				W/ AFUDC, Inflated & OH Adjustments						
CAT.	Description	Discretion Level	Investment Type	2014	2015	2016	2017	2018	2019	5-Year Total
15	Distribution Improvement Blankets (15BL-01)	Non Discretionary	Daily Operations	7480	7740	7976	8096	8314	8179	40306
15	Relocation Blankets (15BL-02)	Non Discretionary	Compliance	170	200	206	209	215	212	1041
15	Distribution Improvement Minors (1511-0X)	Improve Reliability	Infrastructure	583	599	618	627	644	635	3123
15	Distribution Improvement Conversions (1521-0X	Improve Reliability	Infrastructure	291	300	309	313	322	317	1561
15	Road Rebuild Relocation Projects (1531-0X)	Non Discretionary	Compliance	544	499	309	313	322	317	1761
15	Distribution Improvement (1551-0X) - Thermal /	Maintain Standards	Infrastructure	2607	2222	2997	3029	3114	3068	14430
15	Distribution Improvement (1551-0X) - Reliability	Improve Reliability	Infrastructure	1326	1498	2523	2611	2685	2645	11962
15	Distribution Improvement (1551-0X) - Operating	Improve Reliability	Infrastructure	2511	3356	2323	3029	3222	3174	15102
15	5kV Aerial Cable Replacement Program	Maintain Standards	Infrastructure	180	250	257	261	322	476	1566
15	Poughkeepsie 14.4 kV Study	Improve Reliability	Infrastructure	243	429	299	0	0	0	726
15	Newburgh 14.4 kV Study	Improve Reliability	Infrastructure	0	0	1133	0	0	0	1133
15	Overhead Secondary Replacement Program	Improve Reliability	Infrastructure	97	150	154	209	215	212	940
15	14.4kV Cable Rejuvenation Program	Improve Reliability	Infrastructure	583	0	0	783	0	0	783
15	14.4kV UG Infrastructure	Improve Reliability	Infrastructure	0	0	0	0	0	423	423
15	Oil Switch Replacement	Maintain Standards	Infrastructure	53	75	77	104	107	159	523
15	CE Mesh / Protector Relays	Maintain Standards	Infrastructure	194	40	41	42	43	42	208
15	Cutout Replacement Program Zone 1 Devices	Maintain Standards	Infrastructure	787	200	0	0	0	0	200
15	Distribution Pole Replacement Program	Maintain Standards	Infrastructure	112	809	834	940	1074	1058	4715
15	Distribution Automation - ALT Program	Improve Reliability	Infrastructure	631	250	273	261	268	264	1317
15	Recloser Replacement Program	Improve Reliability	Infrastructure	801	649	309	0	0	0	958
15	10X Reliability Program	Improve Reliability	Infrastructure	656	434	664	522	537	529	2687
15	Secondary Network Upgrade Program (All Distr	Maintain Standards	Infrastructure	0	366	378	383	376	1016	2518
15	Rhinebeck Substation Rebuild Circuit ties	Maintain Standards	Infrastructure	146	250	0	0	0	0	250
15	Montgomery Street Substation Integration	Maintain Standards	Infrastructure	0	0	103	0	0	0	103
15	Dashville/Sturgeon Pool circuit exits	Maintain Standards	Infrastructure	0	0	412	0	0	0	412
15	Freehold Substation Rebuild Circuit ties	Maintain Standards	Infrastructure	0	0	0	104	0	0	104
15	Kerhonkson Circuit Exits	Maintain Standards	Growth	0	449	0	0	0	0	449
15	Maybrook Substation Circuit Exits	Maintain Standards	Growth	0	0	0	0	644	0	644
15	Montgomery Substation Circuit Exits	Maintain Standards	Growth	0	0	0	0	0	1919	1919
15	Boulevard Substation Integration	Improve Reliability	Infrastructure	0	0	0	157	0	0	157
15	Modena Integration	Improve Reliability	Growth	0	0	0	313	0	0	313
15	Stanfordville Integration	Risk Reduction	Infrastructure	0	0	0	0	644	0	644
15	Greenfield Road Substation Integration	System Enhancement	Infrastructure	1024	0	0	0	0	952	952
15	Clinton Avenue Retirement	System Enhancement	Infrastructure	0	0	0	0	0	0	0
15	Beacon Conversion	System Enhancement	Growth	0	1273	1177	0	0	0	2451
15	Knapps Corners circuit exits	System Enhancement	Infrastructure	0	0	0	418	0	0	418
15	Coxsackie Circuit exits	System Enhancement	Infrastructure	826	0	0	0	215	212	1253
15	Distribution Automation System & Integration (Ir	System Enhancement	Infrastructure	0	1997	5150	7310	9665	12696	36818
15	Copper Wire Replacement Program	System Enhancement	Infrastructure	0	0	309	470	483	635	1897
15	4800 V Conversion/Infrastructure Program	System Enhancement	Infrastructure	0	1019	1030	1044	1074	2116	6283
15	280A Electronic Recloser Program	System Enhancement	Infrastructure	1	0	360	366	376	688	1790
15	Resiliency / Incremental Aging Infrastructure	System Enhancement	Infrastructure	2	499	515	522	537	0	2075
15	Saugerties Substation Projects	System Enhancement	Infrastructure	316	0	0	0	0	0	316
15	Subtotal - Electric Distribution Improvements			22164	25554	30738	32436	35418	41943	166088

Cases 14-E-0318 & 14-E-0319
Exhibit__(EIP-1)(Redacted)
Page 1 of 1

Projects that must be completed by June 1		
Local Project ID	**Project Title**	**Project Description**
	Rhinebeck Circuit Exits	An integration study was developed as a part of the substation upgrade. Half of this project was budgeted in 2014.
	Kerhonkson Circuit Exits	To connect to the new Kerhonkson Substation
K-2013-09	5084K – Conversion of Old Post Rd and Swartekill Rd	Convert Old Post Rd to beyond Floyd Ackert Rd. Convert Floyd Ackert Rd between Old Post Rd and Swartekill Rd. Convert Swartekill Rd to beyond Floyd Ackert Rd. Install 3 - 250 kVA stepdowns for the remainder of the circuitry.
P-2013-03	6092 - Relocate 1.0 mile of off road circuitry onto Bedell Road	Relocating 1.0 mile of circuitry will eliminate the offroad tie point and eliminate an overloaded 2400V section along Bedell Road. ADD: replace ALT with VIPER ALT (+ $115k)
P-2013-02	7012- Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road	Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road to reduce the load on the 250-stepdown
F-2014-02	8087L/8066L - Lane Gate Road Conversion	Convert 3.9 miles of circuitry to 13.2kV
P-2012-04	7056 - Relocate circuitry on-road & convert to 13.2kV, Lemon Ln. & Hook Rd.	Relocate on-road & convert approximately 1.1 miles of circuitry along Lemon Ln. and Hook Rd. due to voltage concerns.
N-2015-07	5051 - Install VIPER Reclosers	Replace existing 280A V4L with VIPER Reclosers

Budget Projects Summary	
Year	**$**
2015	**$ 16,352,500**
2016	**$ 11,915,150**
2017	**$ 9,247,000**
2018	**$ 5,460,000**
2019	**$ 5,374,000**
SMART	**$ 5,062,000**
Total	**$ 53,410,650**

Definitions		
General Category	Growth	Projects where historical or projected growth is a key driver.
	Infrastructure	Projects where rebuilding that is not specifically tied to growth is a primary driver; will reduce O&M or improve reliability.
	Compliance	Projects that must be completed per regulatory requirements.
	Reliability	Projects where reliability is the primary reason for the project and infrastructure will not be rebuilt.
Specific Category (non-program based)	Thermal	Projects where equipment is above or projected to be above thermal limits.
	Voltage	Projects driven by high, low, or stray voltage.
	Reliability	Projects that fall under infrastructure or compliance that also produce reliability benefits.
	Operating	Projects that improve operating capabilities and/or may reduce CAIDI.

Specific Category (program or substation based)	10X	Projects driven by customers with 10 or more outages per year.
	ALT	Projects to improve reliability through the use of an ALT team.
	4800V	Projects driven by the 4800V conversion program.
	5kV Aerial	Projects driven by replacement of 5kV aerial cable.
	Overhead Secondary	Projects driven by the overhead secondary replacement program.
	Oil Switch	Projects driven by replacements of old oil switches.
	Secondary Network	Projects driven by replacement of aging secondary network cable.
	Planning Study	Projects driven by an area or infrastructure study, usually related to a new or upgraded substation or substation retirement.
	Saugerties	Projects driven by the Saugerties Substation replacement.
	Cu Wire Replacement	Projects driven by copper wire replacement.
	Cable	Projects driven by primary and secondary cable rejuvination.

Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2015	2014		Poughkeepsie		Rhinebeck Circuit Exits	An integration study was developed as a part of the substation upgrade. Half of this project was budgeted in 2014.	Growth	Planning Study					$ 250,000
2015	2016		Kingston		Kerhonkson Circuit Exits		Infrastructure	Planning Study					$ 450,000
2015	2014	2013	Kingston	K-2013-09	5084K – Conversion of Old Post Rd and Swartekill Rd	Convert Old Post Rd to beyond Floyd Ackert Rd. Convert Floyd Ackert Rd between Old Post Rd and Swartekill Rd. Convert Swartekill Rd to beyond Floyd Ackert Rd. Install 3 - 250 kVA stepdowns for the remainder of the circuitry.	Growth	Thermal					$ 615,000
2015	2015	2013	Poughkeepsie	P-2013-03	6092 - Relocate 1.0 mile of off road circuitry onto Bedell Road	Relocating 1.0 mile of circuitry will eliminate the offroad tie point and eliminate an overloaded 2400V section along Bedell Road. ADD: replace ALT with VIPER ALT (+ $115k)	Infrastructure	Operating					$ 415,000
2015	2014	2013	Poughkeepsie	P-2013-02	7012- Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road	Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road to reduce the load on the 250- stepdown	Growth	Thermal			111%		$ 560,000
2015	2015	2015	Fishkill	F-2014-02	8087L/8066L - Lane Gate Road Conversion	Convert 3.9 miles of circuitry to 13.2kV	Infrastructure	4800V					$ 663,000
2015	2013	2012	Poughkeepsie	P-2012-04	7056 - Relocate circuitry on-road & convert to 13.2kV, Lemon Ln. & Hook Rd.	Relocate on-road & convert approximately 1.1 miles of circuitry along Lemon Ln. and Hook Rd. due to voltage concerns.	Growth	Voltage	$ 687				$ 210,000
2015	2015	2015	Newburgh	N-2015-07	5051 - Install VIPER Reclosers	Replace existing 280A V4L with VIPER Reclosers	Growth	Thermal	$ 91				$ 55,000
2015	2015	2012	Poughkeepsie	P-2012-03	7091 - Relocate circuitry on-road & convert to 13.2kV, Hall Hill Rd.	Relocate on-road and convert approixmately 2.2 miles of circuitry along Hall Hill Rd. and Siegler Rd. due to voltage & loading concerns.	Infrastructure	4800V	$ 720		149%		$ 360,000
2015	2015	2015	Poughkeepsie	P-2015-02	7056 - Replace overloaded 200A V4L with a VIPER	Replace a set of overloaded 200A V4L hydraulic reclosers with a VIPER	Growth	Thermal			125%		$ 55,000
2015	2015	2015	Newburgh	N-2015-02	5003 - Extend 5003 to 9W	Extend 5003 circuit 0.45 miles to offload 5002 circuit	Growth	Thermal					$ 202,500
2015	2014	2011	Poughkeepsie	P-2011-07	7053 - Relocate circuitry on-road & convert to 13.2kV, Slate Quarry Rd.	Relocate approximately 2.75 miles of circuitry on-road & convert Slate Quarry Rd. due to voltage & loading concerns.	Growth	Voltage					$ 525,000
2015	2013	2011	Poughkeepsie	P-2011-06	7062 - Establish & integrate new circuit (Ph 3 of 3)	Reconductor 2.3 miles of circuitry along Spring Lake Rd. & Rt. 9 to complete offload of Rhinebeck 7051 ckt.	Growth	Thermal					$ 690,000
2015	2015	2015	Poughkeepsie	P-2015-06	6046 – Install a VIPER as First Fuse Point on New Hackensack Rd.	Install a VIPER as the first fuse point to provide transient protection for 561 customers served along the New Hackensack Rd portion of the Spackenkill 6046 circuit.	Reliability	Reliability	$ 107				$ 55,000
2015	2013	2012	Newburgh	N-2012-02	4012/WN - Rebuild along Gail Place from Rt. 32 to Vermont Dr.	Rebuild 0.4 miles of the 4012 and WN lines.	Infrastructure	Reliability	$ 163				$ 225,000
2015	2015	2015	Poughkeepsie	P-2015-04	6092 - Install VIPER as First Fuse Point	Install a VIPER as the first fuse point to provide transient protection for 1,051 customers served along the Rt. 44 portion of the Manchester 6092 circuit.	Reliability	Reliability	$ 472				$ 55,000
2015	2015	2015	Poughkeepsie	P-2015-05	6046 – Install a VIPER as First Fuse Point on Alda Dr.	Install a VIPER as the first fuse point to provide full fault current interrupting capability and fuse-saving capability to the circuitry along Alda Dr and Daria Dr on the Spackenkill 6046 circuit.	Infrastructure	Reliability	$ 559				$ 55,000
2015	2013	2011	Kingston	K-2011-16	2017/1022 - Foxhall Ave ALT	Install ALT between 2017 and 1022 to protect Albany Ave portion of 2017.	Reliability	ALT	$ 584				$ 115,000
2015	2015	2012	Newburgh	N-2012-04	5083 - Reconductor Perkinsville Road	Reconductor 0.5 miles to create a strong 5081/5083 circuit tie.	Infrastructure	Operating					$ 150,000
2015	2015	2012	Fishkill	F-2012-03	801/802/803/881/882 - Beacon Area (Ph 3 of 4)	Remove the BF cable and build 3 miles of distribution circuitry in its place	Growth	Planning Study					$ 1,275,000
2015	2011	2011	Poughkeepsie	P-2011-25	Replace failed aerial cable & convert Holmes St.	Rebuild and convert 0.25 miles of 3 phase along Holmes St and 0.15 miles of single phase along Crescent Rd. This would eliminate failed aerial cable and replace aging infrastructure.	Infrastructure	5kV Aerial					$ 115,000

Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2015	2015	2011	Poughkeepsie	P-2011-10	621/PH - Retire Maryland Ave Substation (Ph 4 of 5)	Extend the PH by rebuilding approximately 0.5 miles of circuitry along S. Cherry St. to provide a new high voltage circuit path & convert all spurs. Hang step downs to retain low voltage ties.	Infrastructure	Planning Study					$ 430,000
2015	2014	2011	Newburgh	N-2011-09	4025 - Governor's Drive URD (Ph 4 of 5)	Replace live-front PM Gear.	Infrastructure	Operating					$ 200,000
2015	2015	2014	Poughkeepsie	P-2014-02a	7091 & 7061 Tie	7091/7061 - Polyphase, Reconductor & Convert 3 miles of Rt. 199 east of TSP. Replace TSP duct bank. Reconductor 1.5 miles west of TSP on Rt. 199 to create strong tie between 7091 and 7061.. (Ph 1 of 3)	Infrastructure	Operating		$ 11		46	$ 675,000
2015	2015	2015	Newburgh	N-2015-05	5033 - Bring Aumick Road circuitry on road	Improve reliability to 52 customers along Aumick Rd. by bringing 0.85 miles of single phase on-road	Infrastructure	Reliability	$ 348				$ 170,000
2015	2013	2011	Newburgh	N-2011-04a	4095 - Polyphase 2 miles along Lake Road in the Beaver Dam area	Establish strong ties. ($607/COA for both phases)	Infrastructure	Reliability	$ 619				$ 600,000
2015	2015	2014	Kingston	K-2014-03	3091 - Relocate Sundown Rd on-road	Rebuild one mile of circuitry on-road along Sundown Rd.	Reliability	Reliability	$ 688				$ 300,000
2015	2015	2014	Newburgh	N-2014-04	5084- New Ransom Rd. Feed	Build 0.4 miles of 3-phase to feed customers down Ransom Rd.	Reliability	Operating	$ 731				$ 120,000
2015	2014	2013	Catskill	C-2013-02	1083 - Rebuild single phase Route 51, Route 54, Roberts Hill Road and Highmount Road, 5.0 Miles	Rebuild the single phase circuitry along Route 51, Route 54, Roberts Hill Road and Highmount Road to replace failing 1930s pole plant.	Infrastructure	Reliability	$ 759				$ 750,000
2015	2015	2012	Catskill	C-2012-05	1092 - Rebuild & Reconductor Route 22, Route 145, 2 miles, Part II of II	Replace the #2 ACSR with 336 MCM Wr. Rebuilding and reconductoring the circuitry will eliminate problems associated with conductor failures.	Infrastructure	Reliability	$ 937				$ 600,000
2015	2015	2012	Newburgh	N-2012-03	5051 - Polphase Egbertston Road	Polyphase 1.2 miles on-road to create a strong tie and allow customers to benefit from the ALT. Also may help with Maybrook integration.	Reliability	10X	$ 1,148				$ 360,000
2015	2015	2014	Newburgh	N-2014-05	5021 - Single phase feed on Albany Post	Bring 0.5 miles of single phase circuitry on road near Albany Post Rd.	Reliability	10X	$ 1,421				$ 75,000
2015	2015		Poughkeepsie		Taconic Crossing #1		Infrastructure	Operating					$ 50,000
2015	2015		Fishkill		SMART GRID	Likely Tioranda/Merritt Park area - Regulators, Switched Caps, and ALTs	SMART						$ 1,600,000
2015	2015		ALL		Switched Capacitors	20 locations	SMART						$ 400,000
2015	2015		ALL		Electronic Reclosers	Replacement program	Infrastructure	Reliability					$ 650,000
2015	2015		ALL		Open Secondary Replacement	Replacement program	Infrastructure	Overhead Secondary					$ 150,000
2015	2015		ALL		Oil Switch Replacement	Replacement program	Infrastructure	Oil Switch					$ 75,000
2015	2015		Poughkeepsie		CE Mesh/Protector Relays	Replace rusted units	Infrastructure	Operating					$ 40,000
2015	2015		ALL		Cutout Replacement Program	Develop new $/COA and establish a new customer count threshold for replacement of porcelian with polymer cutouts	Reliability	Reliability					$ 200,000
2015	2015		ALL		Pole Replacement Program	Replace poles identified via the inspection and resistograph programs	Infrastructure	Reliability					$ 810,000
2015	2015		ALL		Microgrid Project	TBD	Reliability	Reliability					$ 500,000
2015	2015		Newburgh		Secondary Network Cable	Phase 1 of the Newburgh Secondary Network Cable	Infrastructure	Secondary Network					$ 367,000
2015	2015		ALL		5 kV Aerial Program	Replacement program	Infrastructure	Operating					$ 135,000
2016	2016	2014	Poughkeepsie	P-2014-03	7013 - Create New Hibernia 7013 Circuit	Polyphase 3.0 miles into mainline and add new breaker switchgear to take on load of surrounding circuits to defer need for a new Stanfordville Transformer	Growth	Thermal					$ 600,000
2016	2016	2015	Fishkill	F-2015-01a	8086/8066 - South Mountain Pass Conversion - Phase I	Polyphase/convert 4.4 miles of the 8066/8086 circuits to eliminate 4800V and create a 3-phase tie. POSSIBLE 2015 SMART GRID PROJECT	Infrastructure	4800V		$ 8			$ 462,000

Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2017	2017	2015	Fishkill	F-2015-01b	8086/8066 - South Mountain Pass Conversion - Phase II	Polyphase/convert 4.4 miles of the 8066/8086 circuits to eliminate 4800V and create a 3-phase tie POSSIBLE 2015 SMART GRID PROJECT	Infrastructure	4800V		$ 8			$ 707,000
2016	2016	2015	Newburgh	N-2015-01	5004/4011 - Polyphase Leslie Rd.	Polyphase /re-conductor 1.25 miles to create a 4011/5004 tie	Growth	Thermal					$ 375,000
2016	2016	2015	Poughkeepsie	P-2015-01a	7095 - Convert Shekomeko (Phase 1 of 3)	Convert 7.7 miles of 4800 to single phase 7620 along McGhee, Rt. 83, Hunns Lake, Pugsley Hill, Shaefer, Carpenter Hill, and Conklin Hill. This would eliminate cascading voltage issues, eliminate 4800 circuitry, and create 5 high voltage ties.	Infrastructure	4800V				49	$ 580,000
2016	2016	2014	Fishkill	F-2014-03	801/802/803/881/882 - Beacon Area (Ph 4 of 4)	Convert the 881, 882, 8015L, 8085L to 13.2kV; install an ALT team between new distribution feeders; retire Beacon and Conway Place Substations	Growth	Planning Study					$ 1,143,000
2016	2016	2013	Kingston	K-2013-13	341-345 – High Voltage Conversion	Build 0.5 mi of 336 ACSR, recondcutor & convert 0.3 mi of ACSR, and reconductor 0.3 mi of ACSR all along Rt 213. This alows the rebuild of Sturgeon Pool and converts the 341 & 345 circuits.	Growth	Planning Study					$ 610,000

= must completed by June 1
= programs which contain specific projects (most to be supplied by Engineering)
=draw up in case funding becomes available and/or anticipated permitting issues

K - 13 - 09

Title: 1 – 5084K – Conversion of Old Post Rd and Swartekill Rd
District: Kingston
Budget Year Submitted: 2013
Project Category: Growth – Thermal

History:

Old Post Rd and Swartekill Rd are each served by a 250 kVA stepdown after a partial conversion was done in 2007 to solve voltage problems and thermal overloads in the area. The conversion was limited by costs that were higher than expected. The load has continued to increase since then requiring a second phase of conversion to be completed. The loading on the Old Post Rd stepdown during summer 2010 was approximately 92A. The loading on the Swartekill Rd stepdown during summer 2010 was approximately 74A.

Solution: (refer to the attached circuit maps)

Convert Old Post Rd to beyond Floyd Ackert Rd. Install a 250 kVA stepdown for the remainder of the circuitry. Convert Floyd Ackert Rd between Old Post Rd and Swartekill Rd. Convert Swartekill Rd to beyond Floyd Ackert Rd. Install a 250 kVA stepdown for the remainder of the circuitry on Floyd Ackert Rd to the east. Install a 250 kVA stepdown for the remainder of the circuitry past Floyd Ackert Rd. Relocate the circuitry near the Swartekill Rd and Floyd Ackert Rd intersection on-road. It appears as though there is no #6 CU conductor so reconductoring is not expected.

Cost:

- Conversion of Old Post Rd past Floyd Ackert Rd (2.2 miles inc. spurs)…….... $440,000
- Conversion of Swartekill Rd past Floyd Ackert Rd (0.9 miles inc. spurs)...……...$175,000

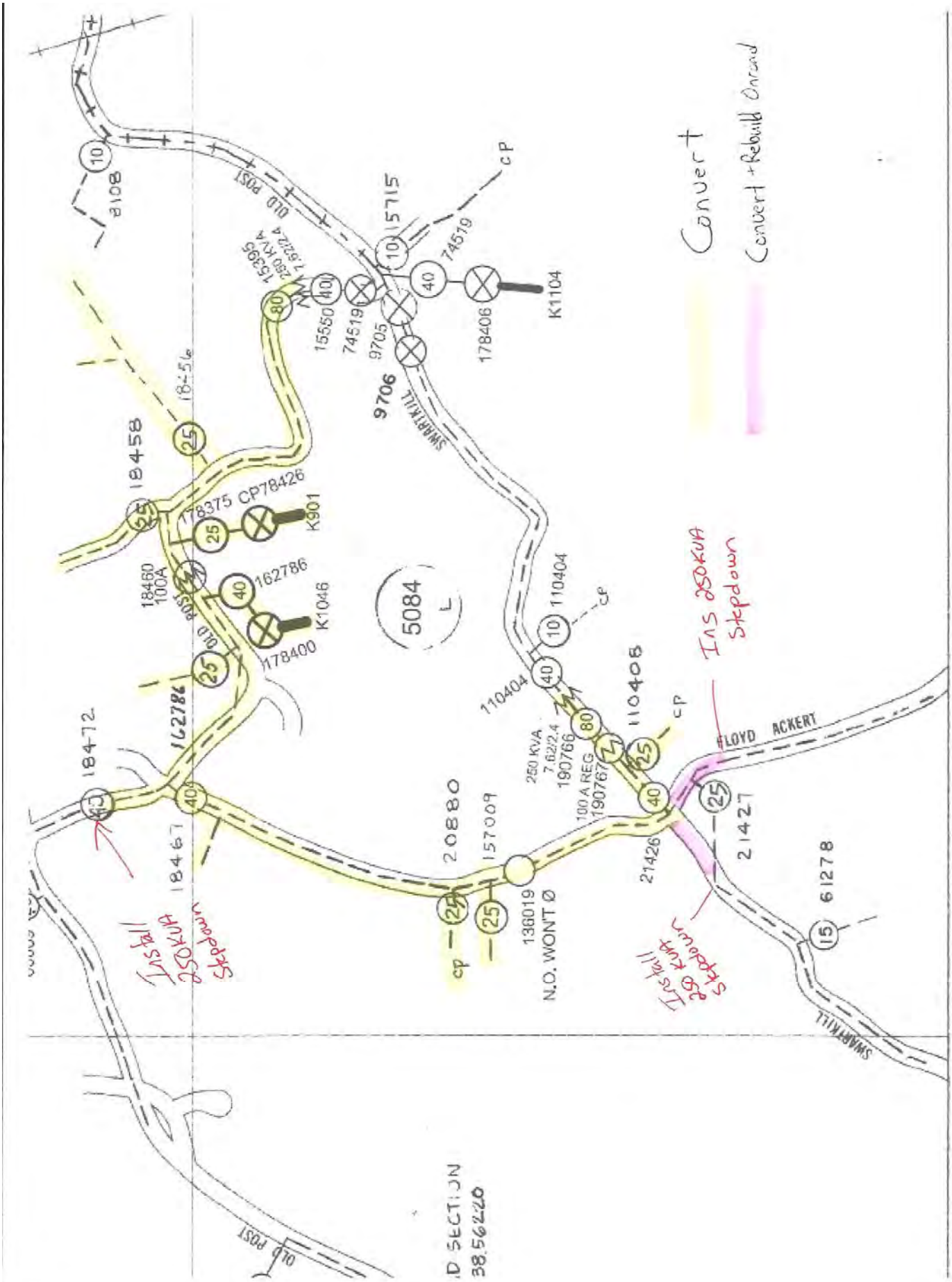
Total Cost (Capital) = $615,000

$/COA (5 year basis, reliability projects only): N/A

Summary:

This project will alleviate the loading concerns on Old Post Rd and Swartekill Rd and provide sufficient capacity for future load growth in the area. The project estimate is most likely high due to the inclusion of spurs in the distance which most likely will not require any capitol work.

K - 13 - 09


Convert
Convert + Rebuild Onroad
Install 25KVA Stepdown
Install 25KVA Stepdown
Ins 25KVA Stepdown
FLOYD ACKERT
SWARTKILL
OLD POST
N.O. WON'T Ø
5084
9706
162786
110405
110404
20880
157009
136019
21426
21427
61278
18458
18456
18472
18467
18460
100A
178375 CP78426
K901
178400
K1046
162786
178406
K1104
74519
15550
74519
9705
15715
110404
CP
250 KVA
7.62/2.4
190766
100A REG
190767
8018
10
40
80
25
15
SECTION
38.562220

2013 Capital Budget Submissions

Manchester – 6092 – Bedell Road – Tie Point

History:

There is a normally open will phase 3-Phase ALT tie point between the 6092 from Manchester and the 6061 from Inwood Ave located on Salt Point Turnpike. The current path to this tie point from the 6092 is via 1.5 miles of off-road forest that utilizes antiquated utility poles. The pole plant is in poor condition, with some of the poles currently roped up in strong need of replacement. The line is also difficult to access, and was out of service for over a month during Irene due to excessive flooding. The poles are also located along the edge of Central Hudson's right-of-way, making for unnecessary tree reliability issues.

Bedell Road, which runs from Van Wagner Road to Salt Point Turnpike, is fed from a single phase stepdown bank. The 2011 load checks reveal that the 7620 to 2400 stepdown bank that serves Bedell Road is operating at or near 100% of its rated capacity.

Solution:

By both converting the 1.0 mile of circuitry on Bedell Road from 2400 to 7620 and polyphasing it, a much more reliable tie point can be installed. The existing Automatic Load Transfer can be reused.

Cost:

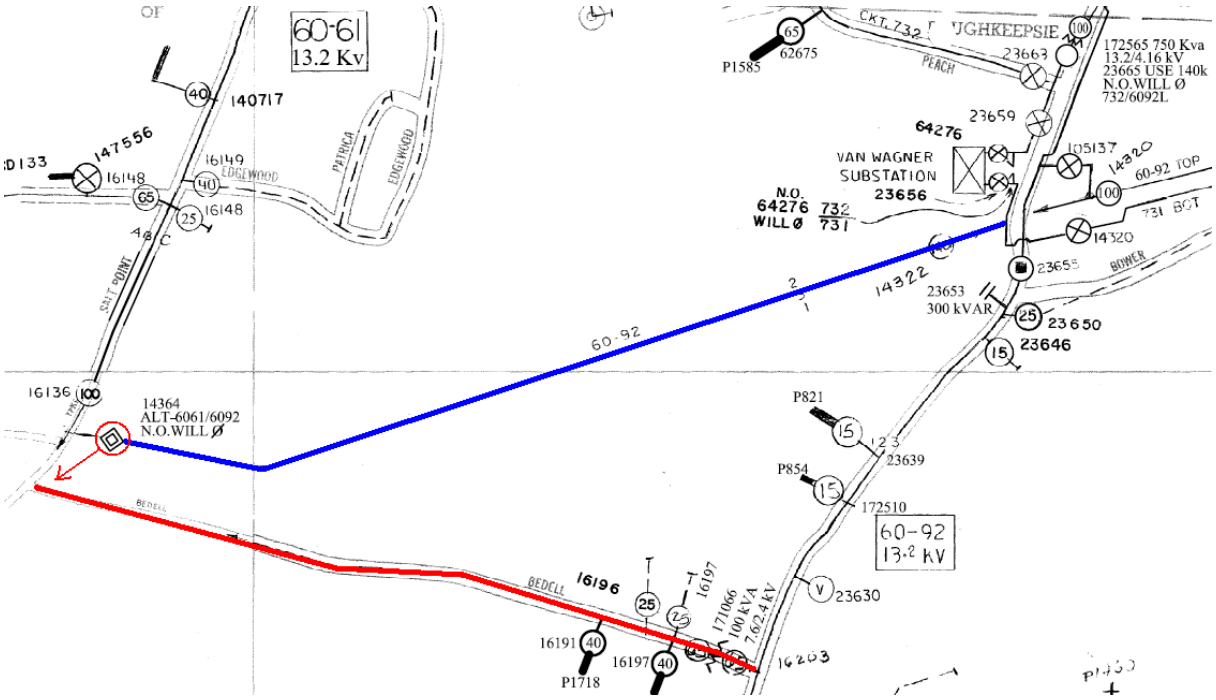
- Polyphase and convert 1.0 mile of 2400-volt single-phase circuitry along Bedell Road to 7620-volt 3-phase……$ 300,000

Total Capital Cost……. $ 300,000

Benefits:

- Increase ALT reliability
- Eliminate excessive off-road tree trimming
- Reduce 2400 circuitry on CH system
- Bring poles road-side
- Eliminate risk of full capacity stepdown unit failing

Map 121


60-61
13.2 Kv
140717
147556
16149
16148
EDGEWOOD
PATRICA
SALT POINT
A B C
P1585
62675
CKT. 732
PEACH
23663
172565 750 Kva
13.2/4.16 kV
23665 USE 140k
N.O.WILL Ø
732/6092L
23659
64276
VAN WAGNER
SUBSTATION
23656
N.O.
64276 732
WILL Ø 731
105137
14320
60-92 TOP
731 BOT
14322
23655
BOWER
23653
300 kVAR
23650
23646
60-92
16136
14364
ALT-6061/6092
N.O.WILL Ø
P821
23639
P854
172510
60-92
13.2 kV
BEDELL
16196
16197
171066
100 kVA
7.62.4 kV
23630
16191
P1718
16203

2013 Capital Budget Submissions

Hibernia – 7012 – Salt Point & Schultzville – Stepdown Convert

History:

As indicated in the 2011 load checks of the 7012 circuit, it was observed that the 7620 → 4800 volt 250 KVA stepdown transformer on Salt Point Turnpike and Clinton Corners Schultzville Road was experiencing excessive capacity issues. The allowable continuous current for the Class 17 unit is 52.1 Amps for each leg on the low side. Load checks showed values of 57 and 58 amps.

Solution:

By relocating the stepdown unit further downstream, more customers can be served off of the high voltage section, alleviating the pressure on the stepdown. The current configuration of the stepdown serves 84 customers. If the unit is moved about 1.8 miles further down the circuit to Willow Lane, only 49 customers with 4800 would remain, reducing the load on the stepdown by about 40%.

