.  Cost Estimate Range: Minimum (\$): 588,910 Maximum (\$): 1,093,690 Formulas give standard ranges per estimate level, but may be overwritten if desired.  No explanation on confidence level required.
Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence  No further estimate range is required.  Cost Estimate Range: Minimum (\$):588,910
Cost Estimate Range: Minimum (\$): 588,910 Maximum (\$): 1,093,690   Cost Estimate Range: Minimum (\$): 588,910 Maximum (\$): 1,093,690
Cost Estimate Range: Minimum (\$):588,910 Maximum (\$):1,093,690   Cost Estimate Range: Minimum (\$):588,910 Maximum (\$):1,093,690
Basis for estimate: Historical Unit Pricing
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  Historic spends are quantified by year and extrapolated to determine future budget need.
F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional)





Version 3.0 12/9/2022



Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 0 Identified; Not Started

#### A. GENERAL

**Project/Program Name: Leak Prone Pipe Main Replacements** 

Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2580-00
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/3024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

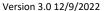
Gas distribution main replacements in accordance with the LPP replacement, see Capital Input File for project listings.

#### Describe the project objective and scope of work:

Central Hudson has established a program to replace all of its leak prone pipe, at a minimum of 15 miles of main per year, as it is the single largest threat to the Central Hudson distribution system as identified by the DIMP program.

### Describe specific scope exclusions, assumptions and constraints:

Project selections for each year are prioritized by a Central Hudson SME committee in conjuction with Central Hudson's main segment risk model (Main Replacement Prioritization). This is done in accordance with the 2021 Rate Order which states "for the avoidance of doubt, not all pipe sections will be replaced in strict adherance to their risk ranking established by the Company's main segment risk model. The Company expressly retains the right to prioritize projects based on factors other than risk..." The scope, prioritization, and cost of individual projects may vary year to





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44) Is there an Innovation Component? No

Needs Assessment: Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Leak prone main replacements are required as part of the Leak Prone Pipe elimination program, as per the 2021 Rate Order: "Effective in 2022, the company will replace or eliminate, at a minimum, 15 miles of leak prone pipe per year and will incur an NRA of 15 BP's if mileage achieved in any year is less than 15 miles."

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of leak prone pipe through this program will reduce the likelihood of leaks on the gas system, extend the life of the assets, and increase reliability.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

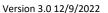
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To meet PSC compliance with regards to the leak prone pipe elimination program and gas safety.

What are the risks and consequences of not completing this project?

If the minimum mileage of 15 miles of replacement is not achieved every year, the company incurs 15 BP NRA.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				r cost estimates s le adjustments for			
	\$206,338,210	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	10,316,910		1,877,400	2,052,760	2,024,280	2,216,290	2,146,180	
	Labor (Monthly Payroll)	6,190,150		1,126,440	1,231,660	1,214,570	1,329,770	1,287,710	
A	Stock Materials	16,507,050		3,003,840	3,284,420	3,238,840	3,546,060	3,433,890	
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	165,070,580		30,038,450	32,844,160	32,388,450	35,460,630	34,338,890	
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	198,084,690	0	36,046,130	39,413,000	38,866,140	42,552,750	41,206,670	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	8,253,520		1,501,920	1,642,210	1,619,420	1,773,030	1,716,940	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	8,253,520	0	1,501,920	1,642,210	1,619,420	1,773,030	1,716,940	0
	* AFUDC may require adjustment after Finance Dep								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Formulas give standard ranges

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

**Cost Estimate Level: Preliminary** 

(that final cost will be within +/-20% of the estimate): **High Confidence Cost Estimate Confidence:** 

No further estimate range is required.

**Cost Estimate Range:** Maximum (\$): Minimum (\$): 165,070,568 247,605,852 ← per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical unit pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Budget estimates are based on yearly average install cost and applied to each project specifically. Variance to the average yearly costs are subject to change based on individual projects scope, contractor pricing, and material costs. Overhear and AFUDC are based on 2022 actuals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional): This budget submittal form also includes all service service work that would be associated with leak prone pipe replacement under funding project 2-251L-01.



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Identified Reinforcements

Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2511-00

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Individual detailed project scopes are developed as needed, according to the potential planned year of the project.

### Describe specific scope exclusions, assumptions and constraints:

Reinforcements to the gas distribution are required in areas where the system may be below base risk, where growth is anticipated, and/or when large loads are requested to be put on the system.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Reinforcements to the gas distribution system are required in areas where the system may be below base risk, operating below 50% MAOP, where growth may be anticipated, or where large loads are requested to be put on the system. In some areas requests for new service may not be possible without a reinforcement.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Reinforcing the system allows the system to maintain reliability and resiliency, and in some instances allow for future growth.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

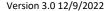
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Load shifting, changing of regulator station equipment, looping mains, and NPA's are always considered prior to reinforcement.

Why was the proposed project scope chosen over other alternatives?

To maintain the system reliability and resiliency, while maintaining gas service to the current customer base.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Some of these projects coincide with the LPP program, and others are to improve operational reliability.

What are the risks and consequences of not completing this project?

Would not contribute to LPP where applicable, and would require denial of service to many customers due to capacity constraints.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process?

N/A





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			r cost estimates sh e adjustments for i			
	\$5,915,700	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	295,790		149,370		146,420			
	Labor (Monthly Payroll)	177,470		89,620		87,850			
A	Stock Materials	473,260		238,990		234,270			
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	4,732,560		2,389,890		2,342,670			
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,679,080	0	2,867,870	0	2,811,210	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	236,620		119,490		117,130			
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	236,620	0	119,490	0	117,130	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Budget estimates are based on project scope and historic project spends to extrapolate for new updated proforma pricing.

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Unidentified LPP Main Relocation

Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2551-02
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

#### Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

This program addresses LPP main relocations due to municipal work, such as paving, municipal infrastructure work, or interference. This program takes advantage of reduced capital cost by leveraging relationships with the municipalities where they may be doing paving work (or the like),

#### Describe the project objective and scope of work:

Individual project scopes are determined on an annual basis by working with the municipalities and determining where work (paving, beautification projects, road rebuilds, etc.) will be done.

### Describe specific scope exclusions, assumptions and constraints:

This program is part of the LPP program and is required to meet a total LPP mileage reduction of 15 miles per year.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

**Discretion Level:** Non-Discretionary **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Leak Prone Pipe replacements are required as part of the Leak Prone Pipe elimination program, as per the 2021 rate order: "Effective in 2022, the Compnay will replace or eliminate, at a minimum, 15 miles of leak prone pipe per year and will incur an NRA of 15 BP's if mileage in any year is less than 15 miles."

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement of leak prone pipe through this program will reduce the likelihood of leaks on the gas system, increasing reliability overall.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1); No

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

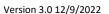
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To meet PSC compliance with regards to gas safety via the LPP program.

What are the risks and consequences of not completing this project?

Increases the likelihood of leaks on the system, and prompts the Company to receive a 15 BP NRA per year.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates she adjustments for l			
	\$21,596,800	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	1,079,840		180,650	197,310	215,400	233,380	253,100	
	Labor (Monthly Payroll)	647,910		108,390	118,390	129,240	140,030	151,860	
A	Stock Materials	1,727,750		289,030	315,700	344,640	373,410	404,970	
D	Non-Stock Material (A/P taxable)	0							
Ī	Contractors (A/P tax exempt)	17,277,430		2,890,330	3,157,000	3,446,380	3,734,050	4,049,670	
Т	Overheads	0							
I	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	20,732,930	0	3,468,400	3,788,400	4,135,660	4,480,870	4,859,600	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	863,870		144,520	157,850	172,320	186,700	202,480	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	863,870	0	144,520	157,850	172,320	186,700	202,480	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 17,277,440 Maximum (\$): 25,916,160

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: FOS-Generated Estimate; Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Estimates are based on historical project actuals which are used to analyze proforma pricing every year and adjust accordingly. FOS estimates are not used, it cannot be deleted from the list above.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Unidentified Leaking Mains

Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2551-04

Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024

In-Service: 12/31/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

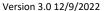
This program will replace distribution main that has been identified as leaking, having water intrusion, or active corrosion, within each calendar year.

#### Describe the project objective and scope of work:

Individual project scopes are determined based on the emergent need, as found by either leak survey or gas operations.

### Describe specific scope exclusions, assumptions and constraints:

This program is part of the LPP program and is required to contribute to the mileage target of 15 miles of LPP per year.





#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Distribution Sustaining** Load Based/Infrastructure:

Maintain System Standards Infrastructure Discretion Level: **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value? N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This work is emergent, and therefore cannot be planned and prioritized. This work is worked on an as needed basis.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Reduces inventory of leaking pipelines.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Operational Excellence** 

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which Team Goal does project most align with? **PSC Gas Safety** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

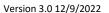
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** Yes **Governance Component:** Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To meet PSC compliance with regards to gas safety and the LPP program.

What are the risks and consequences of not completing this project?

Leaking mains leading to an incident, and the Company incurring NRA BP's if LPP target is not met.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			cost estimates she adjustments for i			
	\$4,038,510	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	1,716,380		329,030	335,430	343,290	350,070	358,560	
	Labor (Monthly Payroll)	121,160		23,230	23,680	24,230	24,710	25,310	
A	Stock Materials	323,090		61,940	63,140	64,620	65,900	67,490	
D	Non-Stock Material (A/P taxable)	0							
l	Contractors (A/P tax exempt)	1,716,380		329,030	335,430	343,290	350,070	358,560	
Т	Overheads	0							
1	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,877,010	0	743,230	757,680	775,430	790,750	809,920	0
R	Labor (Weekly Payroll)	80,750		15,480	15,780	16,150	16,470	16,870	
E	Labor (Monthly Payroll)	0							
T	Contractors (A/P tax exempt)	80,750		15,480	15,780	16,150	16,470	16,870	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	161,500	0	30,960	31,560	32,300	32,940	33,740	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
(	current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Unit Pricing

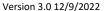
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical project quantities and actual spends are extrapolated to determine future budget need.

# F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 12, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: J. Mead Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Large Diameter Pre-1930 Steel Replacement Program Work C

Work Order #:

Budget Group: Gas Budget Category: 25 Funding Project Number: 2-2581-00
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2027

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Detailed project descriptions, schedule, and project costs are found below.

#### Describe the project objective and scope of work:

Central Hudson has an inventory of approximately 5 miles of large diameter (8"+) steel pipe operating at 60 PSIG that is located in or near high consequence areas ans which was joined using gas welding. Welds of this vintage and type are susceptible to circumferential cracks as identified through DIMP. This replacement program has been established to replace this pipe and remove that threat.

### Describe specific scope exclusions, assumptions and constraints:

Constraints for large diameter steel pipe replacements are usually constrained by the paving scopes of the municipality/state.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Non-Discretionary Investment Type: Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Due to the need for this line, and the many downstream systems it feeds, replacement is required to sustain the system while removing the threat from brittle gas welds. Replacement will also help increase capacity of the already strained system because it is near capacity.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Removing the threats from the system increases safety while also increasing capacity (replacing 8" steel with 12" plastic).

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipalities (>1)

### ESG (Environmental, Social and Governance) and Sustainability:

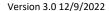
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

There are no other options for this as the PN line is needed to support multiple downstream systems.

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Completing these replacements in line with the LPP program will mitigate the risk of circumferential cracks due to gas welds and will help increase system reliability and capacity.

Yes

What are the risks and consequences of not completing this project?

The risk of the pipeline cracking and leading to an event (e.g. Marple Road).

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process? PN line planning study



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			cost estimates st e adjustments for l			
	\$13,310,700	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	665,530		152,160	178,840	162,460	85,000	87,070	
	Labor (Monthly Payroll)	399,320		91,290	107,310	97,480	51,000	52,240	
A	Stock Materials	1,064,860		243,450	286,150	259,940	136,010	139,310	
	Non-Stock Material (A/P tayable)	0							
ı	Contractors (A/P tax exempt)	10,648,570		2,434,480	2,861,500	2,599,430	1,360,070	1,393,090	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVS)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	12,778,280	0	2,921,380	3,433,800	3,119,310	1,632,080	1,671,710	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	532,420		121,720	143,080	129,970	68,000	69,650	
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	532,420	0	121,720	143,080	129,970	68,000	69,650	0
	* AFUDC may require adjustment after Finance Department								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 9,317,490 Maximum (\$): 17,303,910

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historic unit pricing. Project estimates are based on yearly average install rates derived from historical project actual spends. Variance to the average yearly costs are subject to change based on individual project scopes. Overhead and AFUDC percentages are based on 2022 actuals.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 3, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: David McGowan Current Life-Cycle Phase: 4 Implementation (IT/OT)

#### A. GENERAL

Project/Program Name: Gas Meter Work Order #:

Budget Group: Gas Budget Category: 27 Funding Project Number:

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: In-Service:

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

X081A, X084A, 2712-00-18

#### Describe the project objective and scope of work:

Meter Services is required to purchase and install metering equipment to support regulatory requirements, as well as new business initiatives.

#### Describe specific scope exclusions, assumptions and constraints:

Meters and related material are required to support regulatory and new business requirements.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Sustaining

**Discretion Level:** Non-Discretionary **Investment Type:** New Business

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Compliance

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Regulatory and new business.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)
Maintaining accurate metering.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? Group Expense

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

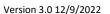
Environmental Component: No Social Component: No

**Governance Component:** No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







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$\sim$	7.				 
	/A\				
C.	_	_	-	I N 7 -	

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Requirements are yearly.

What are the risks and consequences of not completing this project?

Variations in the number of installs, equipment failures, cost increases, and material lead times.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



### **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				Il future year cost estimates should include applicable adjustments for inflation.				
	\$18,752	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
A	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	18,752	2,569	2,926	3,028	3,213	3,405	3,611		
l	Contractors (A/P tax exempt)	0								
Т	Overheads	0								
I	AFUDC*	0								
O	Journal Vouchers (JVs)	0								
S	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	18,752	2,569	2,926	3,028	3,213	3,405	3,611	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
Hi	Contractors (A/P tax exempt)	0								
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S		0	0	0	0	0	0	0	0	
	* AFUDC may require adjustment after Finance Depart									
	Expense \$ (if applicable):	0								
C	Current Approved Rate Case Funding (\$):	10,389	7,711	2,678						

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included	d in current PSC-approve	ed budget pl	an under a PROGR	AM	
Cost Estimate Level: Cost Estimate Confidence	Conceptual e: (that final cost wil	II be within	+/-30% of the estin	nate): High Confid	ence
No further estimate range is	s required.				Formulas give standard ranges
Cost Estimate Range: No explanation on confid	Minimum (\$): lence level required.	13,126	Maximum (\$):	24,378	per estimate level, but may be overwritten if desired.
Basis for estimate: Histo	orical Unit Pricing				
applicable cost estimating Previous material costs and	g files as appropriate. d trending needs.	de descriptio	on or details for ho	ow your cost estimate wa	as derived. You may add link(s) to
F. ADDITONAL INFORM	MATION				
If there is any additional i	nformation that you we	ould like to	add that is not cov	ered elsewhere in this fo	orm, you may add it here (optional):

**COMMON PROGRAM INDIVIDUAL PROJECT SUBMITTAL** 



Version 3.0 12/9/2022

Submission Date: June 8, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: David Schultz Current Life-Cycle Phase: 4 Construction

#### A. GENERAL

Project/Program Name: Tools Budget Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 43 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/31/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The "Tools" Capital Forecast provides for both the normal replacement of tools and instruments as well as the addition of any new and/or incremental tooling needs throughout the Company to allow our employees to complete their daily work.

Describe specific scope exclusions, assumptions and constraints:

None



A FORTIS COMPANY

## **Budget Submittal Form**

Version 3.0 12/9/2022

**B. JUSTIFICATION** 

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:Non-DiscretionaryInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture
Which <u>Strategic Initiative</u> does project most align with?
Which <u>Team Goal</u> does project most align with?

All Injury Frequency Rate (AIFR)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

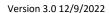
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Maybe - Requires further scope development

Social Component: Yes
Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?  $\ensuremath{\text{N/A}}$ 

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

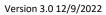
Why do we need to complete this project in the period requested?  $\ensuremath{\text{N/A}}$ 

What are the risks and consequences of not completing this project?  $\ensuremath{\text{N/A}}$ 

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates she adjustments for in			
	\$9,018	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	9,018		1,605	1,639	1,781	2,144	1,849	
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
1	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	9,018	0	1,605	1,639	1,781	2,144	1,849	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	705		705					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence	
No further estimate range is required.  Formulas give standard range.	s
Cost Estimate Range: Minimum (\$): 7,214 Maximum (\$): 10,822   No explanation on confidence level required.	
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  N/A	
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):	



Version 3.0 12/9/2022

Submission Date: June 8, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: David Schultz Current Life-Cycle Phase: 4 Construction

#### A. GENERAL

Project/Program Name: Transportaton Budget Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 45 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/31/2024

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The "Transportation" Capital Forecast includes all vehicles, including light and heavy-duty vehicles, trailers, forklifts, track/earthmoving equipment, and cranes. The Company uses the following industry appropriate criteria for determining the replacement cycle: Light weight vehicles are included on the replacement listing when they are seven years old or have 120,000 miles; Heavy duty vehicles are included on the replacement listing when they are 10 years old or have 10,000 machine hours; and other specialty equipment is specifically included within the Five-Year Capital Plan based on

### Describe specific scope exclusions, assumptions and constraints:

None



Version 3.0 12/9/2022

**B. JUSTIFICATION** 

**Growth/Sustaining/Retirement:** Not Applicable Load Based/Infrastructure: Other Non-Discretionary **Discretion Level: Investment Type: Daily Operations** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44):

**Needs Assessment:** Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

N/A

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) N/A

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Business Modernization** 

Which Strategic Objective does project most align with? Enhance workforce depth and capabilities Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? **PSC CAIDI Outage Duration** 

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

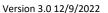
**Checklist Fully Completed: Yes Environmental Component:** 

> **Social Component:** Maybe - Requires further scope development

**Governance Component:** Yes

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development governance.

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?  $\ensuremath{\text{N/A}}$ 

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?  $\ensuremath{\text{N/A}}$ 

What are the risks and consequences of not completing this project?  $\ensuremath{\text{N/A}}$ 

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





## **E. COST ESTIMATE**

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for i			
	\$71,999	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	71,999		13,824	14,115	14,411	14,685	14,964	
Ī	Contractors (A/P tax exempt)	0							
Т	Overheads	0							
	AFUDC*	0							
O N	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	71,999	0	13,824	14,115	14,411	14,685	14,964	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
1:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depar								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	2,904		2,904					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan ui	nder a PROGRAM	
Cost Estimate Level: Preliminary  Cost Estimate Confidence: (that final cost will be within +/-20		
No further estimate range is required.		Formulas give standard ranges
Cost Estimate Range: Minimum (\$): 57,599 Ma No explanation on confidence level required.	aximum (\$): 86,399	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing		
For your conceptual/preliminary estimate provide description or applicable cost estimating files as appropriate. N/A	r details for how your cost estimate was derived	. You may add link(s) to
F. ADDITONAL INFORMATION		
If there is any additional information that you would like to add t	that is not covered elsewhere in this form, you n	nay add it here (optional):



Version 3.0 12/9/2022

May 2, 2023 First Year of 5-Year Budget Period: Submission Date: 2024

R.J.Scandariato **Current Life-Cycle Phase: 1 Planning Submitted By:** 

#### A. GENERAL

**Project/Program Name: Daily Operations- Unidentified** 

Work Order #:

Common: Non-I.T./O.T. **Budget Group: Budget Category:** 41 **Funding Project Number:** 4-4112-02-18 Is this a Specific Project, Program or Blanket? Blanket

Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

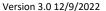
#### Describe the project objective and scope of work:

Funding allocated to facilitate the emergent needs of the organization.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Emergent needs and equipment failures occur outside of the scope of identifed projects. Allocating funding within the budget allows these circumstances to be addressed without sacrificing planned work.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)
Capital replacement broken down equipment can save on recurring maintenance costs.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization Which <u>Strategic Objective</u> does project most align with? Grow invested capital

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

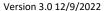
Checklist Fully Completed: Yes Environmental Component: Maybe - Requires further scope development

**Social Component:** Maybe - Requires further scope development

**Governance Component:** Maybe - Requires further scope development

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and

Is complete <u>Sustainability</u> status achieved by this project?\* Maybe - Requires further scope development governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Emergent needs.

What are the risks and consequences of not completing this project? Increased maintenance costs and less reliable equipment

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu					est estimates should include djustments for inflation.				
	\$2,962,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years		
	Labor (Weekly Payroll)	0									
	Labor (Monthly Payroll)	375,000		75,000	75,000	75,000	75,000	75,000			
A	Stock Materials	0									
D	Non-Stock Material (A/P taxable)	0									
ī	Contractors (A/P tax exempt)	2,587,000		623,000	461,000	482,000	481,000	540,000			
Т	Overheads	0									
I	AFUDC*	0									
O N	Journal Vouchers (JVs)	0									
S	CIAC Payments CREDIT	0									
	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	2,962,000	0	698,000	536,000	557,000	556,000	615,000	0		
R	Labor (Weekly Payroll)	0									
E	Labor (Monthly Payroll)	0									
Hi	Contractors (A/P tax exempt)	0									
R	Overheads	0									
E	Journal Vouchers (JVs)	0									
M	Salvage CREDIT	0									
E	CIAC Payments CREDIT	0									
T	Joint Utility Payments CREDIT	0									
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0		
	* AFUDC may require adjustment after Finance Depart	rtment review.									
	Expense \$ (if applicable):	0									
C	current Approved Rate Case Funding (\$):	698,000		698,000							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 2,369,600 Maximum (\$): 3,554,400

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Replacement of similar scope projects.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 2, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J.Scandariato Current Life-Cycle Phase: 1 Planning

### A. GENERAL

**Project/Program Name: EV Charging Infrastructure** 

Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 41

Funding Project Number: 4-4112-02-18

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

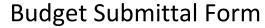
Addition of electric vehicles to the Central Hudson fleet.

#### Describe the project objective and scope of work:

Install charging infrastructure at Central Hudson facilities to support the electric vehicles that are being added to the company fleet.

### Describe specific scope exclusions, assumptions and constraints:

Coordination with Transportation, Engineering, and Facilities is underway to determine location and type of charging infrastructre that is needed.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

NYS and Central Hudson have goals to transition the fleet to more electric vehciles. In order for this to be successful charging infrastructure will need to be installed to support the needs.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Support of a corporate goal.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Increase awareness as community and industry leader

Which <u>Strategic Initiative</u> does project most align with? Beneficial Electrification

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

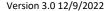
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Maybe - Requires further scope development

Governance Component: No

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To support the introduction of electric vehicles.

What are the risks and consequences of not completing this project? Electric vehicles that are purchased would not be able to be effectivly utilized.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh adjustments for i					
	\$1,480,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years		
	Labor (Weekly Payroll)	0									
	Labor (Monthly Payroll)	0									
A	Stock Materials	0									
D	Non-Stock Material (A/P taxable)	0									
Į,	Contractors (A/P tax exempt)	1,480,000		349,000	268,000	278,000	278,000	307,000			
Т	Overheads	0									
I	AFUDC*	0									
O N	Journal Vouchers (JVs)	0									
s	CIAC Payments CREDIT	0									
	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	1,480,000	0	349,000	268,000	278,000	278,000	307,000	0		
R	Labor (Weekly Payroll)	0									
E	Labor (Monthly Payroll)	0									
	Contractors (A/P tax exempt)	0									
R	Overheads	0									
E	Journal Vouchers (JVs)	0									
M	Salvage CREDIT	0									
E	CIAC Payments CREDIT	0									
T	Joint Utility Payments CREDIT	0									
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0		
	* AFUDC may require adjustment after Finance Departs										
	Expense \$ (if applicable):	0									
	<b>Current Approved Rate Case Funding (\$):</b>	349,000		349,000							

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 1,184,000 Maximum (\$): 1,776,000

No explanation on confidence level required.

Formulas give standard ranges per

estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Installation of similar scope projects.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 2, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J.Scandariato Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

**Budget Group:** 

Project/Program Name: Solar Systems on Company Facilities

Work Order #:

Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4112-02-18

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Funding allocated to facilitate the installation of solar generation infrastructure at Central Hudson facilities.

Describe specific scope exclusions, assumptions and constraints:

N/A



Version 3.0 12/9/2022

N/A

**B. JUSTIFICATION** 

Load Based/Infrastructure: Other Growth/Sustaining/Retirement: Distribution Growth

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Installation of local solar generation at Central Hudson facilities will decrease the dependance on the grid, lowering costs for customers as well as supporting NYS renewable generation goals.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

All electricity generated would offset the need to purchase that amount of energy improving capacity of the grid.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Increase commitment to sustainability in planning/performance processes

Which <u>Strategic Initiative</u> does project most align with? Energy Policy Driven Investments

Which Team Goal does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

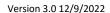
Checklist Fully Completed: Yes Environmental Component: Yes

**Social Component:** Maybe - Requires further scope development

**Governance Component:** Yes

Is complete <u>Sustainability</u> status achieved by this project?\* Maybe - Requires further scope development

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?  $\ensuremath{\text{N/A}}$ 

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To support clean energy policy.

What are the risks and consequences of not completing this project? Operations will continue as they are today.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				r cost estimates sh e adjustments for i			
	\$3,050,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	3,050,000		30,000	180,000	1,994,000	657,000	189,000	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,050,000	0	30,000	180,000	1,994,000	657,000	189,000	0
R	, ,	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
Т.	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges per
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The market price of materials and supplys.	estimate level, but may be overwritten if desired.
Basis for estimate: Vendor Generated Cost Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. A applicable cost estimating files as appropriate.  Solar developer assisted in cost estimate.	ou may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	y add it here (optional):



Version 3.0 12/9/2022

June 6, 2023 First Year of 5-Year Budget Period: Submission Date: 2024

R.J. Scandariato Current Life-Cycle Phase: 1 Planning **Submitted By:** 

#### A. GENERAL

Project/Program Name: Architectural/Engineering Design

Work Order #:

Common: Non-I.T./O.T. **Budget Group: Budget Category:** 41 **Funding Project Number:** 4-4111-00-18

Is this a Specific Project, Program or Blanket? Target Schedule - Start: 1/1/2024 Blanket

In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Funding allocated to facilitate design work for projects that require longer time and/or to compete design to allow construction schedules to be met.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Many building construction projects require profressional designs to meet building codes, ensure safety, and be in compliance with requirements of any other jurisdictional authority.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Potential energy efficiency savings and industry leadership.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence Which <u>Strategic Objective</u> does project most align with? Grow invested capital

Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Maybe - Requires further scope development

Social Component: Maybe - Requires further scope development Governance Component: Maybe - Requires further scope development

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?  $\ensuremath{\text{N/A}}$ 

What are the risks and consequences of not completing this project?

Not being in compliance with codes and not meeting net plant targets by missing construction windows.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process? N/A

Yes



## E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			cost estimates sh adjustments for i			
	\$1,480,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	1,480,000		349,000	268,000	278,000	278,000	307,000	
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,480,000	0	349,000	268,000	278,000	278,000	307,000	0
R	, ,	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
Т	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 1,184,000 Maximum (\$): 1,776,000

No explanation on confidence level required.

Formulas give standard ranges per
estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

N/A

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 2 Design

#### A. GENERAL

Project/Program Name: Paving

Budget Group: Common: Non-I.T./O.T.

Budget Category: 41

Funding Project Number: 4-4112-02-18

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Funding allocated to facilitate necessary paving projects at all Central Hudson facilities as needed to maintain safe and functional parking lots and roadways.

Describe specific scope exclusions, assumptions and constraints:

N/A





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

No

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Asphalt has a finite life and requries replacement once deterioration begins in order to maintain a safe surface for vehicles and pedestrians.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Poor aspalt results in potholes and potental low spots. Both senarios could lead to trips, slips (in winter), and damage to vehicles.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with?

Which <u>Strategic Objective</u> does project most align with?

Which <u>Strategic Initiative</u> does project most align with?

DOES NOT ALIGN WITH ANY STRATEGIC OBJECTIVE

DOES NOT ALIGN WITH ANY STRATEGIC INITIATIVE

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

No

#### ESG (Environmental, Social and Governance) and Sustainability:

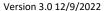
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: No

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?  $\ensuremath{\text{N/A}}$ 

What are the risks and consequences of not completing this project? Having deteriorated asphalt at compnay properties.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			r cost estimates sh e adjustments for i						
	\$2,962,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years			
	Labor (Weekly Payroll)	0										
	Labor (Monthly Payroll)	0										
A	Stock Materials	0										
D	Non-Stock Material (A/P taxable)	0										
l	Contractors (A/P tax exempt)	2,962,000		698,000	536,000	557,000	556,000	615,000				
Т	Overheads	0										
I	AFUDC*	0										
O	Journal Vouchers (JVs)	0										
S	CIAC Payments CREDIT	0										
	Joint Utility Payments CREDIT	0										
	TOTAL ADDITIONS:	2,962,000	0	698,000	536,000	557,000	556,000	615,000	0			
R	Labor (Weekly Payroll)	0										
E	Labor (Monthly Payroll)	0										
H	Contractors (A/P tax exempt)	0										
R	Overheads	0										
E	Journal Vouchers (JVs)	0										
M	Salvage CREDIT	0										
E	CIAC Payments CREDIT	0										
T	Joint Utility Payments CREDIT	0										
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0			
	* AFUDC may require adjustment after Finance Department											
	Expense \$ (if applicable):	0										
	Surrent Approved Rate Case Funding (\$):	319,000		319,000								

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

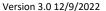
Paving of several projects each year, more paving in 2024, 2025, and 2026 to allow for repaving of Kingston to allign with PCC/Training Academy Projects.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Work Order #:



6 2 2 6 - H



Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 4 Construction

#### A. GENERAL

Project/Program Name: Primary Control Center

Budget Group: Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4112-04-19

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 5/1/2021 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

WO 6227-H: Training Academy - Site Development, IT/OT work orders for equipment

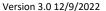
#### Describe the project objective and scope of work:

Construct a Primary Control Center for both Transmission and Distribution System Operations. This new facility will ensure all safety and security protocols are in place for real-time operation of our gas and electric systems. The Primary Control Center will provide a modern space cohabited for transmission and distribution functions and emergency preparedness; equipped with the technology and space to operate over the next 50 years. All regulatory policies and COVID-19 lessons learned will be incorporated within the new

#### Describe specific scope exclusions, assumptions and constraints:

The project is under construction and on track for an in-service date of 12/31/2024.







**B. JUSTIFICATION** 

Load Based/Infrastructure:InfrastructureGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:Non-DiscretionaryInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Primary Control Center is needed to support the Grid Modernization Program and meet NYS policy requirements.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved reliability and customer satisfaction when Primary Control Center is up and running.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Energy Leadership

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

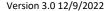
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes
Governance Component: Yes

Is complete Sustainability status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Modify the current Primary Control Center.

#### Why was the proposed project scope chosen over other alternatives?

New construction allows for all modern needs of a Primary Control Center to be incorported and the current Primary Control Center to remain as a backup.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This project is under construction and needs to continue so its gets completed, allowing for fuctional testing and be in-service to support Grid Modernization.

What are the risks and consequences of not completing this project?

Not being in compliance with NYS energy policy.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?

The training academy project was deferred until after the Primary Control Center.



	Capital Estimate Summary	Year 1 = 1si 5-year bu	,			r cost estimates sh le adjustments for i			
	\$44,323,759	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	160,000	85,000	75,000					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	41,000,000	38,000,000	3,000,000					
Т	Overheads	288,759	213,759	75,000					
I	AFUDC*	2,875,000	1,150,000	1,725,000					
O N	Journal Vouchers (JVs)	0							
s		0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	44,323,759	39,448,759	4,875,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
Hi	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	( ,	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S		0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart	-							
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	4,628,000	0	4,628,000					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Bid

**Cost Estimate Range:** 

Cost Estimate Confidence: (that final cost will be within +/-5% of the estimate): High Confidence

42,107,571

No further estimate range is required.

Formulas give standard ranges per

estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Contractor/Vendor Bids For Entire Project

Minimum (\$):

For your definitive/bid estimate, provide link(s) to applicable cost estimating files.

Available if needed.

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Maximum (\$):

46,539,947







Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 4 Construction

#### A. GENERAL

Project/Program Name: Training Academy- Site Development Work Order #: 6 2 2 7

Budget Group: Common: Non-I.T./O.T.

Budget Category: 41

Funding Project Number: 4-4112-04-19

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 5/1/2021

In-Service: 6/30/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Develop the land and install infrastructure for the site that will house the new Gas Village, Pole Yard, Primary Control Center, and Training Academy.

#### Describe specific scope exclusions, assumptions and constraints:

The project is under construction and on track for an in-service date of 6/30/2024.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

In order to have a useful and accessible parcel for the training programs and Primary Control Center the site needs to be cleared and developed first.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Enhance workforce depth and capabilities

Which <u>Strategic Initiative</u> does project most align with? Workforce Development

Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: No Governance Component: Yes

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Other sites were considered, but this site was selected.

Why was the proposed project scope chosen over other alternatives?

The scope of this project was developed to meet operational needs, FERC/NERC standards, town codes, and NYS DEC stormwater management requirements.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This project is underway and needs to continue until completion.

What are the risks and consequences of not completing this project?

Not fulfilling permit requirements and jeopardizing use of the Primary Control Center.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

1162

Yes



	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates sl le adjustments for		de				
	\$12,074,772	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years			
	Labor (Weekly Payroll)	4,859	4,859									
	Labor (Monthly Payroll)	31,332	6,332	25,000								
A	Stock Materials	11,339	11,339									
D	Non-Stock Material (A/P taxable)	77,589	77,589									
I	Contractors (A/P tax exempt)	10,063,521	9,063,521	1,000,000								
Т	Overheads	24,804	9,304	15,500								
I	AFUDC*	1,045,958	803,922	242,036								
ON	Journal Vouchers (JVs)	815,370	815,370									
s	CIAC Payments CREDIT	0										
	Joint Utility Payments CREDIT	0										
	TOTAL ADDITIONS:	12,074,772	10,792,236	1,282,536	0	0	0	0	0			
R	Labor (Weekly Payroll)	0										
E	Labor (Monthly Payroll)	0										
T	Contractors (A/P tax exempt)	0										
R	Overheads	0										
E	Journal Vouchers (JVs)	0										
M	Salvage CREDIT	0										
E	CIAC Payments CREDIT	0										
T	Joint Utility Payments CREDIT	0										
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0			
	* AFUDC may require adjustment after Finance Depart											
	Expense \$ (if applicable):	0										
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0								

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Bid

**Cost Estimate Range:** 

Cost Estimate Confidence: (that final cost will be within +/-5% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 11,471,033 Maximum (\$): 12,678,511

No explanation on confidence level required.