Cost:

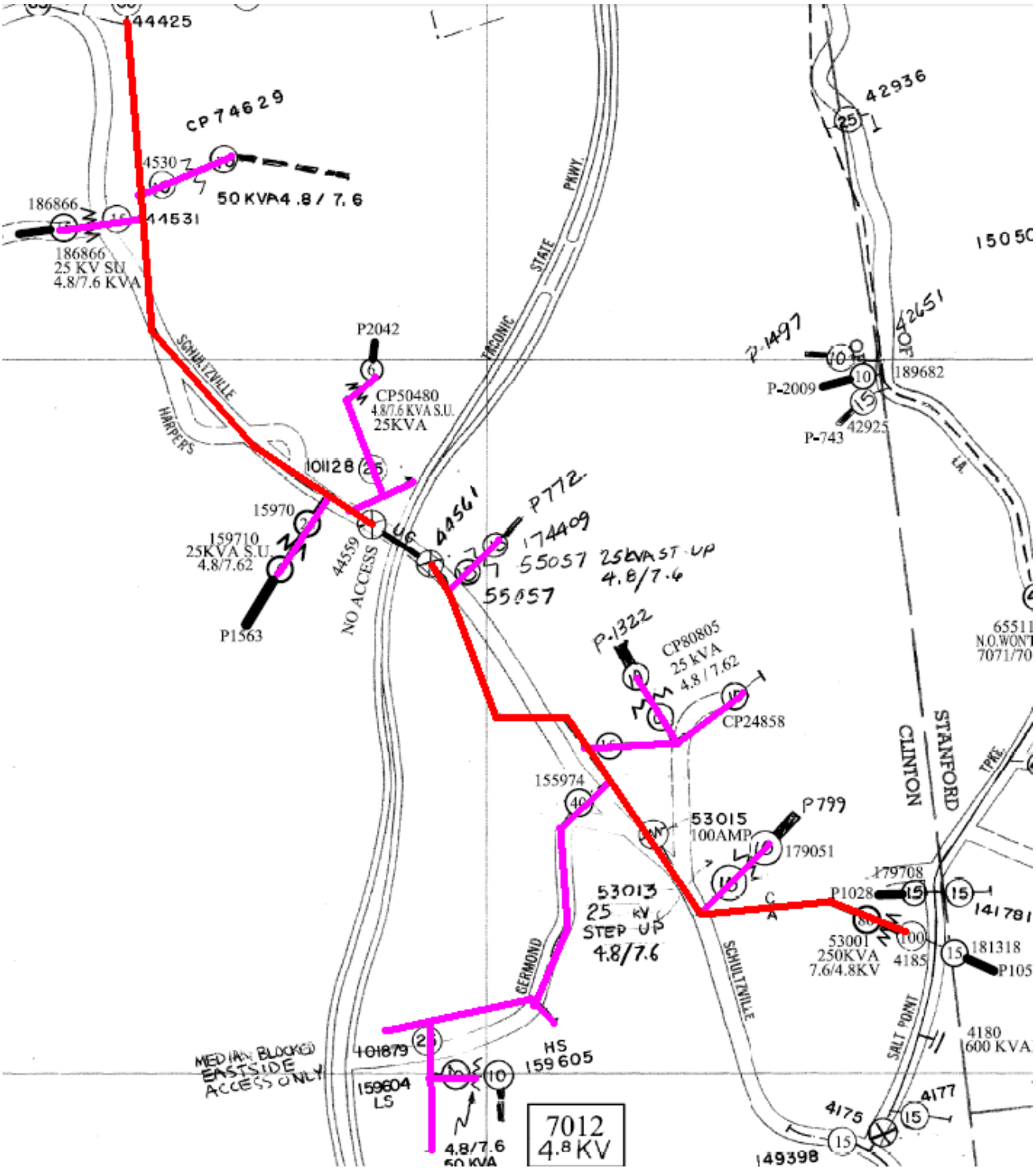
- Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road from 4800 to 7620 volts……..... $ 360,000
- Convert 1.0 mile of spurs from 4800 to 7620……....$ 200,000

Total Capital Cost…… $ 560,000

Benefits:

- Reduce pressure on the 250 KVA stepdown bank
- Reduce the amount of 4800 circuitry on the CH system

Map 121


44425
CP74629
44530
50 KVA 4.8 / 7.6
186866
44531
186866
25 KV SU
4.8/7.6 KVA
SCHULTZVILLE
HARPERS
P2042
CP50480
4.8/7.6 KVA S.U.
25KVA
10128
15970
159710
25KVA S.U.
4.8/7.62
P1563
44559
NO ACCESS
44561
P772
174409
55057
55057 25KVA ST-UP
4.8/7.6
P-1322
CP80805
25 KVA
4.8/7.62
CP24858
155974
53015
100AMP
P799
179051
53013
25 KV
STEP UP
4.8/7.6
GERMOND
MEDIAN BLOCKED
EASTSIDE
ACCESS ONLY
101879
159604
LS
HS
159605
4.8/7.6
50 KVA
7012
4.8 KV
42936
P-1497
42651
P-2009
189682
P-743
42925
65511
N.O.W.O.N.T.
7071/70
CLINTON
STANFORD
179708
P1028
141781
53001
250KVA
7.6/4.8KV
4185
181318
P105
SCHULTZVILLE
SALT POINT
4180
600 KVA
4175
4177
149398

Title: F-2014-02 – 8087L/8066L – Lane Gate Road Conversion
District: Fishkill
Budget Year Submitted: 2014
Project Category: Infrastructure – 4800V

History:

Lane Gate Road in Cold Spring is the site of one of the largest remaining load pockets of 4800V construction in the Fishkill district. There are 3.9 miles of this phase-phase design, which is inherently not effectively grounded. During outage events this can lead to live wires on the ground, system backfeed and partial voltage to customers. Approximately half of the 4800V on Lane Gate Road is on the 8087L circuit and the other half is on the 8066L circuit. During peak load periods, the normally-open tie at pole #P69859 cannot be used to pick up much load on the 8066L circuit due to the limitations imposed by the 167kVA step-down transformer at pole #P59171, which is already loaded to about 102% of its nameplate rating at peak.

Solution:

The 2 miles of 4800V circuitry downstream of the stepdown at pole #P59171 should be converted to 13.2kV as well as the 1.3 miles downstream of the stepdown at pole #177371. The majority of the transformers in these locations are already dual-rated and only about 20% of the pole plant will need to be replaced, though some infrastructure is located off-road in locations that are difficult to access. This conversion will also strengthen the tie at pole #P59171 by rendering it usable during hot weather.

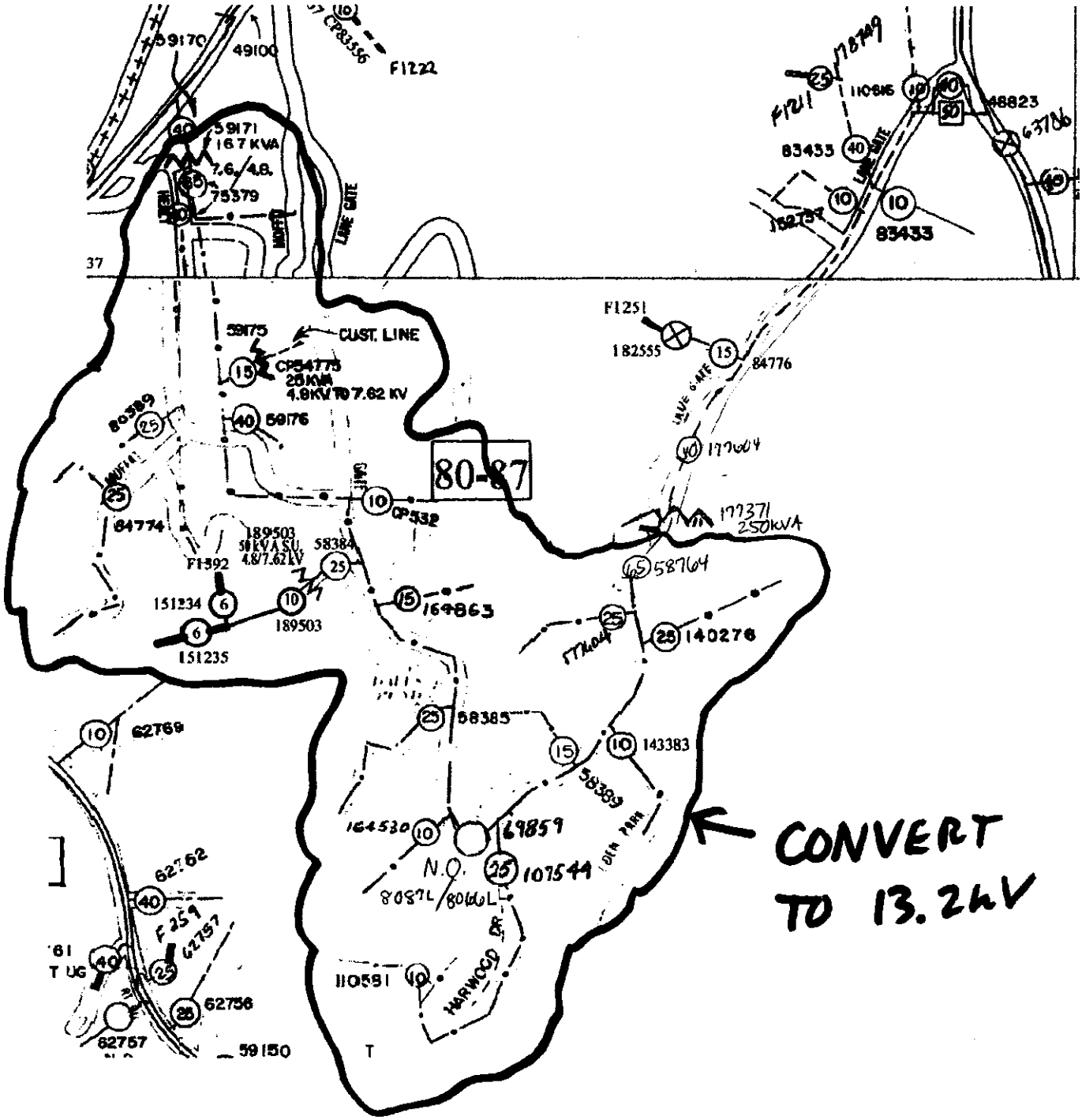
Cost:

- Convert 3.9 miles of circuitry to 13.2kV…….....$663,000

Total Cost (Capital) = $663,000

Summary:

- Convert 3.9 miles of the 8087L circuit to high voltage and remove entire 4800V section.


80-87
CUST. LINE
CONVERT
TO 13.2kV

Title: 7056 ckt. – Relocate circuitry on-road & convert to 13.2kV, Lemon Ln. & Hook Rd.

History:

Lemon Lane and Hook Road, which are fed from the 7056 circuit via a 250 kVA stepdown transformer and a 100kVA stepdown transformer, has had a history of voltage issues. Voltage readings taken during Summer peak 2010 indicated customers were experiencing voltages as low as 103V despite numerous attempts to improve the situation.

This portion of the 7056 circuit has also had its history of reliability issues. Much of the circuitry along Lemon Lane and Hook Road runs cross-lot and is difficult to access by bucket truck. Over the last five years, this area has experienced six outages in the off-road circuitry alone. Much of the infrastructure along Lemon Ln. and Hook Rd. is 1930s vintage and is in poor condition.

Solution: (refer to the attached circuit maps)

Convert to 13.2 kV circuitry and rebuild on-road 2.1 miles of Hook Road. using 1/0 WR AA open wire circuitry. Convert all spurs to 13.2kV operation.

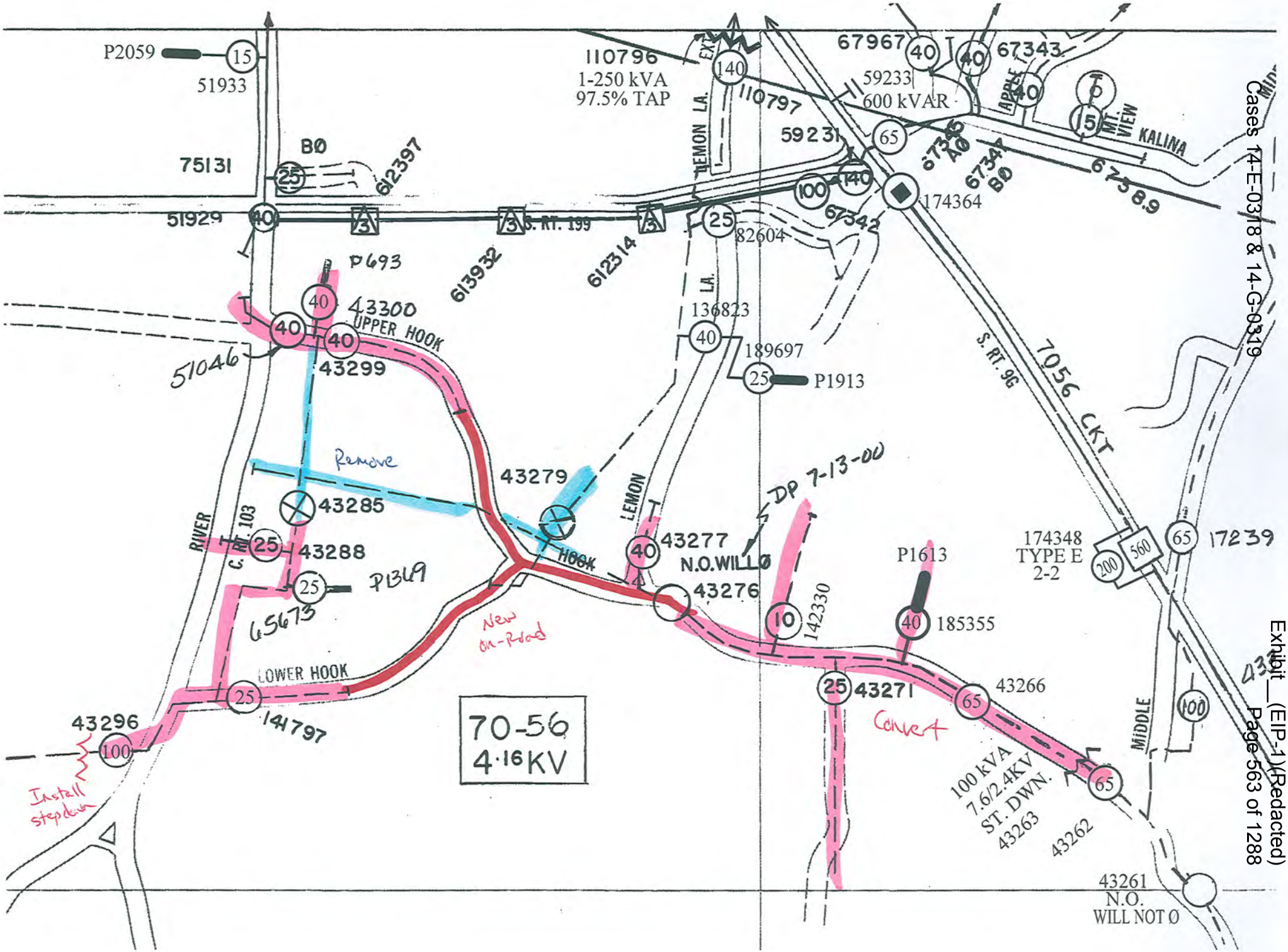
Cost: (refer to the attached circuit maps)

- Rebuild on-road & convert to 13.2kV operation 1.1 miles of circuitry along Hook Road ……. $ 110,000
- Convert all spurs to 13.2kV operation…… $ 100,000

Total Cost (Capital) = $ 210,000

Summary:

Rebuild and convert 2.1 miles of single-phase 4.16kV circuitry to 13.2kV circuitry along Hook Rd. Convert all other spurs to 13.2kV operation. This project will improve the condition of the pole plant, and relieve the voltage issues currently present. It will also reduce frequency and duration of tree-related outages, and would decrease the cost to trim the line in the future. The historical $/COA for the line relocation portion of this project is $687, and feeds 72 customers.


P2059
15
51933
75131
B0
25
612397
51929
40
3
S. RT. 199
612314
613932
110796
1-250 kVA
97.5% TAP
EXT.
140
110797
LEMON LA.
59233
600 kVAR
67967
40
67343
APPLE
MT. VIEW
KALINA
59231
65
67345
A0
67341
B0
67589
100
67342
174364
82604
25
P693
40
43300
UPPER HOOK
43299
51046
136823
189697
P1913
S. RT. 96
7056 CKT
Remove
43279
43285
RIVER
C. RT. 103
25
43288
P1369
65673
LEMON
DP 7-13-00
43277
N.O. WILL Ø
HOOK
New on-Road
43276
10
142330
P1613
40
185355
174348
TYPE E
2-2
200
560
65
17239
LOWER HOOK
43271
43266
Convert
43296
100
141797
Install step down
70-56
4·16 KV
100 KVA
7.6/2.4KV
ST. DWN.
43263
43262
MIDDLE
43261
N.O.
WILL NOT Ø

Title: N-15-07 – 5051 – Replace existing Hydraulic Reclosers with VIPERs
District: Newburgh
Budget Year Submitted: 2015
Project Category: Reliability – Reliability

History:

The Maybrook 5051 circuit currently serves 1123 customers along Maybrook Rd. and Rt. 207. The first fuse point on the circuit is a set of 280A Type V4L Hydraulic Reclosers. The next downstream device is a set of 3 x 140K fuses. The coordination curves on the reclosers do not allow for a larger size fuse downstream. Due to the fuse size limitation, there have been a number of outages due to overloaded fuses. The circuit feeds the very western tip of the service territory so phase balancing and offloading options are severely limited.

Solution: (refer to the attached circuit maps)

Install a VIPER as the first fuse point on Rt. 207 (N25750-in place of the existing 140K fuses), Replace the 280A Hydraulic Reclosers with 600A disconnects on N43272 and upgrade existing downstream fuses.

Cost: (refer to the attached circuit maps)

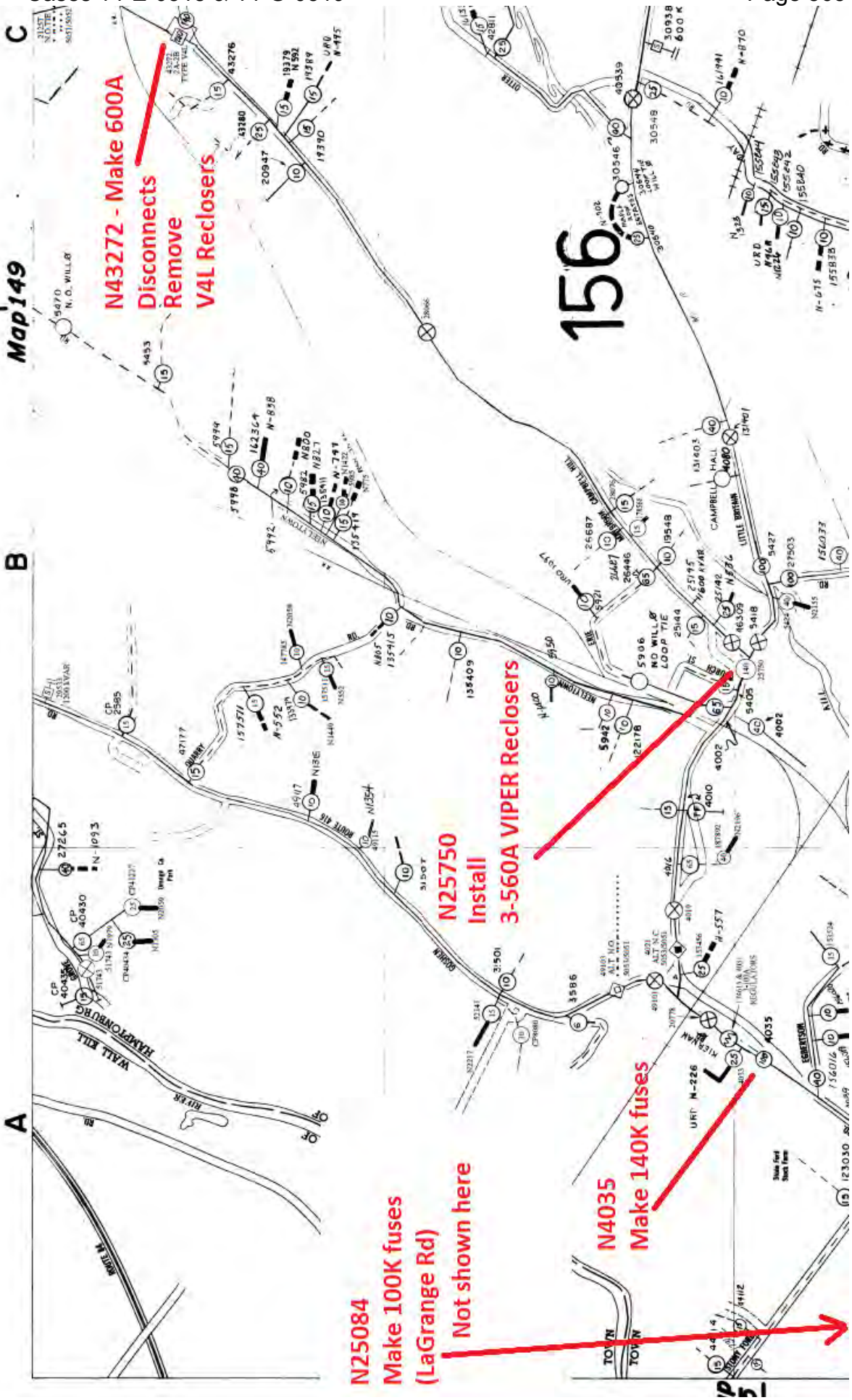
- Install a VIPER as the first fuse point…… …..……...$55,000

Total Cost (Capital) = $55,000

$/COA: $91

Summary:

This project will allow several fuses downstream of the VIPER reclosers to be upgraded to accommodate overloaded fuses at the edge of the service territory.


Map 149
N43272 - Make 600A
Disconnects
Remove
V4L Reclosers
N25750
Install
3-560A VIPER Reclosers
N25084
Make 100K fuses
(LaGrange Rd)
Not shown here
N4035
Make 140K fuses
156
A
B
C

Title: 7091 ckt. – Relocate circuitry on-road & convert to 13.2kV, Hall Hill Rd.

History:

Hall Hill Rd., which is fed from the 7091 circuit via a 167kVA stepdown transformer, has had a history of thermal and voltage issues. Load checks taken in Summer 2010 indicate that the stepdown is at 125% of its rated capacity. A 100A regulator is installed 1.9 miles downstream from the stepdown for voltage support. However, it has been found that low voltage still persists in this area during summer peak.

This portion of the 7091 circuit has also had its history of reliability issues. Much of the circuitry along Hall Hill Rd. runs cross-lot and is difficult to access by bucket truck. Over the last 5 years, this area has experienced 13 outages in the off-road circuitry alone. Much of the infrastructure along Hall Hill Rd. is 1940s vintage and is in poor condition. The circuitry is also all 4.8kV delta, presenting safety issues.

Solution: (refer to the attached circuit maps)

Convert to 13.2 kV circuitry and rebuild on-road 2.0 miles of Hall Hill Rd. and 0.2 miles of Siegler Rd. using 1/0 WR AA open wire circuitry. Install a stepdown transformer at pole 43595 to feed Siegler Rd, and a stepdown transformer at pole 52572 to feed the remaining portion of Hall Hill Rd. Convert all other spurs to 13.2kV operation.

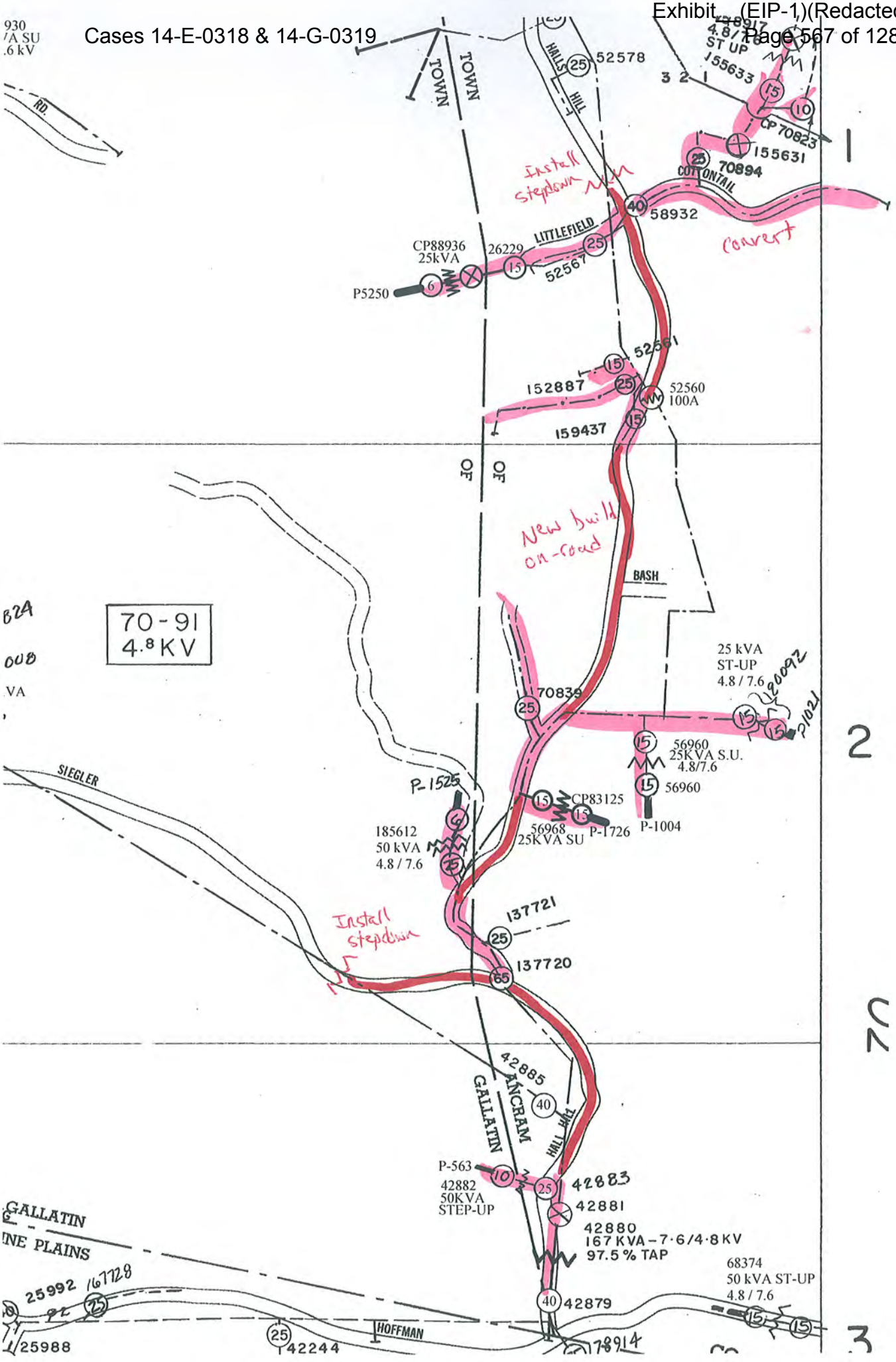
Cost: (refer to the attached circuit maps)

- Rebuild on-road & convert to 13.2kV operation 2.2 miles of circuitry along Hall Hill Road and Siegler Rd……. $ 220,000
- Install two stepdown transformers to feed remaining area……. $ 20,000
- Convert all spurs to 13.2kV operation…… $ 120,000

Total Cost (Capital) = $ 360,000

Summary:

Rebuild and convert 3.4 miles of delta 4.8kV circuitry to 13.2kV circuitry along Hall Hill Rd. Install a stepdown transformer at pole 43595 to feed Siegler Rd, and a stepdown transformer at pole 52572 to feed the remaining portion of Hall Hill Rd. Convert all other spurs to 13.2kV operation. This project will improve the condition of the pole plant, and relieve the thermal and voltage issues currently present. It will also reduce frequency and duration of tree-related outages, and would decrease the cost to trim the line in the future. The historical $/COA for the line relocation portion of this project is $720, and feeds 100 customers.


930
/A SU
.6 kV
RD.
TOWN
TOWN
HALLS
HILL
52578
155633
CP 70823
155631
70894
COTTONTAIL
Install
stepdown
40
58932
Convert
LITTLEFIELD
CP88936
25kVA
26229
52567
P5250
52561
152887
52560
100A
159437
OF
OF
New build
on-road
BASH
70-91
4.8 KV
25 kVA
ST-UP
4.8 / 7.6
70839
56960
25KVA S.U.
4.8/7.6
56960
P-1021
SIEGLER
P-1525
CP83125
185612
50 kVA
4.8 / 7.6
56968
25KVA SU
P-1726
P-1004
Install
stepdown
137721
137720
42885
ANCRAM
GALLATIN
HALL HILL
P-563
42882
50KVA
STEP-UP
42883
42881
42880
167 KVA – 7·6/4·8 KV
97.5 % TAP
68374
50 kVA ST-UP
4.8 / 7.6
42879
GALLATIN
INE PLAINS
25992
167728
25988
HOFFMAN
42244
78914
1
2
3

Title: P-15-02 – 7056 – Replace overloaded 200A V4L Reclosers with a VIPER
District: Poughkeepsie
Budget Year Submitted: 2015
Project Category: Growth – Thermal

History:

The Rhinebeck 7056 circuit on Rt. 9G north of Rt. 199 serves both Bard College primary metered services. In addition, the 7056 circuit is the alternate feed to the 7051 / 7056 ScadaMate ALT that protects the village of Tivoli along with portions of northwest Red Hook. The combined load at Bard College has grown to 3.9 MVA as of 2013 or 172A per phase. The 200A V4L reclosers on P83207 only serve 69 customers so the Bard College load is virtually the entire load that is normally served. Load checks from the summer of 2013 measured that the 7051 / 7056 ALT serves up to 189A on the highest loaded phase and 140A on the lightest loaded phase. In the event of a 7051 mainline outage that results in an operation of the 7051 / 7056 ALT, these 200A reclosers could be forced to carry as much as 361A. 200A V4L reclosers only have a 4 hour overload rating of 125% or 250A. The existing reclosers were installed in 2002 and are due to be changed out for maintenance. There have been three outages downstream of these reclosers during the past five years. Without these reclosers, the additional 530 customers served from the upstream protective device would have been interrupted as well.

Solution: (refer to the attached circuit maps)

Replace the 200A Type V4L reclosers with a VIPER Installation that will have a continuous current rating of 800A.

Cost: (refer to the attached circuit maps)

- Replace a set of 200A Type V4L Reclosers with a VIPER…..……...$55,000

Total Cost (Capital) = $55,000

% Loading: <125% - 200A V4L recloser after ALT Operation

Summary:

This project will alleviate an overload problem that would occur in the event of a 7051 mainline outage resulting in the operation of the 7051 / 7056. By mitigating this problem, the ALT will be able to remain available for year round load conditions. Additionally, the increased capacity will allow for additional load growth at Bard College. This project will also avoid the maintenance expense that will need to be spent to change out the existing hydraulic reclosers for their periodic maintenance.

Bard College

7051/7056 ALT

Replace 3-200A Type V4L Reclosers with a VIPER

Title: N-15-02– 5003 – Extend 5003 circuit to 9W in order to offload the 5002
District: Newburgh
Budget Year Submitted: 2015
Project Category: Growth – Thermal

History:

The 5002 circuit historically operates at or above its 6/9 MVA Design Criteria. It peaked at 6.45MVA in the summer of 2013. With additional load growth in the area, including the Royal Kedem Winery expansion, the circuit is expected to peak even higher in 2014. The 5002 circuit ties only with the 5001 circuit (5.70MVA 2013 peak) to the south and 5083 circuit (6.4MVA 2013 peak) to the north. The nearby 5003 circuit is underutilized and only peaked at 3.25MVA in 2013.

Solution: (refer to the attached circuit maps)

Extend the 5003 circuit 0.45 miles down McLoughlin Road to Rt. 9W in order to offload the southern section (1.7MVA estimated) of the 5002 circuit. The extension will bring the 5002 circuit well below its 6/9MVA design rating as well add load to the under-utilized 5003 circuit. An added benefit to this project is that the existing section of the 5002 circuit down McLoughlin Rd. is currently offload and difficult to access. The project would allow the circuit to be easily accessed to increase reliability.

Cost: (refer to the attached circuit maps)

- Double Circuit 0.45 miles……..……...$202,500

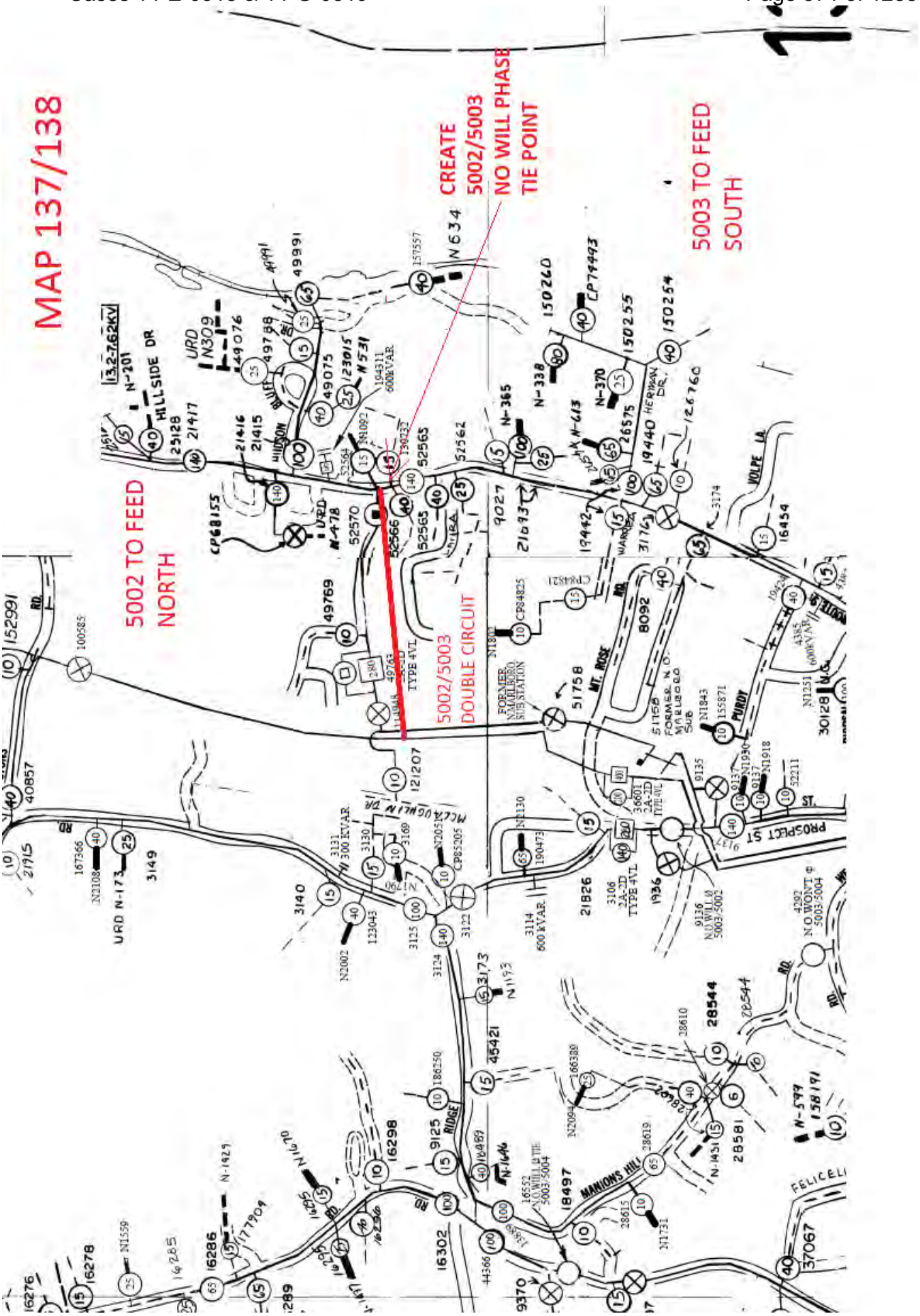
Total Cost (Capital) = $202,500

Average Age of Pole Plant: 51 years
(all reliability/operating - use a representative sample)

% Loading: 108%
(all thermal projects – limiting element)

Summary:

Extending the 5003 circuit (along with the 5002 on a double pole plant) 0.45 miles down McLoughlin Rd. will allow for the offloading of the 5002 circuit and rebuilding an aged, off-road pole plant.


MAP 137/138
5002 TO FEED NORTH
5002/5003 DOUBLE CIRCUIT
CREATE 5002/5003 NO WILL PHASE TIE POINT
5003 TO FEED SOUTH
MT. ROSE
PURDY
PROSPECT ST
MANIONS HILL
RIDGE
HILLSIDE DR
HERMAN DR.
WOLFE LA.
13.2-7.62KV
URD N309
URD N-478
URD N-173
URD N-201
600 KVAR
TYPE 4VL
TYPE 2A-2D
FORMER MARLBORO SUB STATION
FORMER N.O. MARLBORO SUB
N.O. WILL BE 5003/5004
N.O. WILL BE 5003/5002
N.O. WONT BE 5003/5004

Project: P-11-07

Title: 7053 ckt. – Relocate circuitry on-road & convert to 13.2kV, Slate Quarry Rd.

History:

Slate Quarry Rd., which is fed from the 7053 circuit by a 250kVA stepdown, has had a history of thermal and voltage concerns. Currently, a 100A regulator is positioned immediately following the stepdown, and other regulators exist along tie points nearby off Slate Quarry Rd. Summer 2002 load checks indicated that the step down was loaded to 98% of its capacity. It is safe to assume the load has only grown since then.

This portion of the 7053 circuit has also had its history of reliability issues. Approximately 1.2 miles of the circuitry along Slate Quarry Rd. runs cross-lot through heavily treed areas. Over the last 3 years, this area has experienced 5 outages in the off-road circuitry alone.

Solution: (refer to the attached circuit maps)

Convert to 13.2 kV circuitry and rebuild on-road 2.75 miles of Slate Quarry Rd. using 1/0 WR AA open wire circuitry. Convert all spurs to 13.2kV operation.

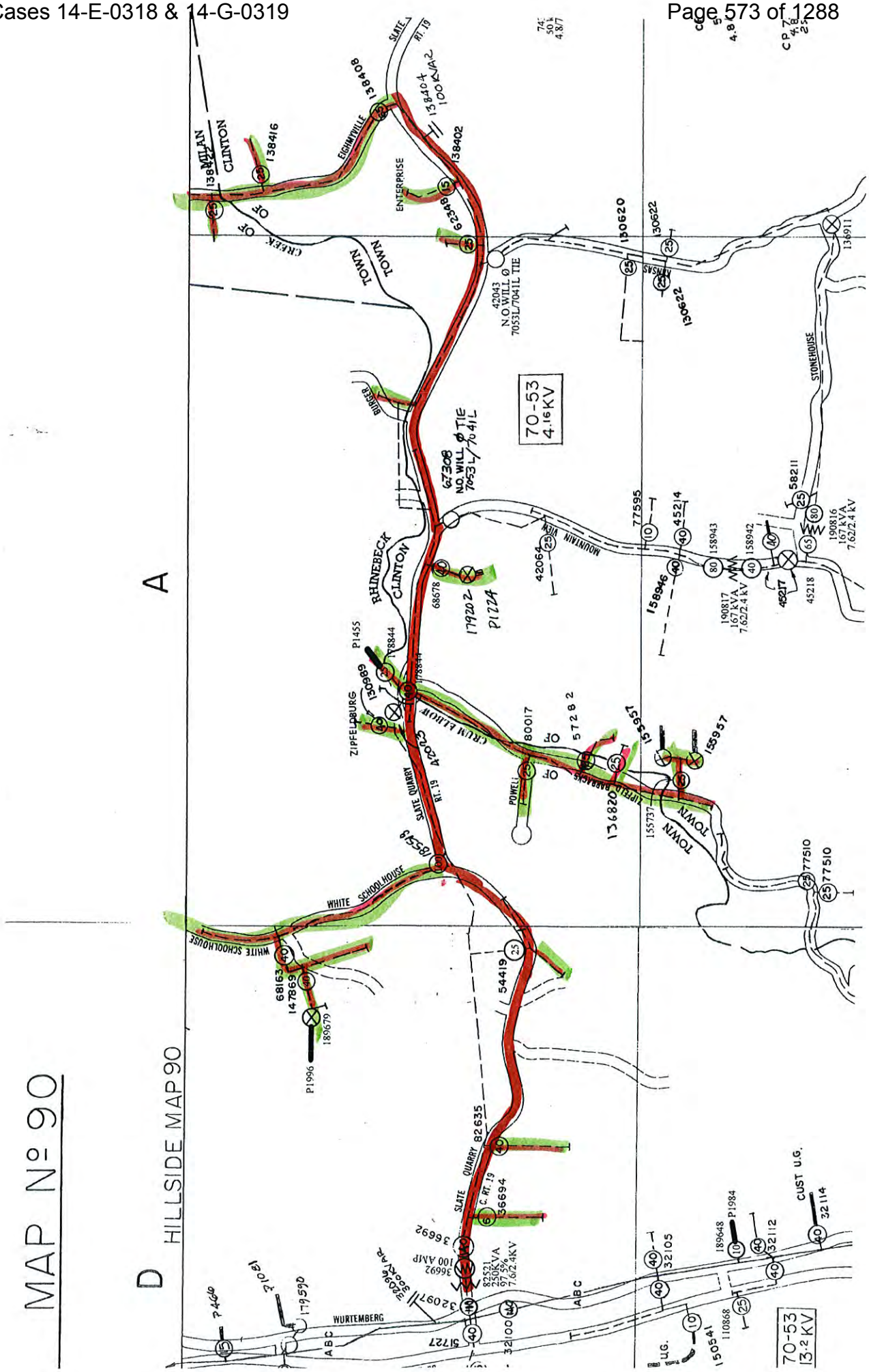
Cost: (refer to the attached circuit maps)

- Rebuild on-road & convert to 13.2kV operation 2.75 miles of circuitry along Slate Quarry Road..... $ 275,000
- Convert all spurs to 13.2 kV operation..... $ 250,000

Total Cost (Capital) = $ 525,000

Summary:

Rebuild and convert 2.75 miles of single-phase 2.4kV circuitry to 13.2kV circuitry along Slate Quarry Rd, converting all spurs to 13.2kV operation. This project will relieve the thermal and voltage issues currently present along Slate Quarry Rd. It will also reduce frequency and duration of tree-related outages, and would decrease the cost to trim the line in the future. The line relocation portion of this project has an estimated $/COA of $616.


MAP Nº 90
A
D
HILLSIDE MAP 90
MILAN
CLINTON
TOWN OF CLINTON
RHINEBECK
TOWN
ENTERPRISE
ZIPFELBURG
SLATE QUARRY
WHITE SCHOOLHOUSE
WURTEMBERG
STONEHOUSE
MOUNTAIN VIEW
POWELL
70-53
4.16KV
70-53
13.2 KV
138416
138408
138404
100KVA
138402
138429
42043
N.O.WILL Ø
7053L/7041L TIE
130620
130622
136911
67308
NO.WILL Ø TIE
7053L/7041L
68678
179202
P1124
42064
77595
45214
158943
158942
158946
58211
190816
167 kVA
7.62/2.4 kV
45217
45218
190817
167 kVA
7.62/2.4 kV
P1455
198844
198843
136689
80017
57282
155957
155957
136820
155737
77510
77510
68163
147869
189679
P1996
54419
82635
C. RT. 19
36694
36692
82521
250KVA
97.5%
7.62.4KV
100 AMP
32097
32098
32100
51727
179590
P4460
ABC
ABC
32105
189648
P1984
32112
CUST U.G.
32114
U.G.
150541
110868

Project: P-11-19b

Title: 7062 ckt. – Establish and integrate new circuit (Phase 3)

History:

The two circuits from Rhinebeck Substation feeding the Red Hook area to the west of Milan are overloaded. The 2002 Milan Integration Study recommended a new circuit to be fed from Milan Substation to the north when the load growth in the area justifies the project. Phase II of this project will have created a new Milan 7062 circuit extending north out of the Substation to the existing three phase circuitry along Turkey Hill Rd. The Rhinebeck 7051 and 7056 circuits that serve the Red Hook area to the west of Milan both peaked at 6.7MVA and 7.7MVA, respectively, in 2008.

Solution: (refer to the attached circuit maps)

Develop a new 7062 circuit from Milan Substation. The new 7062 circuit would run north out of Milan Substation along Milan Hill Rd., and continue on Becker Hill Rd. It would then travel west along Turkey Hill Rd., continuing on Spring Lake Rd. to Rt. 9. From Rt. 9, it would run north to Pitcher Ln., where it would connect to the existing 7051 mainline. The circuitry should then be tapped into Rockefeller Lane and the two sets of solids on pole 172330 just south of Rockefeller Lane should be opened.

Phase III: Reconductor 2.1 miles with 336 WR AA conductor along Spring Lake Road and 0.2 miles along Route 9, and tie into the existing 7051 circuit.

Cost: (refer to the attached circuit maps)

- Reconductor 2.3 miles along Spring Lake Rd. and Route 9..... $ 690,000

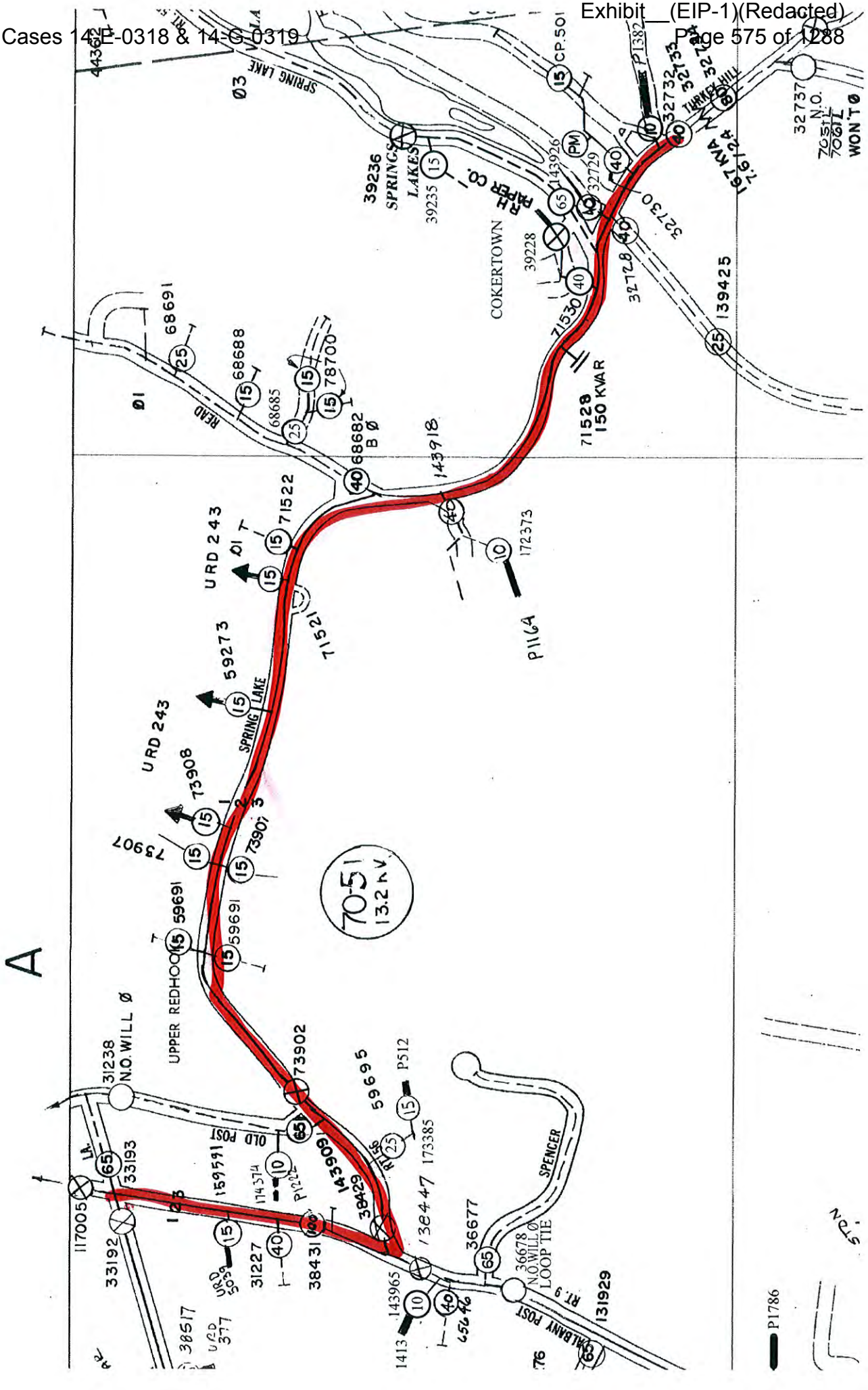
Total Cost (Capital) = $ 690,000

Summary:

Reconductor along Spring Lake Rd. and Route 9, allowing the new Milan 7062 circuit to extend to Rt. 9. From here, it would run north to Pitcher Ln., where it would connect to the existing 7051 mainline. The circuitry should then be tapped into Rockefeller Lane and the two sets of solids on pole 172330 just south of Rockefeller Lane should be opened.

This solution provides synergies with the rebuild of circuitry along Milan Hill Road (Phase 1) to improve reliability on the 7061 circuit; the first 1.3 miles of construction benefits both the 7061 circuit and 7051 circuit. In addition, the 2002 Milan Integration Study recommended a new circuit to be fed from Milan Substation to the north when the load growth in the area justifies the project. The 7051 and 7056 circuits that serve the Red Hook area to the west of Milan both peaked at 6.7MVA and 7.7MVA, respectively, in 2008. Therefore, this project is imminent based on load growth, and provides a significant additional reliability benefit to the customer served by this circuitry.

The Northern Dutchess Area Study has also recommended this budget project.


A
SPRING LAKE
Ø3
39236
SPRINGS LAKES
39235
RED CREEK
COKERTOWN
39228
143926
32729
32730
32728
139425
32732
32733
32734
TURKEY HILL
32737
N.O.
WON'T Ø
CP 501
P1382
68691
68688
68685
78700
68682
B Ø
Ø1
READ
143918
71530
71528
150 KVAR
71522
71521
URD 243
59273
SPRING LAKE
73908
73907
59691
UPPER REDHOOK
31238
N.O. WILL Ø
73902
59695
P512
173385
OLD POST
159591
143909
38429
38431
31227
33193
33192
117005
38517
143965
1384 47
36677
36678
N.O. WILL Ø
LOOP TIE
SPENCER
RT. 9
ALBANY POST
131929
P1164
172373
7051
13.2 kV
P1786

Title: P-15-06 – 6046 – Install a VIPER as First Fuse Point on New Hackensack Rd.
District: Poughkeepsie
Budget Year Submitted: 2015
Project Category: Reliability – Reliability

History:

The Spackenkill 6046 circuit currently serves 561 customers along New Hackensack Rd south of Red Oaks Mill Rd. The first fuse point on this portion of the circuit is a set of 100K fuses thus providing no transient protection for the circuitry downstream.

There have been 7 transient outages downstream of the 100K fuses on spur lines since the circuit was established in 2011 affecting a total of 758 customers. Additional, there have been 2 transient outages involving two of the 100K fuses each time. These two outages affected a total of 777 customers. It is undesirable to have such a large pocket of customers served from circuitry that does not have any transient protection. The Spackenkill 6046 circuit was listed on the "2013 Worst Circuit Report" as one of the Poughkeepsie District circuits with poorer reliability.

Solution: (refer to the attached circuit maps)

Install a VIPER as the first fuse point on New Hackensack Rd. replacing the 100K fuses on 137727.

Cost: (refer to the attached circuit maps)

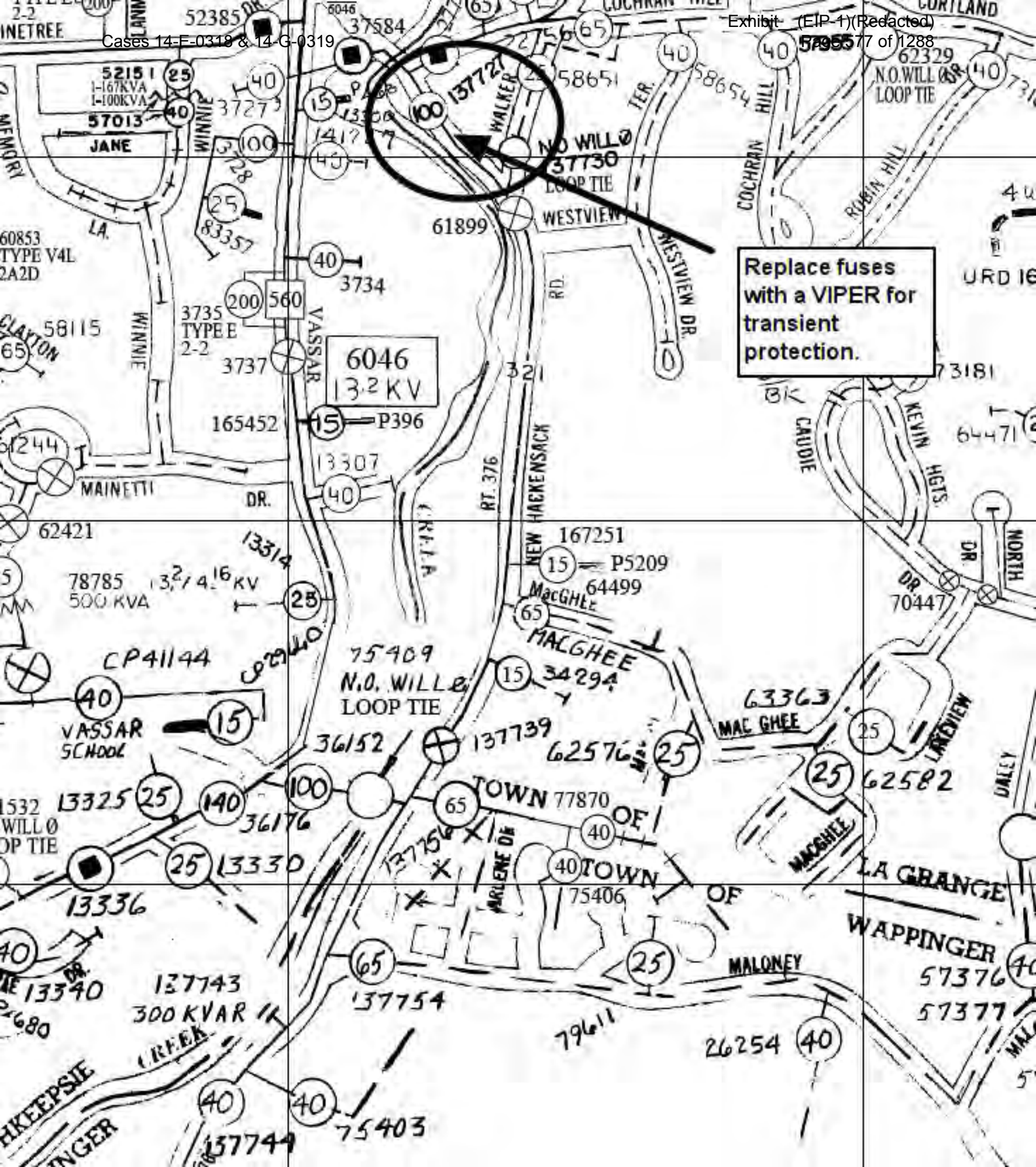
- Install a VIPER as the first fuse point…… …..……...$55,000

Total Cost (Capital) = $55,000

$/COA: $107

Summary:

This project will provide transient protection to the Spackenkill 6046 circuit along New Hackensack Rd that serves 561 customers.


Replace fuses with a VIPER for transient protection.
6046
13.2 KV
52151
1-167KVA
1-100KVA
57013
JANE
WINNIE
VASSAR
WALKER
COCHRAN HILL
ROBIN HILL
WESTVIEW DR.
RT. 376
NEW HACKENSACK
MAINETTI DR.
CAUDIE
KEVIN HGTS.
MacGHEE
MAC GHEE
LAKEVIEW
VASSAR SCHOOL
N.O. WILL Ø LOOP TIE
TOWN OF LA GRANGE
TOWN OF WAPPINGER
MALONEY
MARLENE DR.
CREEK
78785 13.2/4.16 KV 500 KVA
CP41144
300 KVAR
URD

Title: N-12-02 – 4012/WN – Move Circuitry On-Road
District: Newburgh
Budget Year Submitted: 2013
Project Category: Reliability

History:

The 4012 and WN circuits leave the West Balmville substation via off-road transmission towers along Brewer Rd. and continue through the off-road right of way to Rt. 32. The off-road section between Gail Place and Rt. 32 has been the cause of one breaker lockout per year (six lockouts since 2007) and two additional breaker operations per year (twelve operations since 2007). The heavily treed pole plant in this section is in poor condition with wires coming off insulators. In addition, this section has 2 inoperable GOAB switches that limit switching capabilities for the 4012 and WN circuits.

Solution:

Move the off-road portion of the 4012 and WN circuits between Gail Place and Rt. 32 on road.

Cost: (refer to the attached circuit maps)

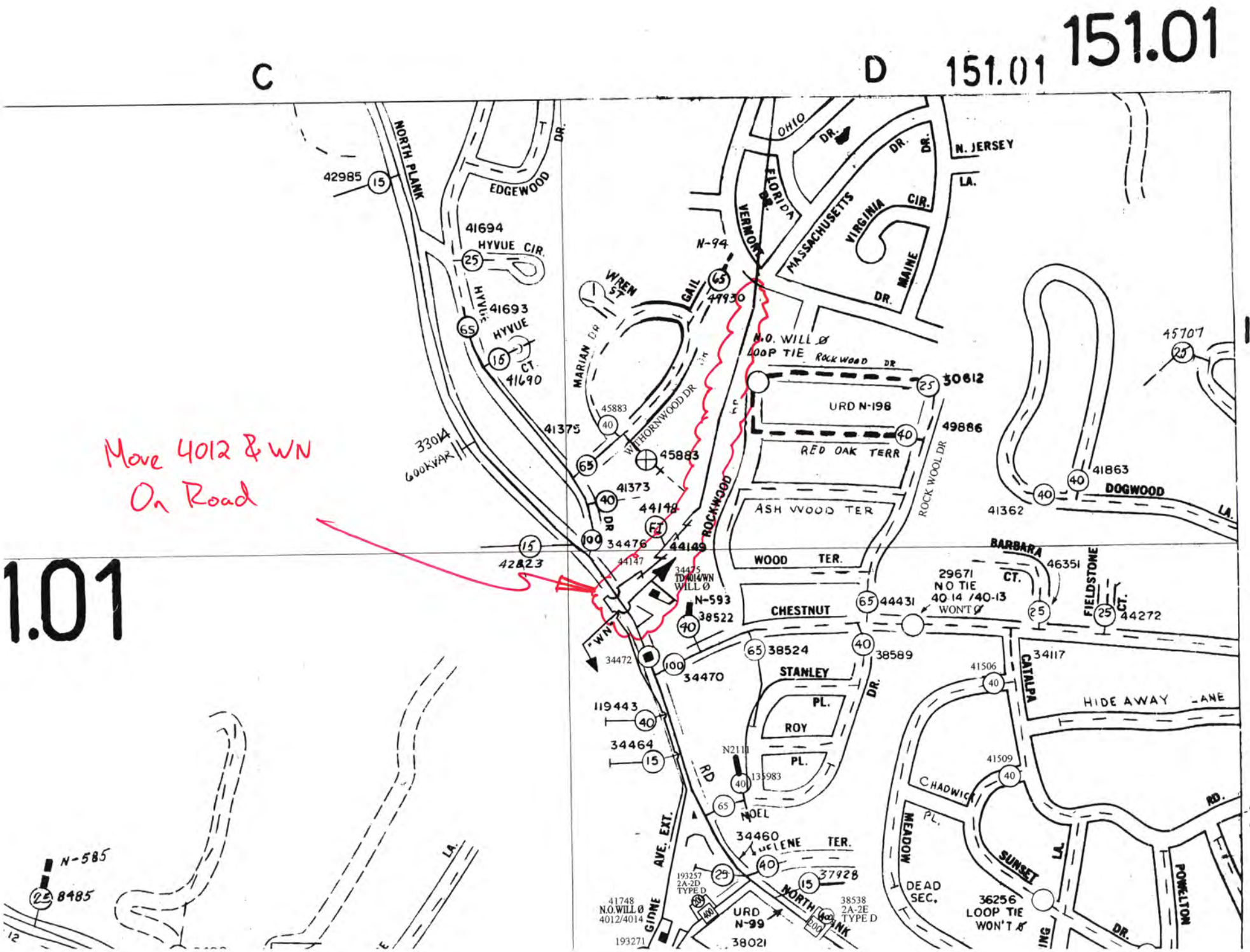
- 0.5 Miles of Three Phase Double Circuit ……... $225,000

Total Cost (Capital) = $225,000

$/COA (5 year basis, reliability projects only): $163

Summary:

Move the 4012 and WN on road along Gail Pl. and Thornwood Dr.


C
D
151.01
151.01
1.01
Move 4012 & WN
On Road
NORTH PLANK
EDGEWOOD DR.
42985
41694
HYVUE CIR.
41693
HYVUE CT.
41690
HYVUE
33014
GOOKWAR
41375
MARIAN DR
WREN ST
GAIL
N-94
OHIO DR.
FLORIDA
VERMONT
MASSACHUSETTS
VIRGINIA CIR.
MAINE DR.
N. JERSEY LA.
44930
45883
WITHORNWOOD DR
N.O. WILL Ø
LOOP TIE
ROCKWOOD DR
30612
URD N-198
RED OAK TERR
49886
45707
41863
DOGWOOD LA.
41362
ROCK WOOL DR
ASH WOOD TER
WOOD TER.
ROCKWOOD
41373
44148
34476
44149
44147
42823
34475
TO 4014WN
WILL Ø
N-593
38522
CHESTNUT
44431
29671
NO TIE
40 14 /40-13
WON'T Ø
BARBARA CT.
46351
FIELDSTONE CT.
44272
34472
34470
38524
38589
STANLEY DR.
PL.
ROY
PL.
119443
34464
N2111
135983
NOEL
RD
AVE. EXT.
34460
HELENE TER.
37928
41748
N.O.WILL Ø
4012/4014
193271
GIDNE
URD N-99
38021
193257
2A-2D
TYPE D
38538
2A-2E
TYPE D
NORTH PLANK
N-585
8485
LA.
34117
CATALPA
HIDE AWAY LANE
41506
41509
CHADWICK PL.
MEADOW
SUNSET LA.
DEAD SEC.
36256
LOOP TIE
WON'T Ø
POWELTON DR.
1
2

Title: P-15-04 – 6092 – Install a VIPER as First Fuse Point
District: Poughkeepsie
Budget Year Submitted: 2015
Project Category: Reliability – Reliability

History:

The Manchester 6092 circuit currently serves 601 customers along Rt. 44 east of James St. The first fuse point on this portion of the circuit is a set of 200K fuses thus providing no transient protection for the circuitry downstream. As part of the Van Wagner Substation retirement project, the tail end of this circuit will be rebuilt and converted to take over the rebuilt and converted Van Wagner 731 circuit and the rebuilt and converted Tinkertown 7024L circuit. This will add an additional 450 customers to the 200K fuses for a total of 1,051 customers.

There have been 8 transient outages downstream of the 200K fuses on spur lines since 2009 affecting a total of 232 customers. Additional, there was 1 transient outage involving one of the 200K fuses. It is undesirable to have such a large pocket of customers served from circuitry that does not have any transient protection.

Solution: (refer to the attached circuit maps)

Install a VIPER as the first fuse point on Rt. 44 replacing the 200K fuses on P15408.

Cost: (refer to the attached circuit maps)

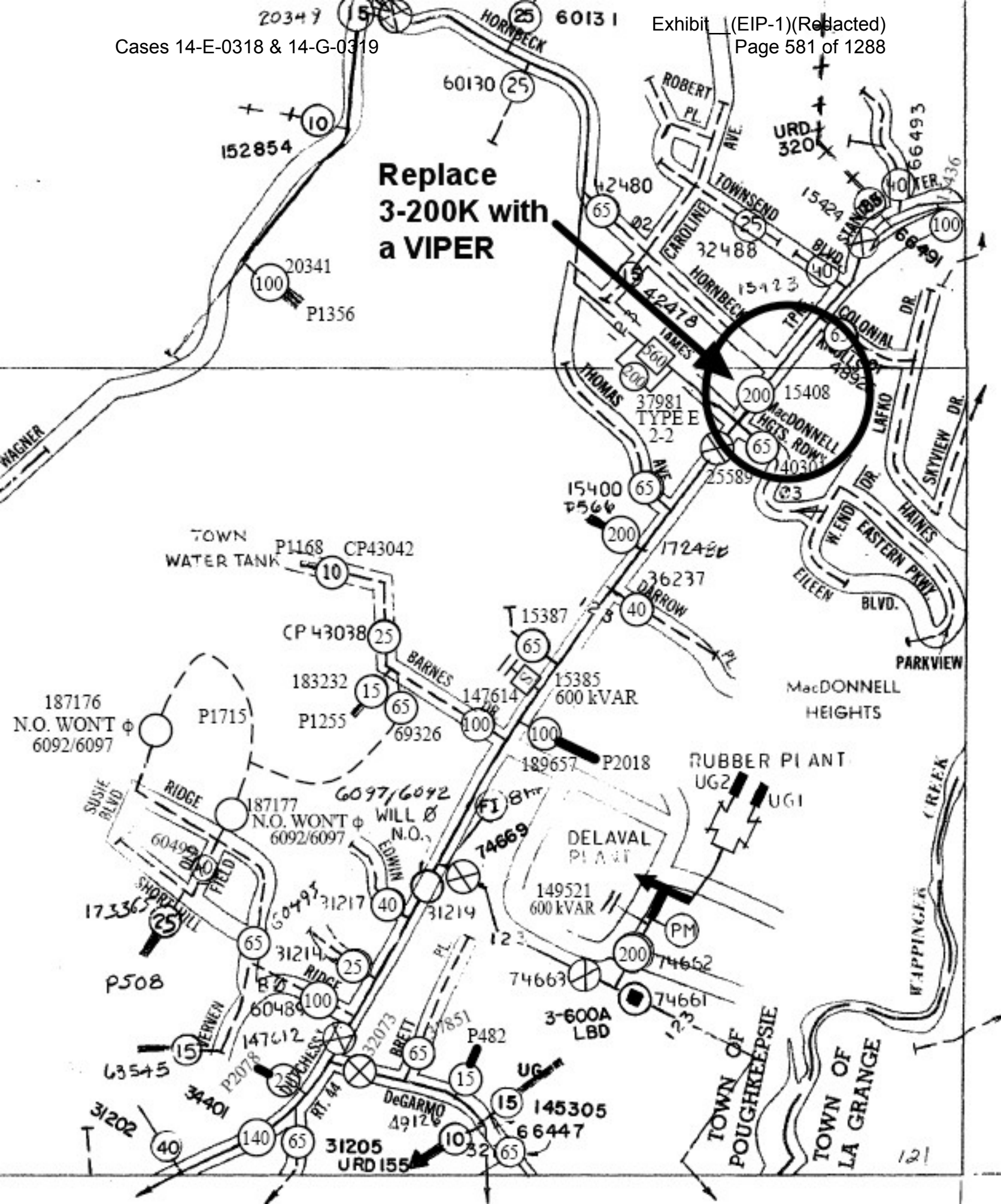
- Install a VIPER as the first fuse point…… …..……...$55,000

Total Cost (Capital) =	$55,000

$/COA: $472

Summary:

This project will provide transient protection to the Manchester 6092 circuit along Rt. 44 that will be serving 1,051 customers with the retirement of the Van Wagner Substation.


Replace
3-200K with
a VIPER
HORNBECK
ROBERT PL.
TOWNSEND AVE.
CAROLINE
HORNBECK
COLONIAL DR.
THOMAS
LAFKO
SKYVIEW DR.
HAINES
W.END
EASTERN PKWY.
EILEEN
BLVD.
PARKVIEW
DARROW
BARNES
WAGNER
TOWN WATER TANK
P1168
CP43042
CP 43038
183232
P1255
69326
187176
N.O. WONT ϕ
6092/6097
P1715
187177
N.O. WONT ϕ
6092/6097
6097/6092
WILL Ø
N.O.
SUSIE BLVD
RIDGE
FIELD
SHORE HILL
P508
WERNER
63545
P2078
DUCHESS
34401
31202
RT. 44
DeGARMO
49126
31205
URD 155
P482
UG
145305
66447
3-600A
LBD
74669
31214
31217
31219
74663
74661
74662
149521
600 kVAR
189657
P2018
RUBBER PLANT
UG2
UG1
DELAVAL
PLANT
MacDONNELL
HEIGHTS
MacDONNELL HGTS. RDWY
TYPE E
2-2
37981
15408
15400
P566
25589
36237
15387
15385
600 kVAR
147614
147612
32073
74851
TOWN OF POUGHKEEPSIE
TOWN OF LA GRANGE
WAPPINGER CREEK
URD 320
66493
66491
42480
42478
32488
15423
15424
20349
60131
60130
152854
20341
P1356
173365
60489
60492
60493
121

Title: P-15-05 – 6046 – Install a VIPER as First Fuse Point on Alda Dr.
District: Poughkeepsie
Budget Year Submitted: 2015
Project Category: Infrastructure – Operating / Reliability

History:

The Spackenkill 6046 circuit splits into numerous separate load pockets. Two such pockets are along Alda Dr. and Daria Dr. Both of these load pockets are located close to the Spackenkill Substation and are protected with 140A Type V4L hydraulic reclosers. These reclosers have a maximum fault current interrupting capability of 6000A. It was brought to the attention of the district engineer that the maximum current at these locations is above 6000A. For a fault close in to these reclosers, there is the potential that the reclosers will be unable to interrupt the fault resulting in a failure of the reclosers and a possible breaker lockout. These two sets of reclosers serve 369 and 245 customers respectively. The 6046 circuit serves a total of 3,039 customers including 894 customers protected by the 6046 / 6091 Titusville ALT.

While hydraulic reclosers provide adequate transient protection to their zone of the protection, their ability to provide fuse-saving protection for the devices downstream is limited. As such, there have been 5 transient outages downstream of these 140A Type V4L reclosers since the circuit was established in 2011 affecting a total of 295 customers. Electronic reclosers have a much faster "fast" curve which allows for more effective fuse-saving capability. The Spackenkill 6046 circuit was listed on the "2013 Worst Circuit Report" as one of the Poughkeepsie District circuits with poorer reliability.

Solution: (refer to the attached circuit maps)

Install a VIPER as the first fuse point on Alda Dr. replacing the solids on P60850. The hydraulic reclosers on P77155 and P60853 will be replaced with two sets of fuses.

Cost: (refer to the attached circuit maps)

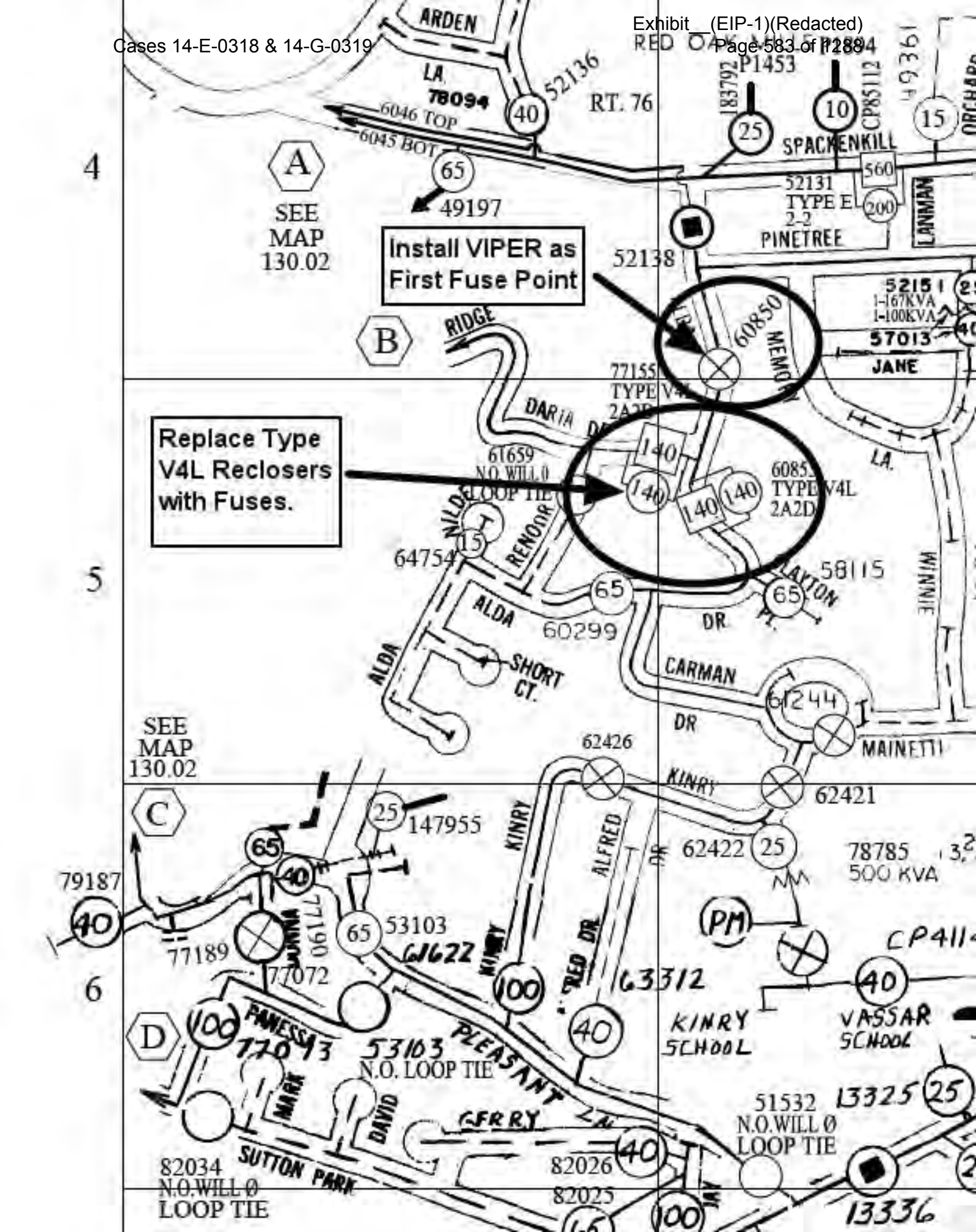
- Install a VIPER as the first fuse point…… …..……...$55,000

Total Cost (Capital) =	$55,000

$/COA: $559

Summary:

This project will provide fuse-saving protection and full fault current interrupting capability to the portion of the Spackenkill 6046 circuit along Alda Dr. and Daria Dr. that serves a total of 614 customers. Additionally, eliminating the hydraulic reclosers will eliminate future expenses required to perform periodic maintenance on them.