Formulas give standard ranges per
estimate level, but may be
overwritten if desired.

Basis for estimate: Contractor/Vendor Bids For Entire Project

For your definitive/bid estimate, provide link(s) to applicable cost estimating files.

N/A

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 2 Design

#### A. GENERAL

**Project/Program Name: Training Academy- Academy** 

Work Order #:

- -

**Budget Group:** Common: Non-I.T./O.T.

**Budget Category:** 41

Funding Project Number:

4-4112-04-19

Is this a Specific Project, Program or Blanket?

Specific

Target Schedule - Start: 1/1/2027

In-Service: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

WO 6227-H: Training Academy - Site Development

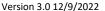
#### Describe the project objective and scope of work:

Constructing the Training Academy that will provide classroom and meeting spaces for employee training, development and meetings, as well as community partners and first responders. The Training Academy would also function as a alternate call center to the Poughkeepise space.

#### Describe specific scope exclusions, assumptions and constraints:

The design of this project will need to be updated to ensure compliance with current building codes and will meet the needs of each department. The budget estimate is based on the current design and a construction schedule of 2027-2028.







#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Growth Sustaining** Load Based/Infrastructure:

**Daily Operations Discretion Level:** System Enhancements **Investment Type:** Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44):

Is there an Innovation Component? No

Needs Assessment: Quality

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Training Academy is needed to provide a modern facility for employees and local first responders to learn and maintain necessary skills to provide safe and efficient service to customers.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Providing a facility dedicated to training will allow for a more condusive atmosphere for efficient training sessions.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Organizational Development

Which Strategic Objective does project most align with? Enhance workforce depth and capabilities

Which Strategic Initiative does project most align with? Workforce Development

Which Team Goal does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

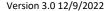
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Yes

> **Social Component:** Yes **Governance Component:** Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

#### Why was the proposed project scope chosen over other alternatives?

This current project scope was developed with operating group's subject matter experts to identify what is necessary to improve training and development of employees.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

The number of new employees entering Central Hudson is very high so having a facility to complete training is essential.

#### What are the risks and consequences of not completing this project?

Training of emplyees will continue the way it is currently completed. In addition, site plan approval from the Town of Ulster may expire if the project is delayed.

Yes

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



	Capital Estimate Summary	Year 1 = 1s 5-year bu				ar cost estimates si ple adjustments for			
	\$31,185,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	310,000					100,000	120,000	90,000
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	30,875,000					8,284,000	16,470,000	6,121,000
Т	Overheads	0							
1	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	31,185,000	0	0	0	0	8,384,000	16,590,000	6,211,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart				-				
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

Prior years funding; not actuals.

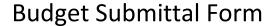
2021-2023

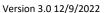
2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges per
Cost Estimate Kange. winimum (φ).	<ul> <li>estimate level, but may be overwritten if desired.</li> </ul>
Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The timing of construction and the impact that will have on the market pricing of material and labor could impact project cost.	,
Basis for estimate: Vendor Generated Cost Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You applicable cost estimating files as appropriate.  See attached work paper.	may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form.	ld it here (optional):







Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 2 Design

#### A. GENERAL

**Project/Program Name: Training Academy- Annex** 

Work Order #:

- -

Budget Group: Co

Common: Non-I.T./O.T.

**Budget Category:** 41

Funding Project Number:

4-4112-04-19

Is this a Specific Project, Program or Blanket?

Specific

Target Schedule - Start: 7/1/2024

In-Service: 6/1/2026

o. 6/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

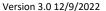
WO 6227-H: Training Academy - Site Development

#### Describe the project objective and scope of work:

Construct an environmentally controlled (indoor) space for the hands on training and development of employees in various departments as outlined by the Workforce, Compensation and Benefits Panel Testimoney of the 2021 rate case filing.

#### Describe specific scope exclusions, assumptions and constraints:

The design of this project will need to be updated to ensure compliance with current building codes and will meet the needs of each department. The budget estimate is based on the current design and a construction schedule of 2025-2026.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Quality

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Annex is needed to provide a modern facility for employees to learn and maintain necessary skills to provide safe and efficent service to customers in an environmentally controlled space.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Construction of the Annex will allow scheduled trainings to be completed regardless of weather conditions.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Organizational Development

Which <u>Strategic Objective</u> does project most align with? Enhance workforce depth and capabilities

Which <u>Strategic Initiative</u> does project most align with? Workforce Development

Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44,

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

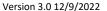
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

**Governance Component:** Yes

Is complete **Sustainability** status achieved by this project?\* Yes

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? N/A

#### Why was the proposed project scope chosen over other alternatives?

This current project scope was developed with operating group's SME's to identify what is necessary to improve training and development of employees.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

The number of new employees entering Central Hudson is very high so having a facility to complete training is essential.

What are the risks and consequences of not completing this project?

The training of emplyees will continue the way it is currently completed. In addition, site plan approval from the Town of Ulster may expire if the project is delayed.

Yes

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the udget plan			r cost estimates sh le adjustments for l					
	\$20,177,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years		
	Labor (Weekly Payroll)	0									
	Labor (Monthly Payroll)	427,000		79,000	88,000	260,000					
A	Stock Materials	0									
D	Non-Stock Material (A/P taxable)	0									
Ī	Contractors (A/P tax exempt)	19,750,000		500,000	9,000,000	10,250,000					
Т	Overheads	0									
I	AFUDC*	0									
O N	Journal Vouchers (JVs)	0									
S	CIAC Payments CREDIT	0									
	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	20,177,000	0	579,000	9,088,000	10,510,000	0	0	0		
R	Labor (Weekly Payroll)	0									
E	Labor (Monthly Payroll)	0									
l¦	Contractors (A/P tax exempt)	0									
R	Overheads	0									
E	Journal Vouchers (JVs)	0									
M	Salvage CREDIT	0									
E	CIAC Payments CREDIT	0									
T	Joint Utility Payments CREDIT	0									
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0		
	* AFUDC may require adjustment after Finance Depart										
	Expense \$ (if applicable):	0									
	urrent Approved Rate Case Funding (\$):	0	0	0							

Prior years funding; not actuals.

2021-2023

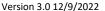
2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary  Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The timing of construction and the impact that will have on the market pricing of material and labor could impact project	per estimate level, but may be overwritten if desired.
Basis for estimate: Vendor Generated Cost Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derive applicable cost estimating files as appropriate.  Work paper attached.	ed. You may add link(s) to
F. ADDITONAL INFORMATION	





10080



June 6, 2023 Submission Date: First Year of 5-Year Budget Period: 2024

R.J. Scandariato Current Life-Cycle Phase: 1 Planning **Submitted By:** 

#### A. GENERAL

**Budget Group:** 

Project/Program Name: Newburgh- New Facility

Work Order #: Common: Non-I.T./O.T. **Budget Category:** 41 **Funding Project Number:** 

Target Schedule - Start: 1/1/2020 Is this a Specific Project, Program or Blanket? **Specific** In-Service: 12/31/2030

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

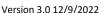
#### Describe the project objective and scope of work:

Construct a new facility specifically suited to meet the operational needs of a district headquarters. This new facility will be sited on a larger parcel of property located in an area that will allow for safer access for both employees and customers.

#### Describe specific scope exclusions, assumptions and constraints:

Alternate parcel evaluations are ongoing. How to divest the current Newburgh facility is not included in this project.





N/A



#### **B. JUSTIFICATION**

Load Based/Infrastructure:InfrastructureGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

An assessment of the current facility was completed by Liscum, McCormack VanVoorhis Achitects and relocating the Newburgh District Facility was the recommendation after the analysis.

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

New facility would provide necessary space for both interior and outdoors, reduce the risk of flood damage if the dam for Washington Lake were to fail, and reduce safety concerns of the existing site.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with?

Which <u>Strategic Initiative</u> does project most align with?

Which <u>Team Goal</u> does project most align with?

Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

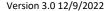
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: Maybe - Requires further scope development

Is complete <u>Sustainability</u> status achieved by this project?\* Maybe - Requires further scope development

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Rehabilitating the current facility.

#### Why was the proposed project scope chosen over other alternatives?

The report demonstrated multiple deficiencies of the current location and one of the major issues is being immediately downstream of the Washington Lake dam if it were to fail.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

This project has been deferred to later in the 5 year plan but is a necessary project to maintain quality long-term service in the Newburgh area.

#### What are the risks and consequences of not completing this project?

Increasing O&M costs, accidents on property due to space limitations, major damage to the facility, vehicles, material, and people if catastrophic failure of dam were to occur.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates sh le adjustments for l			
	\$27,424,607	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	3,429	3,429						
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	27,395,486	185,486				524,000	1,936,000	24,750,000
Т	Overheads	2,145	2,145						
I	AFUDC*	23,659	23,659						
O N	Journal Vouchers (JVs)	(112)	(112)						
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	27,424,607	214,607	0	0	0	524,000	1,936,000	24,750,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart				-	-			
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Low Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:  Formulas give standard ranges per
Cost Estimate Range: Minimum (\$): Maximum (\$):
Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The scope is not defined, the location to build a new facility is not secured and the plan is so far into the future the market could be impacted greatly.
Basis for estimate: Vendor Generated Cost Estimate
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.  A construction estimate was provided in the property assessment completed by LMV architects.
F. ADDITONAL INFORMATION
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

R.J. Scandariato **Current Life-Cycle Phase: 1 Planning Submitted By:** 

#### A. GENERAL

**Project/Program Name: EC Transportation Building** 

Work Order #:

**Budget Group:** 

Common: Non-I.T./O.T.

**Budget Category:** 41 **Funding Project Number:** 

4-4111-00-18

Is this a Specific Project, Program or Blanket? Specific

Target Schedule - Start: 1/1/2025

In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Convert the current transportation shop to garage storage for larger vehicles used by Operations Services.

Build a new transportation shop at the EC facility that is more appropriately sized for the work that is done there and provides a better layout for the employees to work safer and more efficiently.

#### Describe specific scope exclusions, assumptions and constraints:

Programming for specific project needs has not yet been completed but a schematic narrative by an architect is complete.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The current Transportation shop at the Eltings Corners facility was previously used as the main Transportation facility. Since the department relocated to Kingston, this garage has been used only for the fleet in EC and was under utilized in that capacity.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Lower O&M cost for the older building and increase the life of large and expensive equipment like cranes by storing indoors

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

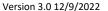
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: No

**Governance Component:** Maybe - Requires further scope development

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None.

#### Why was the proposed project scope chosen over other alternatives?

Get the right size transportation shop for the current work volume at EC while still utilizing the existing structure to allow indoor storage of large and expensive equipment.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Improvement of the means to house equipment.

What are the risks and consequences of not completing this project? Higher O&M costs to large equipment and under utilization of the existing garage.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			cost estimates sh e adjustments for i		le			
	\$4,709,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years		
	Labor (Weekly Payroll)	0									
	Labor (Monthly Payroll)	0									
A	Stock Materials	0									
D	Non-Stock Material (A/P taxable)	0									
ī	Contractors (A/P tax exempt)	4,709,000			505,000	4,204,000					
Т	Overheads	0									
I	AFUDC*	0									
O	Journal Vouchers (JVs)	0									
S	CIAC Payments CREDIT	0									
	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	4,709,000	0	0	505,000	4,204,000	0	0	0		
R	Labor (Weekly Payroll)	0									
E	Labor (Monthly Payroll)	0						(			
l i	Contractors (A/P tax exempt)	0									
I R	Contractors (A/P tax exempt) Overheads	_									
I R E	`	0									
E M	Overheads	0									
	Overheads Journal Vouchers (JVs)	0 0									
E M	Overheads Journal Vouchers (JVs) Salvage CREDIT	0 0 0									
E M E N T	Overheads Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT	0 0 0 0	0								
E M E N T	Overheads Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT Joint Utility Payments CREDIT TOTAL REMOVALS: * AFUDC may require adjustment after Finance Depart	0 0 0 0 0 0	0						0		
E M E N T	Overheads Journal Vouchers (JVs) Salvage CREDIT CIAC Payments CREDIT Joint Utility Payments CREDIT TOTAL REMOVALS:	0 0 0 0 0 0	0						0		

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

**Cost Estimate Range:** Minimum (\$): 3,296,300 Maximum (\$): 6,121,700

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

An architect provided a schematic narrative and a construction manager provided a corresponding construction estimate.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Fishkill Butler Building

Work Order #:

- -

Budget Group: Common

Common: Non-I.T./O.T.

Budget Category: 41

Funding Project Number:

4-4111-00-18

Is this a Specific Project, Program or Blanket?

Specific

Target Schedule - Start: 1/1/2025

In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

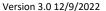
#### Describe the project objective and scope of work:

Rebuild this building that better meets the needs of the organization and operating groups. Design the Transportation Shop to provide the necessary space for vehicles, parts, tools, and equipment.

- -Add a restroom so the employees in this building has more convenient access to it and provides more flexibility to keep crews separated (but on site) in the event of another pandemic
- -Improve ventilation and pipe storage for the gas welding shop.
- -Increase the depth of the garage space to allow for a dump truck and trailer with an excavator to fit. Also consider overhead doors on opposite ends to allow drive in, drive out for the bay where a truck/trailer combination will park.

#### Describe specific scope exclusions, assumptions and constraints:

Programming for specific project needs has not yet been completed but a schematic narrative by an architect is complete.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The Bulter Building is an older steel building that is experiencing corrosion and damage from birds penetrating the exterior. The building is multi-function and is home to the gas welding shop, the transportation shop, vehicle storage, and material/equipment storage.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Lower O&M cost for the older building.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Yes

Governance Component: Maybe - Requires further scope development

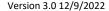
Is complete <u>Sustainability</u> status achieved by this project?\* Maybe - Requires further scope development governance.

1186

\* Sustainability status is achieved for the project if the ESG checklist

shows that there is at least one

component each for environmental, social and





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Repair specific parts of the building as failures occur.

#### Why was the proposed project scope chosen over other alternatives?

Rebuilding allows for reconfiguration of the building and layout to meet the needs of the operating group and completes the project as a whole instead of piece by piece.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To allow the employees in the operating area a safe and functional facility to complete their jobs.

What are the risks and consequences of not completing this project?

Higher O&M costs and larger trucks not fitting in the mechanic's shop for service.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 



	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the udget plan			r cost estimates sl e adjustments for			
	\$4,709,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	4,709,000			505,000	4,204,000			
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,709,000	0	0	505,000	4,204,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
11	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart	<u> </u>							
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 3,296,300 Maximum (\$): 6,121,700

No explanation on confidence level required.

Formulas give standard ranges

per estimate level, but may be
overwritten if desired.

Basis for estimate: Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

An architect provided a schematic narrative and a construction manager provided a corresponding construction estimate.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Tannersville- New Facility

Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4111-00-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/31/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories: 6649-H (4-4111-00-18) Land purchase for new facility. Projected in-service 2023.

#### Describe the project objective and scope of work:

The current Tannersville Office is 1 rented bay at the Tannersville Fire House and a small office area. Construct a new facility owned by Central Hudson that meets the operating needs for that area.

#### Describe specific scope exclusions, assumptions and constraints:

New facility to include indoor material storage, vehicle parking, and an office.







#### **B. JUSTIFICATION**

Infrastructure **Growth/Sustaining/Retirement: Growth Sustaining** Load Based/Infrastructure: System Enhancements **Daily Operations** Discretion Level: **Investment Type:** 

Is there an Innovation Component? No Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The current situation only allows for 1 bucket truck to be parked inside. In addition, the current standard truck is too large for this garage bay. In addition to the limitations of the fire house for the Central Hudson Operation, the fire department has indicated to local supervision they are not interested in extending the lease past the current term. The current lease terms allow Central Hudson to be in the fire house through 2025.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved efficiency (not digging through snow to get to trucks and material), safety, potential for allowing sleeping bunk for those who may need to stay over in a snow event.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve productivity and efficiency

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which Team Goal does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: Yes Environmental Component:** Maybe - Requires further scope development

> **Social Component:** Yes

**Governance Component:** Maybe - Requires further scope development

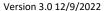
component each for environmental, social and

\* Sustainability status is achieved

for the project if the ESG checklist

shows that there is at least one

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Existing facilities that would meet the operational needs in that area are being explored as well.

Why was the proposed project scope chosen over other alternatives?

Construction of a new facility would ensure the needs of the operational team are met.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? To align with the termination of the lease.

What are the risks and consequences of not completing this project? Not having a location for the Tannersville Crew to work out of.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		,	cost estimates sl adjustments for			
	\$4,186,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	4,186,000		1,157,000	3,029,000				
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,186,000	0	1,157,000	3,029,000	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
li.	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2024

1193

2021-2023

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>
Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The property has not been purchased yet and there are concerns about the challenges the site would have for constru	-
Basis for estimate: Vendor Generated Cost Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derive applicable cost estimating files as appropriate.  An architect provided a schematic narrative and a construction manager provided a corresponding construction estimates and a construction manager provided a corresponding construction estimates.	, ,,
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you	may add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Building 805/806 Rebuild

Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4111-00-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2027 In-Service: 12/31/2030

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

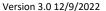
#### Describe the project objective and scope of work:

The existing building 805 & 806 houses the Poughkeepsie District Line, Gas, and storeroom functions. This building is showing signs of significant wear in areas of doors, concrete floors, exterior metal panels, and mechanical equipment. Rebuilding and/or relocating this function off site should be considered.

#### Describe specific scope exclusions, assumptions and constraints:

Programming for specific project needs has not yet been completed.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

\* Sustainability status is achieved

for the project if the ESG checklist

shows that there is at least one

component each for

environmental, social and

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The building has signs of wear in multiple areas and will need significant capital investment over the upcoming years. In addition, interior and exterior space including parking is constrained on campus so evaluating a more appropriate solution for all aspects is needed.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Lower O&M cost for the older building and potential of less congestion at the main campus.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Miscellaneous (wetlands; highway; SWPPP)

#### ESG (Environmental, Social and Governance) and Sustainability:

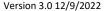
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: Maybe - Requires further scope development

**Governance Component:** Maybe - Requires further scope development

Is complete Sustainability status achieved by this project?\* Maybe - Requires further scope development governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Repairing/replacing parts of the existing building as needed.

#### Why was the proposed project scope chosen over other alternatives?

New construction allows for reconfiguration of the building and layout to meet the needs of the operating group and completes the project as a whole instead of piece by piece. Relocation could reduce capacity constraints too.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To allow the employees in the operating area a safe and functional facility to complete their jobs.

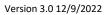
What are the risks and consequences of not completing this project?

Higher O&M costs and space constraints.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

What other factor were considered during the prioritization process? N/A

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,	All future year cost estimates should include applicable adjustments for inflation.					
	\$21,548,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	21,048,000					1,048,000		20,000,000
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	21,048,000	0	0	0	0	1,048,000	0	20,000,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
li.	Contractors (A/P tax exempt)	500,000							500,000
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	500,000	0	0	0	0	0	0	500,000
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Full scope has not yet been developed. Market impact on cost and schedule is unknown multiple years into the future.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived applicable cost estimating files as appropriate.  Estimate based on recently completed projects.	l. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere in this form, you remark the second elsewhere elsewh	nay add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Ellenville Office Renovation Work C

Work Order #:

Budget Group: Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4111-00-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2025 In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The office area in the Ellenville facility is dated, showing signs of wear and does not fit the employees working in the area. Renovate and reconfigure the foreman, crew, and storekeeper office area to meet the current needs and upgrade the building systems.

#### Describe specific scope exclusions, assumptions and constraints:

Programming for specific project needs has not yet been completed.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

Needs Assessment: Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The office areas require updating to meet the needs of the employees. Upgrading the mechanical systems to more efficient and reliable models can reduce the likelihood of breakdowns and limit long trips to Ellenville for repairs.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Lower O&M cost for the older equipment.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization Which <u>Team Goal</u> does project most align with? Employee Engagement LEQ & PEQ

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

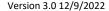
Checklist Fully Completed: Yes Environmental Component: Yes

Social Component: No

Governance Component: Maybe - Requires further scope development

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Repairing/replacing parts of the existing building as needed.

Why was the proposed project scope chosen over other alternatives?

Implementation of the full scope at once rather than in stages that would impact the operations for a longer overall time.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To allow the employees in the operating area a safe and functional facility to complete their jobs.

What are the risks and consequences of not completing this project? Higher O&M costs.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary		t year of the udget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$1,232,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ı	Contractors (A/P tax exempt)	1,232,000			76,000	1,156,000			
Т	Overheads	0							
I	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,232,000	0	0	76,000	1,156,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
11	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0						-	
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	Surrent Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



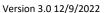
Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Full scope has not yet been developed and market impact on cost and schedule is unknown multiple years into the future	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived applicable cost estimating files as appropriate.  Estimate based on recently completed projects.	I. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you need the second of the secon	nay add it here (optional):



0 4 9 1 - K

Work Order #:





Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 2 Design

#### A. GENERAL

**Budget Group:** 

Project/Program Name: Kingston Retaining Wall Replacement (Rear)

Common: Non-I.T./O.T. Budget Category: 41 Funding Project Number: 4-4111-00-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 12/31/2022 In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The retaining wall along Katrine Ln in the rear of the Kingston office has been evaluated by an engineer and is showing signs of deterioration and has been recommended for replacement.

Describe specific scope exclusions, assumptions and constraints:

Engineering is underway.





#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Not Applicable

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44)

Is there an Innovation Component? No

**Needs Assessment:** Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The retaining wall along Katrine Ln in the rear of the Kingston office has been evaluated by an engineer and is showing signs of deterioration and has been recommended for replacement.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement prior to failure would avoid emergent costs and would eliminate potential injury or equipment damge resulting from a failure.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC THEME

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture

Which <u>Strategic Initiative</u> does project most align with? Transform Safety Culture

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44)

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimate Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipality (1)

#### ESG (Environmental, Social and Governance) and Sustainability:

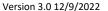
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: Yes

Is complete **Sustainability** status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None.

Why was the proposed project scope chosen over other alternatives?

The wall is showing signs that it is beyond repair.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? So the wall is replaced before it fails.

What are the risks and consequences of not completing this project?

Employee or public injury, damage to equipment and loss of physical security to the Central Hudson side in that area.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,		•	r cost estimates sl e adjustments for			
	\$1,430,452	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	15,000	5,000	10,000					
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	1,271,728	21,728	1,250,000					
Т	Overheads	28,210	3,210	25,000					
ı	AFUDC*	15,514	514	15,000					
O	Journal Vouchers (JVs)	0							
S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,330,452	30,452	1,300,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	100,000		100,000					
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	100,000	0	100,000	0	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
C	urrent Approved Rate Case Funding (\$):	0	0	0					

2024

2021-2023

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary  Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):	<ul> <li>per estimate level, but may be overwritten if desired.</li> </ul>
Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  The cost estimate was provided by the design engineer so there may be construction considerations that he did not accommodate the risks that could significantly impact cost:	•
Basis for estimate: Vendor Generated Cost Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived applicable cost estimating files as appropriate.  The design engineer provided a construction cost estimate.	i. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you r	nay add it here (optional):



Version 3.0 12/9/2022

Submission Date: June 6, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: R.J. Scandariato Current Life-Cycle Phase: 2 Design

#### A. GENERAL

Project/Program Name: Kingston Retaining Wall Replacement (Front)

Work Order #: 4-4111-00-18

Budget Group: Common: Non-I.T./O.T. Budget Category: 41

Funding Project Number: 4
Target Schedule - Start: 12/31/2022 In-Service

In-Service: 12/31/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Specific

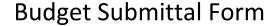
#### Describe the project objective and scope of work:

Is this a Specific Project, Program or Blanket?

The retaining wall along Katrine Ln in the front of the Kingston Office has been evaluated by an engineer and is showing signs of deterioration and has been recommended for replacement.

#### Describe specific scope exclusions, assumptions and constraints:

Engineering has not yet begun so full scope is undefined.







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Not Applicable

Discretion Level: Non-Discretionary Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Is there an Innovation Component? No

Needs Assessment: Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The retaining wall along Katrine Ln in the front of the Kingston Office has been evaluated by an engineer and is showing signs of deterioration and has been recommended for replacement.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Replacement prior to failure would avoid emergent costs and would eliminate the potential injury or equipment damge resulting from a failure.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which Strategic Theme does project most align with?

DOES NOT ALIGN WITH ANY STRATEGIC THEME

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture

Which <u>Strategic Initiative</u> does project most align with? Transform Safety Culture

Which Team Goal does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44):

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates?\* Yes

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipalities (>1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: Yes Environmental Component: No

Social Component: No Governance Component: Yes

Is complete Sustainability status achieved by this project?\* No

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? None.

Why was the proposed project scope chosen over other alternatives?

The wall is showing signs that it is beyond repair.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? So the wall is replaced before it fails.

What are the risks and consequences of not completing this project?

Employee or public injury, damage to equipment, and loss of physical security to the Central Hudson site in that area.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

What other factor were considered during the prioritization process?  $\ensuremath{\text{N/A}}$ 

Yes





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1si 5-year bu		All future year cost estimates should include applicable adjustments for inflation.					
	\$2,143,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
A	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
ī	Contractors (A/P tax exempt)	2,043,000			2,043,000				
Т	Overheads	0							
	AFUDC*	0							
O	Journal Vouchers (JVs)	0							
s	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,043,000	0	0	2,043,000	0	0	0	0
R	` , ,	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	100,000			100,000				
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
Т.	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	100,000	0	0	100,000	0	0	0	0
	* AFUDC may require adjustment after Finance Depart								
	Expense \$ (if applicable):	0							
	<b>Current Approved Rate Case Funding (\$):</b>	0	0	0					

Prior years funding; not actuals.

2021-2023

2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges per
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:	estimate level, but may be overwritten if desired.
The design has not yet been completed so the full scope of work is unknown.	
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You applicable cost estimating files as appropriate.  The estimate for the rear wall was increased due to the larger size of the front wall.	ı may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you may additional information that you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form, you would like to add that is not covered elsewhere in this form.	dd it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: 3 Year Term License Renewal - Feb 2025 - (ArcGIS Portal)

Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number: 4-4220-35-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 2/1/2025 In-Service: 2/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

ArcGIS 3 year License Renewal

Describe specific scope exclusions, assumptions and constraints:

ArcGIS 3 year License Renewal



Version 3.0 12/9/2022

N/A

#### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Implementation Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

ArcGIS 3 year License Renewal

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Complaint Rate

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

**CLICK HERE** 

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

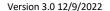
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do not renew licenses and be out of compliance.

Why was the proposed project scope chosen over other alternatives?

To stay in complaince with our licensing agreement and keep using ArcGIS.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Without License renewal, we will not be able to use ArcGIS.

What are the risks and consequences of not completing this project? Without License renewal, we will not be able to use ArcGIS.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $N\!/\!A$ 

What other factor were considered during the prioritization process? Need to continue to use ArcGIS.

Yes



### E. COST ESTIMATE

	Capital Estimate Summary  Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.						
	\$1,132,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
Α	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	1,132,000			538,000			594,000		
D	Contractors (A/P tax exempt)	0								
т	Overheads	0								
1	AFUDC*	0								
0	Journal Vouchers (JVs)	0								
N	CIAC Payments CREDIT	0								
٦	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,132,000	0	0	538,000	0	0	594,000	0	
	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	0								
R	Overheads	0								
	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

792,400

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

Cost Estimate Range: Minimum (\$): \_\_\_

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

1.471.600

**Previous Licensing costs** 

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Work Order #:

Version 3.0 12/9/2022

10185

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

**Project/Program Name: Application Upgrades** 

Common: I.T./O.T. Budget Category: 4220 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2023 In-Service: 12/1/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The Technology organization must also ensure the continued operations of 350 business software platforms over the next 5-years, requiring a capital investment of \$2.8M. These upgrade and enhancement projects, are required to ensure the software solutions continue to receive vendor support, cybersecurity-related updates, and are optimized (enhanced) in alignment with evolving business needs. The portfolio of software applications supports all business functions within the organization, including Human Resources, Engineering & Operations, Finance, Accounting, Customer Service, Regulatory, and New Business. The upgrade and enhancement initiatives align to all five technology strategic drivers.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: We get approval in the 2023 Rate Case.



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

A FORTIS COMPANY

**Growth/Sustaining/Retirement: Growth Sustaining** Load Based/Infrastructure: Infrastructure

Discretion Level: System Enhancements **Investment Type:** Growth

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Infrastructure Needs Assessment:

Checklist Fully Completed: No

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

the Technology organization must also ensure the continued operations of 350 business software platforms over the next 5-years, requiring a capital investment of \$\$\$. These upgrade and enhancement projects, are required to ensure the software solutions continue to receive vendor support, cybersecurity-related updates, and are optimized (enhanced) in alignment with evolving business needs. The portfolio of software applications supports all business functions within the organization, including Human Resources, Engineering & Operations, Finance, Accounting, Customer Service, Regulatory, and New Business. The upgrade and enhancement initiatives align to all five technology strategic drivers.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) We anticipate that future Application Upgrades would have cost savings/avoidance, Customer Experience and Risk Reduction benefits.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

**CLICK HERE** 

Which Strategic Theme does project most align with? **Business Modernization** 

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency Which <u>Strategic Initiative</u> does project most align with? **Business & Operations Modernization** 

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Environmental Component:** Checklist is incomplete **Social Component:** Checklist is incomplete **Governance Component:** Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do nothing.

Why was the proposed project scope chosen over other alternatives? We would increase technical debt and risk by not upgrading technology.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

These requests are for future Application upgrades based on historic data.

What are the risks and consequences of not completing this project?

We would increase technical debt and risk by not upgrading techolog y

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability



### E. COST ESTIMATE

	Capital Estimate Summary		1 = 1st year of theAll future year cost estimates should includeyear budget planapplicable adjustments for inflation.							
	\$2,784,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	1,256,000		200,000	236,000	256,000	270,000	294,000		
Α	Stock Materials	1,528,000		328,000	300,000	300,000	300,000	300,000		
D	Non-Stock Material (A/P taxable)	0								
D	Contractors (A/P tax exempt)	0								
Т.	Overheads	0								
I	AFUDC*	0								
0	Journal Vouchers (JVs)	0								
N	CIAC Payments CREDIT	0								
3	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	2,784,000	0	528,000	536,000	556,000	570,000	594,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	0								
R	Overheads	0								
Ε	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E N T	CIAC Payments CREDIT	0								
	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: cost estimate were based off of historical spend to upgrade applications with some adjustments from learnings	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate. cost estimate were based off of historical spend to upgrade applications with some adjustments from learnings.	
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you n	nay add it here (optional):



Work Order #:

Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

**Project/Program Name: Asset Management** 

Common: I.T./O.T. Budget Category: 4222

udget Category: 4222 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2023 In-Service: 12/1/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

This yearly endeavor replaces older devices, assets no longer supported from a Windows or Cyber perspective, and includes headcount growth and increased demand for computer functionality from field forces. Due to field device model changes, new mounts and power supplies are required to utilize these new Dell semi rugged units. Peripherals, copiers, monitors and other items for daily business are also included.

### Describe specific scope exclusions, assumptions and constraints:

Possibility of signing contracts with new suppliers for better pricing.



Version 3.0 12/9/2022

### **B. JUSTIFICATION**

Load Based/Infrastructure: Other Growth/Sustaining/Retirement: Not Applicable

Discretion Level: Maintain System Standards Investment Type: Growth

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Implementation Is there an Innovation Component? No

Needs Assessment: Productivity; Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Yearly planned purchase and rollout of IT assets to improve performance, meet operational objectives, to ensure vendor support and minimize cyber security risk of older HW/SW.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Cyber Security: Security function and policy initiatives

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete

Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Unsupported and potential security vulnerabilities in end-of-life devices on corporate network

Why was the proposed project scope chosen over other alternatives?

Unsupported and potential security vulnerabilities in end-of-life devices on corporate network

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

We have an obligation to provide tools for users to perform their jobs whether onsite, at home or in the field. We are becoming more reliant on electronic processes versus legacy paper, etc.

What are the risks and consequences of not completing this project?

By not updating our HW, which comes with SW, we risk security gaps, lack of vendor support and poor cyber scores from a Fortis corporate perspective.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?

Business prioritization and resource availability



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the udget plan			r cost estimates sh le adjustments for i			
	\$5,442,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
Α	Stock Materials	5,442,000		1,081,000	1,063,000	1,073,000	1,100,000	1,125,000	
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	0							
т.	Overheads	0							
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,442,000	0	1,081,000	1,063,000	1,073,000	1,100,000	1,125,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
T	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: estimates were estimates based off of historic pricing with some adjustments	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derivable cost estimating files as appropriate. estimates were estimates based off of historic pricing with some adjustments	ved. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you	u may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Aviat Router Replacement Program Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 44 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Replace Aviat routers with Cisco routers. This project consists of design, installation, configuration, and troubleshooting components.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: Materials are readily available

Assumption: Internal resources are available for implementation

Assumption: Material costs remain steady



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N/A

### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The manufacturer of network routers announced an end of sale of November 2022 with an end of life for November 2027.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

None.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

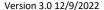
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

The manufacturer of network routers announced an end of sale of November 2022 with an end of life for November 2027. A new manufacturer of network routers and models has been determined.

#### Why was the proposed project scope chosen over other alternatives?

The manufacturer of network routers announced an end of sale of November 2022 with an end of life for November 2027. A new manufacturer of network routers and models has been determined. Cisco routers provide an array of flexible options, strong customer support, training with multiple proven use concepts.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

CHGE understands certain communication circuits and predominately older copper based technology owned and maintained by AT&T and Verizon, may be retired in the coming years. CHGE must be pro active avoiding risk of communication loss to remote sites. Network routers are part of the CHGE's solution to construction, maintain, and operate its own communication network.