Install VIPER as First Fuse Point
Replace Type V4L Reclosers with Fuses.
ARDEN
LA.
78094
6046 TOP
6045 BOT
RT. 76
52136
49197
SEE MAP 130.02
SPACKENKILL
52131
TYPE E
2-2
PINETREE
52138
RIDGE
60850
MEMORY
57013
JANE
DARIA
61659
N.O. WILL Ø
LOOP TIE
60852
TYPE V4L
2A2D
64754
ALDA
60299
SHORT CT.
58115
LAYTON DR
CARMAN DR
61244
MAINETTI
62426
KINRY
62421
62422
78785
500 KVA
79187
77189
77072
53103
61622
63312
KINRY SCHOOL
VASSAR SCHOOL
PANESSA
17043
53103
N.O. LOOP TIE
PLEASANT
MARK
DAVID
GERRY
SUTTON PARK
82034
N.O.WILL Ø
LOOP TIE
82026
82025
51532
N.O.WILL Ø
LOOP TIE
13325
13336
147955
77190
ALFRED
RED DR
RENOOR
WILDA
LANMAN
MINNIE

K16-2011

Name: Foxhall Ave ALT

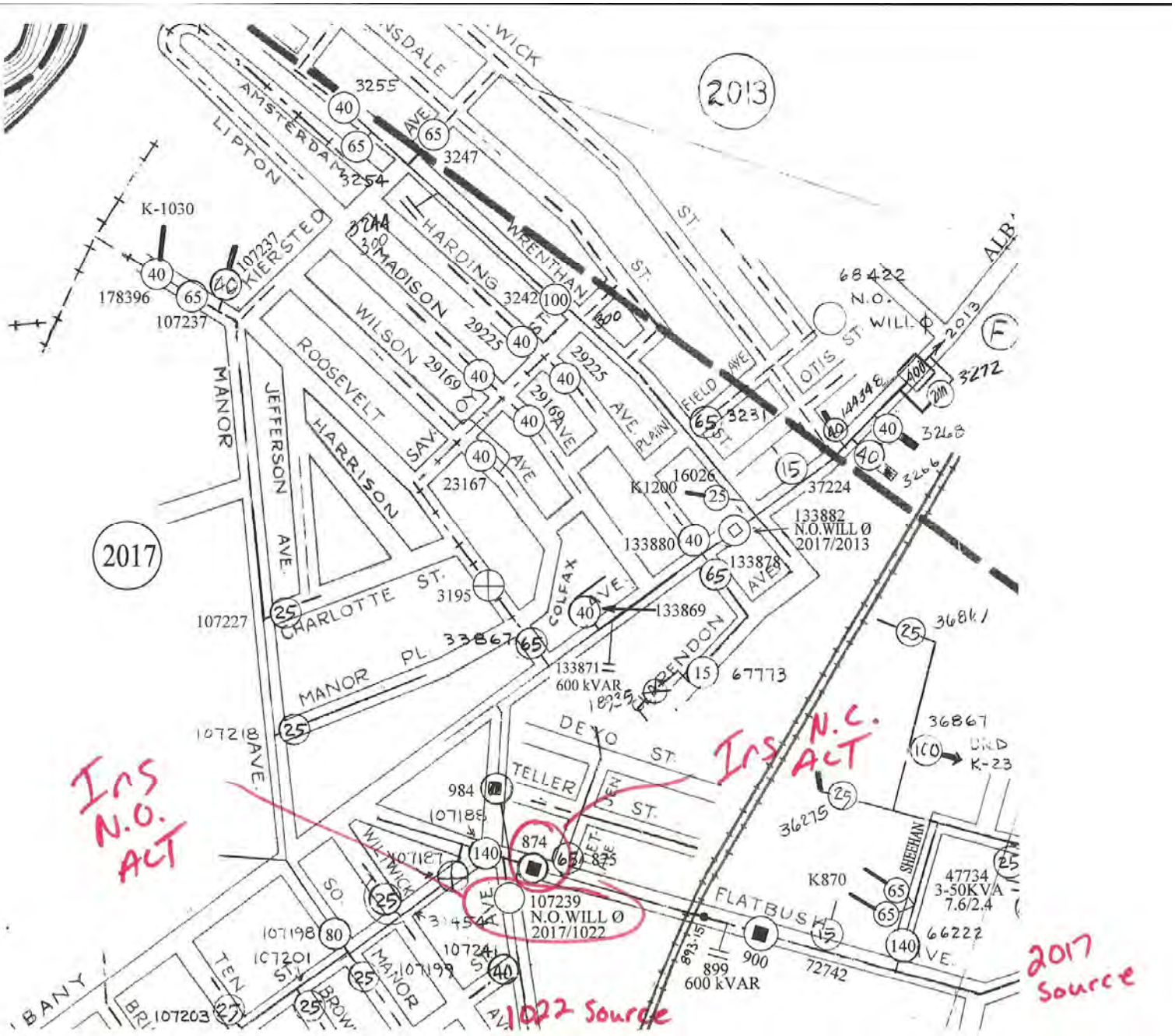
Problem: As part of the East Kingston Integration, the south portion of the Lincoln Park 2013 circuit along Albany Avenue near Foxhall Avenue and Roosevelt Avenue was transferred to the Lincoln Park 2017 circuit. This load transfer provided for better balanced loading between the circuits in the area. However, it lengthened the feed to the pocket of 631 customers in this area. As this circuit path is new, a historical outage analysis could not be performed. However a generic analysis was performed based upon the distance to source.

The alternate source for this ALT will be the East Kingston 1022 circuit at the tie point on Foxhall Avenue and Flatbush Avenue. This ALT will serve 631 customers. The load in this pocket is estimated to be 3.3 MVA. The summer '08 peak load on the East Kingston 1022 circuit was 5.6 MVA.

Solution: Install an ALT team utilizing an Electronic Recloser team to improve the reliability to the customers in the Foxhall Ave area.

Cost: The approximate cost of installing the ALT team is $115,000.

Benefits: Installing this ALT team will improve reliability by providing a reserve circuit during a permanent outage event. This project is projected to have a cost benefit of $584/COA.


2013
2017
3255
3247
3254
AMSTERDAM
LIPTON
K-1030
178396
107237
KIERSTED
HARDING
MADISON
3242
WRENTHAN
WILSON
29225
29169
ROOSEVELT
SAY
AVE
23167
MANOR
JEFFERSON AVE.
HARRISON
CHARLOTTE ST.
3195
107227
MANOR PL
33867
107218
AVE.
COLFAX
133869
133871
600 kVAR
LORENDON
67773
K1200
16026
133880
133882
N.O.WILL Ø
2017/2013
133878
FIELD
OTIS
ST.
WILL.
68422
N.O.
3231
3272
3268
3266
37224
36867
36275
K-23
DEYO ST.
TELLER
984
107188
874
875
107187
WITWICH
107239
N.O.WILL Ø
2017/1022
107198
107201
107241
107199
107203
BRY
BROW
FLATBUSH
899
600 kVAR
900
72742
K870
47734
3-50KVA
7.6/2.4
66222
SHEEHAN
Irs N.O. ACT
Irs N.C. ACT
1022 Source
2017 Source

Project: N-12-03

Title: 5083 Circuit - Reconductor Perkinsville Rd.

Problem:

The 5083 breaker out of Highland Substation has experienced 3 operations and 1 lockout since 2009 due to bird contacts along Rt. 9W between the Mid Hudson Bridge and Macks Lane. In the event of a lockout, the 5081/5083 normally open tie at 153595 cannot be used to carry a significant portion of the 5083 load south of Perkinsville Rd. since the wire is 1/0 aluminum.

Solution:

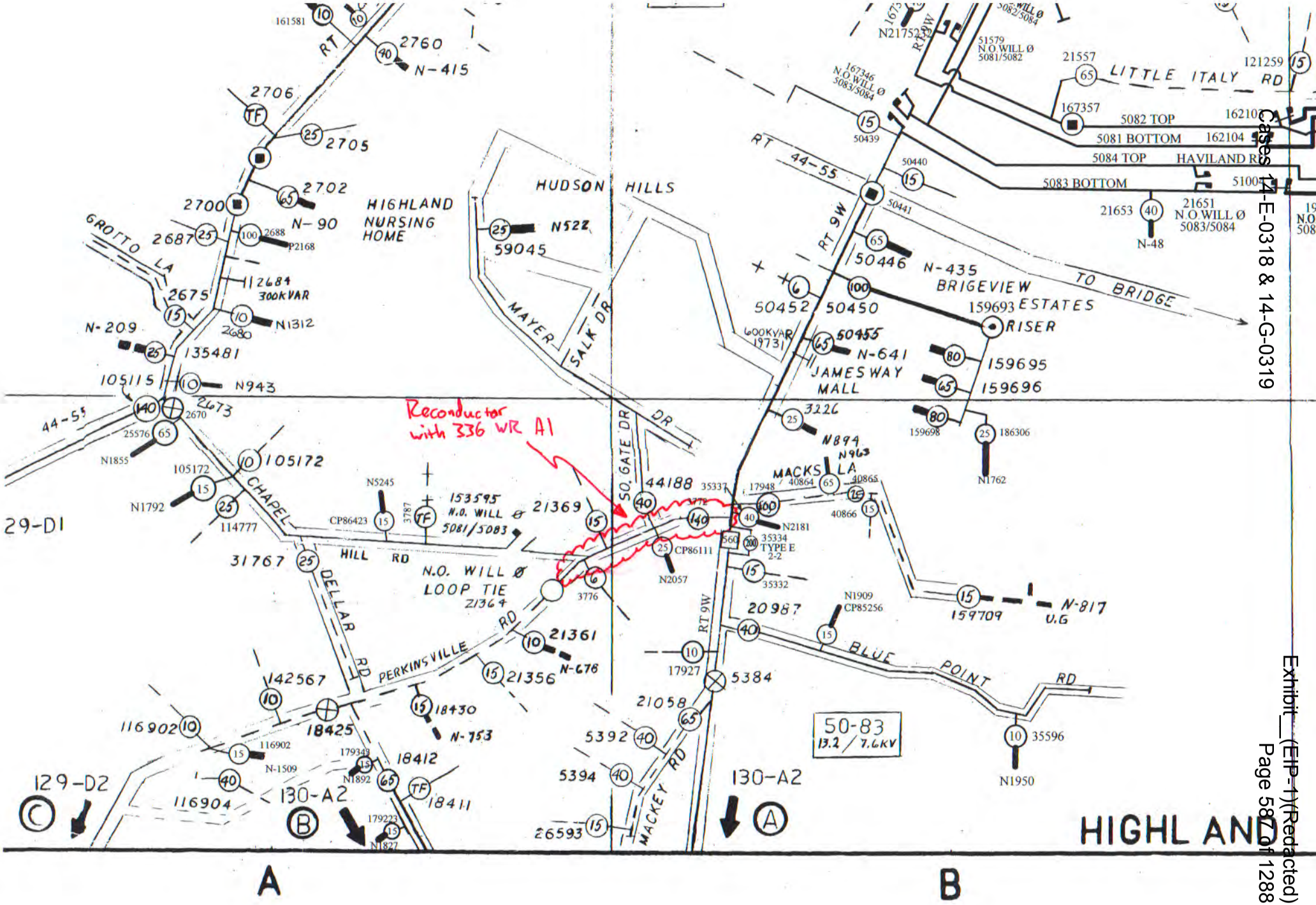
The affected area along Rt. 9W has been fortified with ampacts and animal guards. In addition, disconnects have been added along Rt. 9W in the affected area for sectionalizing purposes. To be able to use the 5081/5083 to pick up the load south of Perkinsville Rd., 0.5 miles needs to be reconductored along Perkinsville Rd.

Approximate Cost: $150,000

Three Phase Reconductoring (336 WR Al w/ minimal pole replacement)
0.5 miles @ $300,000/mile: $150,000

Benefits:

By reconductoring Perkinsville Rd., the normally open 5081/5083 tie at 153595 will be a strong tie that can be used during future outages and for switching.



Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 587 of 1288

Title: F-2012-03 – BF Line – Beacon Infrastructure Improvements/Conversion – Phase III
District: Fishkill
Budget Year Submitted: 2012
Project Category: Growth – Thermal

History:

As per the Beacon Area Study completed in 2013, Beacon Substation has exceeded its firm rating in recent years and the transformers at both Beacon and Conway Place Substations are nearing the end of their useful lives. With additional load growth in this area on the horizon, a solution was developed to address both of these issues as well as to replace the aging infrastructure that is prevalent there. The ultimate goal is to convert the 4.16kV circuitry to 13.2kV, re-build/reclassify the local 14.4kV cables as 13.2kV and retire both Beacon and Conway Place Substations. Phases I and II of this project are underway in 2014 to convert the 801, 802 and 803 circuits to 13.2kV operation.

Solution:

Phase III of this project, to be completed in 2015, is to rebuild the old 14.4kV BF Line as a distribution feeder. The BF Line is currently three miles of paper and lead cable. This cable should be removed and replaced with 336 MCM in order to be established as a distribution circuit. The BF Line currently does not feed any load due to an underground cable failure that occurred in February 2014 which was judged too costly to repair in light of the planned replacement. Once the BF line is removed and a new distribution circuit built in its place, it may pick up loads that were originally fed by the 801, 802 and 803 circuits. In order to minimize risks inherent with shared pole plant and avoid triple-circuiting on Old Glenham Road and Maple Street, the new distribution circuit should utilize the FT Line right-of-way from Forgebrook Substation out to Washington Avenue near Old Town Road before picking up the pole plant of the current BF cable (see attached map).

Cost:

- Remove the BF Cable and build three miles of distribution circuitry…….....$1,275,000

Total Cost (Capital) =	$1,275,000

Summary:

- Remove the BF Cable and build a new distribution circuit to take over loads previously fed by the BF Cable.
- After all phases of this project are complete, Beacon and Conway Place Substations may be retired and operation and maintenance costs associated with these stations will be eliminated.

Future Distribution Circuit Paths

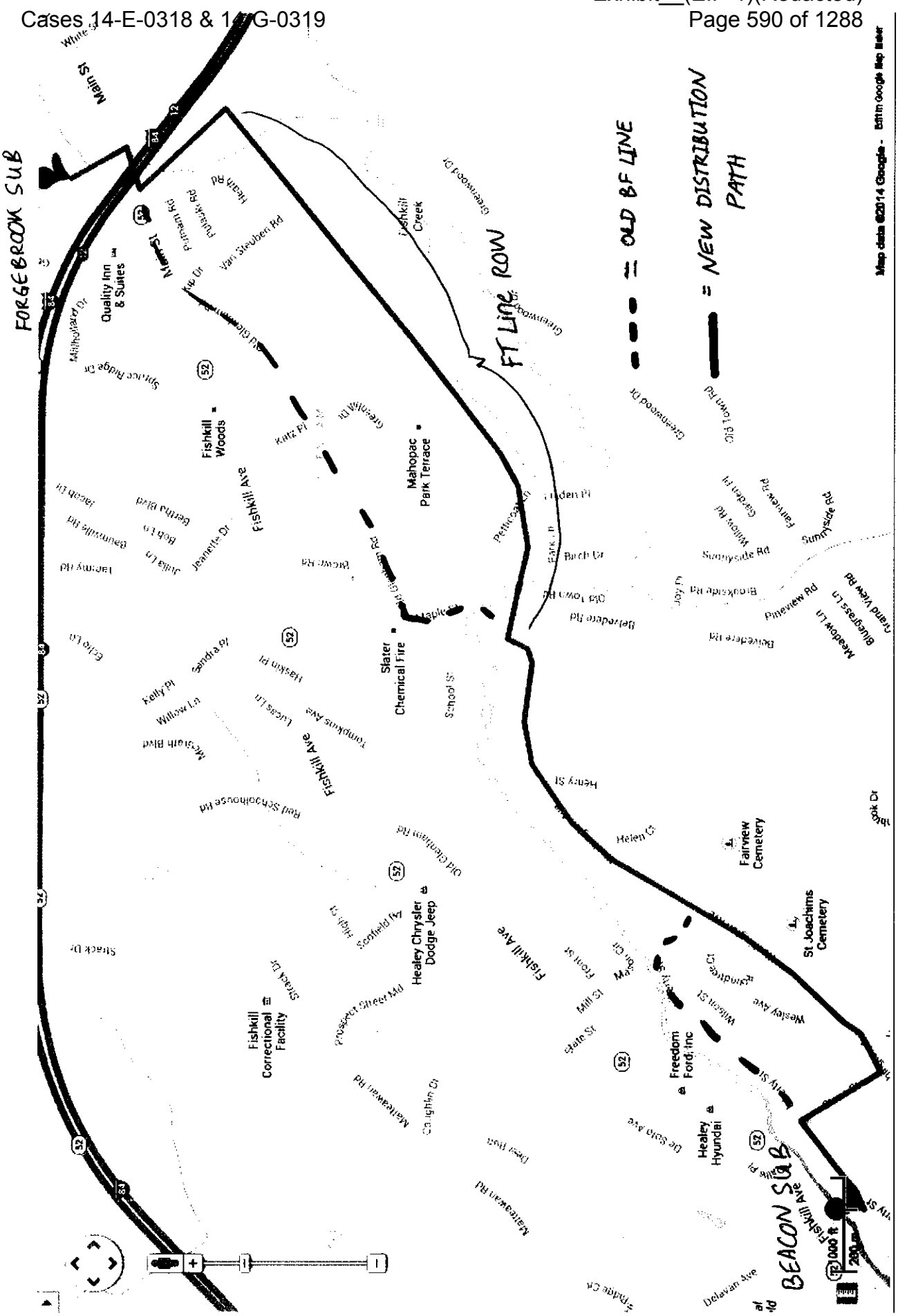
Attachment #6

151.1

Install ALT team for new BF and 8087 ckt

KEY

- Reclassified BF
- Reclassified CM/NM
- 8015 Circuit
- 8085 Circuit
- 8087 Circuit
- ●●● Low Voltage (4.16kV)


FORGEBROOK SUB
FT LINE ROW
= OLD BF LINE
= NEW DISTRIBUTION PATH
BEACON SUB
Main St
Fishkill Ave
Quality Inn & Suites
Fishkill Woods
Mahopac Park Terrace
Slater Chemical Fire
Healey Chrysler Dodge Jeep
Fishkill Correctional Facility
Fairview Cemetery
St Joachims Cemetery
Freedom Ford Inc
Healey Hyundai
Fishkill Creek
Map data ©2014 Google

Project: P-11-25

Title: 6004 ckt. – Replace failed aerial cable & convert to 13.2kV, Holmes St.

History:

The neighborhood surrounding Holmes St. and Crescent Rd. is fed via 1930's vintage aerial cable in a low voltage pocket off the 6004 circuit in the City of Poughkeepsie. Sometime around 2001, the aerial cable located at pole P7893, S. Hamilton St. & Crescent Rd., failed. As a result, just one phase was left energized to feed the homes on Dwight & Crescent, while the other two phases were cut. No additional work has been performed since then to repair the failed cable, as the three-phase tie at Hooker Ave. & Crescent Rd. (which the aerial cable fed to) had been abandoned in years past. To compound matters, as additional load was added along the aerial cable route, single-phase circuitry fed by the cable traces back on the same pole plant, causing unnecessary confusion.

In addition to the old, failed cable, much of the pole plant fed by this area is 1930s vintage and is in poor condition.

Solution: (refer to the attached circuit maps)

Rebuild using 1/0 WR AA spacer cable circuitry and convert to 13.2kV operation 0.25 miles along Holmes St. and S. Hamilton St. Also rebuild and convert 0.15 miles along the right-of-way behind Crescent Rd. Hang a stepdown transformer at pole 7865 to feed the Ivy Terrace community. Convert all other spurs to 13.2kV operation.

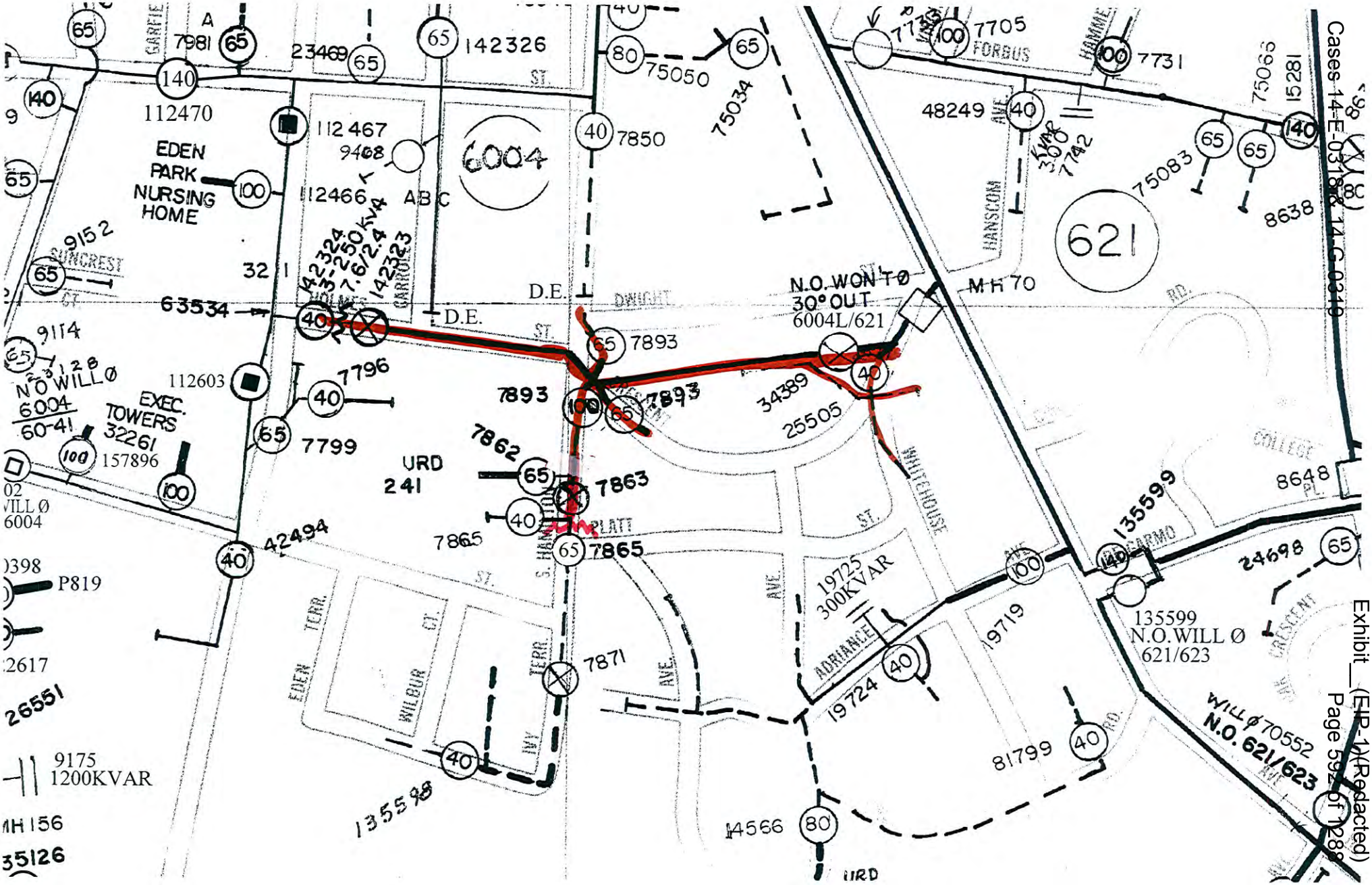
Cost: (refer to the attached circuit maps)

- Rebuild and convert 0.25 miles along Holmes, S. Hamilton & Crescent..... $ 75,000
- Install a stepdown to feed the Ivy Terrace community..... $ 25,000
- Rebuild and convert 0.15 miles along the Crescent right-of-way and convert all other spurs to 13.2kV operation..... $ 40,000

Total Cost (Capital) = $ 140,000

Summary:

Rebuild and convert 0.25 miles of three-phase 2.4kV circuitry to 13.2kV circuitry along Holmes St. and S. Hamilton St. Rebuild and convert 0.15 miles of single-phase 2.4kV circuitry to 13.2kV circuitry along the Crescent Rd. right-of-way. Install a stepdown transformer at pole 7865 to feed the Ivy Terrace community. Convert all other spurs to 13.2kV operation.. This project will remove the aerial cable that failed nearly 10 years ago, and decrease the potential for equipment failures due to an aging infrastructure.



Cases 14-E-0318 & 14-G-0319
Exhibit__(EHP-1)(Redacted)
Page 592 of 1288

Title: 621/623/PH – Retire Maryland Avenue Substation (Ph 4)

History:

The Smith Street and Maryland Avenue Substations feed the existing 4.16kV load pocket in the City of Poughkeepsie and are fed by the Poughkeepsie 14.4 kV loop cable system. Both substations have peaked above their firm rating over the past several years. In addition, both stations consist of equipment over 55 years old, and are in need of major overhauls to continue serving load.

The Reynolds Hill 4.16 kV load is also considered part of the City of Poughkeepsie 4.16 kV load pocket. Rather than being fed from the 14.4 kV loop cable system, this load is fed from the substation transformer tertiary windings. The age of the Reynolds Hill transformers have been a cause for concern, especially considering the unconventional means of supplying the 4.16kV load from the tertiary windings. Due to space constraints at Reynolds Hill, there is no way to separate the 4.16kV load to run independent of those windings. Replacements for those transformers would need to be custom built and would be costly.

The City of Poughkeepsie 4.16kV distribution infrastructure is also in severe disrepair, with much of the existing pole plant and circuitry dating back to the pre-1950's. The 4.16 kV underground cables have experienced numerous failures over the past few years, and the underground infrastructure is aging and in need of repair. The ability to offload the 4.16kV load with the adjacent 13.2kV circuitry is limited due to the accessibility of specific load pockets and step down transformer bank limitations.

The Poughkeepsie 14.4kV Area Study recommended the retirement of the City's 14.4kV loop cable system and 4.16 kV substations, rather than pour significant investment in their upkeep. A five-year plan has been developed to achieve this goal.

Solution: (refer to the attached circuit maps)

Reclassify the PH cable as a 13.2kV circuit and construct a new mainline along the south side of the City of Poughkeepsie to ultimately offload the Maryland Avenue Substation. Phase 3 will have extended the new PH up to the intersection of Forbus St. and S. Cherry St. To continue extending the PH south along the City, build 0.8 miles of 3-phase 13.2kV circuitry with 336 AA spacer cable along S. Cherry St. and DeGarmo Pl. Install 2 stepdown banks at the intersections of DeGarmo & Hooker Ave, and S. Cherry & Hooker Ave. to feed the Hooker Ave. underground circuitry and provide reserve capacity. It is not feasible to replace the circuitry along Hooker Ave. given the poor condition of the ductwork. Convert all other spurs to 13.2kV operation.

Cost: (refer to the attached circuit maps)

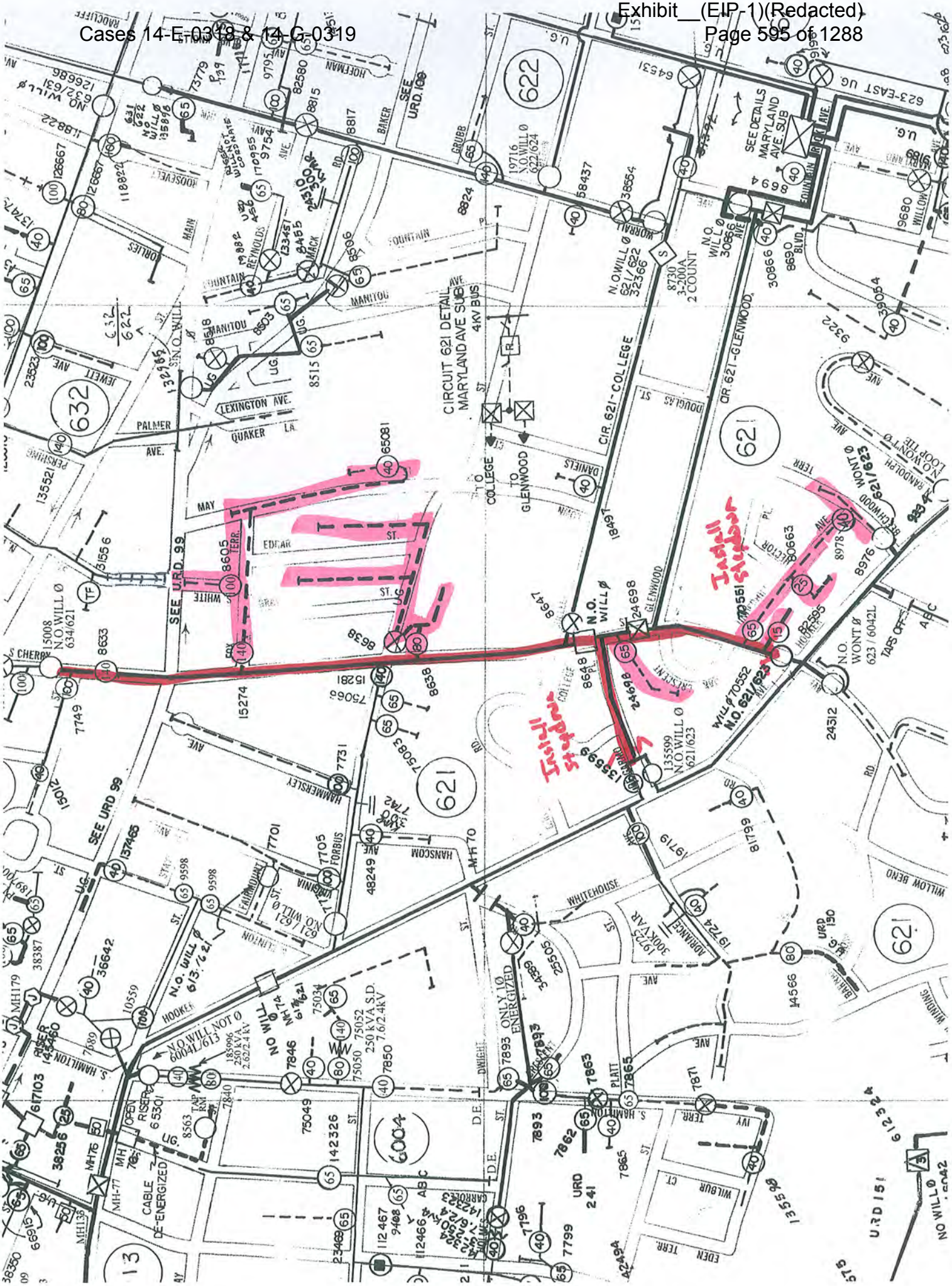
- Build 0.8 miles of 3-phase, 13.2kV circuitry along S. Cherry and DeGarmo with 336 AA spacer cable…….. $240,000
- Install 2 stepdown banks to provide feed & reserve to Hooker Ave……. $140,000
- Convert all spurs to 13.2kV operation……...…… $ 50,000

Total Cost (Capital) = $430,000

Summary:

Build a new circuit mainline using the PH cable as a 13.2kV circuit. From the intersection of Forbus St. and S. Cherry St., build 0.8 miles of new circuitry along S. Cherry St. and DeGarmo Pl. Install stepdown banks along Hooker Ave to offload the 621 and 623 circuits and provide sufficient

reserve capacity. Convert all other spurs to 13.2kV operation. This project will also eliminate over 2 miles of aerial cable circuitry in the City of Poughkeepsie.


CIRCUIT 621 DETAIL
MARYLAND AVE SUB
4KV BUS
CIR. 621-COLLEGE
CIR. 621-GLENWOOD
SEE URD 99
SEE URD 100
SEE DETAILS MARYLAND AVE. SUB
LEXINGTON AVE.
QUAKER LA.
PALMER AVE.
MAY
EDGAR ST.
WHITE ST.
GLENWOOD
COLLEGE
HOOKER
WHITEHOUSE
HAMMERSLEY AVE.
FORBUS
HANSCOM
ADRIANCE
PLATT
DWIGHT
MANITOU
FOUNTAIN PL.
MAIN
BAKER
GRUBB
HOFFMAN
REYNOLDS
MACK
DANIELS
DOUGLAS
JEWETT AVE
PERSHING
WILLOW BEND
EDEN TERR.
WILBUR CT.
IVY TERR.
WHITEHOUSE
ONLY TO ENERGIZED
CABLE DE-ENERGIZED
OPEN RISER
N.O. WILL Ø 621/623
N.O. WILL Ø 623/621
N.O. WILL Ø 634/621
N.O. WILL Ø 621/622
N.O. WILL Ø 621/624
N.O. WILL Ø 621/623
N.O. WILL Ø 6004L/613
N.O. WILL NOT Ø 6004L/613
N.O. WONT Ø 623/621
N.O. WONT Ø 623 / 6042L
TABS OFF
Install Switch
Install Switches
622
632
621
6004
13
URD 241
URD 150
URD 151

Project: N-11-10

Title: Phase I of Governor's Drive URD

Problem: The Governor's Drive URD was designed with no true open loop feed. The PM-9 switches were wired in series making it difficult to perform switching. Commercial customers must be interrupted during switching attempts. The pad-mount transformers are old live-front transformer.

Solution:

Replace live-front transformers and re-wire Governor's Drive

Cost:

Phase I:	$400,000
Phase II:	$400,000
Phase III:	$400,000
Phase IV:	$200,000
Phase V:	$200,000

Benefits: This project will eliminate live-front padmount transformers and create a true open loop.

4 3 2 1

B

A

ROUTE 17K

CRS REALITY
626115
225KVA
CL321

D.O.T. WATER STORAGE
613014
75 kVA
CLS 321

FEDERAL EXPRESS
626301
300 kVA
CLS 351

612229
PAD & COVER ONLY

612235
3 3-WAY JUNCTION BLOCKS

~~TOWER~~ ASSEMBLY

ROAD

626114
3 3-WAY JUNCTION BLOCKS

~~613012~~

612284
25 kVA
CLS 175

INSTALL #2 URD

612157
75 kVA
CLS 321

RISER FOR "EAST" FEED
153224

613047

600 AMP IN LINE LOADBREAK DISCONNECTS

613136

612137

INSTALL VAULT

RISER FOR "WEST" FEED
51480

619078

619079

619080

MANHOLE ONLY WITH CABLES COILED FOR FUTURE USE

~~N.O.~~ REMOVE PM9 LEAVE VAULT

618180

~~N.O.~~

612227

621608
75 kVA
CLS 321

N.Y. TEL

65

~~EAST FEED SPLICED~~

612228

~~WEST FEED ON 3 3-WAY JUNCTION BLOCKS~~ REMOVE J-BLOCKS

DETAIL OF FOUR COMPARTMENT SWITCHGEAR

630795

630796
CL 175

619081

619082

N.O.

CARGO RD

2 RUNS OF CUST OWNED PRIMARY

2 RUNS OF CUST OWNED PRIMARY IN CONDUIT

PB

621023
2000 kVA
CUST OWNED

POST OFFICE

AIR CARGO

619083
150 kVA
CLS 341

622614
225 kVA
CLS 301
N.Y.S. DOT
BLDG 2290

DMV

619085
225 KVA
CLS 321

619084
3□JUNCTION PEDESTAL

612222
PULL BOX

612223
PAD & DUCT ONLY

ENTERPRISE ROAD

GOVERNOR

DRIVE

EAST FEED

WEST FEED

CHILD WORLD

612262
750 kVA
CLS 351

612950
3□FUSE MODULE

612525
PAD & COVER

619016 INSTALL PM11

612141

612142

612143

~~SKY CHEFS~~

PUMPING STATION

618145
300 kVA
CLS 311

612951
75 kVA
CLS 321

ABANDON IN PLACE

612216

612217

NOT ENERGIZED

INSTALL VAULT

612138

612139

612140

612141

619016

3□JUNCTION PEDESTALS

612143

612213

WEST FEED

~~EAST FEED~~

612214

612215

~~EAST FEED IS ON 3 3-WAY JUNCTION BLOCKS IN STACKED FG PADS~~

~~WEST FEED IS ON 3 3-WAY JUNCTION BLOCKS IN STACKED FG PADS~~

INSTALL PULLBOX

ORIGINAL LAYOUT WITH PROPOSED CHANGES

620090
MARRIOT COURTYARD
300 kVA

614142

EAST FEED CABLE ACTUALLY LOOPS THROUGH 614142 BEFORE 619016

CUST OWNED SWITCHGEAR

614339
1000 kVA
CLS 351

~~GRAND UNION~~

619030
225 kVA

④

~~FEDERAL EXPRESS~~

619788
25 kVA
AT&T Tower

CUST OWNED SWITCH-GEAR

619026
1500 kVA

"NELCO"

NOTE

ALL N.O. POINTS ARE WILL □TIES BETWEEN EAST AND WEST FEEDS

LEGEND

- 3 – 2QC #2AL 15KV URD PRIMARY CABLES
- 3– 2/C 4/0 15KV URD PRIMARY CABLES
- SINGLE □PRIMARY
- (3 FI) 3□FAULT INDICATOR INSTALLED HERE

CAUTION

GAS IS IN SAME TRENCH THROUGHOUT MOST OF THE INDUSTRIAL PARK

REVISIONS

① 8-9-01 REVISED PAD 61221 3. PEL/BND
② 2-11-03 INS J BOX & PAD FIELD REV. RSP/BND
③ 7-24-03 W.O.6696 REPLACED PAD 618145 PEL/BND
④ 10-18-07 W.O.5822A M REPLACED PAD 619085. PEL/MPB
⑦ 11-20-98 INS.SWITCH 613012 & PAD 626301 TCJ/BND
⑧ 3-15-99 INS. PAD 621215 RSP/BND
⑨ 4-11-02 WO#3744 INS. NEW PAD RSP/BND
⑩ 4-4-02 CHANGE FUSE SIZE AT FEDERAL EXP RSP/BND

CENTRAL HUDSON GAS & ELEC.CORP.

STEWART INDUSTRIAL PARK
GOVERNOR DRIVE
TN.NEWBURGH

SCALE	N.T.S
DATE	9/22/92
REV.NO.	14
FILE NO.	
MAP 150	C3
W.O.NO. 5466A	CHECKED
PROJ.NO. 87-213	CLEARED
DRAWN R.R.	R/W
SUPV.	APPROVED

N-379

SH NO

CAD DRAWING
DO NOT REVISE MANUALLY

Title: P-14-02 – 7091/7061 – Rt. 199 7091 & 7061 Tie
District: Poughkeepsie
Budget Year Submitted: 2014
Project Category: Infrastructure – Operating

History:

In 2012, the North-East Dutchess Area Study was conducted by Distribution Planning. The study confirmed the noted need for a viable high voltage tie point between the Pulvers Corners 7091 circuit and the Milan 7061 circuit. The Pine Plains load pocket, for practical purposes, is radially fed from the 7091. The 5-Year CAIDI of the 7091 is 3.48, well above the PSC target of 2.50. This is due to the lack of ties when the circuit experiences an interruption, and the distance away from headquarters. The Stanfordville 7072 circuit tie that runs up Rt. 82 into pine Plains cannot absorb the entire village, leaving much of Pine Plains in the dark until repairs are made. The fragility of the circuit ties' ability to adequately take on load was further exacerbated by the recent tensions generated by the distribution switching order to temporarily offload the 7091 and 7092 circuits. The 7061 circuit currently out of Milan substation is a high capacity, 9/12 MVA circuit and peaked at 5.05MW in 2011. The mainline currently has only a small 4800 voltage tie with the end of the 7091 circuit out of Pulvers Corners.

Solution: (refer to the attached circuit maps)

Create a high voltage 3-phase tie along Rt. 199 between the Pulvers Corners 7091 and Milan 7061 circuits by reconductoring and converting 3.5 miles of circuitry with 336 ACSR Bare wire. Hang stepdown for spurs at 4 locations. The tie would allow the entire 7091 to be picked up in the event of an outage, greatly improve the reliability of the area, and retire aging 4800V infrastructure. The new open point should be moved east to pole 39337 to move 100kW of load from the 7091 to the 7061 circuit.

Cost: (refer to the attached circuit maps)

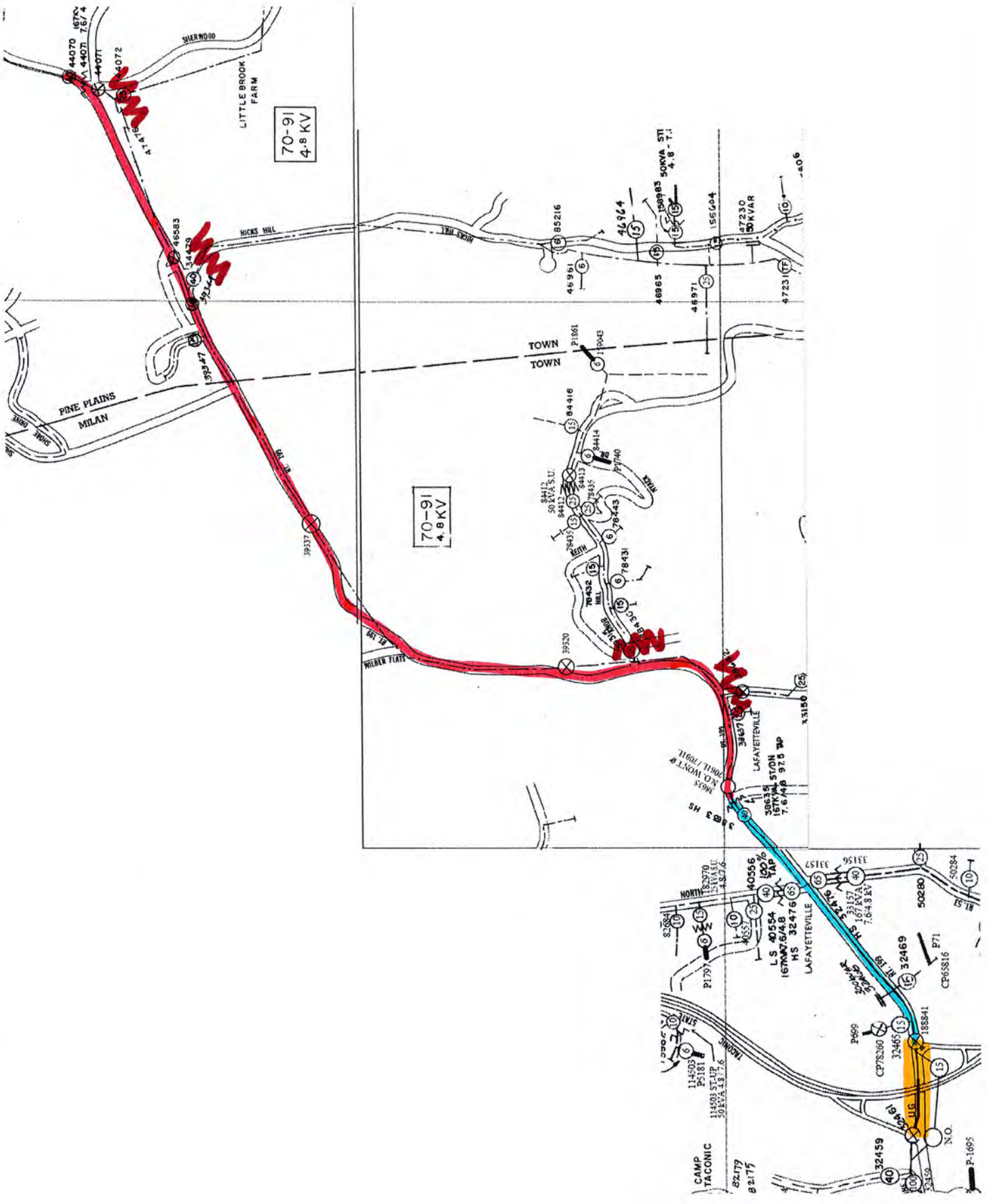
- Reconductor & Convert 2.5 miles of 3-phase with 336 ACSR Bare……..... $750,000
- Reconductor 0.75 miles of 2-phase with 336 ACSR Bare……. $150,000
- Rebuild 0.25 miles of Taconic crossing with 500 MCM and new duct bank…..... $250,000
- Install 4 stepdown transformers to isolate 4800 spurs…… $30,000

Total Cost (Capital) = $1,180,000

$/COA (5 year basis, reliability projects only): N/A

Summary:

Install 3.25 miles of 336 Bare and retrench 0.25 miles of underground with 500 MCM to create a viable tie along Rt. 199 between the Pulvers Corners 7091 and Milan 7061 circuits.


70-91
4.8 KV
LITTLE BROOK FARM
SILVERWOOD
HICKS HILL
TRAIL SOUTH
PINE PLAINS
MILAN
TOWN
TOWN
WILBER FLATS
LAFAYETTEVILLE
NORTH
CAMP TACONIC
TACONIC STATE PARKWAY
50KVA STN
4.8 - 7.6
50KVAR
167KV
7.6/4.8
97.5 TAP
50KVA ST-UP
4.8/7.6

Title: N-15-05– 5033 – Bring 5033 circuit on road along Aumick Rd.
District: Newburgh
Budget Year Submitted: 2015
Project Category: Infrastructure - Reliability

History:

The 5033 circuit single phase spur along Aumick Rd feeds 52 customers and is roughly 69 years old. Roughly 0.85 miles of the circuitry is off-road and prone to many tree and squirrel outages. Customers on this road are constantly on the 10X reports in the past and the fuse looking into the section in the woods is consistently appearing on the 3X report. The outages along this line are typically very long in duration as well since the crews need to patrol in the woods and climb poles in order to make repairs. The average non-storm outage duration is 5.6 hours.

Solution: (refer to the attached circuit maps)

Bring the 0.85 miles of single phase circuitry on-road in order to improve the reliability of the 45 customers along Aumick Rd.

Cost: (refer to the attached circuit maps)

- Single phase Construction 0.85 miles……... $170,000

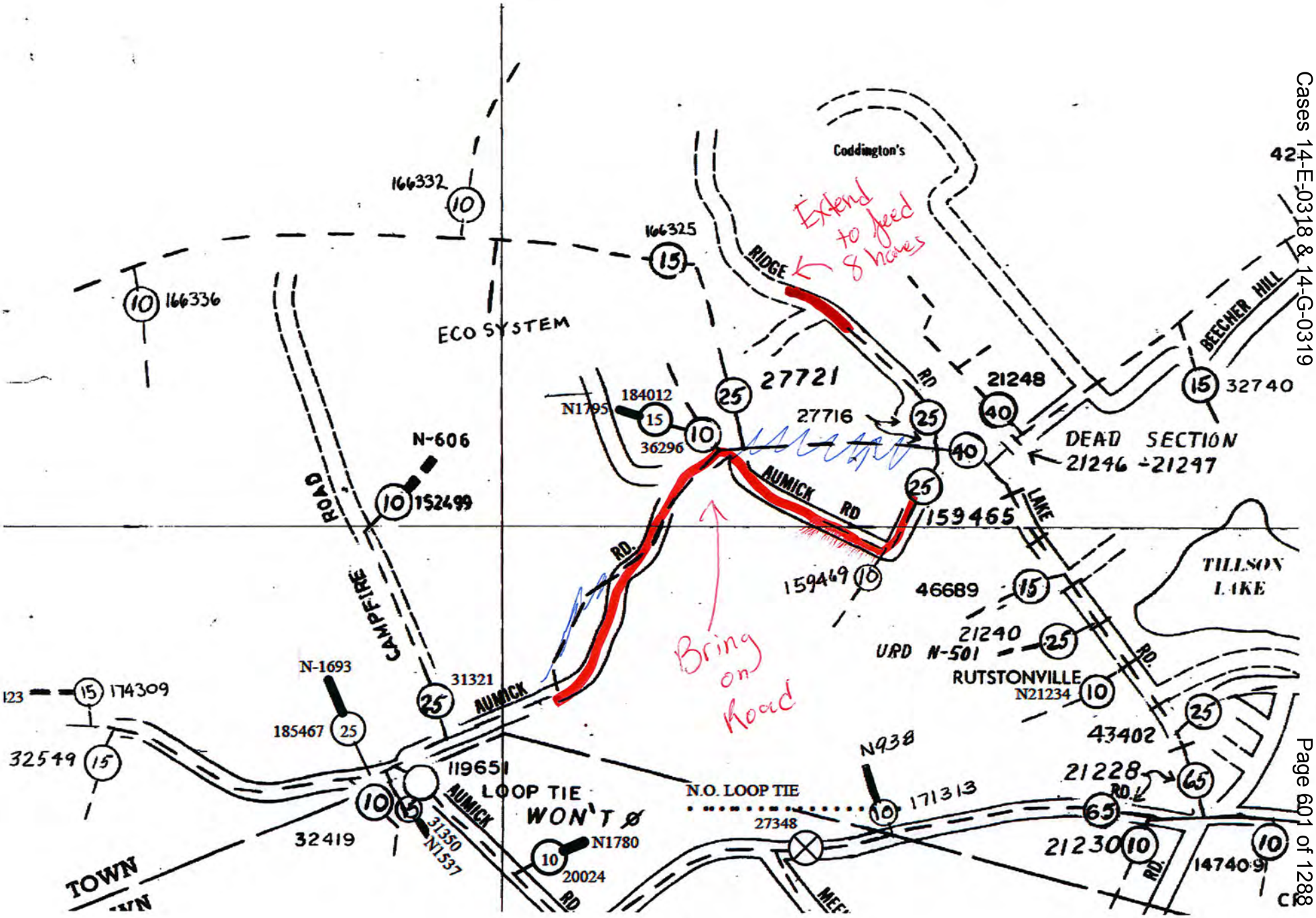
Total Cost (Capital) = $170,000

$/COA: $348 (Both storm and non-storm)

Average Age of Pole Plant: 69 years

Summary:

Bring 0.85 miles of single phase circuitry along Aumick Rd. in order to improve the reliability in the area.



Cases 14-E-0318 & 14-G-0319

Exhibit__(EIP-1)(Redacted)
Page 601 of 1288

Project: N-11-04

Title: Polyphase 2 miles along Lake Road in the Beaver Dam area

Problem:

The 4095 circuit's radial feed to the Beaver Dam has become unreliable in recent years. In the event that the underground cable either on Rt. 94 or Shore Drive becomes defective, approximately 726 customers will remain without power for the duration of the cable repair. The single-phase tie points between the 4095 and the 4097 circuits in the Beaver Dam area are not sufficient to reserve the 726 plus customers and three-phase loads.

Solution:

Polyphase approximately 2 miles of circuitry along Lake Road to Lakeside Drive with 336 WR ACSR 3/0 Bare ACSR neutral. This will create a strong tie between the 4095 and the 4097 circuits. A three-years interruption history yielded a cost per customer outage avoided of $619. It is also recommended to install an ALT team between the 4095 and the 4097 circuits.

Approximated Cost: $750,000

Phase

Polyphase Construction (336 WR ACSR- 3/0 Bare ACSR w/ pole replacement)

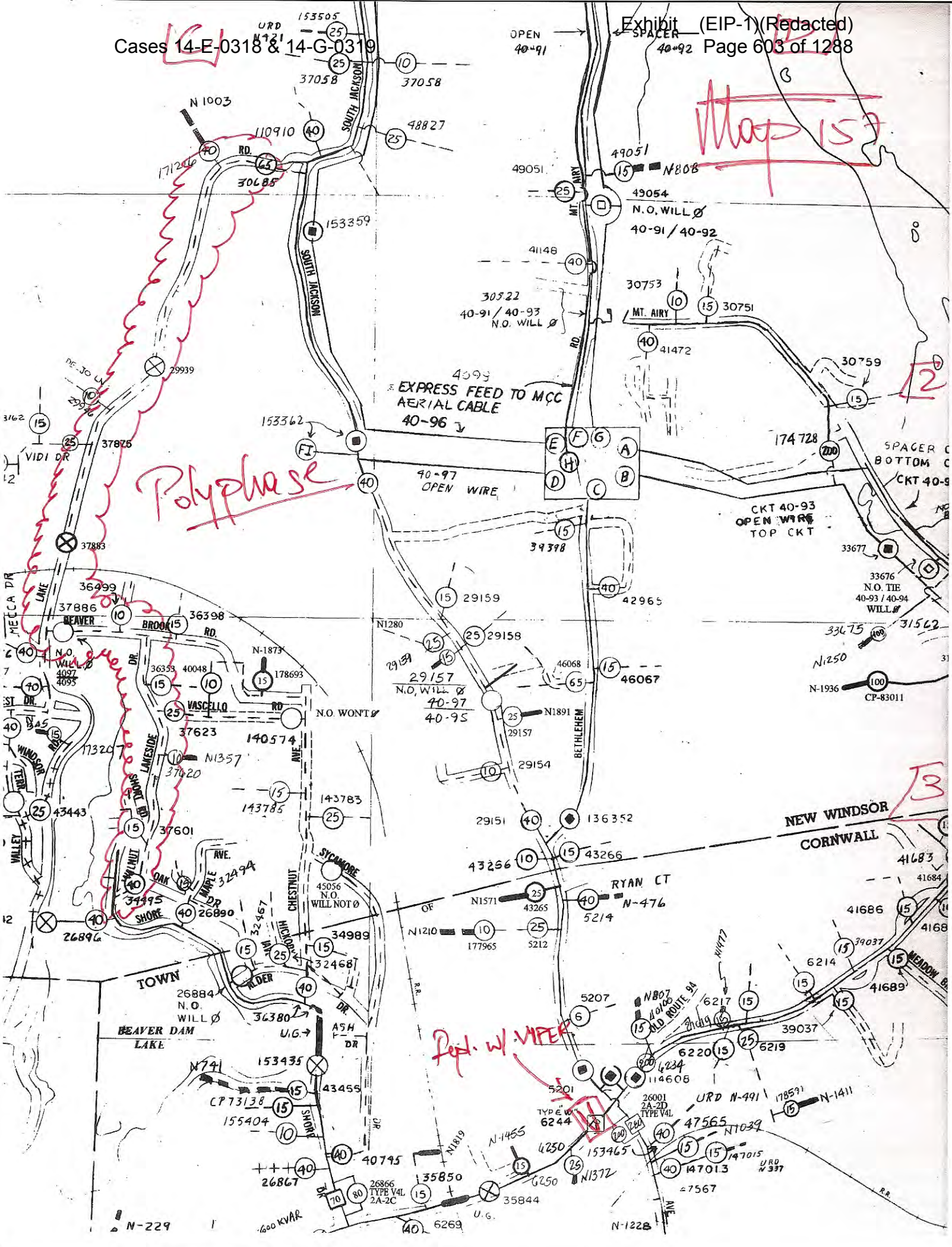
Conductors: 2 miles @ $300,000/mile: $600,000

Phase II

ALT $150,000

Benefits:

This project will improve reliability and reserve the Beaver Dam area.


Map 157
Polyphase
EXPRESS FEED TO MCC
AERIAL CABLE
40-96
40-97
OPEN WIRE
CKT 40-93
OPEN WIRE
TOP CKT
SPACER
OPEN
40-91
SPACER
40-92
49054
N.O. WILL Ø
40-91 / 40-92
30522
40-91 / 40-93
N.O. WILL Ø
30753
MT. AIRY
30751
41472
30759
174728
33677
33676
N.O. TIE
40-93 / 40-94
WILL Ø
29157
N.O. WILL Ø
40-97
40-95
N.O. WON'T Ø
45056
N.O.
WILL NOT Ø
26884
N.O.
WILL Ø
NEW WINDSOR
CORNWALL
RYAN CT
N-476
TOWN
BEAVER DAM
LAKE
Repl. w/ VIPER
NBOZ
OLD ROUTE 9A
26001
2A-2D
TYPE V4L
6244
URD N-491
47565
147013
URD N 337
26866
TYPE V4L
2A-2C
600 KVAR
N-229
N-1228
N-1936
CP-83011
N-1873
178693
N-1411
N808
VASCELLO RD
BROOK RD
BEAVER LAKE
VIDI DR
MECCA DR
WINDSOR TERR
LAKESIDE
SHORE DR
WALNUT AVE
OAK
MAPLE DR
SYCAMORE
CHESTNUT
HICKORY
ELDER
ASH DR
SHORE DR
BETHLEHEM
SOUTH JACKSON
MT. AIRY RD
MEADOW BR
RYAN CT
OF
R.R.
U.G.
O.H.
153505
37058
110910
48827
153359
153362
29939
37825
37883
36499
37886
36398
36353
40048
37623
140574
37620
143783
37601
43443
32494
34495
26890
26896
32467
34989
32468
36380
153435
43455
CP 73138
155404
40795
26867
35850
35844
6269
49051
41148
30522
30685
1712446
N1003
N741
N1280
29159
29158
46068
46067
N1891
29154
136352
43266
N1571
43265
5214
N1210
177965
5212
5207
6217
6214
39037
6219
6220
6234
114608
5201
153465
6250
N1372
N1455
N1819
147015
47567
N1039
N1477
41683
41684
41686
41689
41688
39037
N1250
31562
33675
100
200
39398
42965
29151
40
15
10
25
65
80
70
6
N1357
N1819

Title: K - 14 - 03 – 3091 - Relocate Sundown Rd on-road
District: Kingston
Budget Year Submitted: 2014
Project Category: Reliability

History:

As mentioned in the 2012 worst circuit report for the Neversink 3091 circuit, there are 3 distinct portions of the circuit that drive the poor reliability experienced by the customers served from this circuit. Sundown Road between Sugarloaf Road and East Mountain Road is one of these locations. Between 2008 and 2013, there have been 4 tree-related outages in this one-mile of circuitry. Combined these outages have affected a total of 2,180 customers or an average of 436 customers per year. Due to the difficult to access terrain, outages in this location tend to be much longer in duration with an average duration of 4 hours 40 minutes. The protective device that covers this zone of the circuit serves 613 customers.

Solution: (refer to the attached circuit maps)

Rebuild the 3091 circuitry on-road along Sundown Road between Sugarloaf Road and East Mountain Road. This area is in the NYC DEP watershed; therefore land-use permits will probably need to be obtained to reconstruct the line.

Cost:

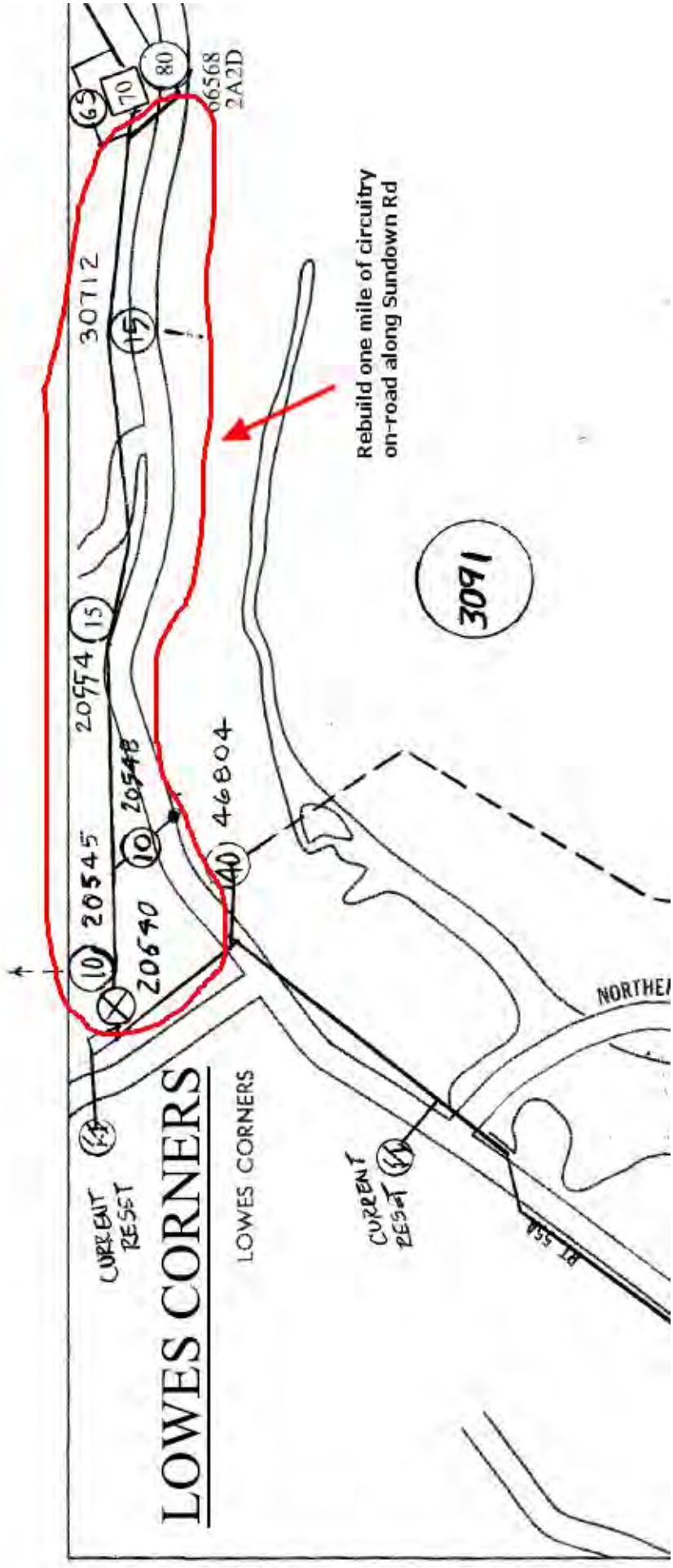
- Rebuild the circuitry on-road along Sundown Road (1.0 mile)……..….. $300,000

Total Cost (Capital) = $300,000

$/COA (5 year basis, reliability projects only): 688

Summary:

This project will rebuild one-mile of outage prone circuitry on-road to eliminate the off-road line that has been a driver of the poor reliability experienced by the customers served from the 3091 circuit east of the Neversink Substation.


Rebuild one mile of circuitry on-road along Sundown Rd
LOWES CORNERS
LOWES CORNERS
CURRENT RESET
CURRENT RESET
3091
30712
20554
20545
20540
20548
46804
06568
2A2D
NORTHE

Title: N-14-04 – 5084 – New Ransom Road Feed
District: Newburgh
Budget Year Submitted: 2014
Project Category: Reliability – Operating

History:

Customers downstream of pole 183860 on the 5084 circuit in Highland have been experiencing poor reliability over the past three years. Tree related conditions have been the preliminary cause of outages. The feed goes through dirt roads, backyards, a small creek, and heavily wooded terrain. Customers on this line include the sewage treatment plant for Highland.

There are also no strong ties in the area. So when outages occur, the durations tend to be lengthy. Many of the poles are extremely difficult to access and must be climbed by crews in order to make repairs.

Since the crews need to climb the poles and no strong ties exist, scheduled outages to 100 customers is necessary to do any work.

Solution: (refer to the attached circuit maps)

Build a new 3-phase feed down Ransom Road from the substation.

Cost: (refer to the attached circuit maps)

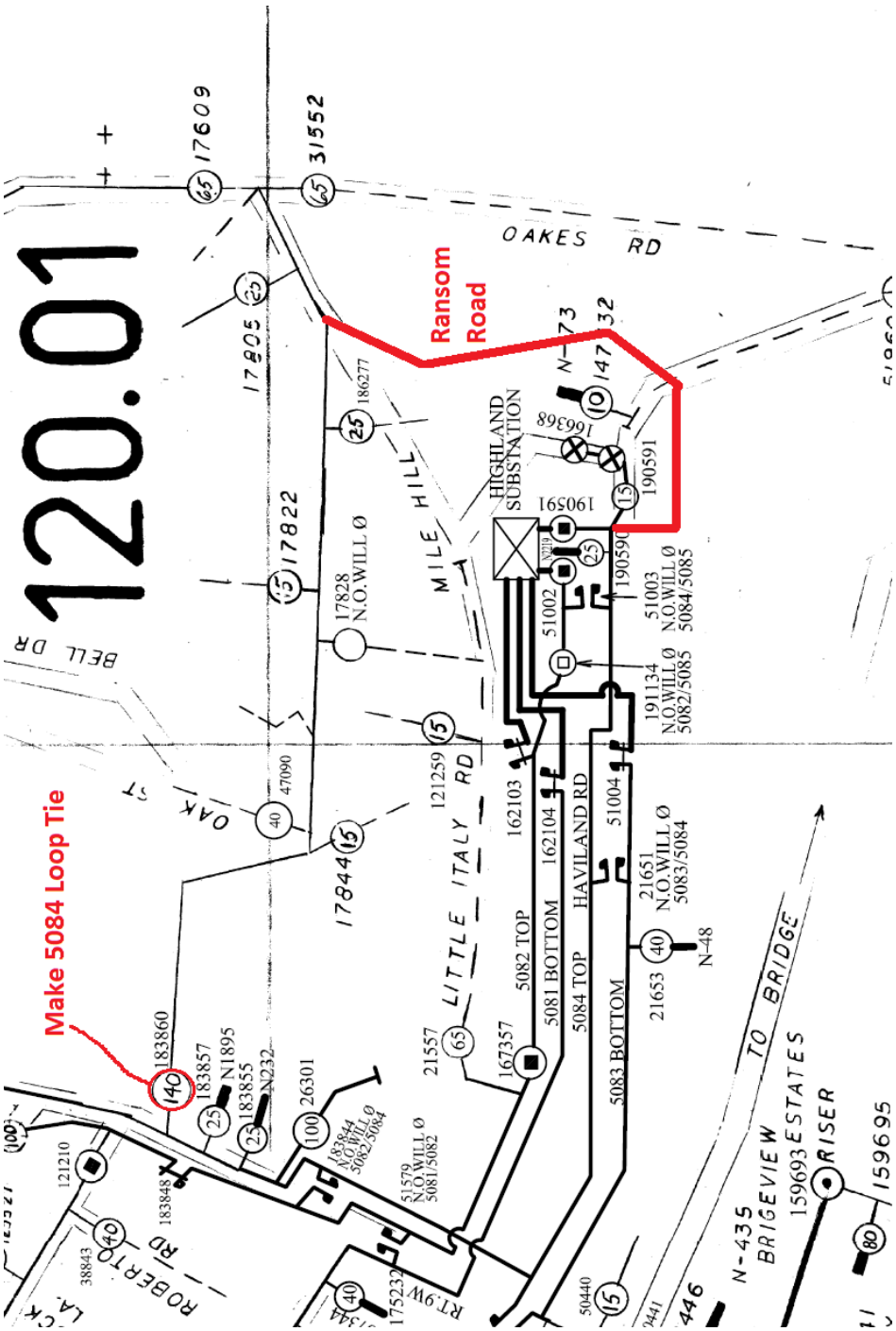
- 0.4 miles of 3-phase construction>…… $120,000

Total Cost (Capital) = $120,000

$/COA (5 year basis, reliability projects only): $731

Summary:

By building this circuitry down Ransom Road, the main feed to these 100 customers is easily accessible and creates a strong tie in the area. The project will improve both customer outages and duration.


120.01
Ransom Road
Make 5084 Loop Tie
OAKES RD
MILE HILL
HIGHLAND SUBSTATION
LITTLE ITALY RD
HAVILAND RD
5082 TOP
5081 BOTTOM
5084 TOP
5083 BOTTOM
TO BRIDGE
BRIGEVIEW ESTATES
RISER
ROBERTO RD
BELL DR
OAK ST
RT.9W
N-435
N-48
N-73

Catskill Proposal C-2013-04

PROJECT NAME:

Circuit 1083- Rebuild Single Phase Route 51, Route 54, Roberts Hill Road and Highmount Road, 5.0 Miles

PROBLEM:

The existing circuit 1083 feed along Route 51, Route 54, Roberts Hill Road and Highmount Road has been experiencing 4.0 outages per year over the last five years. Two Hundred and forty seven customers live in the area. The existing circuitry, both on and off road, is in very poor condition. In addition, the crosslot feeds on Highmount Road and from West Deans Mill Road to Route 51 are inaccessible and in need of repair. The single phase circuitry was installed in 1937.

SOLUTION:

Rebuild 5 miles of single phase circuitry along Route 51, Route 54, Roberts Hill Road and Highmount Road utilizing 1/0 Al weatherproof construction as shown on the attached map. The total distance is 5.0 miles. Rebuilding the single phase will significantly improve the reliability of the area.

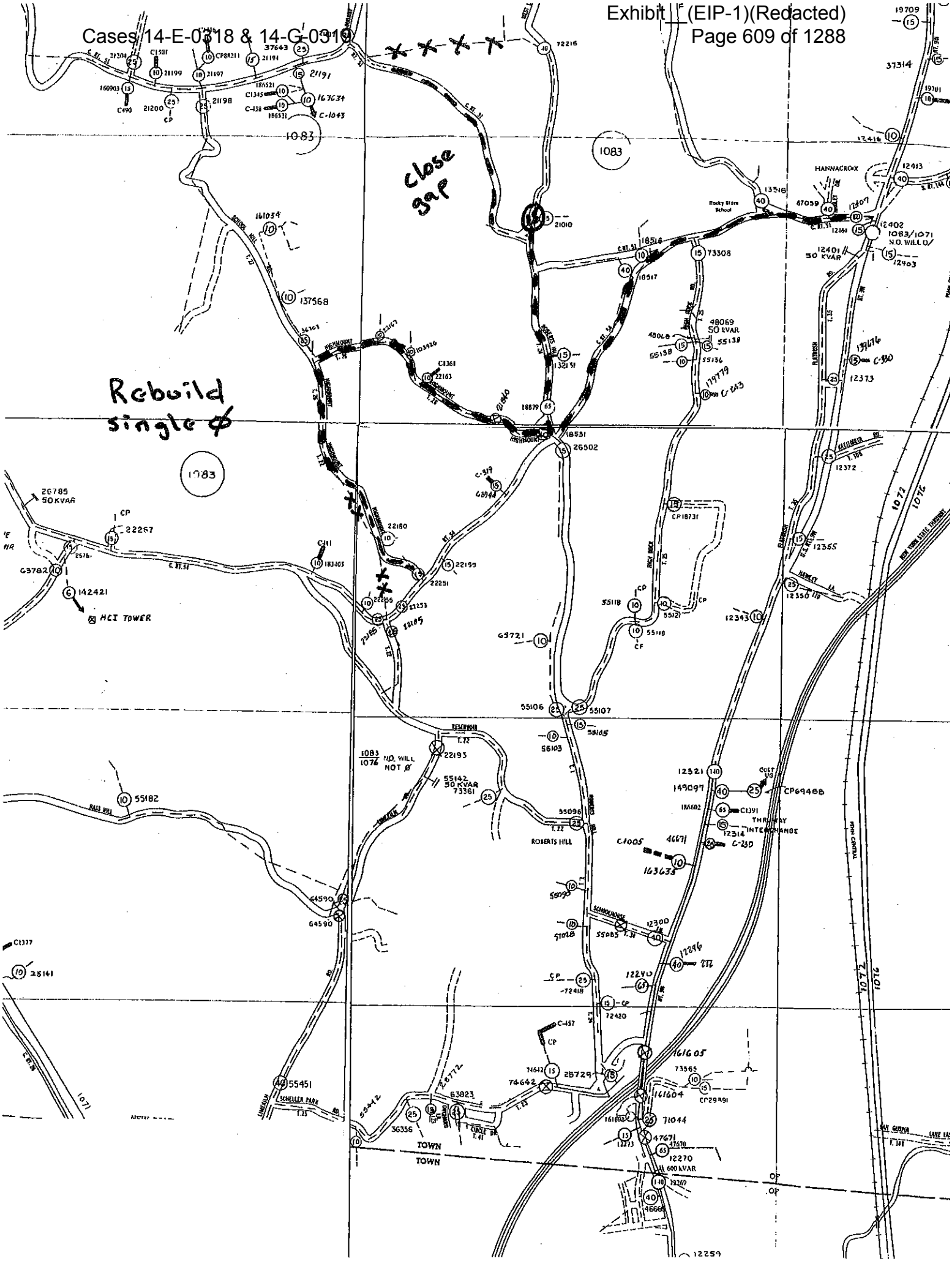
APPROXIMATE COST:

The approximate cost to complete this project will be $500,000.