### What are the risks and consequences of not completing this project?

Not completing this project prolongs CHGE dependance on third party carriers with the associated costs, physical and cyber security oversite, and service levels issues.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process? Resource availability



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			r cost estimates st le adjustments for			
	\$9,706,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	1,848,000		345,000	300,000	400,000	479,000	324,000	
Α	Stock Materials	7,858,000		1,600,000	66,000	192,000	3,000,000	3,000,000	
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	0							
т Т	Overheads	0							
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	9,706,000	0	1,945,000	366,000	592,000	3,479,000	3,324,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate):	Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly implication historic pricing	← per estimate level, but may be
Basis for estimate: FOS-Generated Estimate; Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost es applicable cost estimating files as appropriate. historic pricing adjusted	timate was derived. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere	in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Microwave and Fiber Backhaul Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 44 Funding Project Number: 4-4412-00-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

CHGE's intent is to provide a fiber backhaul network connecting all electric substations, gas gate stations, NS Junction Boxes, and office locations. Redundant paths are preferred to reduce outages although terrain may prevent this. Bakchaul options are analyzed for the most cost-effective solution. CHGE constructed 440 miles of OPGW, distribution fiber, or IRUs with an additional 231 future miles. CHGE must upgrade six microwave radio backhaul links. The FCC opened the 5.925 to 7.125 GHz range for unlicensed use, and links should avoid this.

### Describe specific scope exclusions, assumptions and constraints:

Constraint: Terrain in some areas may not allow for redundant paths within the network.

Assumption: Timely receipt of materials with no delays / materials are readily

available

Assumption: Feasible approach to substation control houses

Assumption: No delays for permitting

Assumption: No delays for make ready work

Assumption: NRC and MRC based on historical pricing from various vendors



Version 3.0 12/9/2022

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure: Other Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

CHGE's intent is to provide a fiber backhaul network connecting substations, gate stations, NS Junction Boxes, and offices.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Build more resilent network to OT field assets and to reduce outages.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates No

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

N/A - This project is a multi-phased project, which was approved in a previous year.

Why was the proposed project scope chosen over other alternatives?

N/A - This project is a multi-phased project, which was approved in a previous year.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

CHGE understands certain communication circuits predominately older copper based technology maintained by third parties may be retired. CHGE must be pro active avoiding risk of communication loss to remote sites.

What are the risks and consequences of not completing this project?

The risk is loss of communication to substations, gate stations, data centers.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Keeping network up to date to provide reliable service to our customers.

What other factor were considered during the prioritization process? Resource availability.

No



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	,						
	\$4,981,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	550,000		200,000	150,000	200,000			
Α	Stock Materials	321,000		156,000	7,000	158,000			
D	Non-Stock Material (A/P taxable)	3,000,000		1,500,000		1,500,000			
D	Contractors (A/P tax exempt)	900,000		500,000		400,000			
'	Overheads	105,000		50,000	5,000	50,000			
1	AFUDC*	105,000		50,000	5,000	50,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,981,000	0	2,456,000	167,000	2,358,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l:	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 3.486,700 Maximum (\$): 6.475.300 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: FOS-Generated Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

historic costs adjusted

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: ERP Phase 3 Assessment

Work Order #:

· |

10184

**Budget Group:** Common: I.T./O.T.

Is this a Specific Project, Program or Blanket?

**Budget Category:** 4220

Funding Project Number: Target Schedule - Start: 1/1/2026 In-Se

In-Service: 6/30/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Specific

### Describe the project objective and scope of work:

This assessment would include: as-is process mapping, to-be process mapping, fit-gap analysis, general ledger design, data analysis and cleanup, integration evaluation, and planning of the implementation of SAP S/4 Hana as a replacement to our Finance/EAM ERP mainframe solutions and ancillary business process applications which are integrated with our mainframe.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: We receive Rate Case Approval to move forward with this assessment and then the implementation.



Version 3.0 12/9/2022

### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Implementation Is there an Innovation Component? No

Needs Assessment: Infrastructure; Productivity; Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

We would like to do this assessment in order to be able to better estimate the implementation of a new ERP system.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Ensures rate base accuracy by enabling Central Hudson to obtain an accurate scope, cost, and impact for Finance and EWAM modernization project.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?  $\ensuremath{\mathsf{No}}$ 

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do nothing; continue to leverage legacy processes and decentralized software

Why was the proposed project scope chosen over other alternatives?

High risk of unknowns, poor cost estimating, insufficient resourcing, and high risk of inaccuracy in 2027 rate projections for the ERP Phase III project

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

This assessment needs to be completed by 2026 in order for us to be able to make good estimation and documentation around the ERP implementation into our next rate case filing.

What are the risks and consequences of not completing this project?

High risk of unknowns, poor cost estimating, insufficient resourcing, and high risk of inaccuracy in 2027 rate projections for the ERP Phase III project.

Was this project included in a prior 5-year forecast?

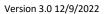
If No, why should this project be completed instead of a planned project?

Yes

Yes

What other factor were considered during the prioritization process?

Business priority and Urgency of ERP Project Kick Off.





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan			ar cost estimates sh ble adjustments for l			
	\$2,574,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0	,						
	Labor (Monthly Payroll)	200,000				200,000			
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	2,200,000				2,200,000			
T	Overheads	0							
1	AFUDC*	174,000				174,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,574,000	0	0	0	2,574,000	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
T	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

2,059,200

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Contractor/Vendor Bids For Certain Work

Minimum (\$):

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

3.088.800

Vendor RFI for Assessment

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: ERP Transformation Work Order #:

**Budget Group:** Common: I.T./O.T. **Budget Category:** 4220 **Funding Project Number:** 10184

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2027 In-Service: 12/1/2029

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

This final phase will migrate remaining functions to SAP solution thus allowing for the Mainframe ERP retirement, and further leveraging our Phase II Investment. This will allow the Company to leverage economies of scale of the SAP system and benefit from the single ERP solution. The inherent integration within the system will greatly transform the current business processes by enabling real-time processing and more in-depth data analytics.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: We receive Rate Case Approval to move forward with this assessment and then the implementation.



Version 3.0 12/9/2022

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Implementation Is there an Innovation Component? No

**Needs Assessment:** Infrastructure; Regulatory; Productivity

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

ERP is the backbone system in our technology landscape and will provide for superior process automation for customer fulfilment and service ERP will provide substantially improved business processes via automation and data analytics that improve supply chain metrics, working capital and resource allocation.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Hard Benefits: 1) Net Present Value (AT) = \$12M; IRR = 21%; TTV = 5.5 years

Soft Benefits: 1) Improved financial Close 2) Increased Client Satisfaction 3) Increased process automation 4) System performance

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

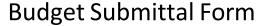
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

- 1. Status Quo do nothing
- 2. Defer project for 12-24 months

Why was the proposed project scope chosen over other alternatives?

- 1. Support for the current system is ending and the cost of the status quo versus the project is substantial
- 2. Will not allow the organization to meets its strategic objectives in the current timelines as agreed with the Board

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To align with Rate Case; will fall after ERP assessment project has completed in 2026.

What are the risks and consequences of not completing this project? Out of compliance with Rate Case.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the All future year cost estimates should include applicable adjustments for inflation.							
	\$49,881,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	4,300,000					1,800,000	2,500,000	
Α	Stock Materials	4,300,000					2,000,000	2,300,000	
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	40,081,000					10,054,000	30,027,000	
<u>'</u>	Overheads	600,000					200,000	400,000	
ı	AFUDC*	600,000					200,000	400,000	
0	Journal Vouchers (JVs)	0							
N	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	49,881,000	0	0	0	0	14,254,000	35,627,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIF	C PROJECT
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the e	stimate): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and max	ximum estimates:  Formulas give standard ranges
stimate Level: Preliminary stimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence stimate confidence is not ideal, so please indicate minimum and maximum estimates: stimate Range: Minimum (\$): Maximum (\$): stimate confidence is not ideal, so please describe the risks that could significantly impact cost: we an assement planned for 2026 to assist with scope, cost and timing estimates  for estimate: Contractor/Vendor Bids For Certain Work  ur conceptual/preliminary estimate provide description or details for how your cost estimate was derive able cost estimating files as appropriate.  smentproject to determine the scope, cost and timeline for the ERP transformation will be completed in 2026	:   per estimate level, but may be overwritten if desired.
Basis for estimate: Contractor/Vendor Bids For Certain Work	
applicable cost estimating files as appropriate.	
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not c	overed elsewhere in this form, you may add it here (optional):



Work Order #:

Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 Submission Date:

Doug Ondreyko Current Life-Cycle Phase: 1 Planning Submitted By:

A. GENERAL

**Budget Group:** 

Project/Program Name: GE OMS Implementation

Common: I.T./O.T.

**Budget Category:** 4230 **Funding Project Number:** 

Target Schedule - Start: 1/1/2025 In-Servi ce: 12/31/2026

Is this a Specific Project, Program or Blanket? Specific

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Advanced Distribution Management System ("ADMS") – An integrated software system to monitor and control field IEDs. Our Outage Management System ("OMS") will be incorporated under one platform to reduce the need to maintain multiple systems. The ADMS will allow for real-time load flow analysis and is used to drive FLISR and VVO for customer benefit.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: Sufficient Corporate funding exists to support the build out of the network in the timeframe needed.



Version 3.0 12/9/2022

N/A

### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Growth

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: New Business

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The software is beyond its vendor supported end of life, migration is mandatory to maintain continuity of regulated business services.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Eliminating the need to update multiple circuit models, as the GIS model can then source our OMS, and DMS, as well as online mapping tools. Streamline the process for work order upgrades and circuit map processing O&M savings.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improved regulatory outcomes Seamless Customer Experience Which <u>Team Goal</u> does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Digital Workplace: Digitization of existing business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.



### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Extending the life of the system, and comparisons of other vendor solutiosn in 2020.

Why was the proposed project scope chosen over other alternatives?

Better O&M Cost Reductions than the alaternatives considered.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

"Grid Modernization supports all four Corporate Strategic Themes:

- 1. Modernizing our business through electric and natural gas system investments and process improvements.
- 2. Continuously improving our performance while maintaining cost effective, efficient, and secure operations.
- 3. Investing in programs and employee development to position the organization for continued success in the future.
- 4. Advocating on behalf of customers and other stakeholders.

Central Hudson's strategy for fulfilling its mission is summed up in four important themes below in Figure 1. As identified in the Corporate Strategic Outlook, Grid Modernization plays an important function amongst these themes"

What are the risks and consequences of not completing this project?

Increased CAIDI and SAIFI due to inaccurate predictive repair response times.

Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?

Yes

What other factor were considered during the prioritization process?

Business Prioritization and Urgency.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates sh e adjustments for i			
	\$4,367,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	525,000			300,000	225,000			
Α	Stock Materials	1,600,000			800,000	800,000			
D	Non-Stock Material (A/P taxable)	2,200,000			1,000,000	1,200,000			
D	Contractors (A/P tax exempt)	0							
<u>'</u>	Overheads	0							
ı	AFUDC*	42,000			42,000				
0	Journal Vouchers (JVs)	0							
N	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,367,000	0	0	2,142,000	2,225,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 3.493.600 Maximum (\$): 5.240.400

No explanation on confidence level required.

Formulas give standard ranges
 per estimate level, but may be overwritten if desired.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

High Level estimated from vendor

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: ADMS Modeling and Enhancements West of River Work Order #:

4 4235 02 18

Budget Group: Common: I.T./O.T. Budget Category: 4230 Funding Project Number: 4-4235-02-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 6/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

As part of the Grid Modernization Program this is the next phase of the ADMS Project that concentrates on the west side of the river. This phase focuses on the testing of ADMS in terms of the remaining models in the organization's service territory, the partial imports from GE along with the associated internal labor of the End-to-End Testing of the IEDs in the field to meet the 2023 and 2024 West of River Grid Modernization milestones, and any enhancements that arise during the regression testing of the models.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: Import models & feeders and be VVO and FLISR ready for West of

River

Assumption: Enhancements to Block 4 Tagging and other features

Assumption: Complete the one line displays for the service territory, Assist and fine tune the modeling process for the CH





N/A



**B. JUSTIFICATION** 

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:New Business

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: New Business

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The end to end testing in this project is critical to ensuring the Grid Mod project is successful.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See BCA tab of Cost Estimate and Benefit Cost Analysis Template document.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve planning and performance management

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

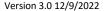
Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

This project is a continuiation of the model import project taking place on the East side of the river.

Why was the proposed project scope chosen over other alternatives?

This project is in line with Central Hudson's Grid Modernization strategy.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to keep on schedule with the Grid Modernization project timeline.

What are the risks and consequences of not completing this project?

It would prevent the Grid Modernization Program from achieving its milestone and operational goal.

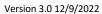
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Part of the grid mod program.

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability.





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.					
	\$1,164,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	300,000		200,000	100,000					
Α	Stock Materials	500,000		500,000						
D	Non-Stock Material (A/P taxable)	300,000		300,000						
D	Contractors (A/P tax exempt)	0								
l <del>'</del>	Overheads	0								
1	AFUDC*	64,000		56,000	8,000					
0	Journal Vouchers (JVs)	0								
N S	CIAC Payments CREDIT	0								
3	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,164,000	0	1,056,000	108,000	0	0	0	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
l¦	Contractors (A/P tax exempt)	0								
R.	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

931,200

No further estimate range is required.

Formulas give standard ranges

← per estimate level, but may be

per estimate level, but a overwritten if desired.

Minimum (\$): \_\_

Maximum (\$): \_\_\_\_

1.396.800

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing; Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Based estimate on what was done for ADMS East of River project, then adjusted

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

**Budget Group:** 

Project/Program Name: Grid Mod Communications - Catskill/Kingston/Newburgh Work Order #:

Budget Category: 44 Funding Project Number:

Is this a Specific Project, Program or Blanket? Program Target Schedule - Start: 1/1/2024 In-Service: 12/1/2026

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Common: I.T./O.T.

Network Strategy ("NS") - Corporate two-way communication network system employed with Tier 1 fiber/microwave and Tier 2 WIFI mesh technologies. Critical network systems tying each field device (substation/IED) to the applicable energy control system EMS & ADMS.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: Sufficient Corporate funding exists to support the build out of the network in the timeframe needed.



Version 3.0 12/9/2022

N/A

### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Distribution Growth

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: New Business

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Capital projects for the transmission and distribution systems may be deferred as load pockets serviced by lateral feeders can be reserved with automated switching.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The application of Conservation Voltage Reduction ("CVR") with Volt-VAR Optimization ("VVO") techniques on the electric distribution system improves efficiency and has the potential benefit of providing approximately 2% in

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Energy Leadership

Which <u>Strategic Objective</u> does project most align with? Improve planning and performance management

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC CAIDI Outage Duration

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environm

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Improved reliability through automated restoration.

Customer energy savings of approximately 2% from VVO and CVR applications.

Deferment of earmarked Cap-Ex dollars for system upgrades (such as secondary transmission feeds to

### Why was the proposed project scope chosen over other alternatives?

Better O&M Cost Reductions than the alaternatives considered.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

"Grid Modernization supports all four Corporate Strategic Themes:

- 1. Modernizing our business through electric and natural gas system investments and process improvements.
- 2. Continuously improving our performance while maintaining cost effective, efficient, and secure operations.
- 3. Investing in programs and employee development to position the organization for continued success in the future.
- 4. Advocating on behalf of customers and other stakeholders.

Central Hudson's strategy for fulfilling its mission is summed up in four important themes below in Figure 1. As identified in the Corporate Strategic Outlook, Grid Modernization plays an important function amongst these themes"

### What are the risks and consequences of not completing this project?

Network Strategy – Tier 2 Gateway and Helper Node Issue: Gateway and Helper Node Location Installation are unable to transport the telemetry at speeds sufficient for operations. Engineering Studies Issue: Defined testing/integration plan for E2E testing and cutover, and were a best effort, knowing there will be IEDs needed in locations additional to those identified at the beginning of the program in 2020.

Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process?

Resource availability.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		,	r cost estimates sh le adjustments for l			
	\$9,731,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	353,000		53,000	150,000	150,000			
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	4,500,000		500,000	2,000,000	2,000,000			
D	Contractors (A/P tax exempt)	4,200,000		550,000	1,650,000	2,000,000			
'	Overheads	178,000		25,000	75,000	78,000			
ı	AFUDC*	500,000		100,000	200,000	200,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	9,731,000	0	1,228,000	4,075,000	4,428,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

## **Budget Submittal Form**

Formulas give standard ranges

Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 7,784,800 Maximum (\$): 11,677,200 

per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historic pricing with adjustments

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Nam GTS Upgrades and Enhancements

Work Order #:

10183

**Budget Group:** Common: I.T./O.T.

**Budget Category:** 4220

4220 Fundin Project Number: Target Schedule - Start: 9/1/2023 In-Se

In-Service: 7/1/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Is this a Specific Project, Program or Blanke Specific

Continuously Upgrade and Enhance GTS. GTS, or the Gas Tracking Systems, is a portal that serves the Retail Access program for Central Hudson and is used to support key gas related business processes. Central Hudson has around 7,000 customers within its service territory that rely on gas marketers for natural gas. This portal helps gas marketers to nominate gas into the system and allows gas buyers to understand how much gas is coming into the Central Hudson system via the marketers. The GTS portal also plays a vital role in supporting the Energy Resources group to perform their day-to-day business operations which include the daily and monthly cash out processes. GTS is supported by Convergence LLC.

Describe specific scope exclusions, assumptions and constraints:

N/A







#### **B. JUSTIFICATION**

Load Based/Infrastructure: Other rowth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standard Investment Type: Growth

Technology Investment Type (CATS-4220, 4222, 4230, 423 Foundational - Upgrade Is there an Innovation Componen No

Needs Assessment: Risk Reduction; Infrastructure; Productivity; Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value? N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

To keep GTS system up to date and reduce any risk by having older technology.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Updated technology/functionality, risk reduction.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document CLICK HERE

Which Strategic Theme does project most align with? Business Modernization

Which Strategic Objective does project most align with Improve system performanc e and resilience

Which Strategic Initiative does project most align with Business & Operations Modernization

Which Team Goal does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 42 Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedu N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional appr

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically sho

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Doing nothing and not upgrading.

Why was the proposed project scope chosen over other alternatives? We want to keep as up to date as we can to minimize any risks.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Vendor suggested upgrade timeframes.

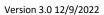
What are the risks and consequences of not completing this project? We will not be up to date and will be open to vulnerabilities.

Was this project included in a prior 5-year forecast?

No
If No, why should this project be completed instead of a planned project?

New project identified due to end of life of existing application, by vendor.

What other factor were considered during the prioritization process? Business priority and resource availability (including vendor.)





### E. COST ESTIMATE

	Capital Estimate Summary		t year of the Idget plan			ar cost estimates : ble adjustments fo			
	\$1,030,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	150,000		100,000				50,000	0
Α	Stock Materials	710,000		542,000				168,000	0
D	Non-Stock Material (A/P taxable)	50,000		50,000					
D	Contractors (A/P tax exempt)	50,000		50,000					
T	Overheads	60,000		50,000				10,000	0
1	AFUDC*	10,000						10,000	0
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,030,000	0	792,000	0	0	0	238,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
I.	Contractors (A/P tax exempt)	0							
R.	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance D	epartment reviev	v						

Expense \$ (if applicable): 0 urrent Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Formulas give standard

Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Cost Estimate Range: Minimum (\$): 721,000 Maximum (\$): 1,339,000 

Franges per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Based of historical vendor cost for upgrades

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Work Order #:

Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: IEA Replacement

Common: I.T./O.T.

Budget Category: 4220 Funding Project Number:

duget Category. 4220 Funding Project Number.

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/31/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

Replace the Mainframe application Integrated Energy Accounting (IEA) with two or more systems that will support both Gas and Electric requirements. The electric solution must be able handle the meter authority work that energy analysts do on behalf of Central Hudson while reporting the data to NYISO. New functionality such as audit trails and uploading documents into the solution are required to ensure accurate data.

### Describe specific scope exclusions, assumptions and constraints:

Assumption: This project will require Central Hudson to implement two or more applications to support both gas and electric requirements.

Assumption: The solution will be capable to calculate industry standard values such as the Send Out and BTU

calculations

Constraint: Getting off of spreadsheets for processes like the supplier contracts and pipeline bulletin

board

Assumption: New system will handle multiple/separate contracts for different seasons and

suppliers



Version 3.0 12/9/2022

### **B. JUSTIFICATION**

Load Based/Infrastructure: Other Growth/Sustaining/Retirement: Distribution Sustaining

Discretion Level: Maintain System Standards Investment Type: Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Compliance; Regulatory

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Yes

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project will support Central Hudsons strategy to get off the Mainframe to avoid the risk of continuing on legacy applications. If we do not replace the gas functionality in IEA it wil impact natural gas reliability by not be able to provide System Operators the natural gas supply.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See BCA tab of Cost Estimate & Benefit-Cost Analysis Template

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency

Which <u>Strategic Initiative</u> does project most align with? Data & Analytics Which <u>Team Goal</u> does project most align with? Group Expense

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

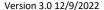
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Continue to look at solutions other NY utilities have implemented for Gas and Electric as well as demo other industry leaders.

#### Why was the proposed project scope chosen over other alternatives?

IEA was able to be customized and meet both Gas and Electric needs. Solutions that lead the industry today do not have the capability for meeting both Gas and Electric needs. This is why Central Hudson is plans to implement two new solutions, one for Gas and one for Electric.

### D. PRIORITIZATION

Yes

### Why do we need to complete this project in the period requested?

Both solutions may take up to three years to implement. With the goal of getting off of mainframe the project should start sooner than later to meet that deadline.

### What are the risks and consequences of not completing this project?

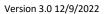
This project is in line with Central Hudsons strategy to get off of the mainframe. With the population of resources able to support and enhance mainframe getting smaller, it is for Central Hudson's best interest to investigate modern solutions that can be supported and enhanced.

Was this project included in a prior 5-year forecast?

Yes

If No, why should this project be completed instead of a planned project?

What other factor were considered during the prioritization process? Business priority and urgency.





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				ear cost estimates st able adjustments for			
	\$1,335,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	300,000				300,000			
Α	Stock Materials	500,000				500,000			
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	500,000				500,000			
T	Overheads	0							
1	AFUDC*	35,000				35,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,335,000	0	0	0	1,335,000	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l i	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 1.068.000 Maximum (\$): 1.602.000 Formulas give standard ranges per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historical pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):







Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

Project/Program Name: Integrated Energy Data Resource (IEDR)

Work Order #: 8 4 0 6 - J

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number: 10304
Is this a Specific Project, Program or Blanket? Program

Target Schedule - Start: 1/1/2024 In-Service: 12/1/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Implementation of the technology to support the requirements and use cases ordered by the commission related to IEDR Phases I and II.

### Describe specific scope exclusions, assumptions and constraints:

Exclusion: Does not include the Netezza mitigation project

Exclusion: Does not include the migration from Netezza to the data lake

Assumption: Resource availability will be provided both internally and externally Assumption: Cost associated to this project will be available per the commission

order

Constraint: The use cases and timeline are dependent on NYSERDA program management and DPS

staff



Version 3.0 12/9/2022

### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:Non-DiscretionaryInvestment Type:Compliance

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Implementation Is there an Innovation Component? No

Needs Assessment: Compliance; Regulatory; Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

PSC Commission Order - IEDR

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

This project's technology is foundational to the enablement of future benefits associated with application retirement for the legacy reporting solution. However, the scope of that migration and retirement is excluded from this project and program, but it is subsequent to this.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Energy Leadership

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?  $\ensuremath{\mathsf{No}}$ 

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Alternative is to not comply with PSC Order regarding IEDR

Why was the proposed project scope chosen over other alternatives? Compliance with PSC Order - IEDR

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

**PSC Commission Order - IEDR** 

What are the risks and consequences of not completing this project?

PSC Commission Order - IEDR

Was this project included in a prior 5-year forecast?
If No, why should this project be completed instead of a planned project?
regulatory requirement

What other factor were considered during the prioritization process?

None; regulatory requirement

No



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan						
	\$32,817,703	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	18,064,902	5,186,496	4,399,406	1,200,000	1,299,000	1,138,000	1,242,000	3,600,000
Α	Stock Materials	3,272,000			500,000	500,000	500,000	500,000	1,272,000
D	Non-Stock Material (A/P taxable)	3,134,909	909,562	475,347	250,000	250,000	250,000	250,000	750,000
D	Contractors (A/P tax exempt)	870,899	267,266	133,633	50,000	50,000	50,000	50,000	270,000
Ϊ́τ	Overheads	3,500,000			500,000	500,000	500,000	500,000	1,500,000
ı	AFUDC*	3,974,993	2,206,379	1,084,614	71,000	71,000	71,000	71,000	400,000
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	32,817,703	8,569,703	6,093,000	2,571,000	2,670,000	2,509,000	2,613,000	7,792,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N T S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	e
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Rough order of magnitude estmate due to lack of requirements and historical costs	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was detailed applicable cost estimating files as appropriate.  Rough order of magnitude estmate due to lack of requirements and historical costs	rived. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, y	ou may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: Infrastructure HW Lifecycle

Blanket

Work Order #:

- |

Common: I.T./O.T.

Is this a Specific Project, Program or Blanket?

**Budget Category:** 4222

22 Funding Project Number: Target Schedule - Start: 1/1/2024 In-Se

In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Continuously upgrade aged HW.

Describe specific scope exclusions, assumptions and constraints: None.



Version 3.0 12/9/2022

N/A

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Need to keep our infrastructure current to limit risks.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)
Risk reduction.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Extend usage of existing hardware after vendor support expires.

Why was the proposed project scope chosen over other alternatives? Risk reduction.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To keep technology up to date and reduce risk.

What are the risks and consequences of not completing this project?

Limited vendor support and/or non compliance for deployed hardware. Potential service disruptions.

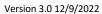
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability.





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$5,871,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	270,000		50,000	50,000	50,000	60,000	60,000	
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	4,400,000		1,000,000	1,000,000	800,000	800,000	800,000	
	Contractors (A/P tax exempt)	775,000		150,000	150,000	150,000	150,000	175,000	
Ϊ́τ	Overheads	180,000		40,000	30,000	30,000	40,000	40,000	
ı	AFUDC*	246,000		57,000	46,000	43,000	50,000	50,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,871,000	0	1,297,000	1,276,000	1,073,000	1,100,000	1,125,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

4,696,800

No further estimate range is required.

7.045,200 Formulas give standard ranges

per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

Historic pricing adjusted.

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: IVR Modernization Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number: 10182
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2024 In-Service: 12/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

The objective of the project is to upgrade IVR and Contact Center Solution from on-prem to a cloud solution. Genesys Cloud CX tier 2 would replace the current on-prem Genesys Voice Platform v9.0 and on-prem OSCC v9.3 Tier 3 would include a Workflow Management solution which would replace Calabrio. Voice Recognition, Voice bots and Visual IVR

### Describe specific scope exclusions, assumptions and constraints:

Constraint: SAP Integration & timing of implementation related to Fortis required 4th quarter blackout (SOX).

Assumption: Resources will be available and aligned to meet the projected go-live date.



Version 3.0 12/9/2022

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Implementation Is there an Innovation Component? No

Needs Assessment: Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Current on-prem Genesys platform limits ability to modernize / enhance IVR & contact center functionality, to be more in line with customer expectations.

### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

More flexibility, better work force management, less dependency on vendor for management, increase IVR call containment rate through expanded self service functions, enable customer to transition to other channels seamlessly, expand customer analytics and to reduce call volume to CSRs.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization Which <u>Team Goal</u> does project most align with? PSC Customer Satisfaction Survey

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Customer Experience: Improve customer experience

### Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

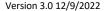
Checklist Fully Completed: No

Environmental Component: Componen

Is complete <u>Sustainability</u> status achieved by this project?\*

Checklist is incomplete Checklist is incomplete Checklist is incomplete \* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

### What other options were considered to the proposed project to meet the objective?

Find short-term maintenance contractor.

Completing small upgrades to the current on-prem solution to stay within support. Completion of two separate TSC projects to enhance functionality of the on-prem solution.

#### Why was the proposed project scope chosen over other alternatives?

Cloud enhancement eliminates the need for service pack upgrades and the two separate TSC projects to enhance functionality of the on-prem solution. The cloud migration offers even more functionality and flexibility to make changes without dependency on a third party vendor.

### D. PRIORITIZATION

### Why do we need to complete this project in the period requested?

It has been overlooked for the past several years.

### What are the risks and consequences of not completing this project?

No enhanced functionality, technology limitations, tied to current limiting vendor, current IVR on prem which poses risk to natural disaster interruption or other interruption. Wouldn't be able to identify problems before they become customer pain points.

No

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Business prioritization of increasing customer experience.

What other factor were considered during the prioritization process?

Resource availability (including vendor).



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu				cost estimates st e adjustments for			
	\$3,044,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	400,000		200,000	200,000				
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	2,300,000		300,000	2,000,000				
D	Contractors (A/P tax exempt)	0							
T	Overheads	0							
1	AFUDC*	344,000		28,000	316,000				
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,044,000	0	528,000	2,516,000	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

## **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

2,435,200

No further estimate range is required.

Formulas give standard ranges

← per estimate level, but may be

overwritten if desired.

Maximum (\$): 3,652,800

No explanation on confidence level required.

Basis for estimate: Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

RFP was done in 2022 to gathe rrquirements and costs

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Payment Experience Vendor & eBill, Bill Presentment and Bill Print Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number: 10182

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2025 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Direct payment options through payment provider replacing Kubra.

### Describe specific scope exclusions, assumptions and constraints:

Constraint: WEB & Mobile development resources availability

Constraint: SAP changes will be needed Assumption: IVR updates needed as well Assumption: CSR Training would be needed Assumption: Chatbot and Notif changes needed



Version 3.0 12/9/2022

### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Implementation Is there an Innovation Component? No

Needs Assessment: Strategic Goal

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Customers can pay via multiple ways; however, the current payment channels are hosted via multiple platforms owned by Kubra. This leads to a segmented experience for customers where they are faced with information delays, lengthy transaction processes, and a disjointed user experience as they navigate between pages. Also New Vendor for Bill Presentment, Bill Print and eBills.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Improved usability will increase the User's experience & Customer Satisfaction scores and also can increase self-service activities on the web, mobile app & IVR, deflecting calls to the Contact Center.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which <u>Strategic Initiative</u> does project most align with? Seamless Customer Experience
Which <u>Team Goal</u> does project most align with? PSC Customer Satisfaction Survey

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Remain status quo with current Kubra functionality for payments & billing.

Why was the proposed project scope chosen over other alternatives?

Kubra experience is not a seemless experience for our customers.

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

It has been overlooked for the past several years.

What are the risks and consequences of not completing this project?

A segmented experience for our customers where they are faced with information delays, lengthy transaction processes, and a disjointed user experience as they navigate between CH and Kubra pages on web and mobile

Was this project included in a prior 5-year forecast?

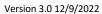
No

If No, why should this project be completed instead of a planned project?

In order to continue to enhance our billing for our customers, we need to find a replacement for our current system/service provider.

What other factor were considered during the prioritization process?

Business priority and urgency.





### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan		All future yea applicab				
	\$3,296,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	250,000			100,000	150,000			
Α	Stock Materials	146,000			71,000	75,000			
D	Non-Stock Material (A/P taxable)	1,900,000			700,000	1,200,000			
D	Contractors (A/P tax exempt)	700,000			100,000	600,000			
T	Overheads	150,000			50,000	100,000			
1	AFUDC*	150,000			50,000	100,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,296,000	0	0	1,071,000	2,225,000	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Rough estimate as a place holder for future implementation	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You applicable cost estimating files as appropriate.  some historical costs	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	/ add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: Land Mobile Radio Replacement with DMR Work Order #:

Common: I.T./O.T. Budget Category: 44 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2024 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

### Describe the project objective and scope of work:

CHGE must upgrade the existing LMR System. Modern systems now use Digital Mobile Radio (DMR) technology. The project objective is to replace Central Hudson's LMR system with a DMR system.

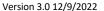
### Describe specific scope exclusions, assumptions and constraints:

Assumption: Number of company vehicles

Assumption: Materials are readily

available







### **B. JUSTIFICATION**

Load Based/Infrastructure:InfrastructureGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The end of life for base radio equipment was in 2014. CHGE's LMR equipment reached full depreciation in 2015. Portable radios are no longer available. Mobile radios are on a made to order basis with extensive lead times over 1 year.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

None

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture

Which <u>Strategic Initiative</u> does project most align with? Transform Safety Culture

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates No

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

### ESG (Environmental, Social and Governance) and Sustainability:

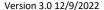
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





#### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Three vendors demonstrated their products and networks in 2022. An array of solutions and servicers were offered. CHGE has determined a DMR system will best serve the company.

#### Why was the proposed project scope chosen over other alternatives?

Overall, a DMR system is superior to an LMR system through audio quality, speed, configuration flexibility, power usage, safety features, network monitoring, and other functions. These demonstrations enabled stakeholders to identify features required of portable and mobile radios needed, required talk groups, and equipment quantities.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

The end of life for base radio equipment was in 2014. CHGE's LMR equipment reached full depreciation in 2015. Portable radios are no longer available. Mobile radios are on a made to order basis with extensive lead times over 1 year.

### What are the risks and consequences of not completing this project?

As first responders, it is important for CHGE to have a radio network. A radio network provides mission critical reliable communication. A simple push to talk method is far easier for emergency and stressful situations. Some areas within CHGE's territory have poor cellular coverage, and crews currently rely upon the LMR System. There is direct communication between Dispatch and crews.

No

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Aged Technology needs to be replaces for safety purposes.

What other factor were considered during the prioritization process? Safety and risk reduction.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan		All future year cost estimates should include applicable adjustments for inflation.				
	\$5,688,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	350,000		100,000	100,000	50,000	50,000	50,000	
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	2,250,000		1,000,000	1,000,000	250,000			
	Contractors (A/P tax exempt)	2,557,000		1,000,000	1,207,000	250,000	50,000	50,000	
·	Overheads	133,000		50,000	50,000	11,000	10,000	12,000	
1	AFUDC*	398,000		143,000	150,000	85,000	10,000	10,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	5,688,000	0	2,293,000	2,507,000	646,000	120,000	122,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l'	Contractors (A/P tax exempt)	0							
R.	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
s	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 4.550.400 Maximum (\$): 6.825.600 Formulas give standard ranges overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing; Historical Data + Job Specific Adjustments; FOS-Generated Estimate; Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

historical Pricing

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Patrick Garvey Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Middleware SOA Upgrade

Work Order #:

-

**Budget Group:** Common: I.T./O.T.

**Budget Category:** 4220

Fund ng Project Number:

In-Service: 12/1/2028

Is this a Specific Project, Program or Blanket? Blanket

Target Schedule - Start: 1/1/2024

inger 3chedule - 3tart. 1/1/2024 III-3ei vice. 12/1/2020

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

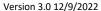
To simplify integration by unifying disparate requirements for the latest integration challenges of mobile, cloud, and IoT into one standards-based integration platform.

### Describe specific scope exclusions, assumptions and constraints:

Constraint: When moving to cloud, how do we move the developed API's with minimal impactD



No





#### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 4 Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Reliability; Resilience; Compliance; Risk Reduction; Service

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Oracle will no longer be supporting the on-prem solution starting 2027 and 2025 is the end date of software updates. Going forward the enterprise cloud solution (OCI) will be the only version supported.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule esti N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approva No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown bel

Checklist Fully Completed: No

Environmental Component: Componen

Checklist is incomplete
Checklist is incomplete

Checklist is incomplete

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Considering SAP and Oracle solutions

Why was the proposed project scope chosen over other alternatives? N/A

### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Premier support ends in December 2025 and Extended support ends in December of 2027.

What are the risks and consequences of not completing this project?

Falling out of Oracle support and security updates.

Was this project included in a prior 5-year forecast?

No
If No, why should this project be completed instead of a planned project?

N?A

What other factor were considered during the prioritization process? Risk reduction/vulnerabilities and additional functionality.



### **E. COST ESTIMATE**

	Capital Estimate Summary		Year 1 = 1st year of the All future year cost estimates should include 5-year budget plan applicable adjustments for inflation.							
	\$1,157,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	250,000		50,000	50,000	50,000	50,000	50,000		
Α	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	500,000		100,000	100,000	100,000	100,000	100,000		
D	Contractors (A/P tax exempt)	287,000		50,000	87,000	50,000	50,000	50,000		
'	Overheads	45,000		5,000	10,000	10,000	10,000	10,000		
1	AFUDC*	75,000		7,000	10,000	12,000	18,000	28,000		
0	Journal Vouchers (JVs)	0								
N S	CIAC Payments CREDIT	0								
3	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	1,157,000	0	212,000	257,000	222,000	228,000	238,000	0	
R	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
l¦	Contractors (A/P tax exempt)	0								
R	Overheads	0								
E	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. to applicable cost estimating files as appropriate. historic pricing with adjustments	You may add link(s)
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optiona



Work Order #:

Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: MWM Replacement

Common: I.T./O.T. Budget Category: 4220 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 6/30/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The scope of this project includes replacing Oracle's Mobile Workforce Management(MWM) application with one or more applications. This will require data migration. The selected solution will include all "must-have" requirements outlined by the Central Hudson business.

#### Describe specific scope exclusions, assumptions and constraints:

Constraint: Some of the more complex screens in MWM cannot be replicated in one application.

Assumption: SAP will eventually be the home of some of the complicated screens



Version 3.0 12/9/2022

N/A

#### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Implementation Is there an Innovation Component? No

Needs Assessment: Productivity; Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Mobile Workforce Management support will be downgraded to Sustaining support in March 2025.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See BCA tab of Cost Estimate - Benefit Cost Analysis Template document.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates



\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

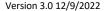
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete Sustainability status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

Many products and vendors will have demos to review if the services provided meet the requirements needed.

#### Why was the proposed project scope chosen over other alternatives?

Currently looking at multiple vendors that offer products that can replace Oracles MWM application. Demos are being scheduled with possible vendors to review their products.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

The impact of delaying an MWM upgrade would open up the company to potential cyber security threats given that support from Oracle will be diminished after March of 2025. See attached email to IT.

### What are the risks and consequences of not completing this project?

By not replacing MWM support, it will be downgraded to sustaining support. The risk with that is how many other companies will stay on sustaining support. If there are many, support will be limited if an issue arises. If there are only a few vendors left on MWM, Oracle may have very little resources to assist Central Hudson if an issue does arise.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

End of life technology

What other factor were considered during the prioritization process? Resource availability

No



### E. COST ESTIMATE

	Capital Estimate Summary		= 1st year of the All future year cost estimates should include applicable adjustments for inflation.						
	\$4,245,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	700,000		500,000	200,000				
Α	Stock Materials	500,000		500,000					
D	Non-Stock Material (A/P taxable)	500,000		500,000					
D	Contractors (A/P tax exempt)	2,300,000		1,500,000	800,000				
'T	Overheads	245,000		168,000	77,000				
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,245,000	0	3,168,000	1,077,000	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	rmulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):	estimate level, but may be erwritten if desired.
Basis for estimate: FOS-Generated Estimate	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may applicable cost estimating files as appropriate.  ROM Estimate - Doing assessment to get betterrequirements and bottoms up estimation	ay add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it	t here (optional):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 Submission Date:

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: Monthly Meter Reading

Common: I.T./O.T.

Work Order #: **Funding Project Number:** 

Is this a Specific Project, Program or Blanket?

**Budget Category:** 4220

Target Schedule - Start: 1/1/2024

In-Service: 6/30/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Specific

#### Describe the project objective and scope of work:

Adjust billing practices and conduct monthly meter reads, thereby eliminating alternate month bill estimates. Increasing customer satisfaction is the primary motivation for this project.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: Will need to increase headcount to support project

Constraint: Availability of IT resources and knowledge to compile information related to SAP code/configuration changes to meet the goal of eliminating bi-monthly billing estimates.





No



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Quality

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Adjust billing practices and conduct monthly meter reads, thereby eliminating alternate month bill estimates. Increasing customer satisfaction is the primary motivation for this project.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Increasing customer satisfaction is the primary motivation for this project.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve customer experience

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Customer Experience: Improve customer experience

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Stay with every other month estimations process and bad customer experience.

Why was the proposed project scope chosen over other alternatives? Increasing customer satisfaction is the primary motivation for this project.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? In order to improve Customer satisfaction with Monthly Meter Reading and billing.

What are the risks and consequences of not completing this project? Continue with poor customer satisfaction with every other month meter reading.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Increase customer satisfaction.

What other factor were considered during the prioritization process? Business priority and resource availability.

No



### E. COST ESTIMATE

	Capital Estimate Summary		r 1 = 1st year of the All future year cost estimates should include year budget plan applicable adjustments for inflation.						
	\$1,066,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	400,000		200,000	200,000				
Α	Stock Materials	600,000		300,000	300,000				
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	0							
'T	Overheads	0							
ı	AFUDC*	66,000		28,000	38,000				
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,066,000	0	528,000	538,000	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	ormulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):	er estimate level, but may be verwritten if desired.
Basis for estimate: Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You mapplicable cost estimating files as appropriate.  Historic costs adjusted	nay add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add	it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Microsoft M365 E5 Step-up Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4222 Funding Project Number: 10185

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 2/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Our current Microsoft licensing is at the M365 E5 level, we aim to take advantage of pricing discounts through the remainder of the year to step up to E5 maintaining compliance with content discovery, and providing foundational capabilities for further projects - 2022 project - Migration from McAfee Endpoint Security to Microsoft Defender, Mobile Device Management policy rebuild, initial deployment of conditional access/DLP. In 2023, Microsoft Teams Telephony integrations and further cybersecurity enhancements including a full DLP project will commence. This work is in support of both the Digital Workspace and Cybersecurity initiatives.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: This licensing stepup is to provide the capabilities through remainder of 2022, we will be joining the Fortis enterprise agreement at renewal to take advantage of the aggregate pricing discounts

Exclusion: MS best practice quick wins for DLP/Conditional access will be deployed in 2022, a full project will commence in 2023 to establish a full practice



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

Load Based/Infrastructure: Other Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Growth

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Maintain the compliance of the advanced ediscovery components leveraged for the Phoenix litigation hold, Improve our endpoint security capabilities and retire the existing McAfee solution at a ~\$130k annual expense, Improve our cyber risk mitigations for data loss, data and environmental access.

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Remove ~\$130k Annual expense of existing McAfee Endpoint Security Solutions, Streamline operational activities through a single Microsoft management console, cost avoidance of \$5M per cyber event.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Digital Workplace: Digitization of existing business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

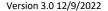
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

#### What other options were considered to the proposed project to meet the objective?

None, aligning to MS as the strategic partner for their services allows us to leverage the market leader in multiple capabilities while streamlining integrations to reduce operational overhead as we are already a ~98% Microsoft based organization.

#### Why was the proposed project scope chosen over other alternatives?

Microsoft is a market leader for Endpoint Security solutions, integrates holistically with our existing infrastructure and tooling and expands capabilities for further cloud hybridization.

#### D. PRIORITIZATION

#### Why do we need to complete this project in the period requested?

We need to maintain compliance with licensed features already in use, this licensing will also allow us to initiate the Mcafee MS Endpoint Security improving our cybersecurity posture and reducing operational expense by completing the migration prior to the MS renewal. Migration planning will be underway that will allow further reduction/recovery of expense in other solutions in 2023 including our security products, VOIP solution and improvement of corporate content security.

#### What are the risks and consequences of not completing this project?

We will be at risk of penalization for being out of licensing compliance, the McAfee migration will not be able to initiate until 2023 and will not be completed prior to it's renewal anniversary and we will further sustain unnecessary expense through 2024.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

What other factor were considered during the prioritization process? Business Prioritization.

Yes



### E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.			
	\$4,346,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
Α	Stock Materials	4,346,000				2,146,000			2,200,000
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	0							
т.	Overheads	0							
ı	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	4,346,000	0	0		0 2,146,000	0	0	2,200,000
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H.	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0		0 0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Formulas give standard ranges

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Cost Estimate Level: Definitive

Cost Estimate Confidence: (that final cost will be within +/-10% of the estimate): High Confidence

No further estimate range is required.

Minimum (\$): 3.911,400 Maximum (\$): 4.780,600  $\leftarrow$  per estimate level, but may be overwritten if desired.

No explanation on confidence level required.

Basis for estimate: Vendor Generated Cost Estimate

For your definitive/bid estimate, provide link(s) to applicable cost estimating files.

Internal labor has been estimated off historical data, SW licensing cost is based off a Microsoft supplied quote that is being re-written for a July purchase timeframe

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Network Infrastructure Lifecycle Upgrades / Replacements Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4222 Funding Project Number: 4-4222-00-18

Is this a Specific Project, Program or Blanket? Blanket Target Schedule - Start: 1/1/2024 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

The CHGE network infrastructure is being replaced to enable Network Segmentation on over 114 network switches and 4092 network connections. This process includes replacing network switches where required, developing access policies for devices and users and creating the appropriate security controls.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: Will continuously keep the Network Infrastructure as up to date as possible by upgrading/replacing the older technology.



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure **Growth Sustaining** 

Maintain System Standards Discretion Level: **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Infrastructure Needs Assessment:

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The CHGE network infrastructure is being replaced to enable Network Segmentation on over 114 network switches and 4092 network connections. This process includes replacing network switches where required, developing access policies for devices and users and creating the appropriate security controls.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Risk reduction from keeping our technology current.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Business Modernization** 

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with? **Business & Operations Modernization** 

Which **Team Goal** does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals? No

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: No** 

**Environmental Component:** Checklist is incomplete **Social Component:** 

**Governance Component:** 

Checklist is incomplete Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do nothing and create risk with using older technology.

Why was the proposed project scope chosen over other alternatives?

We can't afford to have our infrastructure to get to the point where the technology is too old and starts failing causing outages.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

We can't afford to have our infrastructure to get to the point where the technology is too old and starts failing causing outages.

What are the risks and consequences of not completing this project?

We will increase our technical debt and introduce more risk with keeping older technology.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Part of a larger emergent bucket.

Yes

What other factor were considered during the prioritization process? Business area prioritization and resources.



### E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.				
	\$2,306,000	TOTAL	Prior Years Actuals +	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0	Projections	2024	2023	2020	2027	2020	
	Labor (Monthly Payroll)	355,000		50,000	50,000	50,000	100,000	105,000	
A	Stock Materials	1,625,000		300,000	350,000	375,000	300,000	300,000	
D	Non-Stock Material (A/P taxable)	0		300,000	330,000	373,000	300,000	300,000	
D	Contractors (A/P tax exempt)	0							
I T	Overheads	148,000		7,000	10,000	16,000	40,000	75,000	
i	AFUDC*	178,000		10,000	15,000	15,000	55,000	83,000	
0	Journal Vouchers (JVs)	0							
N	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,306,000	0	367,000	425,000	456,000	495,000	563,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low C	Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact of Historic annual costs	← per estimate level, but may be
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate applicable cost estimating files as appropriate.  Look back in history to see how much we've spent on infrastructure upgrades/replacements	e was derived. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this	s form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: OT DMS Upgrade SW

Work Order #:

-

Budget Group: Common: I.T./O.T.

**Budget Category:** 4230

Funding Project Number:

4-4230-05-18

Is this a Specific Project, Program or Blanket?

Specific

Target Schedule - Start: 1/1/2026

In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Upgrade our DMS software to the latest version, along with hardware refresh.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: GE will require certain productivity tools/software to be installed in the Development and Test environments in order to perform the necessary work.

Assumption: No incremental requirements (functional, security or performance, etc.) beyond current capabilities of the base product is provided.



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Having worked closely with CH, the GE team is intimately familiar with the business drivers, past challenges and system requirements of this upgrade; we know exactly how our industry leading GE Reliance product and support services will solve the immediate upgrade needs while building a foundation for future requirements

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Keeping up to date SW versions will reduce risk and improve effeciencies

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do Nothing; Extend usage of existing SW after vendor support expires

Why was the proposed project scope chosen over other alternatives?

Risk reduction and the ability to provide workorces the ability to support critical infrastructure that supports safe and reliable service for customers.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To keep our sritical SW up to date and in compliance.

What are the risks and consequences of not completing this project?

Limited vendor support and/or non compliance for deployed SW.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Specificly called out IT projects.

No

What other factor were considered during the prioritization process? Business prioritization and resource availability.



### E. COST ESTIMATE

	Capital Estimate Summary		Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.			
	\$3,574,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	200,000				50,000	150,000		
Α	Stock Materials	424,000				23,000	401,000		
D	Non-Stock Material (A/P taxable)	1,000,000				400,000	600,000		
D	Contractors (A/P tax exempt)	1,700,000				200,000	1,500,000		
Ϊ́Τ	Overheads	125,000				25,000	100,000		
1	AFUDC*	125,000				25,000	100,000		
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,574,000	0	0	0	723,000	2,851,000	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reference per estimate level, but may be

overwritten if desired.

2.859,200 Maximum (\$): 4,288,800

No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

vendor high level estimate

**Cost Estimate Range:** 

### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Work Order #:

Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: OT EMS Upgrade SW

Budget Group: Common: I.T./O.T. Budget Category: 4230 Funding Project Number: 4-4235-02-18
Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 5/1/2023 In-Service: 7/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Work with GE to upgrade our EMS SW to Version 2023.2. Reliance EMS software upgrade, along with the installation of the Reliance External User/Office system, and hardware refresh.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: GE will require certain productivity tools/software to be installed in the Development and Test environments in order to perform the necessary work.

Assumption: No incremental requirements (functional, security or performance, etc.) beyond current capabilities of the base product is provided.

Assumption: Data and Displays will be migrated and converted from the legacy system by GE in collaboration with Central Hudson. Creation of custom displays will be performed by the customer.

Assumption: The Central Hudson staff responsible for testing will have suitable knowledge of the system and be available prior to beginning testing to maintain the project schedule as planned and agreed.

Assumption: Central Hudson will assume responsibility for executing the cutover/go-live. Assumption: Central Hudson shall provide the appropriate hardware sizing required for GE to carry out the scope defined in this SoW. GE is not responsible for delays caused by slow network, admin access to servers, and insufficient server sizing.



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component?

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Having worked closely with CH, the GE team is intimately familiar with the business drivers, past challenges and system requirements of this upgrade; we know exactly how our industry leading GE Reliance product and support services will solve the immediate upgrade needs while building a foundation for future requirements.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Keeping up to date SW versions will reduce risk and improve efficiencies.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which Strategic Objective does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Social Component:

**Governance Component:** 

Checklist is incomplete Checklist is incomplete Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do Nothing; Extend usage of existing SW after vendor support expires

Why was the proposed project scope chosen over other alternatives?

Risk reduction and the ability to provide workorces the ability to support critical infrastructure that supports safe and reliable service for customers.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To keep our sritical SW up to date and in compliance.

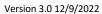
What are the risks and consequences of not completing this project?

Limited vendor support and/or non compliance for deployed SW.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability.





	Capital Estimate Summary	Year 1 = 1si 5-year bu							
	\$1,056,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	100,000		100,000					
Α	Stock Materials	56,000		56,000					
D	Non-Stock Material (A/P taxable)	600,000		600,000					
D	Contractors (A/P tax exempt)	300,000		300,000					
T	Overheads	0							
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,056,000	0	1,056,000	0	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

Minimum (\$): 739.200 Maximum (\$): 1.372.800

No explanation on confidence level required.

Basis for estimate: FOS-Generated Estimate; Vendor Generated Cost Estimate

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Used vendor estimate from a vendor who knows our systems very well.

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 Submission Date:

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: OT Industrial Defender HW Upgrade

Work Order #: **Funding Project Number:** 4-4230-05-18

Common: I.T./O.T. Is this a Specific Project, Program or Blanket? **Budget Category:** 4230 Specific

Target Schedule - Start: 6/1/2024

In-Service: 12/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

We will be upgrading our Industrial Defender system on both the EMS and DMS.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: we will be working directly with Industrial Defender, instead of GE.



Version 3.0 12/9/2022

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable: We will be upgrading our Industrial Defender system on both the EMS and DMS to keep on current technology.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) Technology risk reduction.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which Strategic Objective does project most align with? Improve system performance and resilience

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete Sustainability status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do Nothing

Why was the proposed project scope chosen over other alternatives? Reducing risk by keeping technology up to date

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? HW Life Cycle

What are the risks and consequences of not completing this project? Risk of using older technology, with higher risk of system failure.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Included in a bigget bucket, not specifically called out.

What other factor were considered during the prioritization process? Resource and business prioritization.

Yes



	Capital Estimate Summary		Year 1 = 1st year of the All future year cost estimates should inc 5-year budget plan applicable adjustments for inflation.						
	\$1,376,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	200,000		50,000	50,000			100,000	
Α	Stock Materials	832,000		200,000	200,000			432,000	
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	200,000		50,000	50,000			100,000	
l'T	Overheads	50,000						50,000	
ı	AFUDC*	94,000		25,000	19,000			50,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,376,000	0	325,000	319,000	0	0	732,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l i	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: need to better understand scope/requirements of the upgrade(s)	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. Historic costs adjusted	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	y add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: OT Infrastructure Upgrades

Work Order #:

.

**Budget Group:** Common: I.T./O.T. Is this a Specific Project, Program or Blanket?

**Budget Category:** 4230

Funding Project Number: Target Schedule - Start: 1/1/2023 In-Se

In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Continuous upgrade/replacement of older infrastructure to keep our infrastructure as up to date as possible.

Blanket

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: Will continuously keep the Network Infrastructure as up to date as possible by upgrading/replacing older OT infrastructure to the current standard.



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable: Continuous upgrade/replacement of older infrastructure to keep our infrastructure as up to date as possible

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Risk reduction of older technology being replaced

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

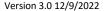
Social Component: Checklist is incomplete

Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do nothing and create risk with using older technology.

Why was the proposed project scope chosen over other alternatives?

We can't afford to have our infrastructure to get to the point where the technology is too old and starts failing causing outages.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

We can't afford to have our infrastructure to get to the point where the technology is too old and starts failing causing outages.

What are the risks and consequences of not completing this project?

We will increase our technical debt and introduce more risk with keeping older technology.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

These were part of an emergent bucket previously.

What other factor were considered during the prioritization process? Business prioritization and urgency.

Yes



	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the dget plan		All future year cost estimates should include applicable adjustments for inflation.						
	\$1,089,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years		
	Labor (Weekly Payroll)	0									
	Labor (Monthly Payroll)	100,000		20,000	20,000	20,000	20,000	20,000			
Α	Stock Materials	24,000		6,000	3,000	5,000	5,000	5,000			
D	Non-Stock Material (A/P taxable)	750,000		150,000	150,000	150,000	150,000	150,000			
D	Contractors (A/P tax exempt)	100,000		20,000	20,000	20,000	20,000	20,000			
·	Overheads	55,000		10,000	10,000	10,000	10,000	15,000			
1	AFUDC*	60,000		10,000	10,000	10,000	15,000	15,000			
0	Journal Vouchers (JVs)	0									
N S	CIAC Payments CREDIT	0									
3	Joint Utility Payments CREDIT	0									
	TOTAL ADDITIONS:	1,089,000	0	216,000	213,000	215,000	220,000	225,000	0		
	Labor (Weekly Payroll)	0									
E	Labor (Monthly Payroll)	0									
li.	Contractors (A/P tax exempt)	0									
R	Overheads	0									
E	Journal Vouchers (JVs)	0									
M	Salvage CREDIT	0									
E	CIAC Payments CREDIT	0									
T	Joint Utility Payments CREDIT	0									
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0		

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low	v Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact historic pricing, but holding for upcoming upgrades that we may not know the details of yet.	← per estimate level, but may be overwritten if desired
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate applicable cost estimating files as appropriate.  Look back in history to see how much we've spent on infrastructure upgrades/replacements.	ate was derived. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in t	his form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Primary Control Center - Kingston Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4230 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2023 In-Service: 1/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Central Hudson is currently constructing a new Training Academy and Primary Control Center, co-located on the same parcel. Co-location of these facilities was utilized to achieve cost synergies associated with site development and permitting, utility installation, and support staffing. The Kingston PCC supports the Grid Mod Program.

#### Describe specific scope exclusions, assumptions and constraints:

Assumption: Building construction will be completed and ready for IT/OT to enter by October

2023

Constraint: Lead time on Hardware (Supply Chain Delays)



Version 3.0 12/9/2022

#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Transmission Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Transformational - Enhancement Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Central Hudson is currently constructing a new Training Academy and Primary Control Center, co-located on the same parcel. Co-location of these facilities was utilized to achieve cost synergies associated with site development and permitting, utility installation, and support staffing. The Kingston PCC supports the Grid Mod Program.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

The benefits of an integrated solution include operating off of a single electric data model, thus reducing the amount of maintenance required.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Energy Leadership

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which Team Goal does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

**Environmental Component: Social Component:** 

**Governance Component:** 

Checklist is incomplete Checklist is incomplete Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Will be senting out an RFP for the AV Wall.

Why was the proposed project scope chosen over other alternatives?  $\ensuremath{\text{N/A}}$ 

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? Rate Case have cliff Date of 2025.

What are the risks and consequences of not completing this project?
The newly constructed PCC will not have the latest and greatest software/functionality.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Part of the PCC.

What other factor were considered during the prioritization process? Business prioritization and resource availability.

Yes



	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan  All tuture year cost estimates should include applicable adjustments for inflation.							
	\$2,180,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	1,078,000	550,000	528,000	0				
Α	Stock Materials	1,102,000	574,000	528,000	0				
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	0		0	0				
т.	Overheads	0							
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,180,000	1,124,000	1,056,000	0	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Conceptual

Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): High Confidence

1,526,000

No further estimate range is required.

Formulas give standard ranges

← per estimate level, but may be overwritten if desired.

2.834.000

Cost Estimate Range: Minimum (\$): \_\_\_\_ No explanation on confidence level required.

Basis for estimate: Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

vendor high level estimate

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: PowerPlan Upgrades and Enhancements Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2025 In-Service: 6/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Upgrade and Enhancements to PowerPlan system in order to have a version the vendor supports. This will also include any enhancements the business see fit for requests from PowerPlan users.

Describe specific scope exclusions, assumptions and constraints:

N/A



Version 3.0 12/9/2022

No

#### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

**Needs Assessment:** Regulatory; Reliability

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

After a certain point in time our version will not be supported by PowerPlan

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Not upgrading and losing application support.

Why was the proposed project scope chosen over other alternatives? PowerPlan is a critical Application and NEEDS to be working properly.

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To keep the critical application up to date and working.

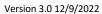
What are the risks and consequences of not completing this project?

The critical application will no longer be supported and will now be an unsupported application.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project?  $\ensuremath{\text{N/A}}$ 

Yes

What other factor were considered during the prioritization process? Resource availability and other business priorities.





	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan							
	\$2,895,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	250,000			50,000	100,000	100,000		
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,800,000			200,000	1,200,000	400,000		
D	Contractors (A/P tax exempt)	720,000			50,000	551,000	119,000		
·	Overheads	35,000			5,000	15,000	15,000		
1	AFUDC*	90,000			15,000	25,000	50,000		
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,895,000	0	0	320,000	1,891,000	684,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Ε	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	ormulas give standard ranges
	er estimate level, but may be verwritten if desired.
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You rapplicable cost estimating files as appropriate.  Historic pricing with adjustments	nay add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add	it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Project/Program Name: SAP Dunning** 

Work Order #:

- |

**Budget Group:** Common: I.T./O.T.

**Budget Category:** 4220

Funding Project Number:

In-Service: 12/1/2024

Is this a Specific Project, Program or Blanket?

Specific

Target Schedule - Start: 1/1/2023

111-361 VICE. 12/1/2024

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Turn on end to end collections functionality in SAP using a phased approach in order to significantly reduce financial risk to the company and rate payers.

#### Describe specific scope exclusions, assumptions and constraints:

Constraint: Resource availability

Constraint: Availability of key IT Contracted resources - Rowan, BRF+ Developer, DM Functional,

**TCS** 

Constraint: Blackout window as per Fortis Q4 policy

Assumption: Approx. 10-12 weeks of training time required for training material creation and delivery of the

training

Assumption: Support available from Alorica to manage increase in call volume

Assumption: Stable Billing and Payment Processing



Version 3.0 12/9/2022

Yes

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Implementation Is there an Innovation Component? No

Needs Assessment: Compliance; Regulatory; Strategic Goal; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Turn on end to end collections functionality in SAP using a phased approach in order to significantly reduce financial risk to the company and rate payers.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Leverage Dunning in SAP for automatic generation of late fees, collection notices, outbound calls and assignment to collection agencies.

Reduce arrears due to customer payments received as a result of collection activities for overdue invoices.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? Earnings (Net Income)

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do nothing.

Why was the proposed project scope chosen over other alternatives? N/A

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to reduce financial risk to the company and rate payers, and to stay in alignment with other New York state utilities collections processes.

What are the risks and consequences of not completing this project?

High Financial Risk - Arrears growth directly impacts the need to increase the write off reserve.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

This is part of the CIS Modernization Project.

What other factor were considered during the prioritization process? Stabalize SAP.

Yes



	Capital Estimate Summary	Year 1 = 1si 5-year bu				r cost estimates si le adjustments for			
	\$2,006,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	500,000		500,000					
Α	Stock Materials	56,000		56,000					
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	1,000,000		1,000,000					
т Т	Overheads	250,000		250,000					
ı	AFUDC*	200,000		200,000					
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,006,000	0	2,006,000	0	0	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



**Cost Estimate Range:** 

### **Budget Submittal Form**

Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan as a SPECIFIC PROJECT

Cost Estimate Level: Definitive

Cost Estimate Confidence: (that final cost will be within +/-10% of the estimate): High Confidence

1,805,400

No further estimate range is required.

Formulas give standard ranges

per estimate level, but may be

overwritten if desired.

2,206,600

No explanation on confidence level required.

Basis for estimate: FOS-Generated Estimate; Historical Proforma Pricing; Historical Data + Job Specific Adjustments

For your definitive/bid estimate, provide link(s) to applicable cost estimating files.

Minimum (\$):

https://centralhudson.sharepoint.com/:x:/r/sites/ProjectPhoenix/Project%20Phoenix%20Library/07.Support%20-%20Post%20Implementation/Production%20Issues%20-%20Dunning/Dunning%20Cutover%20Plan.xlsx?d=w97803ea0648d4e2da537b8c8b040f39a&csf=1&web=1&e=GF6bjD

#### F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):

Maximum (\$):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 **Submission Date:** 

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: SAP Major System Upgrades & Enhancements

Work Order #:

**Budget Group:** Common: I.T./O.T. **Budget Category:** 4220 **Funding Project Number:** 

Is this a Specific Project, Program or Blanket?

Blanket

Target Schedule - Start: 1/1/2024

In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Upgrade SAP S/4 1909 to 2209

Describe specific scope exclusions, assumptions and constraints: N/A

1360



Version 3.0 12/9/2022

N/A

#### **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

•

**CLICK HERE** 

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The S/4 1909 system will be out of support in 2025, prompting the need to upgrade in 2024 to the latest version, 2209

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Could potentially avoid customizations if the base product includes additional features that the company would like to implement.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which Strategic Objective does project most align with?

DOES NOT ALIGN WITH ANY STRATEGIC OBJECTIVE

Which Strategic Initiative does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

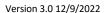
Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

No alternatives

Why was the proposed project scope chosen over other alternatives? N/A

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested? In order to continue to receive support from SAP, the product must be upgraded.

What are the risks and consequences of not completing this project? We will be out of support and no longer have SAP available to assist.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

Need to keep up to date with technology and functionality, reducing risks.

What other factor were considered during the prioritization process? Business prioritization and resource availability.

No



	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan						
	\$6,230,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	1,601,000		500,000	500,000	200,000	200,000	201,000	
Α	Stock Materials	1,090,000		223,000	299,000	179,000	179,000	210,000	
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	2,600,000		1,200,000	500,000	300,000	300,000	300,000	
Т	Overheads	470,000		200,000	100,000	50,000	60,000	60,000	
1	AFUDC*	469,000		200,000	100,000	50,000	59,000	60,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	6,230,000	0	2,323,000	1,499,000	779,000	798,000	831,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l i	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate	te): Medium Confidence
Cost estimate confidence is not ideal, so please indicate minimum and maximum	n estimates:  Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly unknown requirements on upgrades	← per estimate level, but may be
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how applicable cost estimating files as appropriate.  Historical costs adjusted	your cost estimate was derived. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covere	ed elsewhere in this form, you may add it here (optional):



Work Order #:

Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: SAP S4 Hana System Licenses

Budget Category: 4220 Funding Project Number: 4-4220-27-18

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 8/1/2025 In-Service: 10/1/2025

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

Common: I.T./O.T.

Renewal of SAP S/4 lincenses.

Describe specific scope exclusions, assumptions and constraints:

None



Version 3.0 12/9/2022

N/A

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:Maintain System StandardsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Resilience

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

The S/4 license end date in 2025 and we will need to renew the licenses in order to stay in compliance.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)
Limit out of compliance fees by keeping licenses up to date.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? DOES NOT ALIGN WITH ANY STRATEGIC OBJECTIVE

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





### C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

No alternatives

Why was the proposed project scope chosen over other alternatives? N/A

#### D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to continue to receive support from SAP, the licenses must be renewed

What are the risks and consequences of not completing this project?

We will be out of support and could be changed fees or being out of compliance

Was this project included in a prior 5-year forecast?

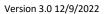
If No, why should this project be completed instead of a planned project?

Need to keep licensing up to date to keep SAP functionality

What other factor were considered during the prioritization process?

**Business prioritization** 

No





	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.						
	\$8,451,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years	
	Labor (Weekly Payroll)	0								
	Labor (Monthly Payroll)	0								
Α	Stock Materials	0								
D	Non-Stock Material (A/P taxable)	8,451,000			8,451,000					
D	Contractors (A/P tax exempt)	0								
.   T	Overheads	0								
1	AFUDC*	0								
0	Journal Vouchers (JVs)	0								
N S	CIAC Payments CREDIT	0								
3	Joint Utility Payments CREDIT	0								
	TOTAL ADDITIONS:	8,451,000	0	0	8,451,000	0	0	0	0	
	Labor (Weekly Payroll)	0								
E	Labor (Monthly Payroll)	0								
H	Contractors (A/P tax exempt)	0								
R	Overheads	0								
Е	Journal Vouchers (JVs)	0								
M	Salvage CREDIT	0								
E	CIAC Payments CREDIT	0								
T	Joint Utility Payments CREDIT	0								
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0	

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Conceptual Cost Estimate Confidence: (that final cost will be within +/-30% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: Reviewed last renewal and increased 10%	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. Y applicable cost estimating files as appropriate. Historic pricing adjusted	ou may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	add it here (optional):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: Submission Date: 2024

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Security Hardware Lifecycle/Replacements

Work Order #: **Budget Group:** Common: I.T./O.T. **Budget Category:** 4240 **Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Target Schedule - Start: 1/1/2025 In-Service: 12/1/2028 Blanket

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

Describe the project objective and scope of work:

This project was created to update/upgrade any security hardware that is coming to end of life and/or needs to be replaces to limit risks

Describe specific scope exclusions, assumptions and constraints:

Upgrades/replacement work will be contracted out



Version 3.0 12/9/2022

## **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Infrastructure; Safety; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This project was created to update/upgrade any security hardware that is coming to end of life and/or needs to be replaces to limit risks

#### Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

This project was created to update/upgrade any security hardware that is coming to end of life and/or needs to be replaces to limit Security risks, and increasing Safety

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve safety and security culture
Which <u>Strategic Initiative</u> does project most align with?
Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

## Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental (

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do nothing and not keep Security HW up to date, increasing secutiry/safety risks.

Why was the proposed project scope chosen over other alternatives? Safety is a corporate goal

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

We will need to update/upgrade aged technology to keep up to date and secure

What are the risks and consequences of not completing this project?

Increased security/safety risks - limited vendor support and/or non compliance for deployed hardware. Potential service disruptions.

Was this project included in a prior 5-year forecast? If No, why should this project be completed instead of a planned project? N/A

Yes

What other factor were considered during the prioritization process?