PROJECT SUMMARY AND BENEFITS:

Completion of this project will replace the poor pole plant that has been associated with the majority of outages in the area.

The $/COA for this project is 506.


Close 3ap
Rebuild single ϕ
1083
1083/1071
N.O. WILL O/
1083
1074
NO. WILL NOT ϕ
HANNACROIX
ROBERTS HILL
TOWN
TOWN
HCI TOWER
50 KVAR
600 KVAR
THRUWAY INTERCHANGE

CATSKILL PROPOSAL

PROJECT NAME:

Circuit 1092- Rebuild & Reconductor Route
22 Route 145, 2.0 Miles, Part I of II

PROBLEM:

Westerlo circuit 1092 is listed on the "2010 Worst Circuit Report" based on 2010 SAIFI and ECM. Circuit 1092 had a 2010 non-storm ECM of 335.07 and a SAIFI of 2.55. The Worst Circuit study identified that the circuitry along Route 22 and Route 145 beginning in Oak Hill and ending in Cooksburgh has been problematic where the #2 ACSR has failed. The steel core is rusting and the conductor is very brittle. The pole plant varies in age from 1939 to 1952. During 2010, this circuitry accounted for 11% of the ECM and 13% of the SAIFI.

To note, no tie exists with this circuitry since it feeds to the edge of the CHG&E western boundary. Eight Hundred customers are served from this portion of circuit 1092.

SOLUTION:

The #2 ACSR should be replaced with 336 MCM Wr. Rebuilding and reconductoring the circuitry will eliminate the problems associated with the conductor failures.

In addition the voltage profile will improve to Preston Hollow and the Susquehanna Turnpike. The voltage in these areas is borderline low.

APPROXIMATE COST:

The approximate cost of this project will be $600,000.

Part I- Polyphase and reconductor Route 22 $ Route 145 with 336 MCM Wr (2.0miles). Approximate cost-$600,000

Part II- Polyphase and reconductor Route 145 to Cooksburgh with 336 MCM Wr (2.0miles). Approximate cost-$600,000

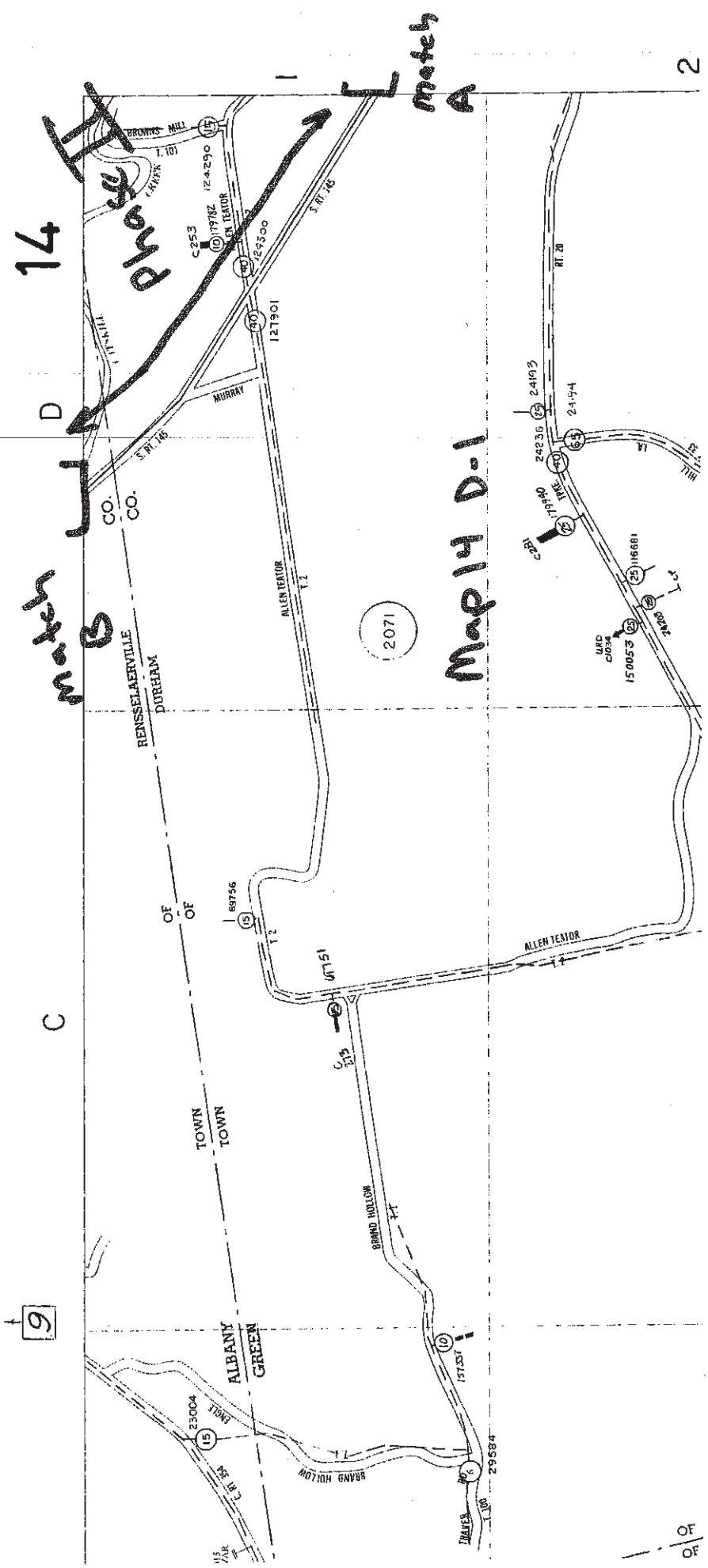
PROJECT SUMMARY AND BENEFITS:

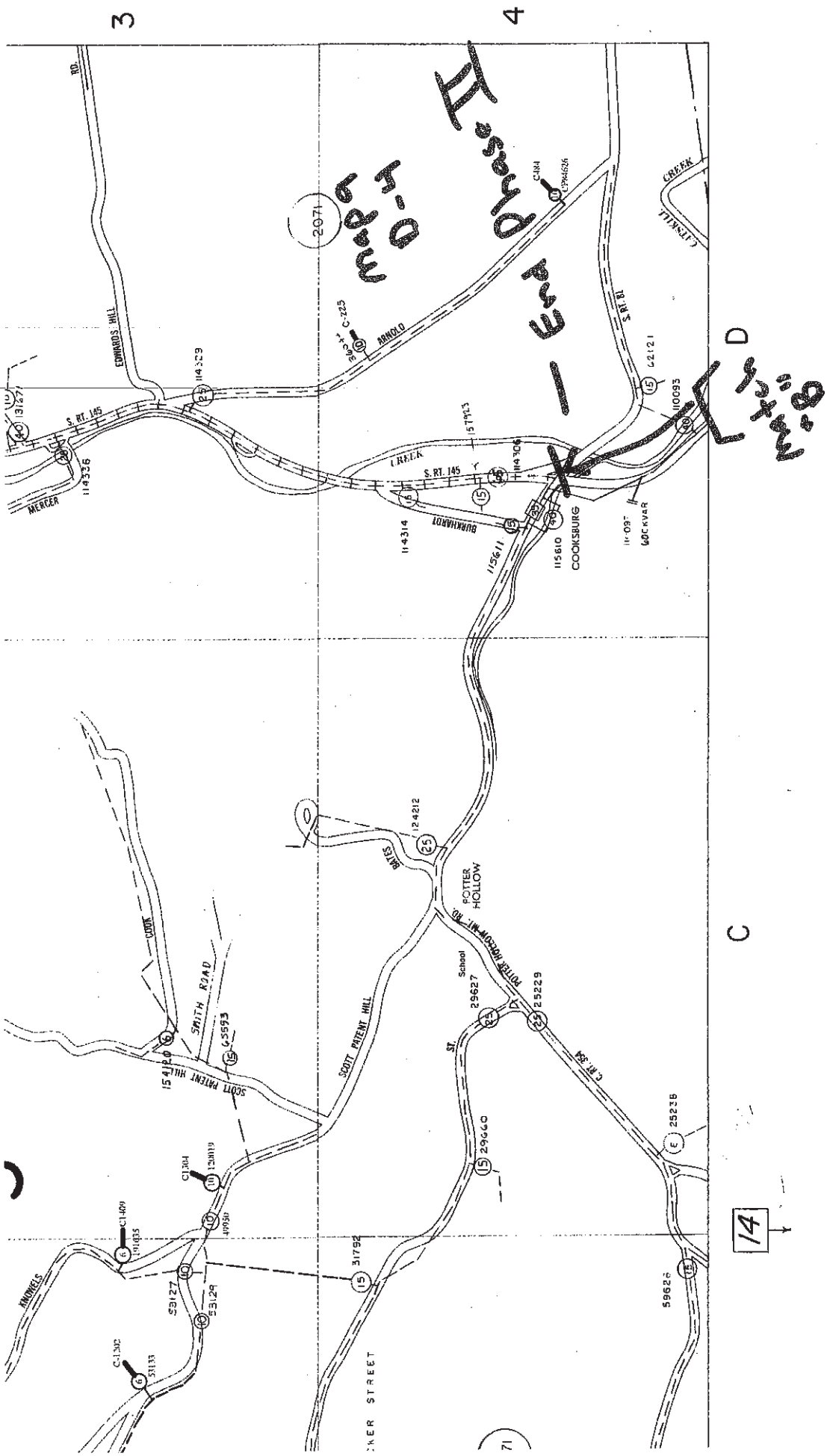
Rebuilding and reconductoring the circuitry will eliminate

the problems associated with the conductor failures. In addition the voltage profile will improve to Preston Hollow and the Susquehanna Turnpike. The voltage in these areas is borderline low. The $/COA for this project is 937.

10
A
B
1
2
OAK HILL
SAYBROOK HILL
SCHOOL HOUSE HILL
GUILDA RD
MANLEY
ROUTE 81
S. RT. 81
CREEK
CLAY HILL
ROUTE 145
C. RT. 27
PRINTING PRESS
KENNEDY
DURHAM
DURHAM SCHOOL
CPUG
POULTNEY
Oak Hill Cemetery
ALLEN GATOR
MARSARD
SUSQUEHANNA
Proposed Phase 1
Proposed Phase 2
Proposed Phase 3

6-18-2010


14
match line
match line
Map 14 D-1
BROWNS MILL
ALLEN TEXTOR
MURRAY
S. RT. 145
RENSSELAERVILLE
DURHAM
CO.
CO.
TOWN
TOWN
OF
OF
ALBANY
GREEN
BRAND HOLLOW
RT. 20
2071
9


3
4
C
D
Road
Map
Rt.
S. RT. 145
EDWARDS HILL
ARNOLD
MERCER
BURKHARDT
COOKSBURG
CREEK
S. RT. 81
SMITH ROAD
SCOTT PATENT HILL
POTTER HOLLOW
BATES
KNOWLES
School
14

Project: N-12-04

Title: 5051 Circuit - Polyphase Egbertson Rd.

Problem:

Customers on the 5051 circuit in Maybrook have been experiencing poor reliability recently in the past three years and appeared on the 10X report for 2010. Tree related conditions have been the preliminary cause of outages followed by vehicle accidents. When outages occur in this area, they tend to be lengthy due to no limited switching capability. Recently, the reliability of this area has been getting worse. This area has experienced 14 outages since 2006, with all of the outages occurring within the past three years. The average length of outage has been 6 hours, 45 minutes. Four-hundred and eight customers being fed down Hamptonburg Rd. have experienced outages lasting an average of 4 hours, 42 minutes due to limited switching capabilities which has adversely impacted CAIDI numbers in Newburgh. Eggbertson Rd. has been the source of PSC complaints within the past year along with a negative newspaper article in the Times Herald Record.

Solution:

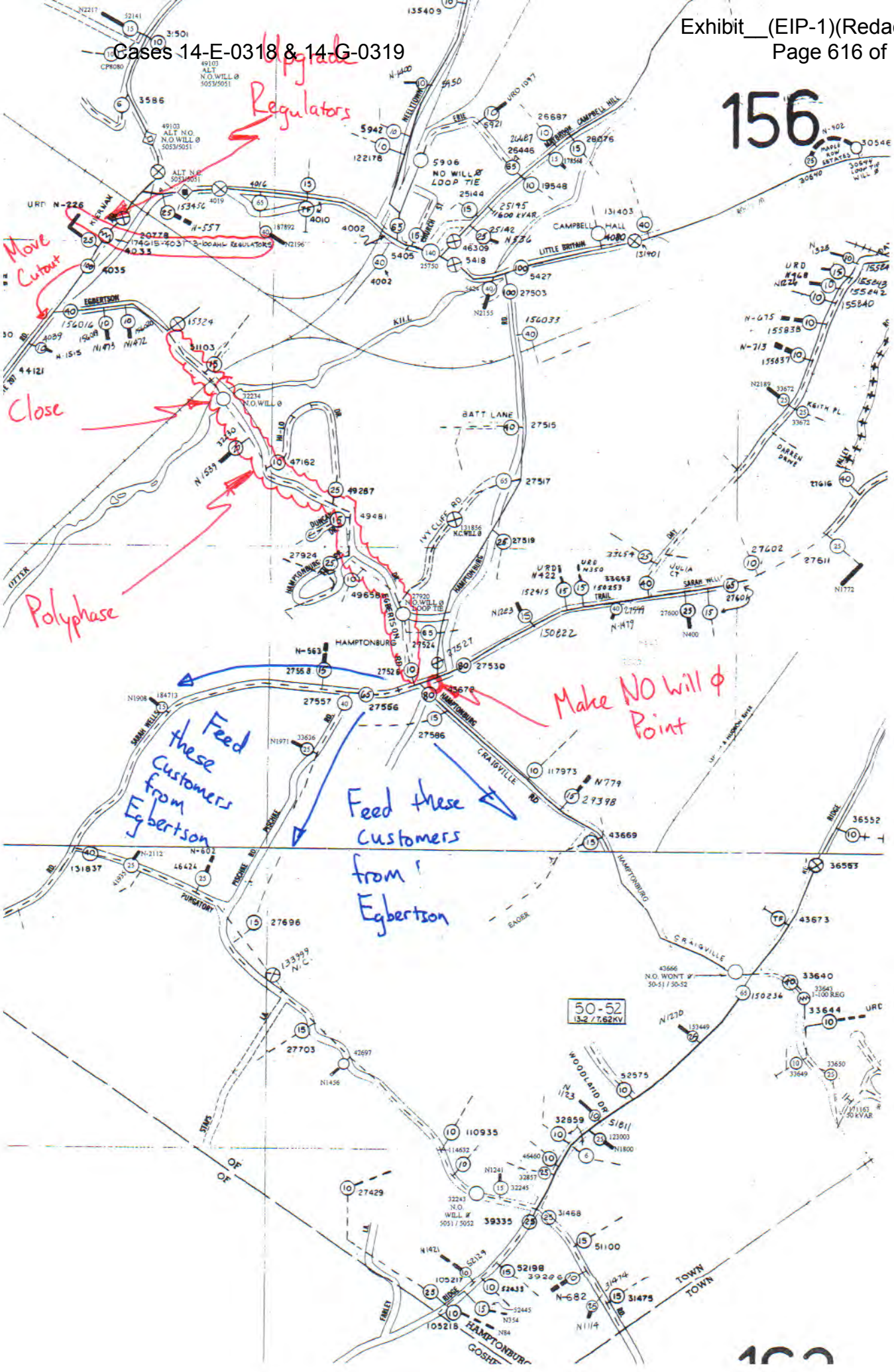
Polyphase Eggbertson Rd. and change the direction of feed on Eggbertson Road. In addition, Eggbertson Rd. can become the feed for customers on Sarah Wells Trail and south past Hamptonburg Rd. The Cost Per Outage Avoided is equivalent to $846 for 219 customers.

Approximate Cost: $360,000

Three Phase Construction (336 WR Al w/ minimal pole replacement)
1.2 miles @ $300,000/mile: $360,000

Benefits:

By changing the feed on Eggbertson Rd., the customers on Eggbertson Rd will experience fewer outages. In addition, the length of outages experienced by customers on Hamptonburg Rd and Sarah Wells Trail can be reduced with added switching capability, which will be invaluable during restoration efforts. By moving the main feed from Hamptonburg Rd. to Eggbertson Rd. the length of outages can also be reduced since many of the poles on Hamptonburg Rd. are located offroad which makes the restoration effort take longer. As an additional benefit, by moving the main feed down Eggbertson Rd., 219 customers can be protected by the 5051/5053 ALT team which will enhance reliability in this area.


Upgrade Regulators
Move Cutout
Close
Polyphase
Make NO Will ϕ Point
Feed these Customers from Egbertson
Feed these Customers from Egbertson
156
50-52
13.2 / 7.62KV
HAMPTONBURG
EGBERTSON
CRAIGVILLE
BATT LANE
KILL
FISCHER RD
PURGATORY
WOODLAND DR
TOWN
GOSHEN

Title: N-14-05 – 5021 – Bring single phase feed on road
District: Newburgh
Budget Year Submitted: 2014
Project Category: Infrastructure – 10X

History:

There are 15 customers along Rt. 299 and along Durma Rd. that experienced 10+ outages during 2012 causing them to be included in the 2012 10X Report. A section of the single phase feed along 299 currently is off-road from Albany Post Road in a very inaccessible terrain. A majority of these poles were installed in the 1940s and 1950s, making them highly prone to failure.

Solution: (refer to the attached circuit maps)

Bring the single phase feed down Rt. 299 on the road.

Cost: (refer to the attached circuit maps)

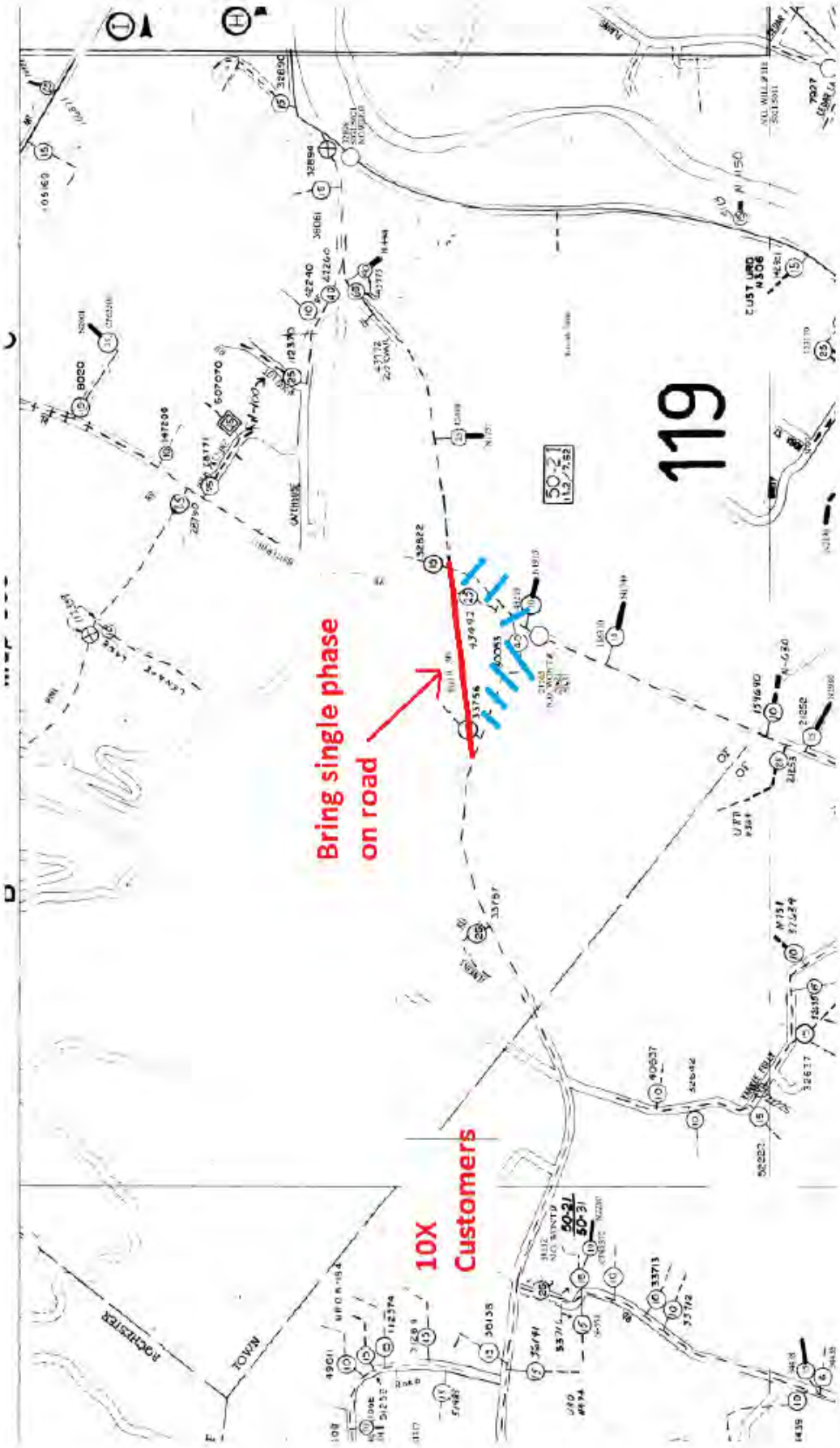
- 0.5 miles of single phase construction……$75,000

Total Cost (Capital) = $75,000

$/COA: $1431

Summary:

By building this circuitry on-road down Rt. 299, the main feed to these customers is easily accessible and many of the aging, failure prone poles can be eliminated. The project will improve both customer outages and duration.


Bring single phase on road
10X Customers
119
ROCHESTER
TOWN

Title: P-14-03 – 7013 – Create New 7013 Circuit
District: Poughkeepsie
Budget Year Submitted: 2014
Project Category: Infrastructure – Thermal

History:

In 2012, the North-East Dutchess Area Study was conducted by Distribution Planning. The study acknowledged many short comings in the area, including the Stanfordville Substation transformer consistently operating above its firm rating and being constantly overheated. Pulvers Corners also hovers near its firm rating. There is little operational flexibility and viable tie points in the region as well. Reliability in this area is above the PSC target for both SAIFI and CAIDI.

Solution: (refer to the attached circuit maps)

In order to defer associated substation capital investment at Stanfordville, a new 7013 circuit out of Hibernia should be constructed. The new circuit would take over the section of the 7012 circuit heading north on Clintons Corners Road. Then the two mile section of single phase circuitry along Pumpkin Lane from Salt Point Turnpike to Prospect Hill would be poly-phased. The circuit would then tie into the 7071 circuit on Prospect Hill. The new circuit would assume all of the 7071 circuit load west of the Taconic Parkway, including the section along Pumpkin Lane being relocated on road in 2013.

An additional mile of circuitry along Nine Partners Road from Pumpkin Lane to Center Road would be poly-phased into the Hibernia 7011 circuit. With this tie, the new circuit could assume all of the 7011 load north of Nine Partners Road and alleviate loading concerns on that circuit. About 3.15MW in total would be assumed by the 7013. 1.2MW of that load would be off of the Stanfordville transformer.

A portion of the Stanfordville 7071 circuit can also be offloaded onto the Hibernia 7012 circuit by moving the existing open point on Route 82 (P#33030) north to P#31152. This transfer would shift an additional 0.35MW of power off of the transformer without any impact to customer reliability.

Electric Substation Design has provided a rough estimate of $500,000 for the associated costs within the Hibernia Substation for the 7013 circuit breaker and accompanying upgrades.

Cost: (refer to the attached circuit maps)

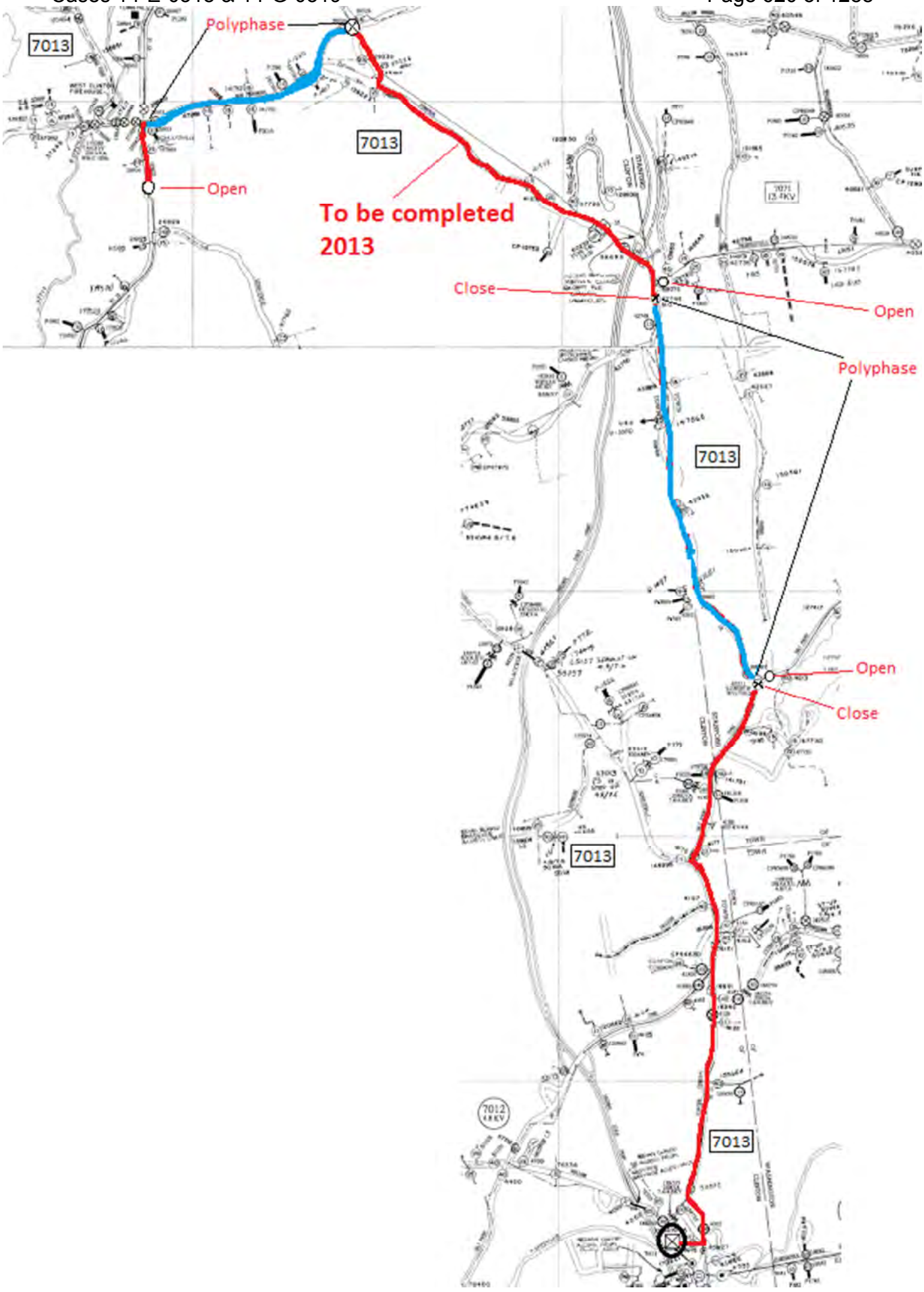
- Polyphase 2.0 miles with 336 ACSR……...$400,000
- Polyphase 1.0 miles with 336 ACSR…….....$200,000

Total Cost (Capital) = $600,000

$/COA (5 year basis, reliability projects only): N/A

Summary:

Install a new breaker out of Hibernia Sub, polyphase a total of 3 miles of circuitry.


7013
Polyphase
7013
Open
To be completed
2013
Close
Open
Polyphase
7013
Open
Close
7013
7012
7013

Title: F-2015-01a – 8086/8066 – South Mountain Pass Conversion (Phase I of II)
District: Fishkill
Budget Year Submitted: 2015
Project Category: Infrastructure – 4800V

History:

Located at the southern edge of Central Hudson service territory near the Westchester County border is one of the longest stretches of 4800V construction remaining in the Fishkill district. This phase-phase design is inherently not effectively grounded, which during outage events can lead to live wires on the ground, system backfeed and partial voltage to customers. This construction comprises approximately 2.1 miles of the 8086 circuit mainline running down Route 9D and across South Mountain Pass Road. There are an additional 0.6 miles of 4800V construction on the east side of South Mountain Pass Road (8066 circuit), followed by 0.7 miles of 2400V and then a 0.3-mile gap between the two circuits. There is a 4800V/2400V stepdown transformer at pole #P74716 from 1940 that is no longer a Central Hudson stock item. In the event of its failure, crews would either need to perform an immediate conversion or arrange a step-up and a stepdown transformer back-to-back in a nontraditional formation.

In addition to the above, the 251 customers downstream of the 100K fuses at pole #110339 are prone to lengthy outages due to a lack of circuit ties for switching. Excluding Twin Peaks, Hurricane Irene, Snow*Fall and Superstorm Sandy, there were seven outage events between 2009 and 2012 for which switching would have been practical had there been a three-phase tie with the 8066 circuit. The average duration of these events was 7 hours and 38 minutes.

Solution:

This project shall be split into two phases. Phase I will polyphase and convert the 8066 circuit side. Specifically, the 8066 circuit should be polyphased downstream of pole #P55940 and also converted to 13.2kV operation downstream of pole #P65442 (see attached circuit map).

Completion of both phases of this project will eliminate 2.7 miles of 4800V circuitry, 0.7 miles of 2400V circuitry, and a difficult-to-replace stepdown transformer that is likely nearing the end of its useful life. Creation of a three-phase tie between the 8066 and 8086 circuits will also reduce the average duration of outage events for customers who are particularly vulnerable to long outages.

Cost (see attached circuit map):

- Polyphase 0.7 miles of the 8066 circuit between pole #P55940 and #P65442*……...….$74,000
- Convert & polyphase 1.3 miles of the 8066 circuit between pole #P65442 and #177573…….....$388,000

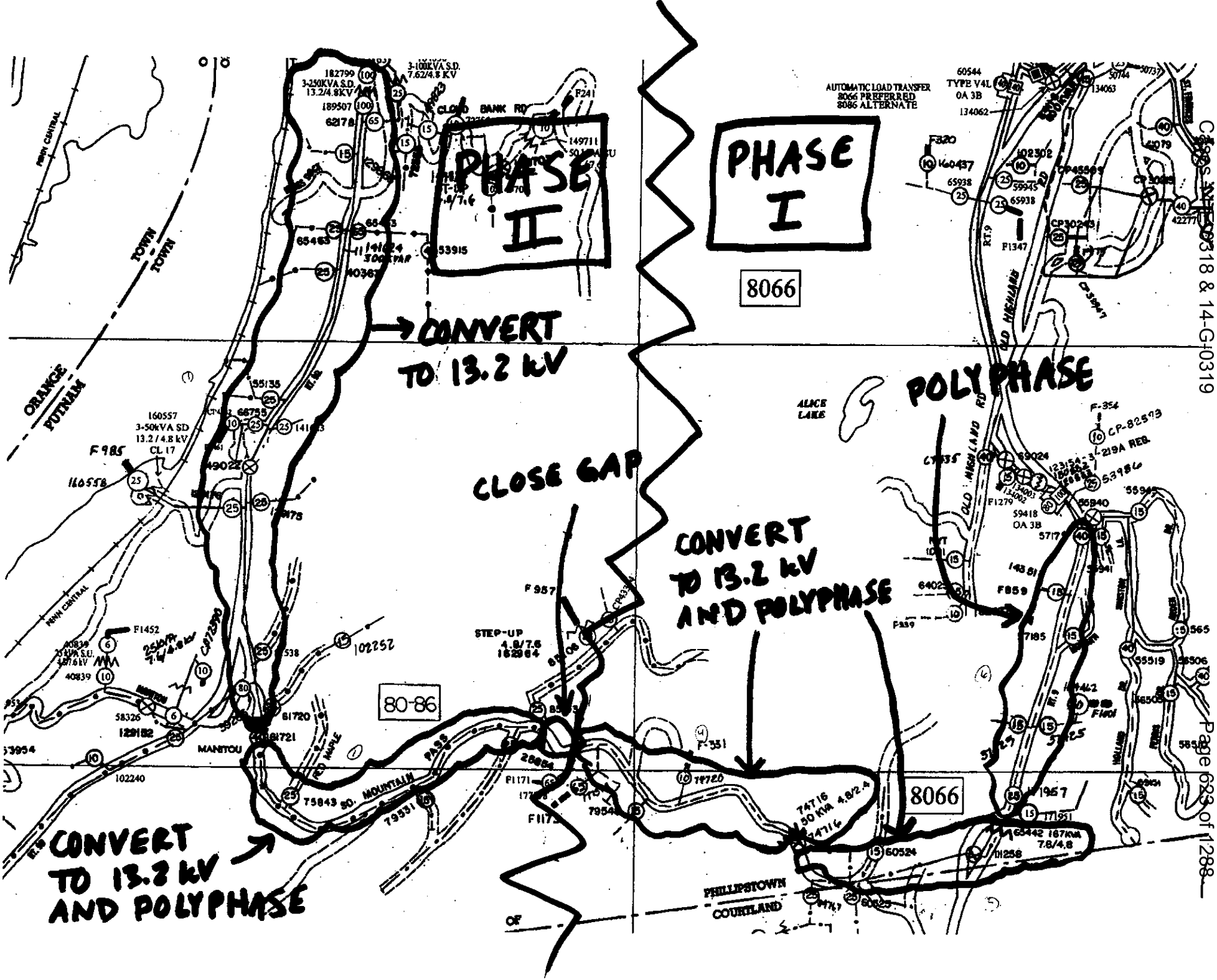
Total Cost (Capital) = $462,000

*Average age of pole plant in this section alone is 25 years; most poles in good shape.

$/Customer Minute Avoided:	$7.68 excluding storms $4.64 including storms
Average Age of Pole Plant:	38 years

Summary:

- Phases I and II will polyphase and convert 4.4 miles of the 8066 and 8086 circuits to 13.2kV to eliminate 2.7 miles of 4.8kV construction and create a three-phase tie between the 8066 and 8086 circuits.



Cases 13-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 623 of 1288

Title: F-2015-01b – 8086/8066 – South Mountain Pass Conversion (Phase II of II)
District: Fishkill
Budget Year Submitted: 2015
Project Category: Infrastructure – 4800V

History:

Located at the southern edge of Central Hudson service territory near the Westchester County border is one of the longest stretches of 4800V construction remaining in the Fishkill district. This phase-phase design is inherently not effectively grounded, which during outage events can lead to live wires on the ground, system backfeed and partial voltage to customers. This construction comprises approximately 2.1 miles of the 8086 circuit mainline running down Route 9D and across South Mountain Pass Road. There are an additional 0.6 miles of 4800V construction on the east side of South Mountain Pass Road (8066 circuit), followed by 0.7 miles of 2400V and then a 0.3-mile gap between the two circuits. There is a 4800V/2400V stepdown transformer at pole #P74716 from 1940 that is no longer a Central Hudson stock item. In the event of its failure, crews would either need to perform an immediate conversion or arrange a step-up and a stepdown transformer back-to-back in a nontraditional formation.

In addition to the above, the 251 customers downstream of the 100K fuses at pole #110339 are prone to lengthy outages due to a lack of circuit ties for switching. Excluding Twin Peaks, Hurricane Irene, Snow*Fall and Superstorm Sandy, there were seven outage events between 2009 and 2012 for which switching would have been practical had there been a three-phase tie with the 8066 circuit. The average duration of these events was 7 hours and 38 minutes.

Solution:

This project shall be split into two phases. Phase II will polyphase and convert the 8086 side. Specifically, the 8086 circuit should be converted to 13.2kV operation downstream of pole #189507 and also polyphased downstream of pole #P61721 (see attached circuit map). Finally, the 0.3 mile gap should be closed between the 8086 and 8066 circuits to allow for a three-phase tie between the two.

Completion of both phases of this project will eliminate 2.7 miles of 4800V circuitry, 0.7 miles of 2400V circuitry, and a difficult-to-replace stepdown transformer that is likely nearing the end of its useful life. Creation of the three-phase tie will also reduce the average duration of outage events for customers who are particularly vulnerable to long outages.

Cost (see attached circuit map):

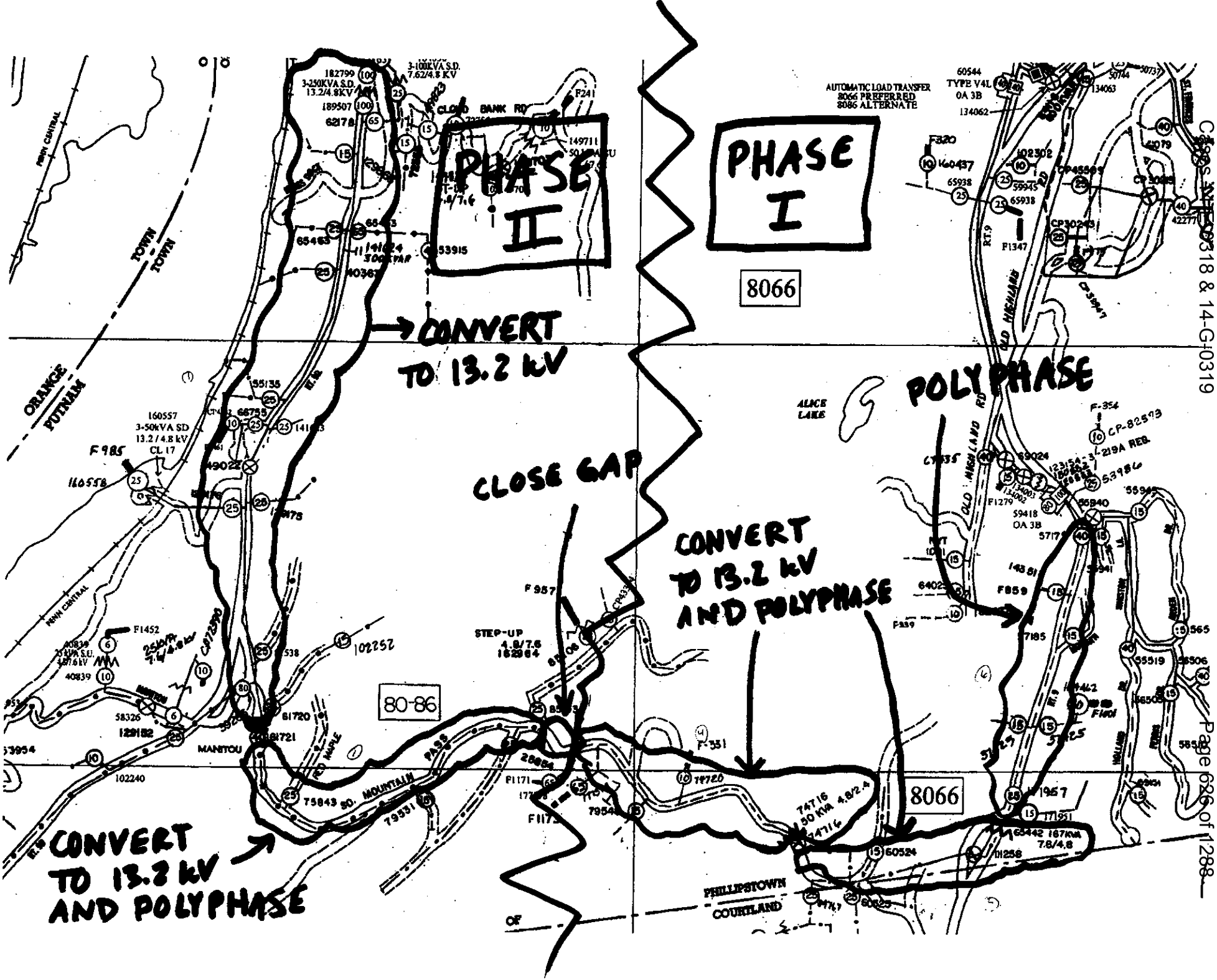
- Convert 1.5 miles of the 8086 circuit between #182799 and #P61721…….…….. $454,000
- Convert & polyphase 0.6 miles of the 8086 circuit between #P61721 and #P85103……..$168,000
- Close 0.3-mile gap between the 8086 and 8066 circuits with 3-phase 13.2kV……..…$85,000

Total Cost (Capital) = $707,000

$/Customer Minute Avoided:	$7.68 excluding storms $4.64 including storms
Average Age of Pole Plant:	38 years

Summary:

- Phases I and II will polyphase and convert 4.4 miles of the 8066 and 8086 circuits to 13.2kV to eliminate 2.7 miles of 4.8kV construction and create a three-phase tie between the 8066 and 8086 circuits.



Case Nos. 14-G-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 626 of 1288

Title: N-15-01 – 4011/5004 – Poly-phase Leslie Rd.
District: Newburgh
Budget Year Submitted: 2015
Project Category: Infrastructure – Operating/Thermal

History:

The Marlboro Substation currently has only two strong ties with outside substations. These ties are with the West Balmville 4013 circuit (8MVA estimated 2014 peak) and the Highland 5083 circuit (6.4MVA 2013 peak). The circuits in the area are all near, at, or above their design ratings. Additionally, these ties exist with the Marlboro 5001 and 5002 circuits, no outside ties exist with the 5003 and 5004 circuits. In the event of a major substation outage, the 5003 and 5004 circuits can-not be reserved. This issue was evident in the recent Marlboro re-build, when the mobile substation had to be utilized in order to carry the load.

Solution: (refer to the attached circuit maps)

Polyphase 0.85 miles down Leslie Rd and Re-conductor 0.4 miles of Frozen Ridge Road to create a strong tie between the 5004 and West Balmville 4011 circuit. Additionally, due to the close proximity of the 5001/5004, this tie can be utilized as a 4011/5001 tie if necessary.

Cost: (refer to the attached circuit maps)

- Polyphase 0.85 miles on Leslie…..……...$255,000
- Re-Conductor 0.4 miles on Frozen Ridge Road……... $120,000

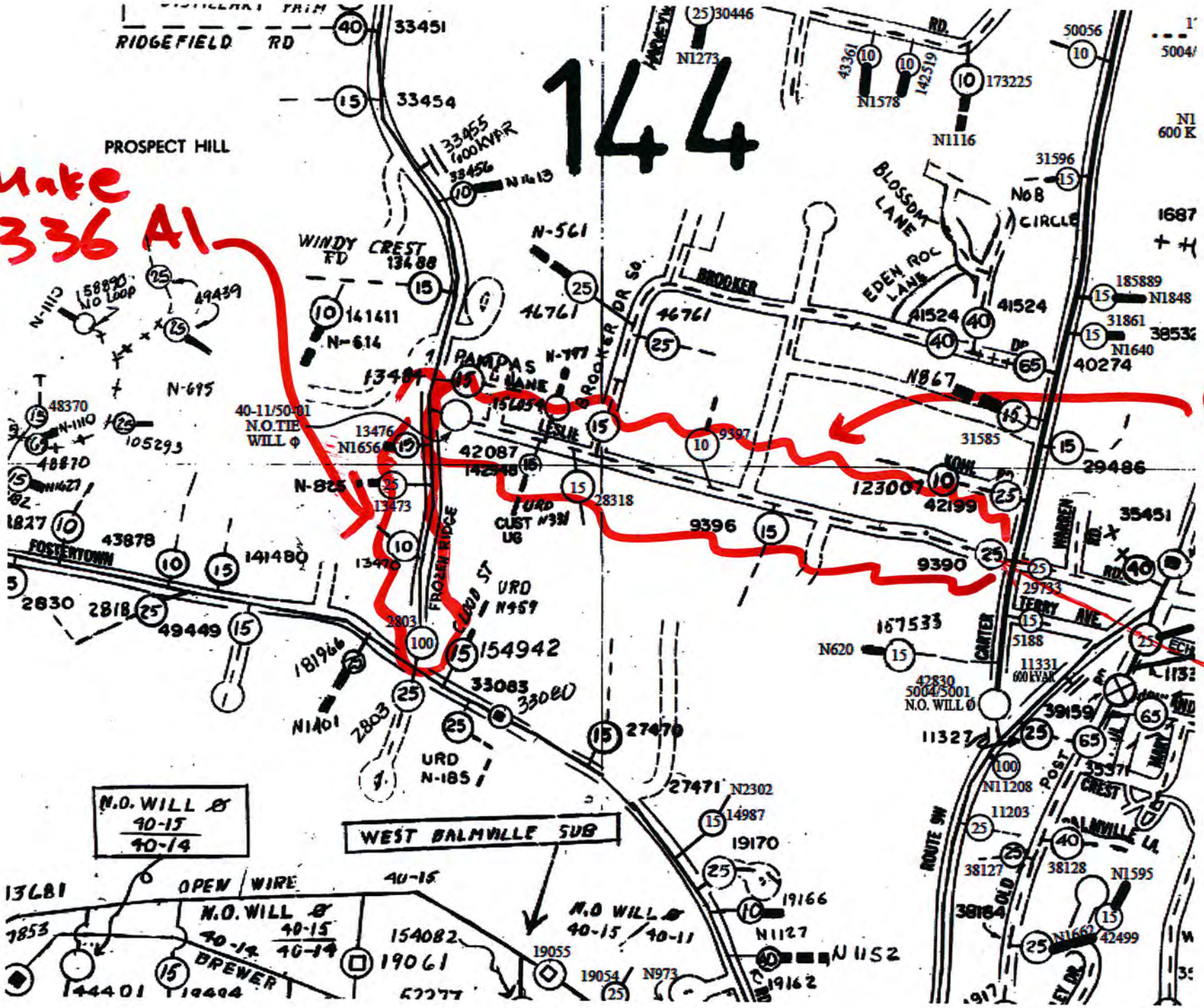
Total Cost (Capital) = $375,000

Average Age of Pole Plant: 48 years

% Loading:
5001 - **95%**
5004 – **91%**
5083 – **107%**
4013 – **89%** (estimated 2014)
4011 – 67% (estimated)

Summary:

With an additional strong tie between Marlboro and West Balmville, the ability to reserve customers greatly increases. With this tie, the recent Marlboro Substation work could have been completed without the use of the mobile substation. Additionally, in the event of a major substation outage at Marlboro or West Balmville, customers can be picked up in a shorter amount of time.


144
Make 336 A1
Polyphase
N.O. will Ø 3004/1401
PROSPECT HILL
RIDGEFIELD RD
WINDY CREST RD
PAMPAS LANE
BROOKER DR SO
BROOKER
BLOSSOM LANE
EDEN ROC LANE
NOB CIRCLE
FOSTERTOWN
FROZEN RIDGE
CLOUD ST
LESLIE
KOHL
WARREN
CARTER
TERRY AVE
ROUTE 9W
OLD POST RD
CRESTVILLE LA
OLD DR
URD CUST UG
URD N-959
URD N-185
40-11/50-01 N.O.TIE WILL Ø
N.O. WILL Ø 40-15 / 40-14
WEST BALMVILLE SUB
OPEN WIRE
N.O. WILL Ø 40-15 / 40-14
N.O WILL Ø 40-15 / 40-11
BREWER
42830 5004/5001 N.O. WILL Ø
11331 600 KVAR
154942
141480
123007
42087
42199
33083
19170
19061
154082
27470
27471
33451
33454
33455 1400KVAR
30446
50056
173225
31596
185889
31861
40274
29486
35451
29733
39159
11327
11203
38127
38128
38184
42499
19166
19055
19054
19162
N1273
N1578
N1116
N1848
N1640
N867
N1401
N1595
N1127
N1152
N973
N2302
N620
N-561
N-614
N-695
N-825
N-1110
N-1113
N-1113
N-1113

Title: P-15-01 – 7081/7095 – Convert Shekomeko
District: Poughkeepsie
Budget Year Submitted: 2015
Project Category: Infrastructure – Voltage – 4800V

History:

The Smithfield 7095 circuitry feeding to the west is built in a vertical configuration along transmission towers running adjacent to the E Line for 2.5 miles before transitioning to distribution poles on Pugsley Hill Rd. On 8/15/12, lightning struck this portion of the 7095 in the first zone of protection, necessitating downstream switching for the single phase circuitry. It was found that the utilized tie point did not have the capacity to deliver sufficient voltage to the area. In order to correct this, additional sections of circuitry were subsequently offloaded onto adjacent tie points. Following this, it was again discovered that the strain on these new sources also did not have the capacity to deliver the 114 minimum allowable voltage. This cascading voltage issue led to multiple abnormal conditions. This one outage necessitated offloads onto the 7072, the 7081, and the 7091.

Due to the 7095's uncommon distribution build along the E Line transmission tower, this area remained in abnormal configuration for several weeks.

This portion of the 7095 circuitry starts out 7.62kV for 2.2 miles, steps down to 4.8kV delta for 1.8 miles, steps back up to 7.62kV for 1.7 miles, and then steps back down again to provide for a 4.8kV delta tie point.

For these 4.8kV delta circuitry sections, the existing wire size is #4 copper, with an average pole plant age of 48.6 years.

Solution: (refer to the attached circuit maps)

Previous work: Just west of this Shekomeko pocket, a CATV job was completed in 2014 to convert 1.1 miles of single phase 4.8kV delta to 7.6kV along Hunns Lake Rd, of which the previous tie point was used to assist in voltage support. Also, just east of this Shekomeko pocket, 2.1 miles were converted in 2014 from 4.8kV delta to 7.62kV along McGhee Hill Rd to address an overloaded 250 KVA stepdown, further closing in on the 4.8kV delta pocket. Furthermore, a small pole plant on Smithfield Valley is being converted from 4.8kV delta to 7.62kV.

Shekomeko can be strengthened by completing multiple conversions that can be done in up to 3 phases. Phase 1 would be to reconductor and convert 1.7 miles of single phase along McGhee Hill Rd/Northeast Center Rd and install a stepdown for Tripp Rd. Also, reconductor and convert 1.2 miles of single phase along Rt. 83/Rt. 82A/Sn Fri Rd. Phase 2 would be to reconductor and convert 1.4 miles of single phase along Hunns Lake Rd and close a small on-road gap at Smithfield Valley Rd and install a stepdown for the southern part of Smithfield Valley Rd. This also eliminates a difficult 0.5 mile off-road line to patrol feeding from Hunns Lake Rd to this area (which had at least 5 outages since 2010 potentially attributable to this off-road section). Phase 2 also includes reconductoring and converting 1.2 miles of single phase along Pugsley Hill and Shaefer. Phase 3 would be to reconductor and convert 1.3 miles of single phase along Carpenter Hill and 0.9 miles of single phase along Conklin Hill.

This would eliminate low voltage issues when in an abnormal configuration - which would most likely last for several weeks. This would create five 7.62kV tie points, and eliminate the unconventional voltage changes along the 7095 (high to low to high to low). There are not many foreseen tree issues.

Cost: (refer to the attached circuit maps)

- Phase 1: reconductor & convert 1.7mi along McGhee and 1.2mi along Rt. 83.....$580,000
- Phase 2: reconductor & convert 1.4mi along Hunns Lake and 1.2mi along Pugsley Hill...….$520,000
- Phase 3: reconductor & convert 1.3mi along Carpenter Hill and 0.9mi along Conklin Hill....$440,000

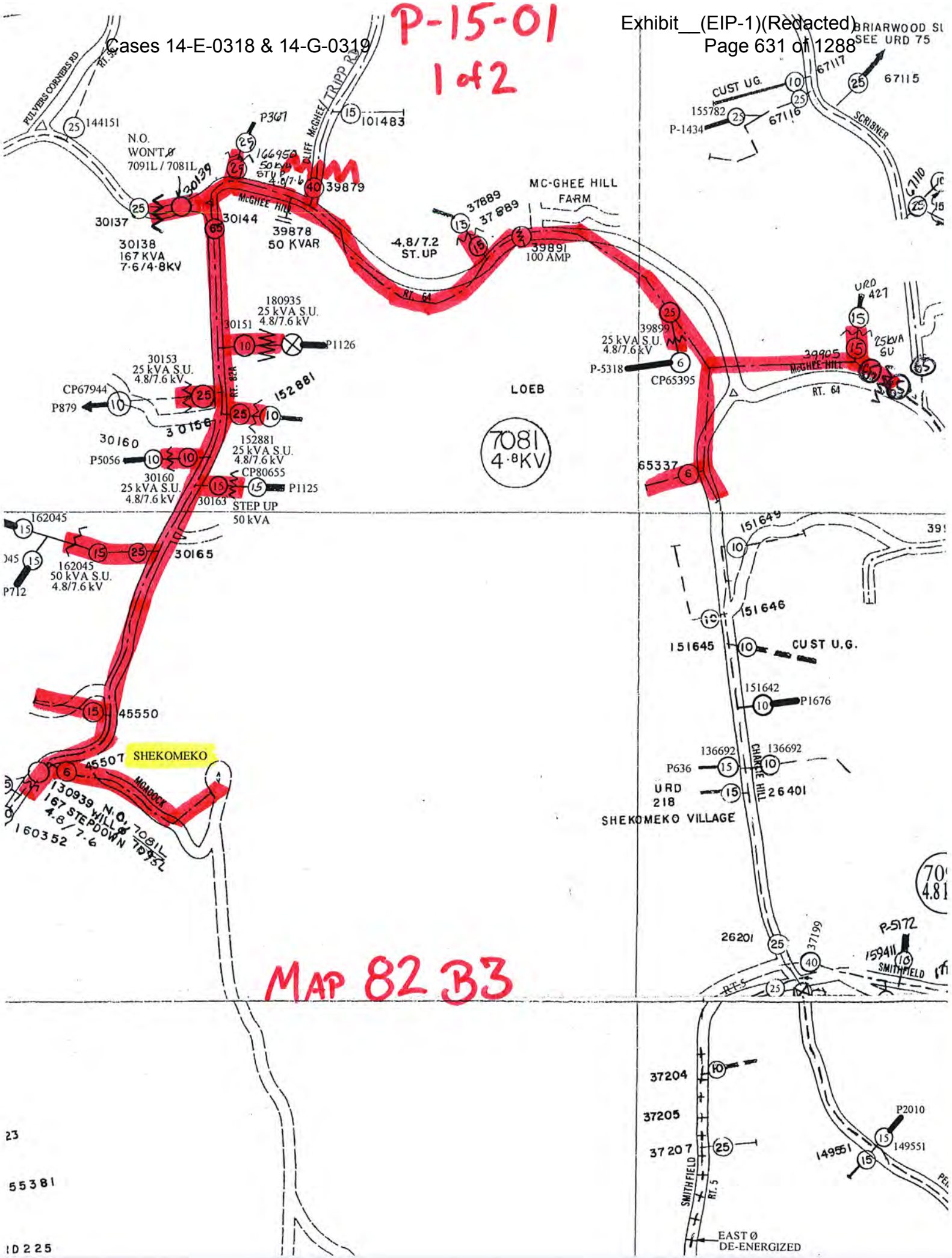
Total Cost (Capital) =……..$1,540,000

Average Age of Pole Plant: 48.6 years

Summary:

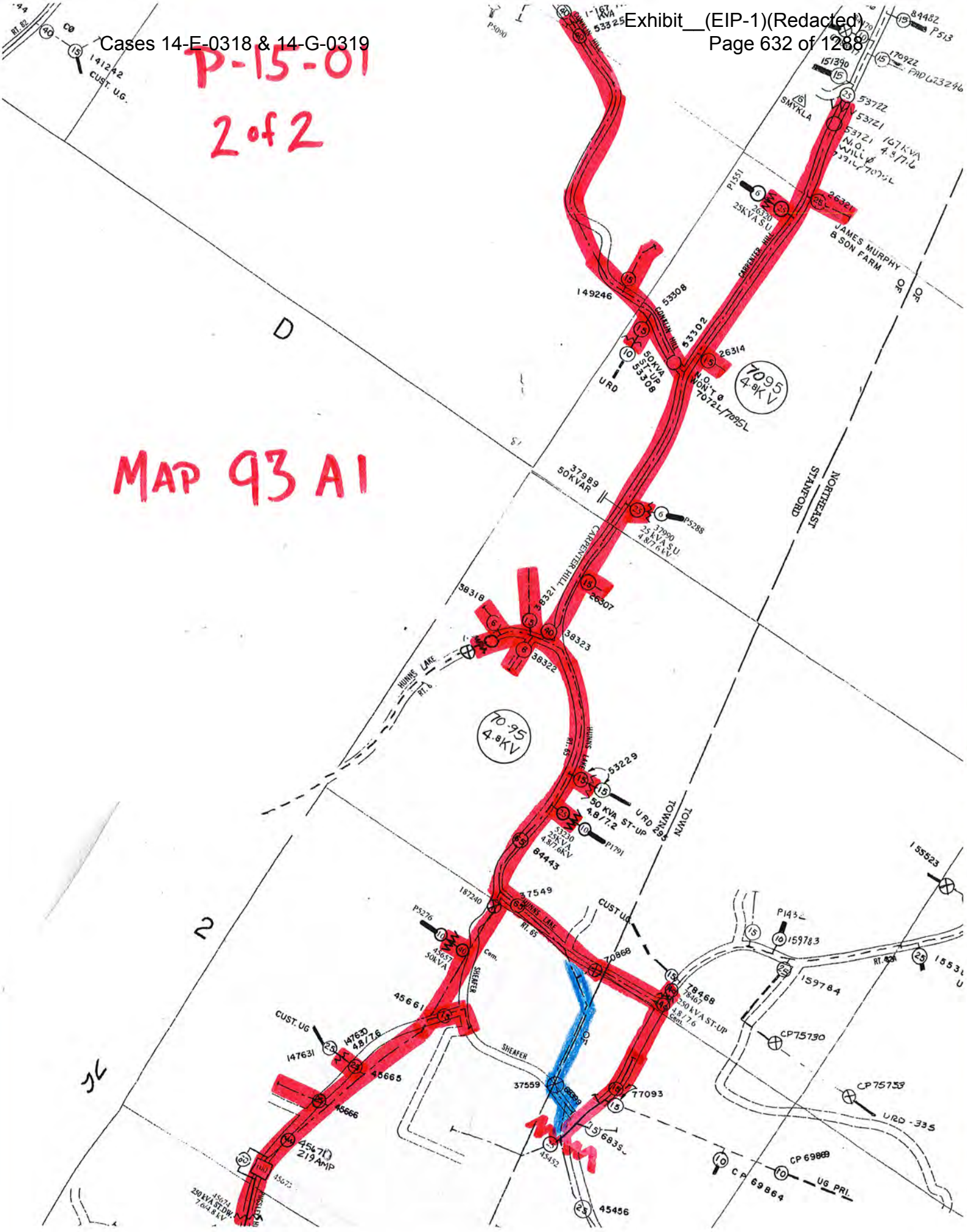
Convert 7.7 miles of single phase 4.8kV delta to 7.62kV circuitry in the Shekomeko area. This would eliminate cascading voltage issues that arise during emergency and planned outages, eliminate 7.7 miles of 4.8kV delta circuitry, and create 5 single phase high voltage ties.

P-15-01
1 of 2


PULVERS CORNERS RD
RT. 55
144151
N.O.
WON'T Ø
7091L / 7081L
30139
P367
166950
50 KVA
STY Ø
4.8/7.6
CLIFF McGHEE TRIPP RD
101483
39879
30137
30144
McGHEE HILL
39878
50 KVAR
30138
167 KVA
7·6/4·8KV
-4.8/7.2
ST.UP
37889
37889
MC-GHEE HILL
FARM
39891
100 AMP
RT. 64
180935
25 kVA S.U.
4.8/7.6 kV
30151
P1126
30153
25 kVA S.U.
4.8/7.6 kV
CP67944
P879
RT. 82A
152881
30156
30160
P5056
152881
25 kVA S.U.
4.8/7.6 kV
CP80655
30160
25 kVA S.U.
4.8/7.6 kV
30163
P1125
STEP UP
50 kVA
LOEB
7081
4·8KV
39899
25 kVA S.U.
4.8/7.6 kV
P-5318
CP65395
65337
URD
427
25kVA
SU
39905
McGHEE HILL
RT. 64
BRIARWOOD SI
SEE URD 75
67117
CUST UG.
155782
P-1434
67116
67115
SCRIBNER
67110
162045
162045
50 kVA S.U.
4.8/7.6 kV
P712
30165
45550
SHEKOMEKO
45507
MORDOCK
130939 WILLS
167 STEPDOWN
4.8/7.6
160352
7081L
7091L
151649
151646
151645
CUST U.G.
151642
P1676
136692
136692
P636
URD
218
26401
CHARLIE HILL
SHEKOMEKO VILLAGE
26201
37199
P-5172
159411
SMITHFIELD
RT.5
MAP 82 B3
37204
37205
37207
P2010
149551
149551
SMITHFIELD
RT. 5
EAST Ø
DE-ENERGIZED
23
55381
ID 225

P-15-01
2 of 2

MAP 93 A1



P-15-01 Shekomeko Conversion

Source: FOS - ICPR

McGhee - 1.7 miles			
Pole #	Vintage	Age	Wire
39906	1934	80	#4 Cu
39904	1934	80	#4 Cu
39901	1934	80	#4 Cu
39899	2008	6	#4 Cu
39897	1934	80	#4 Cu
39895	1977	37	#4 Cu
39893	1934	80	#4 Cu
39891	1934	80	#4 Cu
187653	2007	7	#2 Al
187655	2007	7	#2 Al
187657	2007	7	#2 Al
187664	2007	7	#2 Al
39881	1934	80	#4 Cu
39878	1934	80	#4 Cu
166951	1994	20	#2 Al
30141	1994	20	#2 Al
		46.9	**#4 Cu**

Rt. 83 - 1.2 miles			
Pole #	Vintage	Age	Wire
30143	1929	85	#4 Cu
30146	1929	85	#2 Cu
30148	1929	85	#4 Cu
30150	1929	85	#4 Cu
30152	1984	30	#4 Cu
30155	1996	18	#4 Cu
30158	1997	17	#4 Cu
30161	2009	5	#4 Cu
30165	1991	23	#4 Cu
30168	1972	42	#4 Cu
30171	1992	22	#4 Cu
30175	1999	15	#4 Cu
45507	1976	38	#4 Cu
		42.3	**#4 Cu**

Hunns Lake - 1.4 miles			
Pole #	Vintage	Age	Wire
70872	1981	33	#2 Al
70869	1961	53	#2 Al
58904	1984	30	#2 Al
37533	1948	66	#4 Cu
37550	1981	33	#4 Cu
186693	2005	9	#2 Al
70155	1959	55	#4 Cu
84443	1970	44	#2 Al
138455	1980	34	#2 Al
138451	1980	34	#2 Al
53231	1946	68	#4 Cu
53228	1946	68	#4 Cu
38323	1964	50	#4 Cu
		44.4	**4 Cu/#2 A**

Pugsley Hill & Shaefer - 1.2 miles			
Pole #	Vintage	Age	Wire
45656	1937	77	#4 Cu
45658	1937	77	#4 Cu
45660	1937	77	#4 Cu
45661	1989	25	#4 Cu
45664	1937	77	#4 Cu
45666	1937	77	#4 Cu
45670	1997	17	#4 Cu
45673	2002	12	#4 Cu
		54.9	**#4 Cu**

Carpenter Hill - 1.3 miles			
Pole #	Vintage	Age	Wire
38325	1931	83	#4 Cu
37984	1963	51	#4 Cu
37987	1933	81	#4 Cu
37990	1989	25	#4 Cu
26309	1933	81	#4 Cu
26313	1980	34	#4 Cu
26317	1989	25	#4 Cu
26321	1933	81	#4 Cu
53720	1947	67	#4 Cu
		58.7	**#4 Cu**

Conklin Hill - 0.9 miles			
Pole #	Vintage	Age	Wire
53325	1946	68	#4 Cu
53321	1946	68	#4 Cu
53317	1946	68	#4 Cu
53312	1946	68	#4 Cu
149246	1985	29	#4 Cu
53303	2004	10	#4 Cu
		51.8	**#4 Cu**

Overall	
Pole Age	**48.6**
Wire	**#4 Cu**

Current Year
2014

Title: F-2014-03 – Conway Place –Beacon Infrastructure Improvements/Conversion – Phase IV
District: Fishkill
Budget Year Submitted: 2014
Project Category: Growth - Thermal

History:

As per the Beacon Area Study completed in 2013, Beacon Substation has exceeded its firm rating in recent years and the transformers at both Beacon and Conway Place Substations are nearing the end of their useful lives. With additional load growth in this area on the horizon, a solution was developed to address both of these issues as well as to replace the aging infrastructure that is prevalent there. The ultimate goal is to convert the 4.16kV circuitry to 13.2kV, re-build/reclassify the local 14.4kV cables as 13.2kV and retire both Beacon and Conway Place Substations. Phase I of this project will be completed in 2013 with the conversion of one load pocket that is currently fed by the 8087L and 803 circuits. Phase II, to be completed in 2014, will involve converting the remaining circuitry out of Beacon Substation to 13.2kV. Phase III, to be completed in 2015, will be to re-build the BF Line as a distribution feeder and take over the load previously fed by the 801, 802 and 803 circuits.

Solution:

The last phase of this project, to be completed in 2016, is to complete conversion work for the circuits exiting Conway Place Substation. 1.5 miles of the NM line consist of paper and lead cable and must be re-built. It may then be combined with the CM Line as a single distribution feeder and take over the load currently served by the 881 circuit. To avoid double-circuiting with the 8015 circuit, a normally-open point should be added near pole #134813 and the new CM/NM circuit should feed the existing line off Wilkes Street up to the open point at pole #134827. The CM/NM will then double-circuit with the 8051 circuit for several spans and continue down North Elm Street, up Oak Street to the existing normally open point at pole #164667. The majority of the pole plant is in good condition. The 882 circuit should be converted and fed via the BF by closing the tie point at pole #P71397.

The final stage of conversion for Phase IV will be of portions of the 8015L and 8085L. The 8015L has 0.59 miles of three-phase which should be converted in order to create tie points with the CM/NM at pole #P23259 and also the BF at pole #P18169. The 8085L step-down transformers at pole #121249 should be relocated to pole #134456. Afterwards, 0.24 miles of single phase and 0.62 miles of three-phase should be converted in order to create strong ties with the new BF Line. Finally, an ALT team should be installed between the reclassified BF Line and the reclassified CM/NM Line in order to maintain the current level of reliability seen by the Beacon area.

Cost:

- Convert the 881, 882, 8015L and 8085L……...…….....$874,000
- Install an ALT team between the new BF Line and new CM/NM Line……...$130,000
- Retire Conway Place Substation……...……..$54,000
- Retire Beacon Substation……..……..$85,000

Total Cost (Capital) = $1,143,000

Summary:

- Convert the 881, 882, 8015L and 8085L circuits to 13.2kV.
- Install an ALT team between the reclassified BF Line and the reclassified CM/NM Line in order to maintain the current level of reliability.
- After all phases of this project are complete, Beacon and Conway Place Substations may be retired and operation and maintenance costs associated with these stations will be eliminated.

Convert 882 ckt to become end of new BF mainline

Reconductor NM and convert 881 ckt (will connect with CM and become new ckt mainline)

Convert 8015L

Convert 801, 802, and rest of 803 to continue new BF mainline

Reconductor BF (beginning of new ckt mainline)

Attachment #5

151.1

Convert 803 and transfer to 8015

KEY

- Phase 1 (2013)
- Phase 2 (2014)
- Phase 3 (2015)
- Phase 4 (2016)

Convert 882

Convert 801

Convert 8085L

Remove old 4.16kV off-road circuitry

Budget Project
- Convert 8087L and 803
- Transfer 803 to 8087

Title: 13 – 341-345 – High Voltage Conversion
District: Kingston
Budget Year Submitted: 2013
Project Category: Growth – Thermal

History:

As part of the P & MK Line conversion, Sturgeon Pool Substation is planned to be rebuilt for 115 kV operation in 2015. The transformer serving the existing Sturgeon Pool 341 circuit will be replaced with a 115 – 13.8 kV transformer requiring the conversion of the distribution circuit.

The Sturgeon Pool 341 circuit serves approximately half of the load in the Rifton area. The other circuit in this 4.16 kV pocket is the Dashville 345 circuit. These two circuits are the primary reserve for each other. The tie between these circuits is the only 3Ø tie for the Dashville 345 circuit. The Sturgeon Pool 341 circuit has only one other 3Ø tie and that is a capacity limited tie with the High Falls 3021L circuit on the west side of the Sturgeon Pool Substation. The Sturgeon Pool 341 circuit had a summer 2012 peak of approximately 1.0 MVA. The Dashville 345 circuit had a summer 2012 peak of approximately 1.1 MVA. Since these two circuits are critical to the reserve capability of each, both circuits will need to be converted to 13.8 kV operation. In addition, since the distribution source at Dashville would not be converted to 13.8 kV operation another tie into this area would have to be built to allow for contingency and maintenance outages. The existing capacity limited 3Ø tie with the High Falls 3021L circuit will not suffice as a suitable tie due to its location. During previous winters, there have been icing problems on the circuitry crossing the Wallkill Creek in front of the Sturgeon Pool dam. In addition, the mainline of the 341 circuit traverses off-road through the Rifton Rec Center after crossing the Wallkill until the circuit reaches Rt. 213. Problems in this first portion of the circuit can lead to outages with very long durations. Due to these two reasons, the main 3Ø tie should be on the east side of the Wallkill Creek which is where the entire customer base is located.

Solution: (refer to the attached circuit maps)

It is recommended that the Sturgeon Pool 341 circuit subsume the Dashville 345 circuit, since the combined loading of the two circuits is only approximately 2.1 MVA. The mainline circuitry on the Sturgeon Pool 341 circuitry south of the Rec Center is comprised of 336 BA conductors built for 13.8 kV operation. The circuitry to the north is another story and has already been proposed to be rebuilt up to William White Rd in 2013. At this point, 250 kVA stepdown transformers would be installed for Rt. 213 to the north and William White Rd would be converted up to the existing 341 / 1014L open point on Union Center Rd.

The mainline circuitry on the Dashville 345 circuitry up to Maple Ave is also comprised of 336 BA conductors however some rebuild work would be necessary as some of the pole sizes and insulators are not to 13.8 kV standards. The spur lines on the circuit (Cow Hough Rd, Dashville Rd, Church Hill Rd and Old Post Rd) would be converted as well providing that a minimal amount of work is required otherwise stepdown transformers would be installed.