We need to reduce Safety/security Risks



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$2,722,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	299,000			25,000	50,000	87,000	87,000	50,000
Α	Stock Materials	0						0	
D	Non-Stock Material (A/P taxable)	2,190,000			175,000	350,000	375,000	440,000	850,000
D	Contractors (A/P tax exempt)	0					0	0	0
T T	Overheads	75,000			4,000	7,000	7,000	7,000	50,000
ı	AFUDC*	158,000			5,000	20,000	20,000	20,000	93,000
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,722,000	0	0	209,000	427,000	489,000	554,000	1,043,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l'	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Included in current PSC-approved budget plan under a PROGRAM	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  We don't know the scope of future upgrades at the moment	per estimate level, but may be overwritten if desired.
Basis for estimate: FOS-Generated Estimate; Historical Unit Pricing; Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derive applicable cost estimating files as appropriate. historic annual cost for HW upgrades/replacement	ed. You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you	may add it here (optional):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 Submission Date:

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

#### A. GENERAL

**Budget Group:** 

Project/Program Name: ServiceNow Upgrades & Enhancements - Ongoing Sprints

Program

Work Order #:

Common: I.T./O.T. Is this a Specific Project, Program or Blanket? **Budget Category:** 4220

**Funding Project Number:** Target Schedule - Start: 1/1/2024

In-Service: 12/1/2028

Please attach a list of the projects making up this Program including their associated cost estimates.

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

## Describe the project objective and scope of work:

Ongoing product enhancement, patching, workflow and catalog item improvements. Enables the management of technology leveraged by workforce to support customer needs.

## Describe specific scope exclusions, assumptions and constraints:

Work dependent on hiring of ServiceNow Admin.



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N/A

**B. JUSTIFICATION** 

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Productivity; Reliability; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

To ensure ServiceNow has the most recent security patches and and supported software versions.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No Environmental Component: Checklist is incomplete

Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete Sustainability status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Annual version upgrades are required to stay in support with the vendor.

Why was the proposed project scope chosen over other alternatives?

ServiceNow is part of the Technology parties long term strategy to modernize.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Each year there a two version updates required for Central Hudson to make.

What are the risks and consequences of not completing this project?

Possibility of losing support rights by not updating to current versions of ServiceNow.

Was this project included in a prior 5-year forecast?

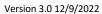
If No, why should this project be completed instead of a planned project?

We are limiting emergent buckets.

What other factor were considered during the prioritization process?

Other project Prioritization and resource constraints.

No





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan	All future year cost estimates should include applicable adjustments for inflation.					
	\$1,459,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	450,000		50,000	100,000	100,000	100,000	100,000	
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	650,000		50,000	150,000	150,000	150,000	150,000	
D	Contractors (A/P tax exempt)	200,000			50,000	50,000	50,000	50,000	
T.	Overheads	60,000			10,000	15,000	15,000	20,000	
1	AFUDC*	99,000		6,000	11,000	19,000	27,000	36,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,459,000	0	106,000	321,000	334,000	342,000	356,000	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H.	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Ongoing upgrades/updates, but we don't currently know detailed reuirements/functionality of future upgrades	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Historic annual cost spent	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	y add it here (optional):



Version 3.0 12/9/2022

May 1, 2023 First Year of 5-Year Budget Period: 2024 Submission Date:

**Submitted By:** Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

**Project/Program Name: SLA Improvements** 

Common: I.T./O.T.

Work Order #: **Budget Category:** 44

**Funding Project Number:** 

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2026 In-Service: 12/1/2029

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

## Describe the project objective and scope of work:

Inability to maximize grid mod efficiencies due to discontinuations of copper lines, slower protocols and lack of redundancies within Network. Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

## Describe specific scope exclusions, assumptions and constraints:

Extend usage of existing hardware after vendor support expires.



Version 3.0 12/9/2022

## **B. JUSTIFICATION**

**Growth/Sustaining/Retirement:** Load Based/Infrastructure: Infrastructure **Growth Sustaining** 

Maintain System Standards Discretion Level: **Investment Type:** Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Infrastructure Needs Assessment:

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Inability to maximize grid mod efficiencies due to discontinuations of copper lines, slower protocols and lack of redundancies within Network. Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document: **CLICK HERE** 

Which Strategic Theme does project most align with? **Business Modernization** 

Which Strategic Objective does project most align with? Improve productivity and efficiency Which <u>Strategic Initiative</u> does project most align with? **Business & Operations Modernization** 

Which **Team Goal** does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipalities (>1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

**Checklist Fully Completed: No** 

**Environmental Component:** Checklist is incomplete **Social Component: Governance Component:** 

Checklist is incomplete Checklist is incomplete

Is complete Sustainability status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Extend usage of existing hardware after vendor support expires.

#### Why was the proposed project scope chosen over other alternatives?

Alternatives were not a viable option. inability to maximize grid mod efficiencies due to discontinuations of copper lines, slower protocols and lack of redundancies within Network.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Inability to maximize grid mod efficiencies due to discontinuations of copper lines, slower protocols and lack of redundancies within Network. Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

What are the risks and consequences of not completing this project?

Inability to maximize grid mod efficiencies due to discontinuations of copper lines, slower protocols and lack of redundancies within Network.

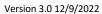
Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process? Business prioritization and resource availability.





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan							
	\$2,131,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	85,000				20,000	20,000	25,000	20,000
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,950,000				500,000	500,000	500,000	450,000
	Contractors (A/P tax exempt)	0							
Ϊ́Τ	Overheads	30,000				5,000	5,000	10,000	10,000
ı	AFUDC*	66,000				8,000	19,000	19,000	20,000
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	2,131,000	0	0	0	533,000	544,000	554,000	500,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
I¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Formulas give standard ranges

Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

No further estimate range is required.

No explanation on confidence level required.

Basis for estimate: Historical Unit Pricing; Historical Data + Job Specific Adjustments; Historical Proforma Pricing

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Historic pricing adjusted

**Cost Estimate Range:** 

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

**Project/Program Name: Substation Upgrades** 

Common: I.T./O.T. Budget Category: 44

44

**Funding Project Number:** 

Work Order #:

- |

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2024 In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

## Describe the project objective and scope of work:

Upgrade substations Networking to keep them up to date and eliminate risks. Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

## Describe specific scope exclusions, assumptions and constraints:

Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.





N/A



#### **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: Maintain System Standards Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Upgrade substations Networking to keep them up to date and eliminate risks

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Upgrade substations Networking to keep them up to date and eliminate risks

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve system performance and resilience

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

Local municipalities (>1)

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

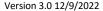
Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Extend usage of existing hardware after vendor support expires.

Why was the proposed project scope chosen over other alternatives?

Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Provides workforces the ability to support critical infrastructure that supports safe and reliable service for customers.

What are the risks and consequences of not completing this project?

Limited vendor support and/or non compliance for deployed hardware. Potential service disruptions.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

N/A

Yes

What other factor were considered during the prioritization process?

Business prioritization and resource availability



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan						
	\$3,635,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	214,000		9,000	20,000	50,000	35,000	50,000	50,000
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	0							
D	Contractors (A/P tax exempt)	2,900,000		400,000	1,000,000	1,000,000	100,000	200,000	200,000
.   T	Overheads	107,000			9,000	50,000	7,000	20,000	21,000
1	AFUDC*	414,000			100,000	180,000	10,000	62,000	62,000
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,635,000	0	409,000	1,129,000	1,280,000	152,000	332,000	333,000
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l i	Contractors (A/P tax exempt)	0							
R.	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E N	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  This estimate was created from historical costing with some adjustments	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing; Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You applicable cost estimating files as appropriate.  This estimate was created from historical costing with some adjustments	may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may ad	d it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: UN - Digital Circuit Mapping - Licenses and Upgrades Work Order #:

Budget Group: Common: I.T./O.T. Budget Category: 4220 Funding Project Number:

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 6/1/2024 In-Service: 12/1/2027

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

## Describe the project objective and scope of work:

In order to use the new electric utility network model, Central Hudson will have to upgrade the ArcGIS web environment servers and rebuild/remap all field based and back office mapping applications.

## Describe specific scope exclusions, assumptions and constraints:

Assumption: Proceed with electric UN migration and that it is completed.



Version 3.0 12/9/2022

No

**B. JUSTIFICATION** 

A FORTIS COMPANY

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

**Needs Assessment:** Productivity; Reliability; Risk Reduction; Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Being driven by ESRI sunsetting the ArcGIS ArcFM model.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Additional enhanced detail to facility mapping and model data available to the field crews and back office personnel.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

**CLICK HERE** 

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

#### ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

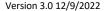
Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Alternative is to seek extended support from ESRI for the ArcGIS/ArcFM model and associated mapping software.

Why was the proposed project scope chosen over other alternatives?

To maintain vendor support and stay current with the other utility industry companies.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

Sunset date is February of 2026...https://support.esri.com/en-us/products/arcmap/lifecycle.

What are the risks and consequences of not completing this project?

Reduced or non availability for technical support for the company's ESRI GIS system.

Was this project included in a prior 5-year forecast?

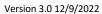
If No, why should this project be completed instead of a planned project?

Called out as a specific project, to be prioritized.

No

What other factor were considered during the prioritization process?

Business prioritization and resource availability.





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.				
	\$1,045,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	0							
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	1,045,000		475,000			570,000		
D	Contractors (A/P tax exempt)	0							
T.	Overheads	0							
1	AFUDC*	0							
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,045,000	0	475,000	0	0	570,000	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H.	Contractors (A/P tax exempt)	0							
R.	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$): Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost: historic cast with adjustments, but not sure the scope of the upgrades at this point	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Proforma Pricing; Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  Historic cast with adjustments.	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you may	y add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: UN - Estimating Design SBS AUD Upgrade & Enhancement Work Order #:

Specific

Funding Project Number:

- |

**Budget Group:** Common: I.T./O.T. Is this a Specific Project, Program or Blanket?

**Budget Category:** 

4220 Funding Proj Target Schedule - Start: 1/1/2025

025 In-Service: 12/1/2025

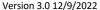
Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

This implementation will result in More accurate estimates for customer distribution work

Describe specific scope exclusions, assumptions and constraints: None.





No



## **B. JUSTIFICATION**

Load Based/Infrastructure: Infrastructure Growth/Sustaining/Retirement: Growth Sustaining

Discretion Level: System Enhancements Investment Type: Infrastructure

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

This implementation will result in More accurate estimates for customer distribution work

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.) increases customer satisfaction

For the following strategic alignment guestions, reference CHG&E's current Strategic Outlook document:

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Customer Experience: Improve customer experience

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

**CLICK HERE** 

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.





# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Do nothing and keep current system with ineffeciencies.

Why was the proposed project scope chosen over other alternatives? Need to improve system and processes.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested? Improve ineffecient processes and ncrease customer satisfaction.

What are the risks and consequences of not completing this project? Continuation of inefficient processes.

Was this project included in a prior 5-year forecast?
If No, why should this project be completed instead of a planned project?
Business priority.

What other factor were considered during the prioritization process? Business prioritization and resource availability.

No



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan			All future year cost estimates should include applicable adjustments for inflation.				
	\$535,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	200,000			200,000				
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	200,000			200,000				
D	Contractors (A/P tax exempt)	100,000			100,000				
'T	Overheads	15,000			15,000				
1	AFUDC*	20,000			20,000				
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	535,000	0	0	535,000	0	0	0	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



**Cost Estimate Range:** 

# **Budget Submittal Form**

Version 3.0 12/9/2022

**Budget Status:** Not included in current PSC-approved budget plan

Minimum (\$):

Cost Estimate Level: Preliminary

Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): High Confidence

428,000

No further estimate range is required.

Formulas give standard ranges

reper estimate level, but may be

overwritten if desired.

No explanation on confidence level required.

**Basis for estimate:** Historical Data + Job Specific Adjustments

For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. You may add link(s) to applicable cost estimating files as appropriate.

Maximum (\$):

642.000

historic casts with adjustments

## F. ADDITONAL INFORMATION

If there is any additional information that you would like to add that is not covered elsewhere in this form, you may add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: UN - Underground Network Management GIS Implementation

Specific

Work Order #:

-

Common: I.T./O.T.

Is this a Specific Project, Program or Blanket?

**Budget Category:** 

4220 Funding Project Number: Target Schedule - Start: 1/1/2027 In-Se

In-Service: 12/1/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

#### Describe the project objective and scope of work:

Model in detail Central Hudsons underground network systems. Will require digitization of the company's manhole and pull box CAD records.

## Describe specific scope exclusions, assumptions and constraints:

Assumption: electric model is migrated to ESRI utility network model Assumption: company requires the availability of these records within GIS.



Version 3.0 12/9/2022

No

## **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

**Needs Assessment:** Productivity; Reliability; Risk Reduction; Safety

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Will be a potential requirement for the future expansion of grid modernization to the company's underground network system.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Additional enhanced detail to facility mapping and model data available to the field crews and back office personnel.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Operational Excellence

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Digital Workplace: Digitization of existing business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Continue to maintain CAD and paper-based records.

Why was the proposed project scope chosen over other alternatives?

Would be a requirement for grid modernization to have this equipment modelled digitally in GIS.

## D. PRIORITIZATION

Why do we need to complete this project in the period requested?

In order to meet future grid modernization goals for the underground network sytems this period was chosen.

What are the risks and consequences of not completing this project?

Potential inability to model smart grid equipment and support company's intiatives for grid modernization

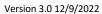
Was this project included in a prior 5-year forecast?

No
If No, why should this project be completed instead of a planned project?

Business priority

What other factor were considered during the prioritization process?

Business priority and resource availability





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the 5-year budget plan		All future year cost estimates should include applicable adjustments for inflation.					
	\$1,164,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	204,000					100,000	104,000	
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	600,000					300,000	300,000	
D	Contractors (A/P tax exempt)	200,000					100,000	100,000	
т Т	Overheads	70,000					30,000	40,000	
ı	AFUDC*	90,000					40,000	50,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,164,000	0	0	0	0	570,000	594,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
l¦	Contractors (A/P tax exempt)	0							
R	Overheads	0							
Е	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved by	oudget plan			
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be will	ithin +/-20% of the estimate):	Medium Confidence		
Cost estimate confidence is not ideal, so please indicat	te minimum and maximum estimate	es:	Formulas give standard ranges	
Cost Estimate Range: Minimum (\$):  Cost estimate confidence is not ideal, so please described to do a least to do			per estimate level, but may be overwritten if desired.	
Basis for estimate: FOS-Generated Estimate				
For your conceptual/preliminary estimate provide desc applicable cost estimating files as appropriate. historic costs adjusted	ription or details for how your cos	t estimate was derived. You	u may add link(s) to	
F. ADDITONAL INFORMATION				
If there is any additional information that you would like	e to add that is not covered elsewh	ere in this form, you may ac	dd it here (optional):	



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

**Budget Group:** 

Project/Program Name: ArcGIS Pro Upgrade and Enhancements

I Enhancements Work Order #: 4-4220-35

Budget Category: 4220 Funding Project Number: 4-4220-35

Is this a Specific Project, Program or Blanket? Specific Target Schedule - Start: 1/1/2024 In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

# Describe the project objective and scope of work:

Common: I.T./O.T.

Migrate to ESRI's new data model, ArcGIS Pro. This will include 3 phases, Gas, Electric, and Fiber. Central Hudson will require a third party vendor to assist in migrating the data from ArcGIS Desktop to the new data model. Setting up new servers and databases will be done by Central Hudson IT.

# Describe specific scope exclusions, assumptions and constraints:

Constraint: Applications currently integrated with ArcGIS Desktop may not be compatible with the ArcGIS Pro.



Version 3.0 12/9/2022

Yes

# **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

**Needs Assessment:** Productivity; Quality; Safety; Risk Reduction

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

ArcGIS desktop has reached the end of support and will require Central Hudson to migrate to AcrGIS Pro. If we do stay on the current version it could not only be a risk for the support of ArcGIS but other applications that integrate may stop supporting ArcGIS Desktop.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Leverage information and operating technologies

Which <u>Strategic Initiative</u> does project most align with? Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? PSC Gas Safety

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

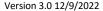
Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

## What other options were considered to the proposed project to meet the objective?

Stay on existing version with limited ability to support or resolve issues with GIS and integrated applications.

#### Why was the proposed project scope chosen over other alternatives?

ArcGIS is a foundational application we use. To not move to a supported new version of it we mean we have to change our strategy and a new application.

## D. PRIORITIZATION

## Why do we need to complete this project in the period requested?

ESRI will stop supporting ArcGIS Desktop in March of 2026.

# What are the risks and consequences of not completing this project?

If an issue arises and support ends, Central Hudson will no longer be able to have questions answered by ESRI, vulnerabilities may be left unpatched, incompatibilities may occur, and new functionality will not be added.

## Was this project included in a prior 5-year forecast?

No

## If No, why should this project be completed instead of a planned project?

newly identified project, Core application needed to ensure the modernization of out distribution grid, gas safety/compliance, gas transformation in alignment with NYS regulatory updates.

What other factor were considered during the prioritization process? Regulatory updates.



# E. COST ESTIMATE

	Capital Estimate Summary		ar 1 = 1st year of the All future year cost estimates should include applicable adjustments for inflation.						
	\$3,362,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	500,000		100,000	200,000	200,000			
Α	Stock Materials	0							
D	Non-Stock Material (A/P taxable)	2,000,000		400,000	800,000	800,000			
D	Contractors (A/P tax exempt)	500,000		100,000	200,000	200,000			
	Overheads	84,000		10,000	37,000	37,000			
1	AFUDC*	278,000		24,000	100,000	154,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	3,362,000	0	634,000	1,337,000	1,391,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
H	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
N	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Havent gathered all requirements/scope to be able to have higher confidence	per estimate level, but may be overwritten if desired.
Basis for estimate: FOS-Generated Estimate; Historical Data + Job Specific Adjustments	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. Historic pricing	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ny add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Warehouse Labeling, Hardware, and Barcoding

Work Order #:

- 1

**Budget Group:** Common: I.T./O.T. Is this a Specific Project, Program or Blanket?

**Budget Category:** 4220

Specific

Funding Project Number: Target Schedule - Start: 1/1/2026 In-Se

In-Service: 12/1/2026

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

# Describe the project objective and scope of work:

Project scope includes the labeling and hardware procurement for the Eltings Corner store room. Organizing and optimizing the warehouse, indentifying and selecting the right labels and their locations, procuring hardware, testing the hardware, designing the database for printing the labels, and training are included in this phase. The barcoding phase will also include requirements to document the process, lab test the printers, labels and devices, write test scripts for testing, load the master data, and user and integration testing for the MMS system.

# Describe specific scope exclusions, assumptions and constraints:

Constraints - Need proper Wifi Coverage and weather conditions for labeling outdoor areas

Assumptions - CH Team will need to manage the labeling Team, build interface to MMS, supervise and apply labels and designate a Project Manager to be the primary point of contact.



Version 3.0 12/9/2022

N/A

# **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Not ApplicableDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Enhancement Is there an Innovation Component? No

Needs Assessment: Productivity; Quality

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Implementing warehouse barcoding will eliminate the manual counting for stock movements. This will minimize human error and provide accruate data in real-time to improve efficiency.

Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

See BCA tab in Cost Estimate & Benefits - Cost Analysis Template

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with?

DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Transformation: New systems / Enhancements that enable NEW business processes

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

# ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

Checklist Fully Completed: No E

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete **Sustainability** status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective? Only one vendor has been identified.

#### Why was the proposed project scope chosen over other alternatives?

Implementing warehouse barcoding in the main warehouse first will allow us to document lessons learned. Documenting the lessons learned will assist with estimates and more seemless roll out of the 8 other district store rooms.

## D. PRIORITIZATION

## Why do we need to complete this project in the period requested?

There will be an immediate cost savings by implementing this solution sooner than later.

# What are the risks and consequences of not completing this project?

Completing the labeling and barcoding project prior to the EWAM implementation allows Supply Chain to become proficient with the barcoding functionality from a change management perspective and should result in realizing efficiency and productivity savings sufficient to justify the project.

Was this project included in a prior 5-year forecast?

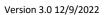
If No, why should this project be completed instead of a planned project?

Will be in 2024 Rate Case.

What other factor were considered during the prioritization process?

Time, Resources, Urgency and business prioritization.

No





# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1st year of the All future year cost estimates should include applicable adjustments for inflation.							
	\$1,224,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0	,			0			
	Labor (Monthly Payroll)	530,000				530,000			
Α	Stock Materials	204,000				204,000			
D	Non-Stock Material (A/P taxable)	435,000				435,000			
D	Contractors (A/P tax exempt)	0							
·	Overheads	0							
1	AFUDC*	55,000				55,000			
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,224,000	0	0	0	1,224,000	0	0	0
R	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
T	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0
	* AFUDC may require adjustment after Finance Departn								
	Expense \$ (if applicable):	0							
	Current Approved Rate Case Funding (\$):	0	0	0					

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Medium Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Preliminary cost for a project scheduled for 3 years from now	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Proforma Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate. used historical estimates from similar projects	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	ay add it here (optional):



Version 3.0 12/9/2022

Submission Date: May 1, 2023 First Year of 5-Year Budget Period: 2024

Submitted By: Doug Ondreyko Current Life-Cycle Phase: 1 Planning

A. GENERAL

Project/Program Name: Workday Upgrades and Enhancements

Specific

Work Order #: Funding Project Number:

10184

**Budget Group:** Common: I.T./O.T. Is this a Specific Project, Program or Blanket?

**Budget Category:** 4220

Target Schedule - Start: 1/1/2026

**In-Service**: 12/31/2028

Indicate and summarize any other work orders associated with the overall project, including those of other budget categories:

# Describe the project objective and scope of work:

Upgrade and Enhance Workday to keep the functionality and version as current as possible.

# Describe specific scope exclusions, assumptions and constraints:

Ongoing upgrades and enhancements to keep Workday up to date.



Version 3.0 12/9/2022

## **B. JUSTIFICATION**

Load Based/Infrastructure:OtherGrowth/Sustaining/Retirement:Growth SustainingDiscretion Level:System EnhancementsInvestment Type:Daily Operations

Technology Investment Type (CATS-4220, 4222, 4230, 4235, 44): Foundational - Upgrade Is there an Innovation Component? No

Needs Assessment: Infrastructure

If need is Safety, Regulatory or Compliance have we considered options, validated the need and challenged the value?

N/A

Describe the justification for this project. Include attachments or links to planning studies if applicable:

Keeping Workday up to date will assist with hiring and retaining employees and reducing turnover costs. Upgrading technology will also reduce cyber risks associated with aged technology.

## Describe any quantifiable benefits (such as monetary benefits/business case, operational cost savings, cost avoidance, etc.)

Keeping Workday up to date will assist with hiring and retaining employees and reducing turnover costs. Upgrading technology will also reduce cyber risks associated with aged technology.

For the following strategic alignment questions, reference CHG&E's current Strategic Outlook document: CLICK HERE

Which <u>Strategic Theme</u> does project most align with? Business Modernization

Which <u>Strategic Objective</u> does project most align with? Improve productivity and efficiency
Which <u>Strategic Initiative</u> does project most align with?

Business & Operations Modernization

Which <u>Team Goal</u> does project most align with? DOES NOT ALIGN WITH ANY TEAM GOAL

Technology Strategic Alignment (CATS-4220, 4222, 4230, 4235, 44) Sustainment: Upgrade / Optimization of existing systems

Have you taken into account potential environmental impacts that would need to be considered for cost and schedule estimates N/A

\* Environmental impacts must be taken into consideration to the extent that you are able considering current phase, maturity of scope and knowledge of field conditions.

Do you anticipate the project to require significant jurisdictional approvals?

## ESG (Environmental, Social and Governance) and Sustainability:

Complete the ESG Checklist on the separate worksheet (tab). Results of your answers will be automatically shown below:

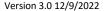
Checklist Fully Completed: No

Environmental Component: Checklist is incomplete
Social Component: Checklist is incomplete
Governance Component: Checklist is incomplete

Is complete <u>Sustainability</u> status achieved by this project?\*

\* Sustainability status is achieved for the project if the ESG checklist shows that there is at least one component each for environmental, social and governance.







# C. ALTERNATIVES

What other options were considered to the proposed project to meet the objective?

Do nothing, Workday platform remains I static current state and does not evolve as business needs change.

Why was the proposed project scope chosen over other alternatives?

We don't want to risk ineffeciencies or cyber risks.

# D. PRIORITIZATION

Why do we need to complete this project in the period requested?

To keep the workday platform up to date with vulnerabilities and functionality.

What are the risks and consequences of not completing this project?

Workday platform remains in static current state and does not evolve as business needs change. We don't want to risk ineffeciencies or cyber risks.

Was this project included in a prior 5-year forecast?

If No, why should this project be completed instead of a planned project?

This project was a part of Emergent bucket, but is now specifially called out.

What other factor were considered during the prioritization process?

Business prioritization and urgency, along with IT input on Technical Debt.

Yes



# E. COST ESTIMATE

	Capital Estimate Summary	Year 1 = 1s 5-year bu	t year of the Idget plan			ar cost estimates sh ble adjustments for i			
	\$1,032,000	TOTAL	Prior Years Actuals + Projections	Year 1 2024	Year 2 2025	Year 3 2026	Year 4 2027	Year 5 2028	Future Years
	Labor (Weekly Payroll)	0							
	Labor (Monthly Payroll)	162,000				50,000	50,000	62,000	
Α	Stock Materials	42,000				14,000	14,000	14,000	
D	Non-Stock Material (A/P taxable)	600,000				200,000	200,000	200,000	
D	Contractors (A/P tax exempt)	150,000				50,000	50,000	50,000	
l <del>'</del>	Overheads	39,000				10,000	14,000	15,000	
1	AFUDC*	39,000				10,000	14,000	15,000	
0	Journal Vouchers (JVs)	0							
N S	CIAC Payments CREDIT	0							
3	Joint Utility Payments CREDIT	0							
	TOTAL ADDITIONS:	1,032,000	0	0	0	334,000	342,000	356,000	0
	Labor (Weekly Payroll)	0							
E	Labor (Monthly Payroll)	0							
	Contractors (A/P tax exempt)	0							
R	Overheads	0							
E	Journal Vouchers (JVs)	0							
M	Salvage CREDIT	0							
E	CIAC Payments CREDIT	0							
T	Joint Utility Payments CREDIT	0							
S	TOTAL REMOVALS:	0	0	0	0	0	0	0	0

\* AFUDC may require adjustment after Finance Department review.

Expense \$ (if applicable): 0

Current Approved Rate Case Funding (\$): 0

2021-2023 2024

Prior years funding; not actuals.



Version 3.0 12/9/2022

Budget Status: Not included in current PSC-approved budget plan	
Cost Estimate Level: Preliminary Cost Estimate Confidence: (that final cost will be within +/-20% of the estimate): Low Confidence	
Cost estimate confidence is not ideal, so please indicate minimum and maximum estimates:	Formulas give standard ranges
Cost Estimate Range: Minimum (\$): Maximum (\$):  Cost estimate confidence is not ideal, so please describe the risks that could significantly impact cost:  Not sure of future upgrade scope, but know there will ne to be updates to the Workday platform.	per estimate level, but may be overwritten if desired.
Basis for estimate: Historical Unit Pricing	
For your conceptual/preliminary estimate provide description or details for how your cost estimate was derived. applicable cost estimating files as appropriate.  We based the estimate on previous upgrades and enhancements to the system.	You may add link(s) to
F. ADDITONAL INFORMATION	
If there is any additional information that you would like to add that is not covered elsewhere in this form, you ma	y add it here (optional):

# **DETAIL SCHEDULES 2024-2028 FORECAST**

ELECTRIC ADDITION	S			v	V/ AFUDC. Inflate	d & OH Adjustme	ents	
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Production	Dashville Rubber Gate Replacement & Headgates	Maintain System Standards	1,903	2023	2020	2027	2020	1,903
Electric Production	Dashvile Concrete Reinforcement on Spillway	Maintain System Standards	409			-		409
Electric Production Electric Production	Dashville Pond Control System	System Enhancements System Enhancements	104	-	108	-	-	104 108
Electric Production	Dashville Staircase to Bottom Door Dashville Walkway over Tailrace	System Enhancements System Enhancements	-	-	164	-		164
Electric Production	High Falls Concrete Cap Replacement	Maintain System Standards			-			-
Electric Production Electric Production	High Falls Trash Rake Upgrade Sturgeon Pool Dam Camera System	System Enhancements System Enhancements	356 664	-	-	-		356 664
Electric Production	Dashville Major Overhaul #1	Maintain System Standards	523	4,583				5,106
Electric Production	Dashville Major Overhaul #2	Maintain System Standards	26	537	4,713	-	-	5,276
Electric Production Electric Production	Dashville Facility Camera System Hydro SCADA - New Com Link	System Enhancements  Maintain System Standards	-	521 155	-	-		521 155
Electric Production	Sturgeon Pool Remote Start	System Enhancements	-	39	31	1,145	-	1,214
Electric Production	High Falls Rubber Sluice Gate	Maintain System Standards	-			-	-	-
Electric Production	Dashville Remote Start Sturgeon Pool Tailrace Gates	System Enhancements System Enhancements			- :	85	471	555
Electric Production	Sturgeon Pool Southern Wall Foundation Reinforcement	Maintain System Standards	-	-	-	1,105	-	1,105
Electric Production	Sturgeon Pool Replace Toe of Dam	Maintain System Standards	-		-		1,150	1,150
Electric Production	Sturgeon Pool Relay Protection / Breakers High Falls Facility Camera System	Maintain System Standards System Enhancements			- :	981	690 999	1,670
Electric Production	Sturgeon Pool Window Replacements	Maintain System Standards	-	-	-	-	-	-
Electric Production	Sturgeon Pool Retaining Wall Penstock	Maintain System Standards	-			-	1,691	1,691
Electric Production Electric Production	Upgrade Excitation Systems at all Sites  Missellaneous Misse Hudes projects	Maintain System Standards	- 63	161	162	218	334 226	334 831
Electric Production	Miscellaneous Minor Hydro projects  Emergent Projects	Maintain System Standards Maintain System Standards	319	-	- 102	-	- 220	319
Electric Production	Retirement of S. Cairo	Non Discretionary		211				211
Electric Production	Retirement of Coxsackie	Non Discretionary	-	211	-	-		211
Electric Production	Subtotal - Electric Production		4,367	6,417	5,178	3,533	5,560	25,055
Electric Transmission	High Priority Replacements (Various)	Non Discretionary	5,302	5,493	5,748	5,836	6,112	28,491
Electric Transmission	FV Line Indian Lake Crossing - Eversource	Non Discretionary	100	2,547	-	-		2,648
Electric Transmission Electric Transmission	115kV DW Line - West Balmville WN / 4012 Underbuild Transmission Minor Projects	Non Discretionary Non Discretionary	196	64 204	1,741 213	217	227	1,805 1,056
Electric Transmission	Electric Transmission Structure Coating Program	Maintain System Standards	1,501	1,561	1,635	2,124	1,432	8,253
Electric Transmission	MG and GK Line 115kV Upgrade ( Modena - Kerhonkson)	Maintain System Standards	421	-	-	-		421
Electric Transmission	FK Line 115kv Upgrade (Kerhonkson - High Falls)	Maintain System Standards	963			-		963
Electric Transmission Electric Transmission	P Line 115kV Upgrade (High Falls - Sturgeon Pool)  ROW Repair Project (Deficiencies)	Maintain System Standards Maintain System Standards	390 400	416	435	442	463	390 2,156
Electric Transmission	Honk Falls Substation Tie-in (Kerhonkson Autotransformers)	Maintain System Standards	-	-		-	-	
Electric Transmission	ACSR Conductor Replacement Program, FV - Part 102C	Maintain System Standards						
Electric Transmission Electric Transmission	Knapps Corners Substation Tie-in (115kV KB & SK Lines)  Trap Rock Substation Tie-in and TR Line retirement	Maintain System Standards Maintain System Standards	-	-	-	959		959
Electric Transmission	69kV KM Line Rebuild - Knapps to Myers - 102C	Maintain System Standards	2,879	-	-	-	-	2,879
Electric Transmission	SB Line: New 115kV Line - Hurley Ave. to Saugerties - Article VII: 11.11 miles	Maintain System Standards	9,260				-	9,260
Electric Transmission Electric Transmission	H Line: New 115kV Line - Saugerties to N.Catskill - Article VII: 12.25 miles	Maintain System Standards	8,497 250	12,477 4,991	3,587 11,968	12,152	7,017	24,562 36,378
Flectric Transmission	HG Line: New 69kV Line - Honk FallIs to Neversink - Part 102C  Retirement of O & OB Line Section from Dashville Tap to Ohioville	Maintain System Standards Maintain System Standards	250	4,991	11,900	12,152	7,017	30,370
Electric Transmission	Q Line: New 115kV Line - Pleasant Valley - Rhinebeck	Maintain System Standards	600	624	1,088	8,838	17,353	28,503
Electric Transmission	Removal of SD / SJ and WM Tap Lines	Maintain System Standards	-	-	-	-	- :	-
Electric Transmission Electric Transmission	69kV GM Line: Retirement of Clinton Avenue Tap Section 115kV SK Line Rebuild	Maintain System Standards Maintain System Standards	-	-	109	221	231	561
Electric Transmission	115kV 5 Line Rebuild	Maintain System Standards	250	416	2,538	5,524	-	8,728
Electric Transmission	115kV CN Line Rebuild	System Enhancements						
Electric Transmission	NW Line 345/115/69 Station Connection & 1.2 Mile NW Line 115kV Rebuild	System Enhancements	-	-	-	-		-
Electric Transmission	Subtotal - Electric Transmission		31,010	28,794	29,063	36,312	32,835	158,013
Electric Substation	Substation Minor Projects (1-1311-00-18)	Non Discretionary	560	559	575	596	595	2,885
Electric Substation	Substation Battery Replacement Program (1-1312-05-18)	Maintain System Standards	100	203	105	217	108	732
Electric Substation Electric Substation	Greenfield Rd Substation Upgrade (Reuse Kerhonkson & Modena Transformers) (1-1312-99-19)  Bethlehem Road - UB Line Relay Upgrade & Breaker Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards	1,009 809	- :	-			1,009
Electric Substation	Union Avenue - UB Line Relay Upgrade (1-1312-99-19)	Maintain System Standards	151	-	-	-	-	151
Electric Substation	Rock Tavern - 345 kV Disconnect Replacement (RTB-4483 & RTB-31194) (1-1312-99-19)	Maintain System Standards	199		-		-	199
Electric Substation Electric Substation	New Baltimore Upgrade (New 12MVA Transformer, relays, and 15kV breakers) (1-1312-99-19) Lincoln Park - Relay Upgrade & BRP (115 kV - LR-1219-HP, HP-1318) (1-1312-99-19)	Maintain System Standards Maintain System Standards	3,051 604	- :	-			3,051 604
					-	-	-	202
Electric Substation	Forgebrook 115kV Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	202					222
Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP	Maintain System Standards	222	-	-	-		
Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP Terminal Upgrade Work for 115kV Loop (High Falls) (1-1312-99-19)	Maintain System Standards Maintain System Standards	222 126		-	-	-	126
Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards Maintain System Standards	222	-	-	-		126 126
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108	-	-	-	-	126 126 2,024 7,108
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1659) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117		- - - - - 157		-	126 126 2,024 7,108 2,117
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP Terminal Uparade Work for 1154V Loop (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Cossackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649	- - - - - - - 5,077	- - - - - - 157	-		126 126 2,024 7,108 2,117 1,806
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP Terminal Uparade Work for 1154V Loon (High Falls) (1-1312-99-19) P Line Moved to 115kV Bis (Sturgeon Pool) (1-1312-99-19) Cossackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Battimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Millian PLC Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117	914	- - - - - - 157	-		126 126 2,024 7,108 2,117 1,806 6,077 914
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1659) (1-1312-99-19) BRP     Terminal Uparade Work for 1154V Loop (High Falls) (1-1312-99-19)     P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19)     Cossackie - DeC Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19)     South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19)     New Baltimore (FMA Freehold - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19)     Wilsin PLO - Regulation Project (D-VAR Only) (1-1312-99-19)     Milan PLC Replacement (1-1312-99-19)     Milan PLC Replacement (1-1312-99-19)     Fishkil Plains Reak Updrade (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000	914 609	- - - - - 157 - -			126 2,024 7,108 2,117 1,806 6,077 914
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP Terminal Uparade Work for 1154V Loco (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Cossackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehodd) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Missiphook Transformer (1-1312-99-19) Fishkill Palins Relaw Uparade (1-1312-99-19) Fishkill Palins Relaw Uparade (1-1312-99-19) Sand Dock - Add Breaker For Tilcon (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649	914	- - - - - 157 - - -	-	-	126 126 2,024 7,108 2,117 1,806 6,077 914 609
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP Terminal Uparade Work for 1154V Loco (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (IO-WAR & Transformer) (1-1312-99-19) New Battimore (FKA Freehold) - DEC Peaker Regulation Project (IO-WAR Only) (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Fishkill Plains Relay Upgrade (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Tion (1-1312-99-19) Highland Relay Upgrade (1-1312-99-19) ESPIP Highland Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000	914 609 812 183 162	- - - - - - 157 - - - -	-		126 2,024 7,108 2,117 1,806 6,077 914 600 833 183
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP Terminal Upgrade Work for 1154V Loop (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Cossackie - DEC Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold - DEC Peaker Regulation Project (D-WAR Only) (1-1312-99-19) Grid Mot - Multiple Substations (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Fishkill Planis Relaw Upgrade (1-1312-99-19) Sand Dock - Add Breaker For Ticon (1-1312-99-19) Highand Relay Upgrade (1-1312-99-19) ESPIP Miller On Relay Upgrade (1-1312-99-19) Miller Relay Upgrade (1-1312-99-19) ESPIP Miller Relay Upgrade (1-1312-99-19) ESPIP Miller Todd Hill Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000	914 609 812 183 162 264		-		126 126 2,024 7,106 2,117 1,806 6,077 914 609 833 183 162 264
Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP     Terminal Uparade Work for 1154V Looc (High Falls) (1-1312-99-19)     P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19)     Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19)     South Cairo - DEC Peaker Regulation Project (IO-VAR & Transformer) (1-1312-99-19)     South Cairo - DEC Peaker Regulation Project (IO-VAR & Transformer) (1-1312-99-19)     South Cairo - DEC Peaker Regulation Project (IO-VAR Only) (1-1312-99-19)     Grid Mod - Multiple Substations (1-1312-99-19)     Maybrook Transformer Upgrades (1-1312-99-19)     Maybrook Transformer Upgrades (1-1312-99-19)     Fishkill Plains Relay Upgrade (1-1312-99-19)     SSPIP     Sand Dock - Add Breaker For Titon (1-1312-99-19)     Highland Relay Upgrade (1-1312-99-19)     SSPIP     Todd Hill Relay Upgrade (1-1312-99-19)     ESPIP     Todd Hill Relay Upgrade (1-1312-99-19)     Todd Hill Relay Upgrade (1-1312-99-19)     ESPIP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000	914 609 812 183 162 264 305	- - - - - 157 - - - - - -	-	-	126 2,024 7,108 2,117 1,806 6,077 914 608 833 183 162 264 305
Electric Substation Electric Substation	South Cairo (15 kV - W-1659) (1-1312-99-19) BRP Terminal Upgrade Work for 1154V Loop (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Cousackie - DEC Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold) - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold) - DEC Peaker Regulation Project (D-WAR Only) (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Bilan PLC Replacement (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Titcon (1-1312-99-19) Hijhalnd Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000	914 609 812 183 162 264 305 366		-	-	126 2,024 7,106 2,111 1,806 6,077 914 605 833 183 162 264 300
Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP Terminal Upgrade Work for 1154V Loop (High Falls) (1-1312-99-19) P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19) Cossackie- DEC Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold) - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold) - DEC Peaker Regulation Project (D-WAR & Only) (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Ticon (1-1312-99-19) Highland Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) Hibernia (98 VV - 5-972) (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223		-	-	126 2.024 7,106 2,117 1,806 6,077 914 6009 833 183 166 264 305 306 306 2,032
Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203				126 2,024 7,108 2,117 1,800 6,077 914 600 833 163 264 306 2,032 223 203
Electric Substation Electric Substation	South Cairo (15 KV - W-1658) (1-1312-99-19) BRP Terminal Upgrade Work for 115KV Loop (High Falls) (1-1312-99-19) P Line Moved to 115KV Bus (Sturgeon Pool) (1-1312-99-19) Coussackie - DEC Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-WAR & Transformer) (1-1312-99-19) New Baltimore (FMA Freehold - DEC Peaker Regulation Project (D-WAR & Only) (1-1312-99-19) New Baltimore (FMA Freehold - DEC Peaker Regulation Project (D-WAR & Only) (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Tiacon (1-1312-99-19) Highland Relay Upgrade (1-1312-99-19) ESPIP Miller Only Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Walden Relay Upgrade (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) ESPIP East Kingston PLC Replacement (1-1312-99-19) Hibernia (69 kV - E-972) (1-1312-99-19) ESPIP Reynods Hill (15 kV - TD-6001, TD-6005) - Evaluate Switcheaer Purchase (1-1312-99-19) BRP Reversink (15 kV - W-1128, CK-7391) (1-1312-99-19) BRP Reversink (15 kV - W-1128, CK-7391) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203 203				126 2,024 7,106 2,117 1,806 6,077 914 608 833 188 166 266 2,033 2,033 2,23 2,03 2,03
Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203			-	126 2,024 7,108 2,1117 1,806 6,077 914 6,093 833 183 162 2,64 3,05 3,66 2,032 2,23 2,23 2,23 2,23 2,23
Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203 203 1,015	-		-	1262 1262 1262 1262 1262 1262 1262 1262
Electric Substation Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP     Terminal Upgrade Work for 115kV Loop (High Falls) (1-1312-99-19)     P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19)     Cossackie- DCE Peaker Regulation Project (Tarnsformer Only) (1-1312-99-19)     South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19)     New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19)     New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19)     Grid Mor - Multiple Substations (1-1312-99-19)     Milan PLC Replacement (1-1312-99-19)   ESPIP     Sand Dock - Add Breaker For Ticon (1-1312-99-19)   ESPIP     Fishkill Plains Relav Upgrade (1-1312-99-19)   ESPIP     Millerton Relav Upgrade (1-1312-99-19)   ESPIP     Fold Hill Relav Upgrade (1-1312-99-19)   ESPIP     East Walden Relav Upgrade (1-1312-99-19)   ESPIP     East Kingston PLC Replacement (1-1312-99-19)   ESPIP     East Kingston PLC Replacement (1-1312-99-19)   ESPIP     East Kingston PLC Replacement (1-1312-99-19)   ESPIP     Reynods Hill (15 kV - T-D-6001, TD-6005) - Evaluate Switchpear Purchase (1-1312-99-19) BRP     Reversink (15 kV - W-1128, CK-7391) (1-1312-99-19) BRP     Mobile Switchpear (1-1312-99-19) BRP     Mobile Switchpear (1-1312-99-19)     South Wall Street - Retire Substation (1-1312-99-19)     South Wall Street - Retire Substation (1-1312-99-19)     Montpomery St. 14kV Switchpear (1-1312-99-19)	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203 203	- - - - - - - - - - - - - - - - - - -		-	1262 2,024 7,108 7,108 7,108 7,108 7,108 1833 1833 1833 1833 1826 264 264 2032 2033 1,015
Electric Substation Electric Substation	South Cairo (15 kV - W-1689) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards	222 126 126 2,024 7,108 2,117 1,649 1,000 - - - 21	914 609 812 183 162 264 305 366 1,929 223 203 203 1,015	-		-	1262 1262 1262 1262 1262 1262 1262 1262

ELECTRIC ADDITION	S			W	V/ AELIDO Inflato	1 8 OH Adjustma	ento	
ELLOTRIC ADDITION				v	V/ APODC, IIIIale	a on Aujustine	HIES	
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Substation	Hunter Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards			105	-		105
Electric Substation	Neversink Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards			167	-		167
Electric Substation Electric Substation	Wiccopee Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	1,226	-	418	-	-	1,226 418
Electric Substation	Sturgeon Pool 4kV Relay Upgrade (1-1312-99-19) ESPIP North Chelsea PLC Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards	-		837			837
Electric Substation	Sturgeon Pool (15 kV - OS-1, OS-2, OS-3) (1-1312-99-19) BRP	Maintain System Standards			357			357
Electric Substation Electric Substation	Pulvers T#1 69-13.8kV Replacement(1-1312-99-19)  Myers Corners Switchgear Upgrade & 69kV Breaker TV-399-KM Repl (1-1312-99-19)	Maintain System Standards Maintain System Standards	-	203 102	2,196 3,137	-		2,399 3,239
Electric Substation	Balmville - Retire Substation (1-1312-99-19)	Retirement	- :	- 102	3,137			-
Electric Substation	Smithfield Relay Modernization (1-1312-99-19)	Maintain System Standards		-	105	1,976	-	2,081
Electric Substation Electric Substation	Sand Dock Relay Upgrade (1-1312-99-19) ESPIP Staatsburg BM85 RTU Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards			105	974 650		1,079 650
Electric Substation	Merritt Park PLC Replacement (1-1312-99-19)	Maintain System Standards	-	-		1,083		1,083
Electric Substation Electric Substation	Sand Dock (15 kV - 10 Breakers) (1-1312-99-19) BRP Tioronda (15 kV - W-567, TD-8085, TD-8086, TD-8087) (1-1312-99-19) BRP	Maintain System Standards	-	-	-	1,083 476	-	1,083 476
Electric Substation	Converse Street Relay Upgrade, Switchgear, Transformer, RTU Replacements (1-1312-99-19)	Maintain System Standards Maintain System Standards	- :		209	2.111		2.321
Electric Substation	Shenandoah Relay Upgrade, BRP (15 kV - 25 Breakers) (1-1312-99-19)	Maintain System Standards		609	1,882	4,072		6,564
Electric Substation	Ancram Replacement from EC Spare, Replace EC Spare (1 Phase 34.5/13.8kV) (1-1312-99-19) Smithfield Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards			837	2,274	866	3,110 866
Electric Substation	Westerlo BM85 RTU Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards			-		541	541
Electric Substation	Spackenkill PLC Replacement (1-1312-99-19)	Maintain System Standards		-	-		887	887
Electric Substation Electric Substation	Galeville PLC Replacement (1-1312-99-19) Saugerties PLC Replacement (1-1312-99-19)	Maintain System Standards				108	974 1.082	1,082 1.082
Electric Substation	Hurley Avenue (15 kV - W-252, W-1575, CKT-2091, CKT-2092, CKT-2093, CKT-2094) (1-1312-99-19) BRP	Maintain System Standards Maintain System Standards				-	509	509
Electric Substation	Tioronda Switchgear Replacement (1-1312-99-19)	Maintain System Standards		-	-	108	2,164	2,273
Electric Substation Electric Substation	Jansen Avenue Substation Upgrade, GE Harris RTU Replacement, BRP (15 kV - 9 Breakers) (1-1312-99-19) Hurley Avenue - 115-13.8 kV 13.4/17.9/22.4 MVA Transformer & Switchgear (1-1312-99-19)	Maintain System Standards Maintain System Standards	-	-	-	108	3,046 2,164	3,155 2,164
Electric Substation	Rock Tavern 115 kV Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards  Maintain System Standards	- :			-	216	216
Electric Substation	345kV Switch Replacement Program (1-1312-98-19)	Maintain System Standards	507	508	523	541	541	2,621
Electric Substation Electric Substation	115kV Switch Replacement Program (1-1312-98-19) Pot Heads - East (1-1312-98-19)	Maintain System Standards Maintain System Standards	106 634	812	837	866	866	3,487 634
Electric Substation	Kerhonkson 115/69kV Autotransformers Phase 2 (1 - 56MVA) (Remove 61850) (1-1312-98-19)	Maintain System Standards	1,525	-	-	-	-	1,525
Electric Substation	Rock Tavern 345kV 311 Line A2 Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	242	-	-		-	242
Electric Substation Electric Substation	Roseton 345kV 311 Line A2 Relay Upgrade (1-1312-98-19) ESPIP Hurley Ave. 345kV Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards Maintain System Standards	242		1,046	-		242 1,046
Electric Substation	Rock Tavern 345kV Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	-	-	-	2,382	595	2,977
Electric Substation	Pleasant Valley 115kV Modernization (Package Sub & Relays) (1-1312-98-19)	Maintain System Standards	-	-	-	541	4,329	4,870
Electric Substation Electric Substation	Roseton 345kV Relay Upgrade (1-1312-98-19) ESPIP Woodstock - Switchgear Replacement (1-1312-31-15)	Maintain System Standards Maintain System Standards	103	3,046	- :	108	3,247	3,355 3,149
Electric Substation	Modena - Add 3rd Bkr to Complete 115kV Ring Bus (see P&MK memo) (1-1312-52-17)	Maintain System Standards	402	1,199	1,569			3,170
Electric Substation	Tilcon - Tap Station (1-1312-52-16)	System Enhancements	62	508	3,137	2,599	-	6,305
Electric Substation	Subtotal - Electric Substation		26,230	20,219	22,589	22,874	22,731	114,644
Electric New Business	New Business	Non Discretionary	2,704	3,082	3,430	2,590	2,856	14,662
Electric New Business Electric New Business	Bellefield PharmaCann	Non Discretionary Non Discretionary	1,550 1,033	373	-	-		1,923 1,033
Electric New Business	Cresco	Non Discretionary		852				852
Electric New Business	Hudson Heritage	Non Discretionary	517	319	-	-		836
Electric New Business Electric New Business	Coeymans Industrial Park Unidentified warehouse, production	Non Discretionary Non Discretionary	517	1,065 852	1,625 1,625	4,410	4,498	2,690 11,903
Electric New Business	ELEC. N.B. OVERHEAD - BLANKET	Non Discretionary	5,313	5,641	5,913	6,197	6,510	29.574
Electric New Business Electric New Business	ELEC. & GAS COMB. URD - BLANKET ELEC. URD - BLANKET	Non Discretionary	567 487	602 516	631 542	661 568	695 597	3,155 2,710
Electric New Business	ELEC. URD - BLANKET	Non Discretionary	407	510	542	300	597	2,710
Electric New Business	Subtotal - Electric New Business		12,688	13,301	13,766	14,426	15,156	69,338
Electric Distribution	Distribution Improvement Blankets (15BL-01)	Maintain System Standards	7,204	7,333	7,501	7,646	7,799	37,483
Electric Distribution Electric Distribution	Relocation Blankets (15BL-02) Distribution Improvement Minors (1511-0X)	Non Discretionary Maintain System Standards	216 58	220 59	225 60	229 61	234 62	1,124 300
Electric Distribution	Distribution Improvement Conversions (1521-0X)	Maintain System Standards	333	339	347	354	361	1,735
Electric Distribution	Road/Bridge Rebuild Relocation Projects (1531-0X)	Non Discretionary	556	566	289	295 655	301	2,006
Electric Distribution Electric Distribution	CATV Make-ready Overhead Secondary Replacement Program	Non Discretionary Maintain System Standards	617 222	629 230	643 236	655 240	668 245	3,213 1,174
Electric Distribution	Distribution Pole Replacement Program	System Enhancements	15,437	21,998	22,504	22,938	22,979	105,856
Electric Distribution	Distribution Automation - Other  Distribution Automation - Major Program (\$2.7M corp.myer)	System Enhancements	515	524	536	546	557	2,677
Electric Distribution Electric Distribution	Distribution Automation - Major Program (\$2.7M carryover) Distribution Improvement (1551-0X) - Thermal / Voltage	System Enhancements System Enhancements	5,071	503 629	-	-		5,574 629
Electric Distribution	Distribution Improvement (1551-0X) - Reliability	System Enhancements	1,111	1,336	1,473	1,174	1,554	6,649
Electric Distribution Electric Distribution	CEMI/Worst Circuit Reliability Program	System Enhancements	1,164	1,128	1,088	1,339	1,213	5,931
Electric Distribution	Resiliency Program  Distribution Improvement (1551-0X) - Operating/ Infrastructure Condition	System Enhancements Maintain System Standards	2,890	1,943	1,800 1,607	4,164	4,461	1,800 15,065
Electric Distribution	5kV Aerial Cable Replacement Program	Maintain System Standards	-	105	-	-	-	105
Electric Distribution Electric Distribution	Copper Wire Replacement Program  4800 V Conversion/Infrastructure Program	Maintain System Standards Maintain System Standards	4,155	2,868	938 2,668	683 2,381	2,340	1,620 14,412
Electric Distribution	Network Cable and Equipment	Maintain System Standards Maintain System Standards	1,858	2,147	2,116	382	390	6,894
Electric Distribution	Secondary Network Upgrade Program (All Districts)	Maintain System Standards	1,476	1,367	1,897	1,912	446	7,097
Electric Distribution Electric Distribution	URD replacement CAT 15 - Sub Circuit Exits	Maintain System Standards Maintain System Standards	1,353	6,822 1.467	5,626 1,875	6,008 546	6,963 334	26,771 4.222
Electric Distribution	Storm Hardening	System Enhancements	8,211	4,112	4,019	5,205	6,306	27,852
Florin D' : "	Subtotal - Electric Distribution		52,447	56,322	57,449	56,759	57,213	
Electric Distribution Electric Transformers	Subtotal - Electric Distribution  Transformers - New Business	Non Discretionary	52,447 14,112	14,408	57,449 14,711	56,759 14,991	15,275	280,191 73,497
Electric Transformers	Capacitors	Non Discretionary	176	180	184	14,991	191	919
Electric Transformers	Regulators	Non Discretionary	3,352	1,855	1,360	1,386	1,413	9,366
Electric Transformers	Network Protectors	Non Discretionary	-	-	-	-	-	<del></del>
Electric Transformers	Subtotal - Electric Transformers		17,640	16,443	16,255	16,564	16,879	83,782
Electric Meters	X041A - Special Meter Installations	Non Discretionary	199	203	207	211	215	1,036
Electric Meters Electric Meters	X042A - Instrument Transformers X043A - Electric Meters	Non Discretionary Non Discretionary	415 2,155	423 2,200	432 2,246	440 2,289	2,333	2,159 11,223
Electric Meters	AMI Pilot	Non Discretionary					2,333	
				-			-	

ELECTRIC ADDITION	S		W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Meters	Subtotal - Electric Meters		2,768	2,827	2,886	2,941	2,997	14,418
Storm Capital	Subtotal - Storm Capital	Non Discretionary	1,681	1,712	1,751	1,785	1,820	8,749
	Total - Electric Capital Program		148,833	146,035	148.938	155,194	155,191	754.191

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CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Production	Dashville Rubber Gate Replacement & Headgates	Maintain System Standards	2024	124				o real retai
Electric Production	Dashville Concrete Reinforcement on Spillway	Maintain System Standards	-	124	<del></del>	-		
Electric Production	Dashville Pond Control System	System Enhancements						
Electric Production	Dashville Staircase to Bottom Door	System Enhancements	-					
			-					
Electric Production	Dashville Walkway over Tailrace	System Enhancements	-	-	-	-	-	
Electric Production	High Falls Concrete Cap Replacement	Maintain System Standards	-	-	-	-	-	
Electric Production	High Falls Trash Rake Upgrade	System Enhancements	5	-	5	-	-	
Electric Production	Sturgeon Pool Dam Camera System	System Enhancements	-	-	-	-	-	
Electric Production	Dashville Major Overhaul #1	Maintain System Standards	-	87	-	-	-	
Electric Production	Dashville Major Overhaul #2	Maintain System Standards	-	-	89	-	-	
Electric Production	Dashville Facility Camera System	System Enhancements			-		-	
Electric Production	Hydro SCADA - New Com Link	Maintain System Standards		2				
Electric Production	Sturgeon Pool Remote Start	System Enhancements	_			_	_	
Flectric Production	High Falls Rubber Sluice Gate	Maintain System Standards						
	Dashville Remote Start		-					
Electric Production		System Enhancements	-	-	-	-		
Electric Production	Sturgeon Pool Tailrace Gates	System Enhancements	-	-	-		-	
Electric Production	Sturgeon Pool Southern Wall Foundation Reinforcement	Maintain System Standards	-	-	-	-	-	
Electric Production	Sturgeon Pool Replace Toe of Dam	Maintain System Standards		-	-	-	-	
Electric Production	Sturgeon Pool Relay Protection / Breakers	Maintain System Standards				54	-	
Flectric Production	High Falls Facility Camera System	System Enhancements				Ŭ.	+	
			-	-				
Electric Production	Sturgeon Pool Window Replacements	Maintain System Standards	-	-	-		-	
Electric Production	Sturgeon Pool Retaining Wall Penstock	Maintain System Standards	-	-	-	-	-	
Electric Production	Upgrade Excitation Systems at all Sites	Maintain System Standards		-	-	-	33	
Electric Production	Miscellaneous Minor Hydro projects	Maintain System Standards					-	
Electric Production	Emergent Projects	Maintain System Standards	_	_	l -			
	Patiroment of S. Cairo			- E00	<del></del>			
Electric Production	Retirement of S. Cairo	Non Discretionary		522	-		-	
Electric Production	Retirement of Coxsackie	Non Discretionary	-	522	-	-	-	
·					l			
Electric Production	Subtotal - Electric Production		5	1,258	94	54	33	
Electric Transmission	High Priority Replacements (Various)	Non Discretionary	1,215	1.045	1,067	1,087	1,108	
			1,210	993	1,007	1,007	1,100	
Electric Transmission	FV Line Indian Lake Crossing - Eversource	Non Discretionary	-	993	-	-		
Electric Transmission	115kV DW Line - West Balmville WN / 4012 Underbuild	Non Discretionary	-		86	-	-	
Electric Transmission	Transmission Minor Projects	Non Discretionary	67	68	69	71	72	
Electric Transmission	Electric Transmission Structure Coating Program	Maintain System Standards		-	-	-	-	
Electric Transmission	MG and GK Line 115kV Upgrade ( Modena - Kerhonkson)	Maintain System Standards	20				-	
Electric Transmission	FK Line 115kv Upgrade (Kerhonkson - High Falls)	Maintain System Standards	133	-				
	PLINE 115KV Upgrade (Remonkson - right Pails)							
Electric Transmission	P Line 115kV Upgrade (High Falls - Sturgeon Pool)	Maintain System Standards	36	-	-	-		
Electric Transmission	ROW Repair Project (Deficiencies)	Maintain System Standards	-	-	-	-	-	
Electric Transmission	Honk Falls Substation Tie-in (Kerhonkson Autotransformers)	Maintain System Standards	-	-	-	-	-	
Electric Transmission	ACSR Conductor Replacement Program, FV - Part 102C	Maintain System Standards	-	-	-	-	-	
Electric Transmission	Knapps Corners Substation Tie-in (115kV KB & SK Lines)	Maintain System Standards						
Electric Transmission	Trap Rock Substation Tie-in and TR Line retirement					798	-	
		Maintain System Standards	-	-	-	790		
Electric Transmission	69kV KM Line Rebuild - Knapps to Myers - 102C	Maintain System Standards	308	-	-		-	
Electric Transmission	SB Line: New 115kV Line - Hurley Ave. to Saugerties - Article VII: 11.11 miles	Maintain System Standards	1,400	-	-	-	-	
Electric Transmission	H Line: New 115kV Line - Saugerties to N.Catskill - Article VII: 12.25 miles	Maintain System Standards	1,430	1,658	1,814	-	-	
Electric Transmission	HG Line: New 69kV Line - Honk FallIs to Neversink - Part 102C	Maintain System Standards	-	261	1,440	1,467	404	
Electric Transmission	Retirement of O & OB Line Section from Dashville Tap to Objoville	Maintain System Standards	332	372	.,	1,141		
			332	312		544	2 246	
Electric Transmission	Q Line: New 115kV Line - Pleasant Valley - Rhinebeck	Maintain System Standards	-		-	544	2,216	
Electric Transmission	Removal of SD / SJ and WM Tap Lines	Maintain System Standards	1,325	1,260	-	-	-	
Electric Transmission	69kV GM Line: Retirement of Clinton Avenue Tap Section	Maintain System Standards		-	-	-	-	
Electric Transmission	115kV SK Line Rebuild	Maintain System Standards	-	-	-	-	-	
Flectric Transmission	115kV 5 Line Rebuild	Maintain System Standards		-	200	978	-	
Electric Transmission	115kV CN Line Rebuild	System Enhancements	_		200	310		
			-	-	-	-		
Electric Transmission	NW Line 345/115/69 Station Connection & 1.2 Mile NW Line 115kV Rebuild	System Enhancements	-		-	-	-	
lectric Transmission	Subtotal - Electric Transmission		6,266	5,658	4,676	4,945	3,800	2
Flectric Substation	Substation Minor Projects (1-1311-00-18)	Non Discretionary	229	206	255	217	216	
			20	42	233	43	210	
Electric Substation	Substation Battery Replacement Program (1-1312-05-18)	Maintain System Standards	20	42	21	43	22	
	Greenfield Rd Substation Upgrade (Reuse Kerhonkson & Modena Transformers) (1-							
Electric Substation	1312-99-19)	Maintain System Standards	102	-	-	-	-	
Electric Substation	Bethlehem Road - UB Line Relay Upgrade & Breaker Replacement (1-1312-99-19)	Maintain System Standards	102		-	-	-	
Electric Substation	Union Avenue - UB Line Relay Upgrade (1-1312-99-19)	Maintain System Standards	51		-			
Elourio Gubolation	Chieff World Of Entertology Opgrade (1 1912 00 16)	mantan Ojotom Otanda do	, , , , , , , , , , , , , , , , , , ,				+	
	Death Towns 045 IV/ Discourse A Death county (DTD 4400 0 DTD 04404) (4 4040 00 40)							
Electric Substation	Rock Tavern - 345 kV Disconnect Replacement (RTB-4483 & RTB-31194) (1-1312-99-19)	Maintain System Standards	51	-	-	-	-	
	New Baltimore Upgrade (New 12MVA Transformer, relays, and 15kV breakers) (1-1312-99-							
Electric Substation	19)	Maintain System Standards	154	-	-	-	-	
Electric Substation	Lincoln Park - Relay Upgrade & BRP (115 kV - LR-1219-HP, HP-1318) (1-1312-99-19)	Maintain System Standards	51				-	
Electric Substation	Forgebrook 115kV Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	51				+	
Electric Substation	South Cairo (15 kV - W-1658) (1-1312-99-19) BRP	Maintain System Standards	51		-		- : 1	
Electric Substation				-	-	-		
	Terminal Upgrade Work for 115kV Loop (High Falls) (1-1312-99-19)	Maintain System Standards	51		-	-	-	
Electric Substation		Maintain System Standards	51				-	
Electric Substation Electric Substation	P Line Moved to 115kV Bus (Sturgeon Pool) (1-1312-99-19)				-	-	-	
	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19)	Maintain System Standards	102	-				
Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19)	Maintain System Standards		-	_		-	
Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19)  South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19)	Maintain System Standards Maintain System Standards	102	-	-		1	
Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-	Maintain System Standards Maintain System Standards	102		-			
Electric Substation Electric Substation Electric Substation Electric Substation	Cossackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19)	Maintain System Standards Maintain System Standards  Maintain System Standards	102	-	-	-	-	
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) [9] Grid Mod - Multiple Substations (1-1312-99-19)	Maintain System Standards Maintain System Standards  Maintain System Standards  Maintain System Standards  Maintain System Standards	102 102 522	-	- - 53	-	-	
Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) [9] Grid Mod - Multiple Substations (1-1312-99-19)	Maintain System Standards Maintain System Standards  Maintain System Standards  Maintain System Standards  Maintain System Standards	102	- - - 178	53	-	-	
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19)	Maintain System Standards Maintain System Standards  Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102		53	-	-	
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Milan PLC Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522	104	53	-	-	
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Upgrades (1-1312-99-19) Millan PLC Replacement (1-1312-99-19) Fishkill Plains Rebu Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102 -	104 26	-	-		
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Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR & Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Grid Mod - Multiple Substations (1-1312-99-19) Maybrook Transformer Uogrades (1-1312-99-19) Millan PLC Replacement (1-1312-99-19) Fishkill Plains Relay Uograde (1-1312-99-19) Sand Dock - Add Breaker For Tilcon (1-1312-99-19) Highland Relay Uograde (1-1312-99-19) Highland Relay Uograde (1-1312-99-19) Highland Relay Uograde (1-1312-99-19) Highland Relay Uograde (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102 -	104 26 26 26	-		-	
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR A Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Indiperson Transformer Upgrades (1-1312-99-19) MayDrook Transformer Upgrades (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) ESPIP Fishkill Plains Relay Upgrade (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Tilcon (1-1312-99-19) Highland Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102 -	104 26 26	-			
Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR A Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Indiperson Transformer Upgrades (1-1312-99-19) MayDrook Transformer Upgrades (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) ESPIP Fishkill Plains Relay Upgrade (1-1312-99-19) ESPIP Sand Dock - Add Breaker For Tilcon (1-1312-99-19) Highland Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP Millerton Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102 -	104 26 26 26 26 26	-			
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Electric Substation Electric Substation	Coxsackie - DEC Peaker Regulation Project (Transformer Only) (1-1312-99-19) South Cairo - DEC Peaker Regulation Project (D-VAR Transformer) (1-1312-99-19) New Baltimore (FKA Freehold) - DEC Peaker Regulation Project (D-VAR Only) (1-1312-99-19) Girld Mod - Multiple Substations (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Milan PLC Replacement (1-1312-99-19) Fishkill Plains Relay Uggrade (1-1312-99-19) Sand Dock - Add Breaker For Tilcon (1-1312-99-19) Highland Relay Uggrade (1-1312-99-19) ESPIP Milletton Relay Uggrade (1-1312-99-19) ESPIP Todd Hill Relay Uggrade (1-1312-99-19) ESPIP East Walden Relay Uggrade (1-1312-99-19) ESPIP East Walden Relay Uggrade (1-1312-99-19) ESPIP Reynolds Hill Relay Uggrade (1-1312-99-19) ESPIP Reynolds Hill Relay Uggrade (1-1312-99-19) ESPIP East Walden Relay Uggrade (1-1312-99-19) ESPIP East Malden DLC Replacement (1-1312-99-19) East Malden DLC Replacement (1-1312-99-19)	Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	102 102 522 102 - - - - -	104 26 26 26 26 26 26 26 26 26 26 27 20 20 20 20 20 20 20 20 20 20 20 20 20	-			

CTRIC RETIREMENTS								
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Substation	Neversink (15 kV - W-1128, CKT-391) (1-1312-99-19) BRP	Maintain System Standards		52				
Electric Substation	Mobile Switchgear (1-1312-99-19)	Maintain System Standards		-		-	-	
Electric Substation	Clinton Ave Retire Substation (1-1312-99-19)	Retirement		157	-	-	-	
Electric Substation	South Wall Street - Retire Substation (1-1312-99-19)	Retirement		157	-	-		
Electric Substation	Montgomery St. 14kV Switchgear Upgrade (1-1312-99-19)	Maintain System Standards	-	-	320	-	-	
Electric Substation	Lawrenceville Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-	53	-	-	
Electric Substation	Dashville Relay Upgrade (1-1312-99-19) ESPIP Barnegat Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-	53 53	-	-	
Electric Substation Electric Substation	Hunter Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards Maintain System Standards	-	-	53	-	-	
Flectric Substation	Neversink Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-		53	-	- :	
Electric Substation	Wiccopee Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards		-	53	-	-	
Electric Substation	Sturgeon Pool 4kV Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-	53	-	-	
Electric Substation	North Chelsea PLC Replacement (1-1312-99-19)	Maintain System Standards	-	-	107	-	-	
Electric Substation	Sturgeon Pool (15 kV - OS-1, OS-2, OS-3) (1-1312-99-19) BRP	Maintain System Standards			53	-	-	
Electric Substation	Pulvers T#1 69-13.8kV Replacement(1-1312-99-19)	Maintain System Standards	-		160	-	-	
Electric Substation	Myers Corners Switchgear Upgrade & 69kV Breaker TV-399-KM Repl (1-1312-99-19)	Maintain System Standards	-	-	320	-	-	
Electric Substation	Balmville - Retire Substation (1-1312-99-19)	Retirement	-	-	213	-	-	
Electric Substation	Smithfield Relay Modernization (1-1312-99-19)	Maintain System Standards			-	163	-	
Electric Substation	Sand Dock Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-	-	54	-	
Electric Substation	Staatsburg BM85 RTU Replacement (1-1312-99-19)	Maintain System Standards	-	-	-	54	-	
Electric Substation	Merritt Park PLC Replacement (1-1312-99-19)	Maintain System Standards	-	-	-	109	-	
Electric Substation	Sand Dock (15 kV - 10 Breakers) (1-1312-99-19) BRP	Maintain System Standards	-	-	-	109	-	
Electric Substation	Tioronda (15 kV - W-567, TD-8085, TD-8086, TD-8087) (1-1312-99-19) BRP	Maintain System Standards	-	-	-	109	-	
Electric Substation	19)	Maintain System Standards	-	-	53	163	-	
Electric Substation	Shenandoah Relay Upgrade, BRP (15 kV - 25 Breakers) (1-1312-99-19)	Maintain System Standards		104	107	326		
	Ancram Replacement from EC Spare, Replace EC Spare (1 Phase 34.5/13.8kV) (1-1312-							
Electric Substation	99-19)	Maintain System Standards	-	-	-	294	-	
Electric Substation	Smithfield Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-			55	
Electric Substation	Westerlo BM85 RTU Replacement (1-1312-99-19)	Maintain System Standards	-	-	-	-	55	
Electric Substation	Spackenkill PLC Replacement (1-1312-99-19)	Maintain System Standards	-		-	33	89	
Electric Substation	Galeville PLC Replacement (1-1312-99-19)	Maintain System Standards	-	-	-	33	89	
Electric Substation	Saugerties PLC Replacement (1-1312-99-19)	Maintain System Standards	-		-	33	89	
	Hurley Avenue (15 kV - W-252, W-1575, CKT-2091, CKT-2092, CKT-2093, CKT-2094) (1-							
Electric Substation	1312-99-19) BRP	Maintain System Standards	-	-	-	-	111	
Electric Substation	Tioronda Switchgear Replacement (1-1312-99-19)	Maintain System Standards			-	-	222	
	Jansen Avenue Substation Upgrade, GE Harris RTU Replacement, BRP (15 kV - 9							
Electric Substation	Breakers) (1-1312-99-19)	Maintain System Standards	-	-	-	-	277	
	Hurley Avenue - 115-13.8 kV 13.4/17.9/22.4 MVA Transformer & Switchgear (1-1312-99-							
Electric Substation	19)	Maintain System Standards	-	-	-	-	28	
Electric Substation	Rock Tavern 115 kV Relay Upgrade (1-1312-99-19) ESPIP	Maintain System Standards	-	-	-	-	22	
Electric Substation	345kV Switch Replacement Program (1-1312-98-19)	Maintain System Standards	154	157	160	163	166	
Electric Substation	115kV Switch Replacement Program (1-1312-98-19)	Maintain System Standards	102	104	107	109	111	
Electric Substation	Pot Heads - East (1-1312-98-19)	Maintain System Standards	174	-	-	-	-	
	Kerhonkson 115/69kV Autotransformers Phase 2 (1 - 56MVA) (Remove 61850) (1-1312-							
Electric Substation	98-19)	Maintain System Standards	102	-		-	-	
Electric Substation	Rock Tavern 345kV 311 Line A2 Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	61	-	-	-	-	
Electric Substation	Roseton 345kV 311 Line A2 Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	61	- 10	- 407	-	-	
Electric Substation	Hurley Ave. 345kV Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	-	10	107	-	-	
Electric Substation Electric Substation	Rock Tavern 345kV Relay Upgrade (1-1312-98-19) ESPIP Pleasant Valley 115kV Modernization (Package Sub & Relays) (1-1312-98-19)	Maintain System Standards	-	-		54 109	55 554	
	Roseton 345kV Relay Upgrade (1-1312-98-19) ESPIP	Maintain System Standards	-	-		109		
Electric Substation Electric Substation	Woodstock - Switchgear Replacement (1-1312-36-19) ESPIP	Maintain System Standards Maintain System Standards	-	183		-	55	
Electric Substation	Modena - Add 3rd Bkr to Complete 115kV Ring Bus (see P&MK memo) (1-1312-52-17)	Maintain System Standards		157	176		-	
Electric Substation	Tilcon - Tap Station (1-1312-52-16)	System Enhancements	-	137	170		-	
Electric Substation	Tilcon - Tap Glation (1-1312-02-10)	System Emilancements	-	-			-	
Electric Substation	Subtotal - Electric Substation		2 604	2,108	2.586	2,174	2.216	1
Electric New Business	New Business	Non Discretionary	102	108	113	119	125	
Electric New Business Electric New Business	New Business Bellefield	Non Discretionary  Non Discretionary	102	108	113	119	120	
Electric New Business Electric New Business	PharmaCann	Non Discretionary	-			<del></del>		
Electric New Business	Cresco	Non Discretionary	-	-		<del></del>		
Flectric New Business	Hudson Heritage	Non Discretionary	-	-		-	-	
Electric New Business	Coevmans Industrial Park	Non Discretionary	-	_	-	-		
Electric New Business	Unidentified warehouse, production	Non Discretionary	-	_	-	-		
Electric New Business	ELEC. N.B. OVERHEAD - BLANKET	Non Discretionary	92	97	102	107	112	
Electric New Business	ELEC. & GAS COMB. URD - BLANKET	Non Discretionary	31	32	34	36	37	
Electric New Business	ELEC. URD - BLANKET	Non Discretionary	31	32	34	36	37	
		,				7.2		
Electric New Business	Subtotal - Electric New Business		256	269	283	297	312	
Electric Distribution	Distribution Improvement Blankets (15BL-01)	Maintain System Standards	788	731	747	761	776	
Electric Distribution	Relocation Blankets (15BL-02)	Non Discretionary	24	22	22	23	23	
Electric Distribution	Distribution Improvement Minors (1511-0X)	Maintain System Standards	6	6	6	6	6	
Electric Distribution	Distribution Improvement Conversions (1521-0X)	Maintain System Standards	36	34	35	35	36	
Electric Distribution	Road/Bridge Rebuild Relocation Projects (1531-0X)	Non Discretionary	61	56	29	29	30	
Electric Distribution	CATV Make-ready	Non Discretionary	68	63	64	65	66	
Electric Distribution	Overhead Secondary Replacement Program	Maintain System Standards	24	23	23	24	24	
Electric Distribution	Distribution Pole Replacement Program	System Enhancements	1,689	2,194	2,241	2,283	2,285	1
Electric Distribution	Distribution Automation - Other	System Enhancements	56	52	53	54	55	
Electric Distribution	Distribution Automation - Major Program (\$2.7M carryover)	System Enhancements	555	50		-		
Electric Distribution	Distribution Improvement (1551-0X) - Thermal / Voltage	System Enhancements	-	63		-		
Electric Distribution	Distribution Improvement (1551-0X) - Reliability	System Enhancements	122	133	147	117	155	
Electric Distribution	CEMI/Worst Circuit Reliability Program	System Enhancements	127	113	108	133	121	
Electric Distribution	Resiliency Program	System Enhancements			179	-	-	
Electric Distribution	Distribution Improvement (1551-0X) - Operating/ Infrastructure Condition	Maintain System Standards	316	194	160	414	444	
Electric Distribution	5kV Aerial Cable Replacement Program	Maintain System Standards	-	10		-	-	
Electric Distribution	Copper Wire Replacement Program	Maintain System Standards	-		93	68		
	4800 V Conversion/Infrastructure Program	Maintain System Standards	455	286	266	237	233	
Electric Distribution							200	
Electric Distribution Electric Distribution Electric Distribution	Network Cable and Equipment Secondary Network Upgrade Program (All Districts)	Maintain System Standards Maintain System Standards	203	214 136	211 189	38 190	39 44	

ELECTRIC RETIREMENTS	3							
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Electric Distribution	URD replacement	Maintain System Standards	148	680	560	598	692	2,679
Electric Distribution	CAT 15 - Sub Circuit Exits	Maintain System Standards		146	187	54	33	421
Electric Distribution	Storm Hardening	System Enhancements	898	410	400	518	627	2,854
Electric Distribution	Subtotal - Electric Distribution		5,738	5,619	5,720	5,649	5,689	28,415
Electric Transformers	Transformers - New Business	Non Discretionary	409	418	427	435	443	2,132
Electric Transformers	Capacitors	Non Discretionary			-	-	-	-
Electric Transformers	Regulators	Non Discretionary				-	-	-
Electric Transformers	Network Protectors	Non Discretionary		-	-	-	-	-
Electric Transformers	Subtotal - Electric Transformers		409	418	427	435	443	2,132
Electric Meters	X041A - Special Meter Installations	Non Discretionary	5	10	11	11	11	48
Electric Meters	X042A - Instrument Transformers	Non Discretionary			-	-	-	-
Electric Meters	X043A - Electric Meters	Non Discretionary				-		-
Electric Meters	AMI Pilot	Non Discretionary	-		-	-	-	-
Electric Meters	X043A - GE I-210, GE310I Meter Replacements	Non Discretionary	-	-	-	-	-	-
Electric Meters	Subtotal - Electric Meters		5	10	11	11	11	48
	Total - Electric Capital Program		15,283	15,340	13,797	13,566	12,504	70,489

GAS ADDITIONS								
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Gas Transmision	Cathodic Test Stations	Maintain System Standards	42 104	-	-	-	-	42 104
Gas Transmision Gas Transmision	Transmission ROW Capital Improvements Prior Year Projects	Maintain System Standards  Maintain System Standards	26		-			26
Gas Transmision	Class Location Line Valve Program AH9A (Rate Case Proposal)	Non Discretionary	607	-	-	-		607
Gas Transmision	Remote Operated Valves	Maintain System Standards	209	-	-	-	-	209
Gas Transmision	AH Line (AH9) Replacement	Maintain System Standards	523			1		523
Gas Transmision	Poughkeepsie Receival MP/TP Interconnect	Maintain System Standards	1,506	-	-	-		1,506
Gas Transmision	Pig Launching Station (s) for Internal Line Inspection	Maintain System Standards	240	-	-	-	-	240
Gas Transmision	TP Line Identified Segment 1 Replacement	Non Discretionary	984	-	-	-	-	984
Gas Transmision	Cathodic Test Stations	Maintain System Standards	-	43 108	-	-	-	43
Gas Transmision Gas Transmision	Transmission ROW Capital Improvements Prior Year Projects	Maintain System Standards Maintain System Standards	-	108	-	-	_	108 27
Gas Transmision	Class Location Line Valve Program AH17A (Rate Case Proposal)	Non Discretionary	-	634	-	-	-	634
Gas Transmision	Remote Operated Valves	Maintain System Standards	-	742	-	-	-	742
Gas Transmision	AH Line (AH6,7) Replacement	Maintain System Standards	-	814	-	-	-	814
Gas Transmision	Pig Launching Station (s) for Internal Line Inspection	Maintain System Standards	-	619	-	-	-	619
Gas Transmision	Gate Station PLC Replacement	Maintain System Standards	-	543	-	-	-	543
Gas Transmision	TP Line Identified Segment 1 Replacement	Non Discretionary	-	3,116	-	-	-	3,116
Gas Transmision	Cathodic Test Stations	Maintain System Standards	-	-	44	-	-	44
Gas Transmision	Transmission ROW Capital Improvements	Maintain System Standards	-	-	111	-		111
Gas Transmision	Prior Year Projects	Maintain System Standards	-	-	28	-	-	28
Gas Transmision Gas Transmision	Class Location Line Valve Program AH20A (Rate Case Proposal) Remote Operated Valves	Non Discretionary  Maintain System Standards	-	_	645 761	-		645 761
Gas Transmision Gas Transmision	AH Line (AH4,5) Replacement	Maintain System Standards Maintain System Standards	-	-	761 829		-	761 829
Gas Transmision	Pig Launching Station (s) for Internal Line Inspection	Maintain System Standards			349	-		349
Gas Transmision	Gate Station PLC Replacement	Maintain System Standards		_	553	-	_	553
Gas Transmision	TP Line Identified Segment 1 Replacement	Non Discretionary	-	-	3,499	-	-	3,499
Gas Transmision	Cathodic Test Stations	Maintain System Standards	-	-	-	46	-	46
Gas Transmision	Transmission ROW Capital Improvements	Maintain System Standards	-	-	-	114	-	114
Gas Transmision	Prior Year Projects	Maintain System Standards	-	-	-	28	-	28
Gas Transmision	Class Location Line Valve Program TP11A (Rate Case Proposal)	Non Discretionary	-		-	665		665
Gas Transmision	Remote Operated Valves	Maintain System Standards	-	-	-	854	-	854
Gas Transmision	AH Line (AH2,3) Replacement	Maintain System Standards	-	-	-	784	-	784
Gas Transmision	Pig Launching Station (s) for Internal Line Inspection	Maintain System Standards	-	-	-	360	-	360
Gas Transmision	Gate Station PLC Replacement	Maintain System Standards	-	-	-	569	-	569
Gas Transmision Gas Transmision	TP Line Identified Segment 2,3,4,5 Replacements Cathodic Test Stations	Non Discretionary  Maintain System Standards	-	-	-	1,075	46	1,075 46
Gas Transmision	Transmission ROW Capital Improvements	Maintain System Standards	-	-		-	114	114
Gas Transmision	Prior Year Projects	Maintain System Standards			-		29	29
Gas Transmision	Class Location Line Valve Program AH6B (Rate Case Proposal)	Non Discretionary	-	-	-	-	667	667
Gas Transmision	Class Location Line Valve Program AH7A (Rate Case Proposal)	Non Discretionary	-	-	-	-	667	667
Gas Transmision	Remote Operated Valves	Maintain System Standards	-	-	-	-	774	774
Gas Transmision	AH Line (AH15,16) Replacement	Maintain System Standards	-	-	-	-	857	857
Gas Transmision	Pig Launching Station (s) for Internal Line Inspection	Maintain System Standards	-	-	-	-	361	361
Gas Transmision	Gate Station PLC Replacement	Maintain System Standards	-	-	-	-	571	571
Gas Transmision	TP Line Identified Segment 2,3,4,5 Replacements	Non Discretionary	-	-	-	-	1,586	1,586
Gas Transmission	Subtatal Car Tanamiraian		4,240	6,647	0.040	4,493	5.672	07.070
Gas Transmission Gas Regulator Stations	Subtotal - Gas Transmission Station Retirements	Maintain Contant Chandrada	4,240	0,047	6,818	4,493	5,672	27,870
Gas Regulator Stations Gas Regulator Stations	Pressure Control Improvements	Maintain System Standards Maintain System Standards	227	-	-	-	-	227
Gas Regulator Stations	Pressure Recording Chart Replacements	Maintain System Standards	154		-	-		154
Gas Regulator Stations	Regulator Station SCADA Implementation	System Enhancements	134	-	-	-		134
Gas Regulator Stations	Prior Year Projects	Maintain System Standards	26	-	-	-	-	26
Gas Regulator Stations	Regulator Station Coating Program (Rate Case Proposal)	Maintain System Standards	103	-	-	-	-	103
Gas Regulator Stations	Mill Street Heater Installation	Maintain System Standards	412		-	-		412
Gas Regulator Stations	Saugerties Regulator Station Rebuild	Maintain System Standards	1,157		-	-	-	1,157
Gas Regulator Stations	Athens Heater Installation	Maintain System Standards	412	-	-	-	-	412
Gas Regulator Stations	Clark St Regulator Station Rebuild	Maintain System Standards	340	-	-	-		340
Gas Regulator Stations	Glasco Regulator Station Rebuild	Maintain System Standards	340	-	-	-	-	340
Gas Regulator Stations Gas Regulator Stations	Station Retirements Pressure Control Improvements	Maintain System Standards  Maintain System Standards		286	-	-	<u> </u>	286
	Pressure Control Improvements  Pressure Recording Chart Replacements	Maintain System Standards  Maintain System Standards		212	-	-		212
Gas Regulator Stations		ivianitalli Oystein Otanualus	_	106		-	- :	106
Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation		_		_			
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects	System Enhancements Maintain System Standards	-			-	-	26
Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects	System Enhancements Maintain System Standards	-	26	-			26 265
Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild	System Enhancements	-	26 265 349		-	-	265 349
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	-	26 265 349 423	-		-	265 349 423
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	-	26 265 349 423 423	-		-	265 349 423 423
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	-	26 265 349 423 423 1,186			-	265 349 423 423 1,186
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	-	26 265 349 423 423 1,186 105		-	-	265 349 423 423 1,186 105
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards	-	26 265 349 423 423 1,186			-	265 349 423 423 1,186
Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects  Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase Station Retirements	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards		26 265 349 423 423 1,186 105 211				265 349 423 423 1,186 105 211
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Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase Station Refirements Pressure Recording Charles Pressure Control Improvements Pressure Coording Charl Replacements	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards		26 265 349 423 423 1,186 105 211	- - - - - - - - - - 291 216			265 349 423 423 1,186 105 211 - 291 216
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Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase Station Retirements Pressure Control Improvements Pressure Recording Chart Replacements Regulator Station SCADA Implementation Prior Year Projects	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards System Standards System Enhancements Maintain System Standards System Enhancements		26 265 349 423 423 1,186 105 211	- - - - - - - - 291 216 108 27			265 349 423 1,186 105 211 - 291 216 108 27
Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase Station Retirements Pressure Control Improvements Pressure Control Improvements Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal)	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards		26 265 349 423 423 1,186 105 211	- - - - - - - - - - 291 291 216			265 349 423 423 1,186 105 211 - 291 216 108 27 269
Gas Regulator Stations Gas Regulator Stations	Regulator Station SCADA Implementation Prior Year Projects Regulator Station Coating Program (Rate Case Proposal) Barclay Heights Regulator Station Rebuild Catskill Heater Replacement Hopewell Heater Replacement North Cornwall Station Rebuild South Gate Estates Property Purchase South Street Property Purchase Station Retirements Pressure Control Improvements Pressure Recording Chart Replacements Regulator Station SCADA Implementation Prior Year Projects	System Enhancements Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards Maintain System Standards System Standards System Enhancements Maintain System Standards System Enhancements		26 265 349 423 423 1,186 105 211	- - - - - - - - 291 216 108 27 269			265 349 423 1,186 105 211 - 291 216 108 27

GAS ADDITIONS							W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total							
Gas Regulator Stations	South Gate Estates Rebuild	Maintain System Standards	-	-	356	-	-	356							
Gas Regulator Stations	Cochecton Heater Installation	Maintain System Standards	-	-	431	-	-	431							
Gas Regulator Stations	South Street Regulator Station Replacement	Maintain System Standards	-	-	905	-	-	905							
Gas Regulator Stations	Station Retirements	Maintain System Standards	-	-	-	168		100							
Gas Regulator Stations Gas Regulator Stations	Pressure Control Improvements Pressure Recording Chart Replacements	Maintain System Standards Maintain System Standards	-		-	224		168 224							
Gas Regulator Stations	Regulator Station SCADA Implementation	System Enhancements	-	-		112		112							
Gas Regulator Stations	Prior Year Projects	Maintain System Standards	-	-	-	28	-	28							
Gas Regulator Stations	Regulator Station Coating Program (Rate Case Proposal)	Maintain System Standards	-	-	-	279	-	279							
Gas Regulator Stations	Titusville Regulator Station Rebuild	Maintain System Standards	-	-	-	1,242	-	1,242							
Gas Regulator Stations	Hughsonville Regulator Station Rebuild	Maintain System Standards	-	-	-	1,006	-	1,006							
Gas Regulator Stations	Violet Avenue Regulator Station Rebuild	Maintain System Standards	-	-	-	1,319	-	1,319							
Gas Regulator Stations	Station Retirements	Maintain System Standards	-	-	-	-	169	169							
Gas Regulator Stations Gas Regulator Stations	Pressure Control Improvements Pressure Recording Chart Replacements	Maintain System Standards Maintain System Standards	-	-	-		225	225							
Gas Regulator Stations	Regulator Station SCADA Implementation	System Enhancements	-	-	-	-	113	113							
Gas Regulator Stations	Prior Year Projects	Maintain System Standards	-	-	-	-	28	28							
Gas Regulator Stations	Regulator Station Coating Program (Rate Case Proposal)	Maintain System Standards	-	-	-	-	282	282							
Gas Regulator Stations	Blue Point Heater Installation	Maintain System Standards	-	-	-	-	451	451							
Gas Regulator Stations	Vails Gate Regulator Station Rebuild	Maintain System Standards	-	-	-	-	938	938							
Gas Regulator Stations	KS Regulator Station Rebuild/Build New Distribution Improvement	Maintain System Standards	-	-	-	-	372	372							
Gas Regulator Stations	Fullers Corners Regulator Station Rebuild	Maintain System Standards	-	-	-	-	1,015	1,015							
Gas Regulator Stations Gas Regulator Stations	Vassar Farms Regulator Station Rebuild Fleetwood Drive Regulator Station Rebuild	Maintain System Standards Maintain System Standards	-	-	-	-	372 372	372 372							
Gas Negulator Stations	Tieetwood Diffe Negulator Station Nebulid	Iviairitaiii Systeiii Staridards					312	312							
Gas Regulator Stations	Subtotal - Gas Regulator Stations		3,304	3,592	3,820	4,376	4,337	19,429							
Gas New Business	GAS NB - TRADITIONAL NEW BUSINESS	Non Discretionary	1,851	1,982	2,040	2,142	2,251	10,266							
Gas New Business	GAS MAINS NEW BUSINESS - SYSTEM	Non Discretionary	2,513	2,591	2,566	2,586	2,718	12,974							
Gas New Business	GAS NEW BUS LOCALS & SERV BLANKETS	Non Discretionary	2,511	2,591	2,566	2,586	2,718	12,972							
Gas New Business	GAS NB - COMMERCIAL CONVERSIONS	Non Discretionary	206	220	227	238	250	1,141							
Gas New Business	GAS NB - SIMPLY BETTER - RES	Non Discretionary	308	330	340	357	375	1,711							
Gas New Business	Greenhaven Correctional	Non Discretionary	2,567	2,658	-	-		5,225							
Gas New Business	Subtotal - Gas New Business		9,955	10,373	7,738	7,908	8,313	44,288							
Gas Distribution	PK Port Ewen	System Enhancements	9,933	10,575	7,730	7,500	0,515	44,200							
Gas Distribution	PN Line Phoenix Street South	Non Discretionary	3,043	-	-	-		3,043							
Gas Distribution	PN Line Evergreen South to IBM	Non Discretionary		3,577	-	-	-	3,577							
Gas Distribution	PN Line - 9D Wappingers North	Non Discretionary	-	-	3,249	-	-	3,249							
Gas Distribution	PN Line - Wappingers Creek South	Non Discretionary	-	-	-	1,700	1,741	3,441							
Gas Distribution	PN Line - New Pipe to IBM	Non Discretionary	-	-	-	-	-	-							
Gas Distribution	NP - Grand Street North of Broadway	System Enhancements			-	-									
Gas Distribution	Corrosion Control	Non Discretionary	310	316	323	329	337	1,615							
Gas Distribution Gas Distribution	Highway Relocation non LPP Service Replacement Blankets - Emergent	Non Discretionary Non Discretionary	1,032 2,581	1,052 2,631	1,077 2,692	1,098 2,746	1,125 2,812	5,385 13,462							
Gas Distribution	Isolated Service Replacement Blankets	Non Discretionary	1,858	1,894	1,939	1,977	2,012	9,693							
Gas Distribution	Local Orders -Operational	Non Discretionary	373	380	389	396	406	1,944							
Gas Distribution	Glasco Upgrade Finish	Non Discretionary	-	-	-	-	-	-							
Gas Distribution	Downing 120 PSIG West of Grand	Non Discretionary	2,987	-	-	-	-	2,987							
Gas Distribution	Marys Avenue Tie - Reserve for Spring Street - phase 2	Non Discretionary	-	-	-	-	-	-							
Gas Distribution	West Point	Maintain System Standards	-	-		2,197	7,874	10,071							
Gas Distribution	KS Line Reinforcement	Maintain System Standards	-	-	2,928	-		2,928							
Gas Distribution Gas Distribution	Farm Tap Elimination Program South Clinton Reg Station	Non Discretionary Non Discretionary	-	-	-	-		-							
Gas Distribution	Compression Coupling Neighborhoods	Maintain System Standards	- :	1,331	2,086	2.891	3.017	9,325							
Gas Distribution	Transmission Service to Distribution	Maintain System Standards	-	996	1,374	1,622	2.258	6,250							
Gas Distribution	Leak Prone Pipe Services	Maintain System Standards	1,745	1,779	1,821	1.857	1,902	9,105							
Gas Distribution	River/Creek Crossing Reinforcements	System Enhancements	-	994	1,371	1,619	2,253	6,237							
Gas Distribution	Road Rebuild - Includes Paving Proj	Non Discretionary	3,613	3,946	4,308	4,668	5,062	21,597							
Gas Distribution	Cast Iron Undermines	Non Discretionary	155	158	162	165	169	808							
Gas Distribution	Unident Leaking - Includes Active Corrosion	Non Discretionary	774	789	808	824	844	4,039							
Gas Distribution	Service Partial/Swing Identified DIPS	Non Discretionary	6,619	7,097	8,040	7,214	6,889	35,859							
Gas Distribution Gas Distribution	Svce Repl Blankets DIPS South Wall Street Area	Non Discretionary Non Discretionary	6,073 2,962	8,215	6,107	5,068	6,057	31,519 2,962							
Gas Distribution	Northern Catskill	Non Discretionary  Non Discretionary	3,017		-			3,017							
Gas Distribution	E Poughkeepsie College to Hooker	Non Discretionary	3,768	-	-			3,768							
	Randolph Ferris Beechwood Neighborhood	Non Discretionary	2,821	-	-	-	-	2,821							
Gas Distribution	Sharon Drive and Route 9	Non Discretionary	1,196	-	-	-	-	1,196							
Gas Distribution Gas Distribution			3,482	-	-	-	-	3,482							
Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton	Non Discretionary													
Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street	Non Discretionary	2,229	-	-	-		2,229							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024	Non Discretionary Non Discretionary	2,229 942	-	-	-	_ :	942							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St	Non Discretionary Non Discretionary Non Discretionary		- 1,687	-	-		942 1,687							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942	1,687 2,573	-	-	-	942 1,687 2,573							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary		1,687 2,573 2,191		-	-	942 1,687 2,573 2,191							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street Midtown Kingston	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942	1,687 2,573 2,191 2,807		-		942 1,687 2,573 2,191 2,807							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942	1,687 2,573 2,191 2,807 2,902		-		942 1,687 2,573 2,191 2,807 2,902							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street Midtown Kingston Fairview Station Neighborhood	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942 - - - - -	- 1,687 2,573 2,191 2,807 2,902 4,213 1,209	-	-	-	942 1,687 2,573 2,191 2,807							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty Si Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street Midtown Kingston Fairview Station Neighborhood PN IBM Area Village of Fishkill - South Nbg Fullerton to West 60 PSIG Swing	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942 - - - - -	- 1,687 2,573 2,191 2,807 2,902 4,213	-	-	-	942 1,687 2,573 2,191 2,807 2,902 4,213 1,209 3,637							
Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution Gas Distribution	NLP-South St/ N of Fullerton Fairview and Quarry Street Liberty St Paving - 2024 NM - South St Garden Smith Foxhall Mid Wall and Fair Street Midtown Kingston Fairview Station Neighborhood PN IBM Area Village of Fishkill - South	Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary Non Discretionary	942 - - - - -	- 1,687 2,573 2,191 2,807 2,902 4,213 1,209	-	-	-	942 1,687 2,573 2,191 2,807 2,902 4,213 1,209							

GAS ADDITIONS				W	// AFUDC, Inflated	& OH Adjustment	ts	
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Gas Distribution	Parker Ave	Non Discretionary	-	-	2,030	-	-	2,030
Gas Distribution	Central Kingston	Non Discretionary	-		4,920	-	-	4,920
Gas Distribution	Uptown Kingston Neighborhood	Non Discretionary	-	-	2,413	-	-	2,413
Gas Distribution	Mansion Violet Hamilton	Non Discretionary	-		3,192	-	-	3,192
Gas Distribution	Central West Poughkeepsie	Non Discretionary	-	-	2,296	-	-	2,296
Gas Distribution	Poughkeepsie Medium Clean-up	Non Discretionary	-	-	710	-	-	710
Gas Distribution	Wappinger's Falls	Non Discretionary	-		1,685	-	-	1,685
Gas Distribution	Village of Fishkill - North	Non Discretionary	-		1,338	-	-	1,338
Gas Distribution	Marine Drive to Cornwall 60 PSIG	Non Discretionary	-	-	-	2,861	-	2,861
Gas Distribution	MNG South	Non Discretionary	-			2,779	-	2,779
Gas Distribution	NLP- South St Neighborhood	Non Discretionary	-	-	-	2,047	-	2,047
Gas Distribution	ME Line- Hwy 17K	Non Discretionary	-	-	-	5,022	-	5,022
Gas Distribution	Stewart Avenue System	Non Discretionary	-			938	-	938
Gas Distribution	Wappinger's Falls Route 9D	Non Discretionary	-			2,110	-	2,110
Gas Distribution	West Beacon	Non Discretionary	-	-	-	7,276	-	7,276
Gas Distribution	NLP- Newburgh Holder	Non Discretionary	-	-	-	1,346	-	1,346
Gas Distribution	ME Line- Hwy 32	Non Discretionary	-			2,941	-	2,941
Gas Distribution	Broome Neighborhood Catskill	Non Discretionary	-	-	-	-	2,730	2,730
Gas Distribution	NLP-Carpenter Ave Phase 2	Non Discretionary	-	-	-	-	2,323	2,323
Gas Distribution	NM - Creek Run	Non Discretionary	-			-	3,228	3,228
Gas Distribution	BN Line Replacement	Non Discretionary	-	-	-	-	2,791	2,791
Gas Distribution	North Highland	Non Discretionary	-	-	-	-	2,841	2,841
Gas Distribution	Old Mill Howard	System Enhancements	-			-	2,113	2,113
Gas Distribution	Malden System	System Enhancements				-	3,771	3,771
Gas Distribution	East Beacon	System Enhancements	-	-	-	-	5,345	5,345
·					-			
Gas Distribution	Subtotal - Gas Distribution		51,581	56,374	60,382	63,691	69,912	301,940
Gas Meters	X081A - Gas Meters	Non Discretionary	1,729	1,765	1,922	2,089	2,271	9,777
Gas Meters	X084A - Special Meter Installation	Non Discretionary	1,171	1,195	1,220	1,243	1,267	6,097
Gas Meters	2712-00-18 - Specific Work Orders	Non Discretionary	27	68	70	72	73	310
•					·			
Gas Meters	Subtotal Gas Meters		2,926	3,028	3,213	3,405	3,611	16,183
	Total - Gas Capital Program		72,005	80,014	81,971	83,874	91,845	409,710

Common Additions				W/ AFUDC, Inflated & OH Adjustments				
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Land & Buildings	Daily Operations - Electric	Maintain System Standards	140	107	111	111	123	5-rear rotal 593
Land & Buildings	Daily Operations - Electric	Maintain System Standards	140	107	111	111	123	593
Land & Buildings	Daily Operations - HVAC	Maintain System Standards	140	107	111	111	123	593
Land & Buildings	Daily Operations - Unidentified	Maintain System Standards	698	536	557	556	615	2,961
Land & Buildings	EV Charging Infrastructrure	Maintain System Standards	349	268	278	278	307	1,481
Land & Buildings	Exterior Door Replacements	Maintain System Standards	90	80	84	83	88	425
Land & Buildings	Solar System on Company Facilities	Maintain System Standards	30	180	1,994	657	189	3,050
Land & Buildings	Architectural/Engineering Design	Maintain System Standards	349	268	278	278	307	1,481
Land & Buildings	Paving	Maintain System Standards	698	536	557	556	615	2,961
Land & Buildings Land & Buildings	Primary Control Center	Maintain System Standards  Maintain System Standards	4,628 1,157	-	-	-	-	4,628 1,157
Land & Buildings	Training Academy, Site Development Training Academy, Academy	Maintain System Standards  Maintain System Standards	1,157	-		8,384	16,591	24,975
Land & Buildings	Training Academy, Annex	Maintain System Standards	579	9,088	10,510	-	-	20,176
Land & Buildings	Newburgh- New Facility	Maintain System Standards	-	-	-	524	1,936	2,460
Land & Buildings	Transportation Building - EC	Maintain System Standards	-	505	4,204	-	-	4,709
Land & Buildings	Bulter Building Rebuild	Maintain System Standards	- 4 457	505	4,204	-	-	4,709
Land & Buildings Land & Buildings	Tannersville- New Facility Building 805/806 Rebuild	Maintain System Standards  Maintain System Standards	1,157	3,029	-	1,048	-	4,186 1,048
Land & Buildings	Ellenville Office Renovation	Maintain System Standards  Maintain System Standards	-	76	1,156	- 1,040	-	1,232
Land & Buildings	KNG- Retaining wall replacement- phase 1 (rear)	Maintain System Standards	1,400	-	-	-	-	1,400
Land & Buildings	POK- outdoor area & retire CNG equipment	Maintain System Standards	201	-	-	_	-	201
Land & Buildings	POK- Facilities Driveway	Maintain System Standards	37 243	-	-	-	-	37 243
Land & Buildings Land & Buildings	POK- Facilities polebarn POK- Install awning@ Drafting (B802), Auditorium (B807) and Rear of B810	Maintain System Standards  Maintain System Standards	134	-	-	-	-	134
Land & Buildings	POK- Bldg 801 - Replace Windows Executive wing	Maintain System Standards  Maintain System Standards	154	-			-	154
Land & Buildings	POK- Operations Pole barn drainage	Maintain System Standards	237	-	-	-	-	237
Land & Buildings	POK- Operations Pole barn concrete floor	Maintain System Standards	55	-	-	-	-	55
Land & Buildings	POK- Replace main building exterior lights with tunable LED	Maintain System Standards	234	-	-	-	-	234
Land & Buildings	POK- Bldg 806 - Expand transformer storage area	Maintain System Standards	201	-	-	-	-	201 100
Land & Buildings Land & Buildings	POK- Record Retention Improvments KNG- Front lot drainage improvments	Maintain System Standards  Maintain System Standards	100 536	-			-	536
Land & Buildings	RFN- Install backup Generator for lodge and office	Maintain System Standards  Maintain System Standards	91	-	-	-	-	91
Land & Buildings	NBG- Repave guard shed to line garage	Maintain System Standards	122	-	-	-	-	122
Land & Buildings	FSH- Restroom Renovations	Maintain System Standards	487	-	-	-	-	487
Land & Buildings	CAT- Repave side and rear lot	Maintain System Standards	365	-	-	-	-	365
Land & Buildings Land & Buildings	FSH- Replace JCI fire detection system with alternate system POK- Auditorium Renovation	Maintain System Standards  Maintain System Standards	304 609		-	-		304 609
Land & Buildings	POK- Lighting Upgrade - Storeroom	Maintain System Standards	140	-	-	-	-	140
Land & Buildings	POK-Bldg. 800 Freight elevator replacement- design	Maintain System Standards	61	-	-	-	-	61
Land & Buildings	KNG- Transportation Restroom reconfiguration	Maintain System Standards	213	-	-	-		213
Land & Buildings	NBG- Replace HVAC Units add dehumidifation	Maintain System Standards	183	-	-	-	-	183
Land & Buildings Land & Buildings	POK- Bldg 807 2nd floor testing room HVAC replacement POK- Upgrade Electric to 801 2nd floor	Maintain System Standards  Maintain System Standards	122 213	-	-	-	-	122 213
Land & Buildings	EC-Water and sewer installation for rigger trailer	Maintain System Standards  Maintain System Standards	487	-	-	-	-	487
Land & Buildings	EC- Install ceiling and lighting in loading dock area	Maintain System Standards	396	-	-	-	-	396
Land & Buildings	GNV- Pole Racks	Maintain System Standards	-	107	-	-	-	107
Land & Buildings	POK- Bldg - 800 mens restroon renovation	Maintain System Standards	-	204	-	-	-	204
Land & Buildings Land & Buildings	POK- MultiMedia Studio FSH- Video wall building preporation Fishkill Dispatch	Maintain System Standards  Maintain System Standards	-	589 54		-	-	589 54
Land & Buildings	POK- Bldg 801 - Replace Windows Second Floor	Maintain System Standards  Maintain System Standards	<del>                                     </del>	161		-	-	161
Land & Buildings	KNG- Front curb & sidewalk	Maintain System Standards		536	-	-	-	536
Land & Buildings	POK- Call Center redesign- design	Maintain System Standards	-	54	-	-	-	54
Land & Buildings	POK- New water main and valve Pheonix st	Maintain System Standards	-	161	-	-	-	161
Land & Buildings	POK- Replace Training Room HVAC Unit hook up to new controls	Maintain System Standards	-	64 86	-	-	-	64 86
Land & Buildings Land & Buildings	POK- Pave Pole & Equipment area POK- Bldg 810 - Replace 1 Leiberts unit in Computer Room	Maintain System Standards  Maintain System Standards	-	161	-	-	-	161
Land & Buildings	KNG- Main level renovation, aud and conf. room	Maintain System Standards  Maintain System Standards		107		-	-	107
Land & Buildings	POK- Bldg 805 Replace Roof	Maintain System Standards		161		-	-	161
Land & Buildings	POK- Record Retention study implementation	Maintain System Standards	-	161	-	-	-	161
Land & Buildings Land & Buildings	POK- Outdoor picnic patio/Executive lot	Maintain System Standards	-	80 161	-	-	-	80 161
Land & Buildings Land & Buildings	POK- Corp Com area re-configure GNV- Expand parking lot	Maintain System Standards  Maintain System Standards	-	161		-	-	161
Land & Buildings	EC- Pave parking by transformer/transportation shop, replace drainage	Maintain System Standards  Maintain System Standards	<del>                                     </del>	321			-	321
Land & Buildings	POK- Building 805 Resurface and Restripe Garage Floors	Maintain System Standards  Maintain System Standards	-	64				64
Land & Buildings	EC- Rehab EC construction maint garage (roof, OHDs, wall)	Maintain System Standards	-	268	-	-	-	268
Land & Buildings	POK- install gas boilers in 803 mechanical room, eliminate steam in 803	Maintain System Standards	-	214	-	-	-	214
Land & Buildings Land & Buildings	POK- Purchase 1/3 of tanks for Saphire fire protection system  EC-Renovate Restrooms in Storeroom	Maintain System Standards  Maintain System Standards		107 161	-	-	-	107 161
Land & Buildings Land & Buildings	KNG- Retaining wall replacement- phase 2 (front)	Maintain System Standards  Maintain System Standards		2,143		-	-	2,143
Land & Buildings	KNG- Replace JCI system Kingston lower building	Maintain System Standards  Maintain System Standards		268	-	-	-	268
	KNG- Replace Rezner heater in Metershop	Maintain System Standards	- 1	54	-	-	-	54

Common Additions					W/ AFUDC,	justments		
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Land & Buildings Land & Buildings	POK- Exterior lighting upgrades POK-Bldg 806 - Restroom Renovation	Maintain System Standards Maintain System Standards	-	-	111 167	-	-	111 167
Land & Buildings	POK-Bidg. 810 cooling tower upgrade	Maintain System Standards  Maintain System Standards	-	-	223	-	-	223
Land & Buildings	POK- Building 806 - Roof Replacement	Maintain System Standards	-	-	278	-	-	278
Land & Buildings	POK- Replace JCI Poughkeepsie builing 810	Maintain System Standards	-	-	334	-	-	334
Land & Buildings	CAT-Renovate estimating and offices (not breakroom)	Maintain System Standards	-	-	278	-	-	278
Land & Buildings	CAT- Install New HVAC Unit (add zone)	Maintain System Standards	-	-	111	-	-	111
Land & Buildings Land & Buildings	FSH- Install New Roof Training Center EC- Replace Storeroom roof	Maintain System Standards Maintain System Standards	-		206 446	-		206 446
Land & Buildings	KNG-Repave parking lot	Maintain System Standards	_	-	446	-	_	446
Land & Buildings	KNG- Replace Drainage West of rear budiling	Maintain System Standards	-	-	251	-		251
Land & Buildings	POK- Bldg 802 - Replace Windows	Maintain System Standards	-	-	167	-	-	167
Land & Buildings	POK- Renovate Sys Ops Restrooms	Maintain System Standards	-	-	167	-	-	167
Land & Buildings Land & Buildings	POK- Replace Window - Bldg 805/806 KNG- Replace JCI system Kingston upper building	Maintain System Standards Maintain System Standards	-	-	111 306	-	-	111 306
Land & Buildings	POK- 810 heat pumps with RTU w/ MERV 13 filter and UV light	Maintain System Standards  Maintain System Standards	-	-	446			446
Land & Buildings	POK- Call center redesign	Maintain System Standards	-	-	446	-	-	446
Land & Buildings	POK- Bldg 803 - Replace Carpet on S1 level	Maintain System Standards	-	-	111	-	1	111
Land & Buildings	KNG- Replace Windows Front Bldg	Maintain System Standards	-	-	390	-	-	390
Land & Buildings	KNG- Replace Carpet Tiles	Maintain System Standards	-	-	111	-	-	111
Land & Buildings Land & Buildings	POK- Building 801 roof replacement POK- Repave roadway behind building 803, 806 and 810	Maintain System Standards Maintain System Standards	-	-	223 278	-	-	223 278
Land & Buildings	POK- Repaive roadway bening building 603, 600 and 610	Maintain System Standards  Maintain System Standards	-	-	780			780
Land & Buildings	KNG-Build Maintenance Shop	Maintain System Standards	-	-	84	-	-	84
Land & Buildings	EC- Rehab EC electricians garage (roof, OHDs, wall)	Maintain System Standards	-	-	-	445	1	445
Land & Buildings	CAT- Replace Generator	Maintain System Standards	-	-	-	83	-	83
Land & Buildings	POK- Freight Elevator loading dock & Driveway	Maintain System Standards	-	-	-	167	-	167
Land & Buildings	POK- Bildg 807 - Upper & lower Roof Replacement	Maintain System Standards	-	-	-	195 222	-	195 222
Land & Buildings Land & Buildings	POK- Boiler Room - Build out for Facilities RFN- Replace siding & windows on lodge and office	Maintain System Standards Maintain System Standards	-	-	-	278	-	278
Land & Buildings	POK- Bldg 803 - Replace HVAC Units S1 & S2 level	Maintain System Standards	-	-	-	278	-	278
Land & Buildings	POK- pole barn for facilities storage	Maintain System Standards	-	-	-	111	-	111
Land & Buildings	POK- Bldg. 805 Replace Gas Garage doors	Maintain System Standards	-	-	-	61	-	61
Land & Buildings	POK- Replace JCI Poughkeepsie builing 807/808	Maintain System Standards	-	-	-	306	-	306
Land & Buildings	POK- Replace watermain on campus (main enty to 807)	Maintain System Standards	-	-	-	389 195	-	389 195
Land & Buildings Land & Buildings	POK- Renovate corp com mens room POK- Paving, drainage and sidewalk south parking lot	Maintain System Standards  Maintain System Standards	-	-	-	473	-	473
Land & Buildings	KNG- RTU replacement	Maintain System Standards	-	-	-	278	-	278
Land & Buildings	EVL- Repave parking lot	Maintain System Standards	-	-	-	278	-	278
Land & Buildings	KNG- Buildout front annex (gas training area)	Maintain System Standards	-	-	-	334	-	334
Land & Buildings	POK- Replace damaged fence around facility	Maintain System Standards	-	-	-	389 28	-	389 28
Land & Buildings Land & Buildings	CAT- Upgrade garage lighting to LED CAT- Replace security shed	Maintain System Standards  Maintain System Standards	-	-	-	83	-	83
Land & Buildings	FSH- Replace security shed	Maintain System Standards		-		83	-	83
Land & Buildings	FSH- Renovate south end of building	Maintain System Standards	-	-	-	612	-	612
Land & Buildings	POK- Renovate S3 Call Center	Maintain System Standards	-	-	-	306	-	306
Land & Buildings	NBG- Rebuild Material Bins	Maintain System Standards	-	-	-	-	176	176
Land & Buildings	NBG- Replace Flooring	Maintain System Standards	-	-	-	-	88 351	88 351
Land & Buildings Land & Buildings	NBG- Renovate Restrooms NBG- Roof Replacement	Maintain System Standards Maintain System Standards		-		-	469	469
Land & Buildings	NBG-Replace Generator	Maintain System Standards  Maintain System Standards	-	-	-	-	100	100
Land & Buildings	POK- building 803 roof replacement	Maintain System Standards	-	-	-	-	322	322
Land & Buildings	KNG-Paving	Maintain System Standards	-	-	- 1	-	586	586
Land & Buildings	CAT- Renovate breakroom	Maintain System Standards	-	-	-	-	234	234
Land & Buildings Land & Buildings	POK- Bldg 803 - Replace Elevator FSH- Hook up to municipal sewer	Maintain System Standards  Maintain System Standards	-	-	-	-	996 293	996 293
Land & Buildings	POK- Renovate corp com womens room	Maintain System Standards  Maintain System Standards	-	-	-	-	295	205
Land & Buildings	POK- Replace JCI Poughkeepsie builling 800	Maintain System Standards	-	-	-	-	351	351
Land & Buildings	KNG-Controls System HVAC	Maintain System Standards	-	-	-	-	59	59
Land & Buildings	CAT-Replace HVAC Unit	Maintain System Standards	-	-	-	-	88	88
Land & Buildings Land & Buildings	EC- Pave Portion of parking and roadway POK- Bldg 807 - Replace tile flooring basement level	Maintain System Standards Maintain System Standards	-	-	-	-	293 176	293 176
Land & Dundings	1 On- Diag out - Nepiace the houring basement level	iviairitaili Systeiii Stariuaids	<u> </u>	-	-	-	1/6	1/6
Land & Buildings	Subtotal - Land & Buildings		17,479	21,996	30,628	18,293	25,802	114,199
Office Equipment	Daily Operations- Misc furniture	Maintain System Standards	171	175	178	182	185	891
Office Equipment	Office Chair Replacement Program	Maintain System Standards	32	32	33	34	34	165
Office Equipment	Revamping space to meet needs of hybrid workforce model	Maintain System Standards	102	104	106	108	110	530 255
Office Equipment Office Equipment	Primary Control Center (42) Training Academy, Annex (15)	Maintain System Standards Maintain System Standards	255	-	95	-	-	255 95
Office Equipment	Training Academy, Annex (13) Training Academy, Annex (training equipment)	Maintain System Standards  Maintain System Standards	-	334	1,392	416	-	2,143
Office Equipment	Training Academy, Academy	Maintain System Standards	-	-		-	554	554
Office Equipment	Tannersville- New Facility (7)	Maintain System Standards	-	43	-	-	-	43

common Additions					W/ AFUDC,	Inflated & OH Ad	justments	
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year Total
Office Equipment	Transportation Building - EC (3)	Maintain System Standards	-	-	19	-	-	19
Office Equipment	Bulter Building Rebuild (5)	Maintain System Standards	-	-	32	-	-	32
Office Equipment	Ellenville Office Renovation (6)	Maintain System Standards	-	-	38	-	-	38
Office Equipment	Subtotal - Office Equipment		560	689	1,893	740	884	4,765
EMS	GE OMS Implementation	Maintain System Standards	-	2,142	2,225	-	-	4,367
EMS	OT EMS Upgrade Hardware	Maintain System Standards	324	319	-	-	-	643
EMS	OT Misc Replacements (4230)	Maintain System Standards	81	80	80	83	84	408
EMS EMS	OT Infrastructure Upgrades	Maintain System Standards	216	213	215	220	225	1,089 435
EMS	OT DMS Upgrade Hardware OT Industrial Defender Hardware Upgrade	Maintain System Standards Maintain System Standards	325	319	215	220	732	1,375
EMS	OT Coure Hardware Upgrade	Maintain System Standards  Maintain System Standards	-	-	-		208	208
EMS	OT EMS Upgrade Software	Maintain System Standards	1,056	-	-	-	-	1,056
EMS	OT Compliance Automation (CIP-010/CIP-002))	Maintain System Standards	162	-	-	-	-	162
EMS	Grid Mod - ADMS Modeling and Enhancements West of River	System Enhancements	1,056	108	-	-	-	1,164
EMS	OT Dragos Neighborhood Watch/Keeper	System Enhancements	-	106	-	-		106
EMS EMS	OT Compliance Automation (CIP-007/CIP-005) OT DMS Upgrade Software	Maintain System Standards Maintain System Standards	-	186	188 723	2.851	-	374 3,574
EMS	Primary Control Center - Zetron Implementation (4230-OT SW)	System Enhancements	1,056	-	-	2,001		1,056
EMS	Primary Control Center OT SW (4230-OT SW))	System Enhancements	634	27	-	-	-	661
EMS	Primary Control Center OT HW (4230-OT HW)	System Enhancements	973	27	-	-	-	999
EMS	Subtotal - EMS		5,883	3,526	3,646	3,373	1,249	17,676
Hardware Hardware	Asset Mgmt - End User Device HW Lifecycle	Maintain System Standards	1,081	1,063	1,073	1,100	1,125	5,443
Hardware Hardware	Luminex Virtual Tape Library Devices - POK  Network Infrastructure Lifecycle Upgrades / Replacements	Maintain System Standards Maintain System Standards	270 367	425	456	495	563	270 2,307
Hardware	Palo Alto HW Lifecycle	Maintain System Standards  Maintain System Standards	648	- 423	-		-	648
Hardware	Plotter Replacement for Drafting	Maintain System Standards	65	-	-	-	-	65
Hardware	IBM Mainframe Disk Storage	Maintain System Standards	270	-	-	-	-	270
Hardware	IDF Rebuilds 2024	Maintain System Standards	162	-	-	-	-	162
Hardware	IDF Rebuilds 2025	Maintain System Standards	-	160	-	-	-	160
Hardware Hardware	IDF Rebuilds 2026 IDF Rebuilds 2027	Maintain System Standards Maintain System Standards	-	-	161 -	165	-	161 165
Hardware	IDF Rebuilds 2028	Maintain System Standards  Maintain System Standards	-	-		-	169	169
Hardware	Luminex Virtual Tape Library Devices - Philadelphia	Maintain System Standards  Maintain System Standards		-	268	-	-	268
Hardware	Small Switch Upgrades	Maintain System Standards	-	159	107	110	113	489
Hardware	Ville WAN HW Lifecycle	Maintain System Standards	-	16	-	-	-	16
Hardware	WAN and Internet HW Lifecycle	Maintain System Standards	-	-	537	-	-	537
Hardware	Mobile Site WAN Router Renewal	Maintain System Standards	151	-	- 4.070	- 1 100	- 4 405	151
Hardware Hardware	Infrastructure HW Lifecycle (Replacement & Storage Upgrades) Primary Control Center IT HW (4222-IT HW)	Maintain System Standards System Enhancements	1,297 108	1,276 27	1,073	1,100	1,125	5,872 135
Hardware	Asset Mamt - End User Device SW Lifecycle	Maintain System Standards	270	266	322	358	394	1.609
Hardware	Microsoft Roadmap: License/Contract Renewal M365 E5 3-Year Renewal	Maintain System Standards		-	2,146	-	-	2,146
Hardware	Project & Portfolio Management Solution ( Enterprise Wide) - PPM	System Enhancements	919	-	-	-	-	919
Hardware	Employee Scorecards	System Enhancements	22	-	-	-	-	22
Hardware	MotioCl Upgrade	Maintain System Standards	22	-	-	-	-	22
Hardware Software	Service Now Phase IV - Corporate Knowledge Base Repository (HR)	System Enhancements	54 106	321	334	342	356	54 1.459
Software	ServiceNow Upgrades & Enhancements - Ongoing Sprints  M365: Safety Incident Apps & Analytics	Maintain System Standards System Enhancements	106	268	334	342	356	1,459
Software	Microsoft Roadmap: Communication & Collaboration (PBX Replacement)	System Enhancements	<del>                                     </del>	-	667		-	667
Software	Annual Bundled Upgrades & Releases of M365 continuous Improvements	Maintain System Standards	106	107	117	125	137	592
Software	Middleware Upgrades - SOA	Maintain System Standards	211	257	222	228	238	1,156
Software	Chronus Mentoring Upgrade & Enhancements	Maintain System Standards		214	-	-	-	214
Software	Datastage Upgrade	Maintain System Standards	-	-	222	-	-	222
Software	DIS Replacement	Maintain System Standards		-	334	-	-	334
Software Software	Episerver UI Upgrade Microsoft Roadmap: Ops Evolution	Maintain System Standards System Enhancements	-	107	222		-	222 107
Software	Cygnet Upgrade & Enhancements	Maintain System Standards	106	-	111		119	336
Software	Records Management Tool Enhancements (Gimmal/E5)	Maintain System Standards	-	214	-	-	297	511
Software	Application Upgrades	Maintain System Standards	528	536	556	570	594	2,784
Software	App Services Emergent	Maintain System Standards		392	813	1,460	1,520	4,185
Software	SAP S/4 Hana System Licenses	Maintain System Standards	2.006	8,451	-	-	-	8,451 2.006
Software Software	SAP Dunning Monthly Meter Reading SW Implementation	Maintain System Standards Maintain System Standards	2,006 528	538	-		-	2,006 1,066
Software	Standby Billing Rates (Cost included within SAP Major Systems Upgrade & Enhancements)	Maintain System Standards  Maintain System Standards	528	538	-		-	1,006
Software	Unmetered service rate case (Cost included within SAP Major Systems Upgrade & Enhancements)	Maintain System Standards  Maintain System Standards	-	-	-		-	_
Software	Gas Block Bill display changes(Cost included within SAP Major Systems Upgrade & Enhancements)	Maintain System Standards  Maintain System Standards	-	-	-	-	-	-
Software	EV commercial rate design	System Enhancements	-	-	-	-	-	-
0 - #	CX - ADA Assessment (Web/Mobile)	Maintain System Standards	106	-	-	-	-	106
Software			_					
Software Software Software	CX - MobileBox (like Session Cam but for Mobile App - a Glassdoor Product) CX - Feedback tab on the website	System Enhancements System Enhancements	106 79	-	-	-	-	106 79

Common Additions		W/ AFUDC, Inflated & OH Adjustments							
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CAT. Software	Description Salesforce Retirement	Discretion Level  Maintain System Standards	2024	2025	<b>2026</b> 167	2027	2028	5-Year Total	
Software	CX - Mobile App Upgrades - Account Settings / Contact Info	System Enhancements	63	-	- 107		-	63	
Software	CX - Mobile App Upgrades - App Tutorial for new users	System Enhancements	132	-	-	-	-	132	
Software	IVR Modernization - Including Visual IVR, Voice Recognition and VoiceBots	Maintain System Standards	528	2,516	-	-	-	3,044	
Software	CX - Centralized Preferences Notifications	System Enhancements	290	296	-	-	-	587	
Software	CX - Kubra Payment Posting API Phase 2	System Enhancements	317	-	-	-	-	317	
Software Software	CX - Mobile App Upgrades - Chatbot for App CX - Mobile App Upgrades - Delete Profile / Register new	System Enhancements System Enhancements	-	134 65			-	134 65	
Software	CX - Mobile App Opgrades - Delete Hollie / Register New  CX - Mobile App Upgrades - DPA Application	System Enhancements	106	108				213	
Software	CX - Mobile App Upgrades - EE Promos	System Enhancements	-	65	-	-	-	65	
Software	CX - Mobile App Upgrades - Push & Email Notifications	System Enhancements	-	135	-	-	-	135	
Software	CX - Mobile App Upgrades - Report Streetlights Out Email form	System Enhancements	-	107	-	-	-	107	
Software	CX - Mobile App Upgrades - Web Chat from App	System Enhancements	-	134	-	-	-	134	
Software Software	CX - Web Upgrades - Digital Welcome Kit for new Customers	System Enhancements System Enhancements	-	134 80	-	-	-	134 80	
Software	CX - Web Upgrades - Email form for updating account owner name CX - Web Upgrades - Landlord, Business, Contractor, Developer Experience	System Enhancements System Enhancements		214				214	
Software	Calabrio/Teliopti workforce scheduling software Replacement	Maintain System Standards	317					317	
Software	CDG Developer Portal	System Enhancements	-	-	278	_	-	278	
Software	eBills Biller Direct API Updates	System Enhancements	-	-	111	_	-	111	
Software	J Log Auto Creation (Form)	System Enhancements	-	-	111	-	-	111	
Software	J Log Portal	System Enhancements	-	-	111	-	-	111	
Software Software	Street Light Out Reporting (GIS Map) CIS/CX Emergent	System Enhancements System Enhancements	-	1,069	222 1,110	488	508	222 3,175	
Software	Customer Bill Redesign	System Enhancements System Enhancements	158	1,069	- 1,110	- 400	- 506	158	
Software	Spanish Customer Bill	System Enhancements	-	108	-		-	108	
Software	Spanish Forms and Letters	System Enhancements	-	107	-	_	-	107	
Software	More Online Energy calculators	System Enhancements	-	108	-	-	-	108	
Software	Website and MyAccount Portal refresh	System Enhancements	-	108	-	-	-	108	
Software	Kubra Replacement - Payment Experience vendor. eBill, Bill Presentment and Bill Print	Maintain System Standards	-	1,071	2,225	-	-	3,296	
Software	SAP Major System Upgrade & Enhancements	Maintain System Standards	2,323	1,499	779	798	831	6,231	
Software	Identity and Access Management (IDAM) Phase 2 (SAP GRC & ServiceNow)	System Enhancements	-	352	-	-	-	352 106	
Software Software	ISE Phase III - Cisco ISE Upgrade to 3.0 and Enhancements and( Rapid 7 Integration)  ServiceNow Phase V - GRC Tool - Policy & Compliance Mgmt	Maintain System Standards System Enhancements	106 544	-	-		-	544	
Software	Cisco ISE VM Updates	Maintain System Standards	-	135		228	-	363	
Software	ISE Phase IV - Cisco Stealth watch Implementation	Maintain System Standards	-	107	111	-	-	218	
Software	Microsoft Roadmap: Access & Data Protection	Maintain System Standards	-	213	222	228	-	664	
Software	Microsoft Roadmap: Device Management	Maintain System Standards	-	-	195	-	-	195	
Software	ServiceNow Phased Cyber investments including Vendor Management & Security	Maintain System Standards	-	-	222	285	356	864	
Software	Web Vulnerability Scanner for Code Dev	System Enhancements	264	- 85	- 89	91	95	264 360	
Software Software	IDAM System Upgrade & Enhancements Cybersecurity SW Emergent	Maintain System Standards Maintain System Standards	-	334	347	356	371	1,408	
Software	ERP Phase III - Wave 1 Finance Assessment & RFP	System Enhancements	-	-	2.574	-	-	2.574	
Software	ERP Transformation	System Enhancements	- 1	_		14.254	35.627	49.881	
Software	EmpCenter Upgrades and Enhancements	Maintain System Standards	-	-	334	-	-	334	
Software	Tagetik Upgrades and Enhancements	Maintain System Standards	-	-	612	-	-	612	
Software	Workiva Upgrade and Enhancements	Maintain System Standards	211	-	556	-	-	767	
Software	Potential Replacement for Maintenance Connection	Maintain System Standards	106	-	-	-	-	106	
Software Software	Office Space Planning SW	System Enhancements	53 317	- 52	-	- 57	-	53	
Software	ARCOS Storm Staffing and Enhancements and SSO Contract Expires 2/22/2024 - Renew contract (Gas Day)	System Enhancements  Maintain System Standards	26	53	56 33	5/	59 36	542 95	
Software	Electric Bid - to - Bill System (Develop Requirements Document)	System Enhancements	11	-	-		-	11	
Software	Gas Bid - to - Bill System (Develop Requirements Document)	System Enhancements	11	-	-	-	-	11	
Software	Automate recording and notification for safety Recognition awards (replace iAuditor)	Maintain System Standards	106				-	106	
Software	Employee Recognition - Achievers	System Enhancements	-	27	-		-	27	
Software	Employment Recommendations Improvement (TBD, Sharepoint, Workday, other) - for recruiting process	System Enhancements		53			-	53	
Software	Incident Reporting Dashboard Enhancements - (Spill report and Dispatch Turnover log Feature)	System Enhancements	- 044	54	56	57	59	226	
Software Software	Real Property Services Forms DB Safety Recognition Program - Webforms	System Enhancements System Enhancements	211	-	- 56	<del>-</del>	-	211 56	
Software	Taleo Data Archival & SSO	Maintain System Standards	<del>                                     </del>	107	- 36		<del></del>	107	
Software	Total HR Data Archival & Process Removal to Retire	Maintain System Standards	-	107	222		-	329	
Software	Training System Rationalization (Workday, HSI, QTS)	Maintain System Standards	528	-	-		-	528	
Software	Workday Upgrades and Enhancements	Maintain System Standards	-	-	334	342	356	1,032	
Software	Workday Enhancements & HR Process Optimizations (Post & Bid)	Maintain System Standards	53	321	- ]	-	-	374	
Software	ERP Emergent	Maintain System Standards	-	164	170	174	182	690	
Software	Implement Facilities Ratings module -eliminate need for another software system	System Enhancements	-	53	4 005	-	-	53	
Software	IEA Replacement SAMS Software Solution for MV-90	Maintain System Standards	- 21	-	1,335	-	-	1,335	
Software Software	T/D System operational Dashboard	Maintain System Standards  Maintain System Standards	53	-	-	-	-	21 53	
Software	Develop asset database in Cascade for Distribution Transformers and Cut-outs	System Enhancements	106	-	-			106	
Software	Install Video Wall In Fishkill	Maintain System Standards	158	-	-	-	-	158	
Software	Install Video Wall in Newburgh	Maintain System Standards	1	160			-	160	
Software	Fleetwave Upgrades and Enhancements	Maintain System Standards	-	-	-	171	-	171	

nmon Additions			W/ AFUDC, Inflated & OH Adjustments						
CAT.	Description	Discretion Level	2024	2025	2026	2027	2028	5-Year	
Software	Incorporate gas transmission aerial inspections, Cathodic inspections/repairs, Gas vent inspections, QA/QC inspections)	System Enhancements	211	-	-	-	1		
Software	OMS - Avineonics Upgrade and Enhancements	Maintain System Standards	-	215	-	-	-		
	M365 - Paperless Data Capture (Fuse Cards, transformer cards, meter cards, claims. tree issues, temporary repair								
Software	findings, gas fuse inspections, tailboards, etc.)	System Enhancements	211	-	-	-	-		
Software	Tesco Enhancements and Upgrade	Maintain System Standards	106	-	-	114	-		
Software	Notifi Upgrade & Enhancement	Maintain System Standards	106	-	133	-	-		
Software	OMS - MyWorld DA Replacement (End Of Support)	Maintain System Standards	264	-	-	-	-		
Software	Upgrade to Web version of the software - Cascade 4.0 in 2024.	Maintain System Standards	264	-	-	-	-		
0.4	UN - ArcGIS 10.6.1 to 10.8.1 Upgrade - includes map viewer build, GL Essentials Server (extended support ends in January of 2024 per ESRI)	Maintain Conton Oton dond	317						
Software Software	New Damage Claim Software	Maintain System Standards System Enhancements	317	-	334	-	-	-	
Software	Emergency Mgmt System Implementation (WebEOC)	System Enhancements	211		234	-	-		
Software	UN - GL Essentials Upgrade and Enhancements	Maintain System Standards	-	643	-		-		
Software	EWAM Emergent	Maintain System Standards	-	178	185	189	197		
Software	5 year term License Renewal - December 2026 (SBS - AUD Estimating Designer Software)	Maintain System Standards		-	890	-	-		
Software	UN - Digital Circuit Mapping - Licenses and upgrades	Maintain System Standards	475	_	-	570	-		
Software	3 year term License Renewal - February 2025 (ArcGIS Portal)	Maintain System Standards		538	_	-	594		
Software	Estimating Design SBS AUD Upgrade & Enhancement	Maintain System Standards	-	536	_	_	594		
Software	UN - Underground Network Management GIS Implementation	System Enhancements	-	-	-	570	594		
Software	Warehouse Barcoding	System Enhancements	- 1	-	1,224	-	-		
Software	Gas Transmission Integrity Upgrade & Enhancement	Maintain System Standards	660	-	-	-	772		
Software	Cygnet Gas Regulator Station Control & System Pressure Monitoring Implementation	System Enhancements	-	-	-	912	950		
Software	PowerPlan Upgrades & Enhancement	Maintain System Standards	-	320	1,891	684	-		
Software	UN - Upgrade and enhance ArcGIS to ArcGIS PRO (for Phase 1 Gas, Phase 2 Electric; Phase3 Fiber)	Maintain System Standards	634	1,337	1,391	-	-		
Software	Mobile Workforce Management (MWM) Replacement	Maintain System Standards	3,168	1,077	-	-	-		
Software	IEDR Phase I	Non Discretionary	6,093	-	-	-			
Software	IEDR Phase II	Non Discretionary	-	2,571	2,670	2,509	2,613		
Software	IT Engineering Inits Emergent	Maintain System Standards	-	58	60	62	64		
Software	CYME Upgrades and Enhancements	Maintain System Standards	211	215	-	-	297		
Software	TOA Upgrades and enhancements	Maintain System Standards	-	267	-	-	-		
Software	GTS Upgrades and Enhancements	Maintain System Standards	792	-	-	-	238		
Software	Primary Control Center - IT SW (4220-Cyber SW)	Maintain System Standards	422	-	-	-	-		
Software	Learning Annex	Maintain System Standards	-	213	222	228	-		
ardware & Software	Subtotal - Hardware & Software		30,851	33,666	31,617	29,421	52,142	1	
Security	Avigilon - Catskill District Office (1) 2023, 2022 deferral	System Enhancements	67	-	-	-	-		
Security	Avigilon - Rock Tavern (3)	System Enhancements	409	-	-	-	-		
Security	Avigilon - Roseton Substation (2)	System Enhancements	256	-	-	-	-		
Security	Avigilon - East Fishkill Substation (4)	System Enhancements	-	266	-	-	-		
Security	Avigilon - Pleasant Valley Substation (5) (4 or 5)	System Enhancements	-	78	-	-	-		
Security	Security Emergent (HW Lifecycle)	System Enhancements	-	209	427	489	554		
Security	Primary Control Center Security (4240-Sec HW)	Maintain System Standards	174	-	-	-	-		
Security	Subtotal - Security		906	554	427	489	554		
Tools	Tools	Maintain System Standards	1,605	1,639	1,781	2,144	1,849	_	
Tools	Subtotal Tools		4.005	4.600	4 704	2,144	1,849		
	Subtotal - Tools Lord Mobile Pedia Penlacement with DMP	Maintain System Standards	1,605 2,293	1,639 2,507	1,781 646	2,144 120			
Communications	Land Mobile Radio Replacement with DMR	Maintain System Standards	,			120	122	1	
Communications	Grid Mod Communications - Kingston Grid Mod Communications - Catskill	System Enhancements	-	2,090 1,985	4,428	-	-	├──	
Communications Communications	IPAM - Infoblox	System Enhancements System Enhancements	51	1,985	-	-	-	<del>                                     </del>	
Communications	LMR - Minors	Maintain System Standards	102		-	-	-	<del>                                     </del>	
Communications	DMR - Minors	Maintain System Standards  Maintain System Standards	102	104	107	109	111	<del>                                     </del>	
Communications	Backhaul Fiber Optic Cable	Maintain System Standards	2.456	167	2.358	- 109	- 111	<del>                                     </del>	
Communications	Aviat Router Replacement Program	Maintain System Standards	1,945	366	592	3,479	3,324	<del>                                     </del>	
Communications	Grid Mod Communications - Newburgh	System Enhancements	1,228	-	- 592	5,418	5,524	<del>                                     </del>	
	SLA Improvement Projects	Maintain System Standards	1,220		533	544	554	t	
Communications	District Offices	Maintain System Standards	307	313	107	-	-	1	
Communications	Eltings Corners Structured Fiber	Maintain System Standards	205		- 107			t	
Communications	NST1 - SB Line Spur (4412-OT Comm)	Maintain System Standards	154			_	-	1	
Communications	Primary Control Center Comm & Network Strategy (4412-OT Comm)	System Enhancements	409	_	_	_	_		
Communications	Substation Upgrades	Maintain System Standards	409	1,129	1,280	152	332	<b>†</b>	
Communications	Subtotal - Communications		9,559	8,662	10,051	4,404	4,442		
	Subtotal - Transportation	Maintain System Standards	13,824	14,115	14.411	14.685	14.964		
	Total - Common Capital Program	,	80,668	84,847	94,453	73,549	101,886	4	