In order to create a strong 3Ø tie for the combined 341/345 circuit it is recommended that new circuitry be built along Rt. 213 west of Dashville toward Rt. 32. This will involve crossing the NYS Thruway, advance planning / communication / and permitting will be required to make this successful. The existing circuitry along Rt. 213 fed from Rt. 32 would need to be reconductored using 336 BA and converted to 13.8 kV operation. The existing circuitry on Rt. 32 up to River Rd would be reconductored using 336 BA. The 3021 circuit is comprised of 1/0 BA mainline conductors along Rt. 32 up to Grove St. where the conductors change to 336 BA. A set of 219 Amp Regulators would need to be installed just north of Grove St to ensure adequate voltage in the event that this tie point must be utilized during summer conditions. Voltages in this area were recording to be between 118v and 120v during summer 2012.

Cost:

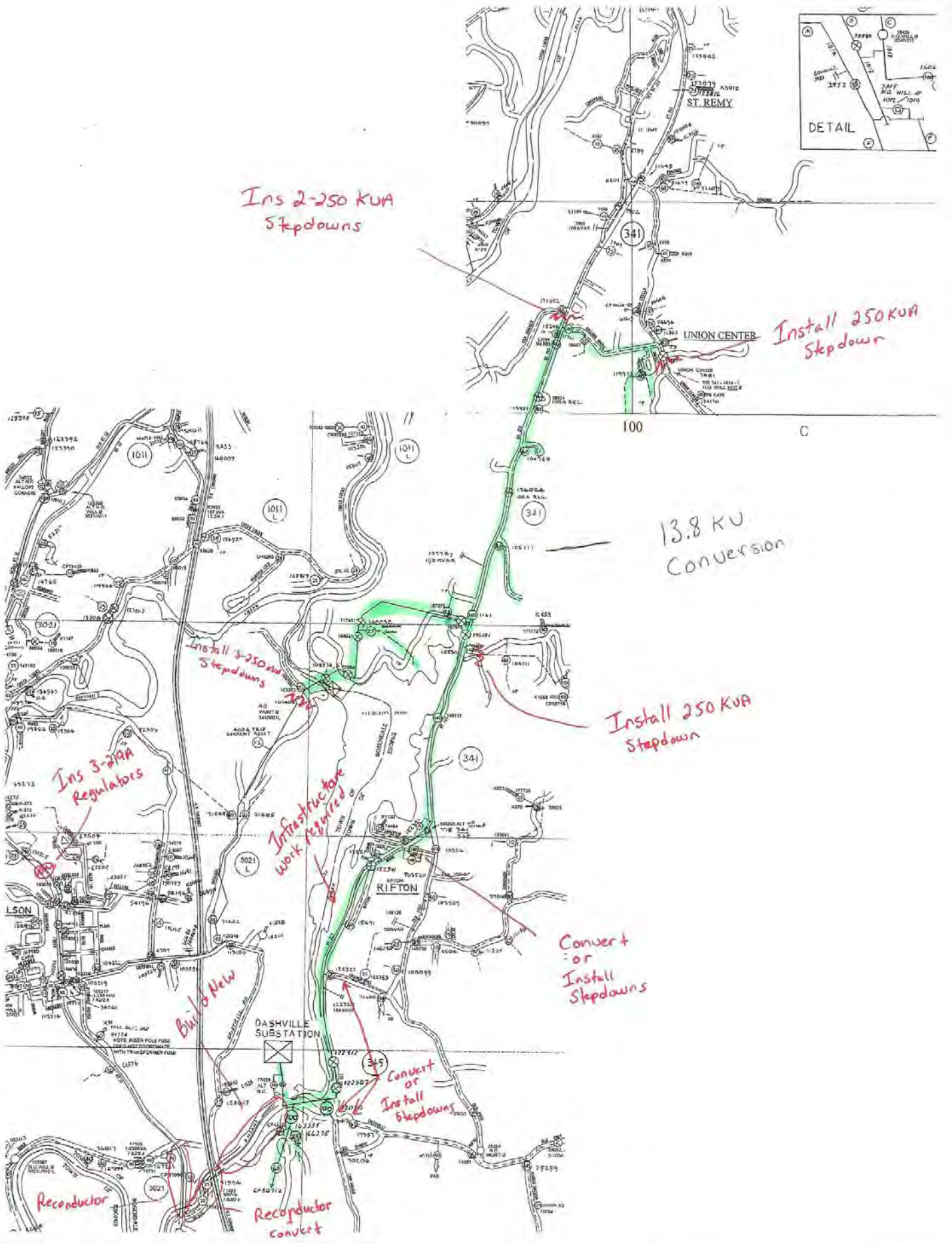
- Install 250 kVA Stepdowns for Union Center, Rt. 213 and Carney Rd..…….. $ 60,000
- Install 250 kVA Stepdowns for Old Post Rd and Church Hill Rd……..…….. $ 30,000
- Install 250 kVA Stepdowns for Dashville Rd and Cow Hough Rd……..……..$ 30,000
- Infrastructure upgrades along Rt. 213 on 345 circuit (10-15 poles)..…… $150,000
- Build new circuitry from NYS Thruway to Dashville Substation (2700')…….... $155,000
- Reconductor and Convert Rt. 213 from Rt. 32 to NYS Thruway (1400')……..… $ 80,000
- Reconductor Rt. 32 from River Rd to Rt. 213 (1800')…….....… $105,000

Total Cost (Capital) = $610,000

Summary:

This project will allow for the rebuild of the Sturgeon Pool Substation along with the conversion of the 341 and 345 circuits. An additional high voltage feed will also be available in the Tilson load pocket with the capability to provide additional capacity and flexibility for the upcoming Smart Grid projects in the area.

K - 13 - 13


Ins 2-250 KVA Stepdowns
ST. REMY
DETAIL
UNION CENTER
Install 250 KVA Stepdown
100
C
13.8 KV Conversion
Install 3-250 KVA Stepdowns
Install 250 KVA Stepdown
Ins 3-219A Regulators
Infrastructure work required
RIFTON
LSON
Convert or Install Stepdowns
Build New
DASHVILLE SUBSTATION
Convert or Install Stepdowns
Reconductor
Reconductor convert

COMMON FORECAST DETAIL

The Common Capital Forecast consists of the Land and Buildings Capital Budget, the Office Furniture Capital Budget, the Tools & Equipment Capital Budget, the Transportation Capital Budget, and the Information & Technology Capital Budget Forecasts.

The Land & Buildings Capital Budget consists primarily of infrastructure replacement projects due to age or equipment failures. These include roof replacements, paving, HVAC equipment replacements, and electric or plumbing system replacements. In addition to these infrastructure replacement projects, there are several special projects included in the 5-year forecast that are envisioned to improve energy efficiency, productivity, or help fulfill strategic initiatives such as improved security and training. The special projects include a building expansion at the Fishkill Division Headquarters (3.2M) and building upgrades at the Standfordville office ($1.6M).

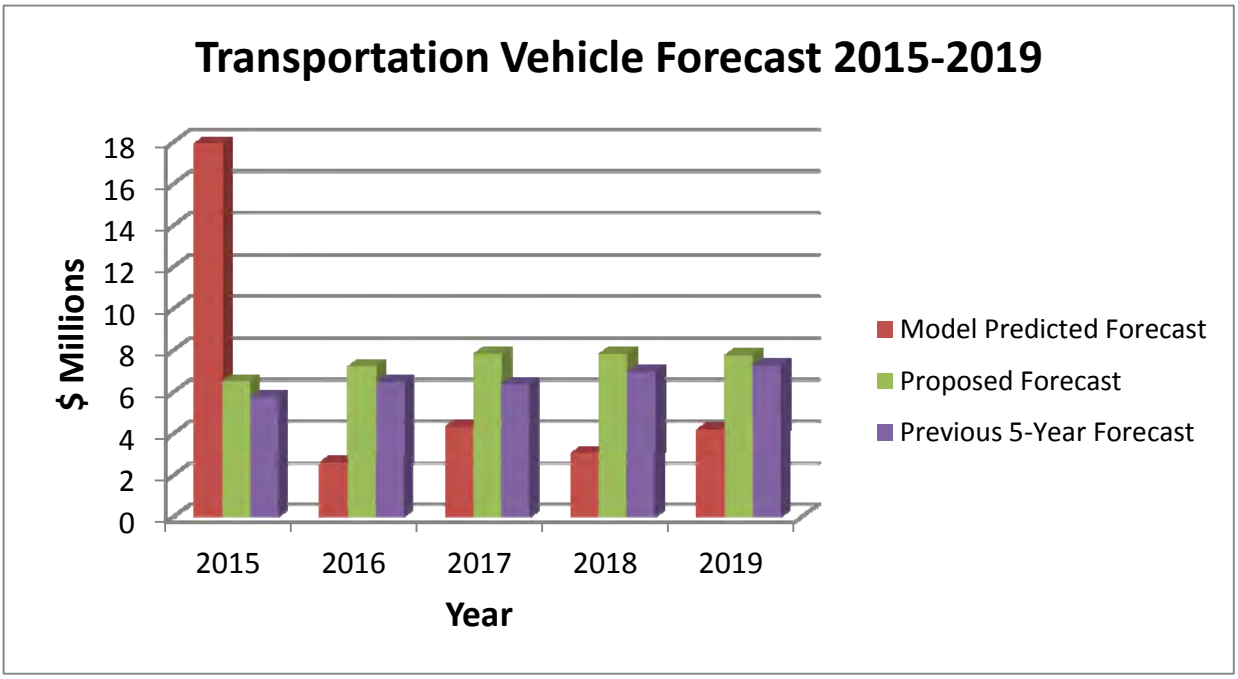
The Office Furniture Capital Budget consists of normal replacements due to wear and tear and those driven by office upgrades or changes requiring additions to meet the new use of the space.

The Tools Budget consists of replacements driven by the replacements of the vehicles they are utilized on, obsolescence and incompatibility, decreased reliability and discontinued manufacturer support. Specialized tools required to accomplish new tasks or support the application of new techniques, are purchased after a trial use period.

The Transportation Capital Forecast is based primarily on the replacement of equipment. Cars, vans, pickups in the past were replaced every 8 years/100k miles, medium duty trucks every 10 years/100k miles, and power operated equipment (bucket trucks) every 12 yrs or 100k miles. Starting with the 2015 Capital budget a new criteria is being implemented based on industry benchmark information for each class of vehicle for a fleet replacement schedule:

  - 12 year replacement age
  - 120,000 mileage replacement
  - 9,500 engine hour replacement

- Yielded a $32M spend over 5 years to replace vehicles older than 12 years; heavily weighted to first year ($18M)
- Added $1M / year for replacing non-road equipment
- Spend is proposed to be levelized over the next 5 years
- Reduces average fleet age and *"caps"* fleet age at 12 years
- Age is currently main driver of fleet replacement; this budget would "flush" the fleet
- With new mileage and hour tracking systems being installed, fleet can be managed on utilization – most vehicles will be replaced before they reach 12 years old

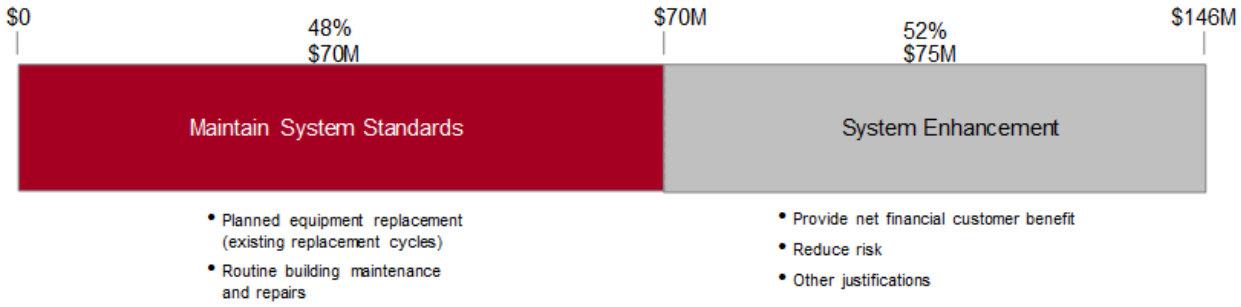


The I/T Capital Budget consists of life cycle replacements for the inventory, new rollouts for expansion, new application systems, and added capacity. For planning purposes, the life cycle of the IT infrastructure is anticipated to be between 5 and 8 years on average, but varies depending upon the type of equipment. The useful life largely depends on usage, environment, technology obsolescence and incompatibility, decreased reliability and discontinued manufacturer support:

Mainframe, peripherals, storage and printers - 8 years
PC & laptops – 5 years
Mobile Computers – 3 years
PC and Network Printers – 3 years
Network devices – 5 years
Telephone systems – 10 to 12 years

Additionally, the I/T Capital Forecast includes software applications and upgrades related to providing a net customer benefit or reducing corporate risk. For this forecast the major software application projects include enhancements for Business Intelligence, Enterprise Content Management, and HR, Financials, and Supply Chain. These software applications and upgrades are evaluated through the IT Steering Committee with a positive return on investment used as the criteria for approving the project. In addition, there are planned system replacement for the Customer Information System (CIS), and the Materials Management System (MMS) to be replaced coincident with the Enterprise Asset Management System, as these systems are nearing the end of useful life and will need to be replaced. Theses systems are custom in house mainframe systems that are unsupported, require intensive maintenance, and are increasingly at risk of failure.

Common Program Summary



Land & Buildings

- 2015 Major Projects
  - Fishkill Office Expansion
  - Poughkeepsie Property Improvements
  - Build Pole Barns for Equipment Storage
  - Repave Parking Lots

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Daily Operations - Electric	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - Flooring	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - HVAC	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - Unidentified	Maintain Standards	261	132	133	265	279	269	272	278	1363
41	Repave Parking Lot (Multi Year) (Kingston)	Maintain Standards	157	79	80	159	167	162	163	167	818
41	Repave Parking Lots (Multi Year)	Maintain Standards	157	79	80	159	167	162	163	167	818
41	Replace Magnetic Door Card Access System (Ellenville)	Maintain Standards	21	0	0	0	0	0	0	0	0
41	Update Restroom Linemen's Area (E.C.)	System Enhancement	26	0	0	0	0	0	0	0	0
41	Fix Floor Drains in Line Garage (E.C.)	Maintain Standards	31	0	0	0	0	0	0	0	0
41	Install Pole Pile (E.C.)	System Enhancement	42	0	0	0	0	0	0	0	0
41	Replace Roof - Front Building Flat	Maintain Standards	601	0	0	0	0	0	0	0	0
41	Replace Magnetic Door Card Access System (Newburgh)	Maintain Standards	37	0	0	0	0	0	0	0	0
41	Enlarge Front Parking Area (Newburgh)	System Enhancement	52	0	0	0	0	0	0	0	0
41	Building 805 - Tile Hallway outside Foremen's Offices	Maintain Standards	5	0	0	0	0	0	0	0	0
41	Building 805 - Install Door - Foremen's Hallway to Stores/Dock	System Enhancement	10	0	0	0	0	0	0	0	0
41	Building 805 - Replace Floor Tile Formen's Offices	Maintain Standards	26	0	0	0	0	0	0	0	0
41	Build Roof over Wire Storage	System Enhancement	63	0	0	0	0	0	0	0	0
41	Install Sand / Item IV / Cold Patch Storage Sheds	System Enhancement	125	0	0	0	0	0	0	0	0
41	Replace Door - Kitchen	Maintain Standards	2	0	0	0	0	0	0	0	0
41	Replace Front Doors - Lodge	Maintain Standards	4	0	0	0	0	0	0	0	0
41	Replace Roof - Snack Shack	Maintain Standards	10	0	0	0	0	0	0	0	0
41	Replace UV Water Treatment	Maintain Standards	10	0	0	0	0	0	0	0	0
41	Storm Drain Repair	Maintain Standards	21	0	0	0	0	0	0	0	0
41	Replace Roof - Small Pavilions (Bocce Ball Courts)	Maintain Standards	31	0	0	0	0	0	0	0	0
41	Install Handicap Ramp @ Front Entrance	System Enhancement	42	0	0	0	0	0	0	0	0
41	Replace Roof - Office	Maintain Standards	63	0	0	0	0	0	0	0	0
41	Building 807 Replace Auditorium Tiles	Maintain Standards	26	0	0	0	0	0	0	0	0
41	Building 807 Temperature Automation	System Enhancement	31	0	0	0	0	0	0	0	0
41	Building 801 - Renovate Women's Rest Room 1st Floor	System Enhancement	42	0	0	0	0	0	0	0	0
41	Building 803 Replace 8 Ton RTU (CHAZ)	System Enhancement	52	0	0	0	0	0	0	0	0
41	Building 803 - Install Conference Center	System Enhancement	78	0	0	0	0	0	0	0	0
41	Building 800 Window Replacement - 2nd Floor	System Enhancement	136	0	0	0	0	0	0	0	0
41	Building 803 Replace Elevator	Maintain Standards	188	0	0	0	0	0	0	0	0
41	Pole Barn along South side of property (40x150x15)(Catskill)	System Enhancement	0	63	64	127	0	0	0	0	127
41	Transportation Garage - Install Remote Door Openers - Bay 2-4	System Enhancement	0	16	16	32	0	0	0	0	32
41	Replace Back Staircases (Fishkill)	Maintain Standards	0	13	13	27	0	0	0	0	27
41	Swing Arm for Transformer Platform (Fishkill)	System Enhancement	0	13	13	27	0	0	0	0	27
41	Install new Salt / Sand Sheds (Fishkill)	System Enhancement	0	18	19	37	0	0	0	0	37
41	Replace Sidewalk	Maintain Standards	0	26	27	53	0	0	0	0	53
41	Replace Magnetic Door Card Access System (Fishkill)	Maintain Standards	0	37	37	74	0	0	0	0	74
41	Replace Roof - Front Building - Sloped	Maintain Standards	0	158	160	318	0	0	0	0	318
41	Replace Front Doors & Raise	Maintain Standards	0	8	8	16	0	0	0	0	16
41	Replace Front Sidewalk & Regrade	Maintain Standards	0	13	13	27	0	0	0	0	27
41	Resurface Gas Garage Floors	Maintain Standards	0	26	27	53	0	0	0	0	53
41	Pave Employee Parking Lot	Maintain Standards	0	37	37	74	0	0	0	0	74
41	Install 40x60 Pole Barn (Newburgh)	System Enhancement	0	40	40	80	0	0	0	0	80
41	Dispatch Center Renovation	System Enhancement	0	26	27	53	0	0	0	0	53
41	Extend Dock Area - Lineman's Garage	System Enhancement	0	26	27	53	0	0	0	0	53
41	Pole Barn for Equipment Storage	System Enhancement	0	79	80	159	0	0	0	0	159
41	Building 804 - Renovate OMS Office Area	System Enhancement	0	16	16	32	0	0	0	0	32
41	Building 803 - Renovate S-1 IT Training Room	System Enhancement	0	21	21	42	0	0	0	0	42
41	Building 800 - Create Women's Rest Room 1st Floor	System Enhancement	0	32	32	64	0	0	0	0	64
41	Building 802 - Roof Replacement	Maintain Standards	0	34	35	69	0	0	0	0	69
41	Building 805 Resurface and Restripe Garage Floors	Maintain Standards	0	32	32	64	0	0	0	0	64

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Building 807 Replace Pneumatic Controls with Electronic	System Enhancement	0	42	43	85	0	0	0	0	85
41	Building 807 Relocate Transformers and Replace Steps	System Enhancement	0	105	107	212	0	0	0	0	212
41	Enlarge Loading Dock / Install Leveler (Ellenville)	System Enhancement	0	0	0	0	56	0	0	0	56
41	Pole Barn along South side of property (40x80x15)(Ellenville)	System Enhancement	0	0	0	0	89	0	0	0	89
41	Replace Loading Dock and Install Roof (E.C.)	System Enhancement	0	0	0	0	89	0	0	0	89
41	Relocate/Install new pole pile (Fishkill)	System Enhancement	0	0	0	0	45	0	0	0	45
41	Pave Front Lot	Maintain Standards	0	0	0	0	111	0	0	0	111
41	Install Roof over wire storage area (Fishkill)	System Enhancement	0	0	0	0	134	0	0	0	134
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	446	0	0	0	446
41	Replace Pole Piles (Newburgh)	Maintain Standards	0	0	0	0	45	0	0	0	45
41	Replace Magnetic Door Card Access System (Stanfordville)	Maintain Standards	0	0	0	0	17	0	0	0	17
41	Install HVAC (Stanfordville)	System Enhancement	0	0	0	0	28	0	0	0	28
41	Replace Boiler & Heating System (Stanfordville)	System Enhancement	0	0	0	0	28	0	0	0	28
41	Install Ladies Rest Room (Stanfordville)	System Enhancement	0	0	0	0	39	0	0	0	39
41	Repave Front and Side Parking Lot (Stanfordville)	Maintain Standards	0	0	0	0	167	0	0	0	167
41	Building 801 - VVT Automation	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 810 Control Center Replace Heat Pumps w/ RTU's	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 802 - VVT Automation	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 807 - Replace Roof - Auditorium	Maintain Standards	0	0	0	0	111	0	0	0	111
41	Building 800 Window Replacement - 1st Floor	System Enhancement	0	0	0	0	145	0	0	0	145
41	Enlarge Transformer Dock & Replace Roof (Ellenville)	System Enhancement	0	0	0	0	0	32	0	0	32
41	Replace Carpeting - Main Bldg and Training Room (Fishkill)	Maintain Standards	0	0	0	0	0	88	0	0	88
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	0	431	0	0	431
41	Build Pole Barn for Transformers (Newburgh)	System Enhancement	0	0	0	0	0	129	0	0	129
41	Window Replacements - Front and North Side	System Enhancement	0	0	0	0	0	140	0	0	140
41	Improve Drainage around Newburgh Building	System Enhancement	0	0	0	0	0	162	0	0	162
41	Install Pole Barn - NE Side of Building	System Enhancement	0	0	0	0	0	129	0	0	129
41	Replace Street Light Poles	Maintain Standards	0	0	0	0	0	54	0	0	54
41	South Road Complex - Install New Curbing	System Enhancement	0	0	0	0	0	54	0	0	54
41	Building 806 Resurface and Restripe Garage Floors	Maintain Standards	0	0	0	0	0	97	0	0	97
41	Building 808 - Replace Windows	System Enhancement	0	0	0	0	0	108	0	0	108
41	Building 807 - Replace Windows	System Enhancement	0	0	0	0	0	162	0	0	162
41	Building 808 Roof Replacement	Maintain Standards	0	0	0	0	0	269	0	0	269
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	0	0	435	0	435
41	Repave Back Parking Lot near Line Garage (Newburgh)	Maintain Standards	0	0	0	0	0	0	87	0	87
41	Replace Front Door - Cottage	Maintain Standards	0	0	0	0	0	0	2	0	2
41	Basement Drainage - Cottage	System Enhancement	0	0	0	0	0	0	54	0	54
41	Paving front of Lodge and roadway into site	Maintain Standards	0	0	0	0	0	0	163	0	163
41	Replace Ice Machine	Maintain Standards	0	0	0	0	0	0	5	0	5
41	Building 802 - Install Awning @ Drafting Entrance	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 807 - Customer Service Entrance Awning	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 810 - Install Awning @ Back Entrance	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 808 Fluid Containment Mechanics Garage	System Enhancement	0	0	0	0	0	0	27	0	27
41	Building 801 Replace 50 Ton RTU	System Enhancement	0	0	0	0	0	0	141	0	141
41	Building 801 - Roof Walkway	System Enhancement	0	0	0	0	0	0	381	0	381
41	Building 803 - Call Center Break Room Renovation	System Enhancement	0	0	0	0	0	0	54	0	54
41	Remove Steam / Water Pipes - Main Building (Asbestos)	System Enhancement	0	0	0	0	0	0	87	0	87
41	Renovate Restrooms - Main Building	System Enhancement	0	0	0	0	0	0	131	0	131
41	Transformer Shop Upgrade	System Enhancement	0	0	0	0	0	0	163	0	163
41	Replace Storm Drains	Maintain Standards	0	0	0	0	0	0	54	0	54
41	Pedestrian Entrance Doors - Main Building & Garage	Maintain Standards	0	0	0	0	0	0	33	0	33
41	Swing Arm for Transformer Platform (Greenville)	System Enhancement	0	0	0	0	0	0	33	0	33
41	Pave Parking Lot	Maintain Standards	0	0	0	0	0	0	0	167	167
41	Install Generator at Storeroom	System Enhancement	0	0	0	0	0	0	0	56	56

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Lighting Upgrade - Storeroom	System Enhancement	0	0	0	0	0	0	0	44	44
41	Replace Exhaust Fan in lineman's garage	Maintain Standards	0	0	0	0	0	0	0	39	39
41	Replace Pavillion & Bath House Roof	Maintain Standards	0	0	0	0	0	0	0	78	78
41	Controls System HVAC	System Enhancement	0	0	0	0	0	0	0	111	111
41	Lighting Upgrade - Storeroom	System Enhancement	0	0	0	0	0	0	0	44	44
41	Replace/Upgrade 803 RTU's	Maintain Standards	0	0	0	0	0	0	0	222	222
41	Replace Training Room HVAC Unit hook up to new controls	Maintain Standards	0	0	0	0	0	0	0	67	67
41	Pave Pole & Equipment area	Maintain Standards	0	0	0	0	0	0	0	89	89
41	Replace Carpeting - Call Centers	Maintain Standards	0	0	0	0	0	0	0	83	83
41	Upgrade Lighting - Mechanics Garage	System Enhancement	0	0	0	0	0	0	0	11	11
41	Install New signs	Maintain Standards	0	0	0	0	0	0	0	11	11
41	Controls System HVAC	System Enhancement	0	0	0	0	0	0	0	333	333
41	Build Additional Office/Cubical Space	System Enhancement	0	0	0	0	0	0	0	667	667
41	Expand Fishkill Storeroom and Garage Area	System Enhancement	1569	790	801	1591	1671	0	0	0	3262
41	Building Expansion (Stanfordville)	System Enhancement	0	0	0	0	0	1616	0	0	1616
41	Subtotal Building & Grounds		4001	2002	2028	4031	4183	4145	2549	2716	17624

Land and Buildings Capital Budget Project Descriptions

2015 Project Descriptions

Title: Poughkeepsie - Dispatch Center Renovation
Description: Renovate existing dispatch center in Bldg 807.
Justification: Existing setup is not work friendly during storm operations. A renovation will make work flow and dispatching operation more productive and create more space for the multiple employees using this space during storm operations and everyday work situations.

Title: Poughkeepsie - Extend Dock Area – Linemen's Garage
Description: Extend the existing platform to the end of the garage space.
Justification: Extending the dock area to the end of the garage will allow linemen with trucks parked in these bays of the garage easier loading and unloading of materials into and out of trucks. Extending the platform also creates more uniform work area and helps to eliminate trip and fall hazards that currently exist in the garage space.

Title: Poughkeepsie – Pole Barn for Storage Equipment
Description: Build Pole Barn for Equipment and Materials Storage - Bldg 806.
Justification: Building a pole barn will allow for materials and equipment currently stored out in the weather to be put under cover during bad weather. This will eliminate wear and tear on multiple pieces of equipment and reduce replacement costs on these vehicles in the long run. This will also allow for multiple connex boxes to be reduced and for materials to be secured indoors. This will help eliminate theft of materials in connex boxes and parts off certain pieces of equipment currently stored outdoors.

Title: Poughkeepsie – Bldg 804 – Renovate OMS Office Area
Description: Renovate existing office space and training area space for additional office space as well as cubical space.
Justification: The OMS training room will be moved down to S3 to allow for more office space due to increase in staffing needs. The existing space will be renovated to allow for more cubicles and office space as needed for this group.

Title: Poughkeepsie – Bldg 803 – Renovate S-1 IT Training Room
Description: Renovate existing office space and training area space for additional cubical space.

Land and Buildings Capital Budget Project Descriptions

Justification: The IT training room will be moved down to S3 to allow for more office space due to increases in staffing needs. The existing space will be renovated to allow for more cubical space as needed for this group. This will include bringing those personnel who work within the group from the computer room and S3 space into the same work space.

Title: Poughkeepsie. – Bldg 800 – Create Women's Rest Room 1st Floor
Description: Renovate existing office space to create a Women's room on the 1st floor of Bldg 800.
Justification: There is currently no women's room in Bldg 800 on the 1st floor. Creating a new women's room in this area brings the building up to current building codes and meets the needs of the multiple employees that work in this area.

Title: Poughkeepsie – Bldg 802 – Roof Replacement
Description: Replace the existing roof on 802 with Firestone EPDM roof.
Justification: The existing roof is in bad condition due to age and suffers multiple leaks and water issues. Replacing the roof will eliminate water infiltration issues and protect the interior building spaces from further damage.

Title: Poughkeepsie. – Bldg 805 – Resurface and Restripe Garage Floors
Description: Resurface and restripe existing garage surface in electrician's garage.
Justification: The existing garage surface is showing signs of wear and cracking. Resurfacing will help extend the life of the garage slab as well and protect it from water and other chemicals. Restriping will help eliminate backing issues and reduce the chances of backing accidents.

Title: Poughkeepsie – Bldg 807 – Replace Pneumatic Controls with Electronic
Description: Replace pneumatic valve controls with electronic and integrate with the new controls system.
Justification: The existing baseboard control valves will be replaced with electronic valves and integrated into the new controls system. This will give us better control over the heating systems and allow us to more effectively heat the space while saving money. This will also give us the ability to diagnose problems within the system more efficiently and quickly.

Title: Catskill – Pole Barn along South Side of Property
Description: Build a pole barn along the South side of the property approximately 40' x 150' x15'
Justification: Building a pole barn will allow for materials and equipment currently stored out in the weather to be put under cover during bad weather. This will eliminate wear and tear on multiple pieces of equipment and reduce replacement costs on these

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vehicles in the long run. This will also allow for multiple connex boxes to be reduced and for materials to be secured indoors. This will help eliminate theft of materials in connex boxes and parts off certain pieces of equipment currently stored outdoors.

Title: Eltings Corner – Install Remote Door Openers – Transportation Garage
Description: Install remote door openers on garage doors bays 2-4 at the EC transportation garage
Justification: Installing remote door openers will reduce safety concerns about opening these doors and will alleviate the stresses of getting these doors opened with manpower alone.

Title: Fishkill – Replace back Staircases
Description: Replace the staircases on the back side of the Fishkill district office.
Justification: The existing staircases are deteriorated and causing safety concerns. By changing these staircases from concrete to non-slip galvanized metal, it will help eliminate slips and falls, as well as provide longer lasting stairways into and out of the building.

Title: Fishkill – Swing Arm for Transformer Platform
Description: Replace and upgrade the swing arm for the transformer platform at the Fishkill office.
Justification: Installing a remote controlled swing arm for the transformer platform at the Fishkill District Office will reduce safety concerns and improve loading and unloading of the transformers. This install will help eliminate strains and sprains that are caused by manually pushing/pulling transformers while loading and unloading.

Title: Fishkill – Install New Salt/Sand Sheds.
Description: Install sand/salt/item 4 storage bins.
Justification: Installing these sheds will provide areas where materials can be placed under cover during inclement weather and make it easier and quicker for crews to load materials when needed.

Title: Fishkill – Replace sidewalks
Description: Replace sidewalks around the exterior of the main building.
Justification: The overall condition of the walkways has deteriorated. There are multiple areas that are cracked and heaving causing tripped hazards. Replacing the sidewalks will create a safer path for employees and customers while entering and exiting the facility and reduce the number of safety incidents.

Title: Fishkill – Replace Maglocks on exterior doors.
Description: Replace multiple maglocks with crash bars on all exterior doors.

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Justification: Maglocks are against code and should all be replaced to allow for easy exit and entry. Replacing maglocks will bring doors up to current code and provide safe egress to and from the buildings.

Title: Kingston – Replace Sloped Roof – Front Building
Description: Replace sloped roof on the annex portion of the Kingston District Office.
Justification: The existing roof is deteriorated and needs to be replaced to reduce leaks and water infiltration issues. Existing roof will be replaced with 50 year architectural shingles.

Title: Newburgh – Replace Front doors and Raise
Description: Raise front entry and replace doors.
Justification: The lobby area is prone to flooding due to pitch. Raising the floor and re-pitching toward the parking lot will help keep water out of lobby and front office spaces and reduce the number of complaints and safety issues.

Title: Newburgh – Replace Front Sidewalk and Re-grade
Description: Replace the existing sidewalks, re-grade and lower the sidewalks and flowerbed areas around the front entrance.
Justification: The front sidewalks and flowerbeds areas are contributing to flooding in the main lobby and front office areas. To reduce the likelihood of this occurring re-grading and re-pitching area necessary to reduce the amount of runoff water that flows toward the front of the building.

Title: Newburgh – Resurface Gas Garage Floors
Description: Resurface and restripe the gas mechanics garage floors due to existing deterioration.
Justification: The existing garage surface is showing signs of wear and significant cracking. Resurfacing will help extend the life of the garage slab as well and protect it from water and other chemicals. Restriping will help eliminate backing issues and reduce the chances of backing accidents.

Title: Newburgh – Pave Employee Parking Lot.
Description: Regrade and repave existing employee parking lot to reduce number of safety incidents.
Justification: The existing parking lot does not have proper pitch and runoff is not met creating slippery conditions during inclement weather days. Re-grading and repaving will reduce accidents and improve drainage in turn improving driving and walking conditions while increasing safety for employees.

Title: Newburgh – Install Pole Barn
Description: Install pole barn near back of property approximately 40’ x 60’.
Justification: Building a pole barn will allow for materials and equipment currently stored out

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in the weather to be put under cover during bad weather. This will eliminate wear and tear on multiple pieces of equipment and reduce replacement costs on these vehicles in the long run. This will also allow for multiple connex boxes to be reduced and for materials to be secured indoors. This will help eliminate theft of materials in connex boxes and parts off certain pieces of equipment currently stored outdoors.

Title: Daily Operations – Electrical
Description: Capital required for daily operations and maintenance at all locations.
Justification: Money must be set aside for daily operations and unplanned maintenance tasks that are sure to occur throughout the year.

Title: Daily Operations – Flooring/Carpeting
Description: Capital set aside to cover flooring issues at all locations.
Justification: Money must be seat aside to cover any flooring or carpeting damage that may occur throughout the year. Damages to high traffic areas will create safety hazards for employees and will need to be addressed in a timely fashion.

Title: Daily Operations – HVAC
Description: Capital set aside to cover HVAC issues at all locations.
Justification: Money must be seat aside to cover any HVAC capital replacements that may occur throughout the year.

Title: Daily Operations – Unanticipated Projects
Description: Capital set aside to cover unforeseen projects.
Justification: Unplanned issues are inevitable throughout each year. Money should be allocated to a collection that will cover emergencies and crucial projects that may need to be undertaken.

2015 SPECIAL PROJECTS

Title: Construct a new Transportation and Storage building at Fishkill HQ
Description: Add a building to the existing property to allow for additional material storage and vehicle maintenance.
Justification: The central transportation repair facility has been relocated to Kingston and the existing Fishkill Storeroom does not have the adequate size to optimize storeroom operations. This project is designed to allow additional storage for the most commonly used materials closer to the point of use. This will maintain the overall inventory levels while reducing the handling and shipping costs associated with each these items. It is also intended to reduce the number of times that crews from Newburgh or Fishkill have to travel to a remote location for a single item.

Likewise, the new facility will contain a larger garage that will allow a

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more diversified mechanic staff. This will also reduce the overall time spent transporting vehicles for inspection and maintenance.

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Title: Poughkeepsie– Bldg. 800 Window Replacement 1st Floor
Description: Replace windows on the east and west side of building 800
Justification: The windows located in building 800 at the South Road campus are very old and a large source of heat loss. The windows have bad seals around the casings and in many locations the widows are damaged and unable to fully close. In order to drastically reduce heating costs, these windows should be removed and replaced with more efficient, double-pain windows.

Title: Poughkeepsie– Replace Roof – Bldg 807 - Auditorium
Description: Replace existing roof with 50 year Architectural Shingles or standing seam metal roof system.
Justification: The existing roof is in bad condition due to age and suffers multiple leaks and water issues. Replacing the roof will eliminate water infiltration issues and protect the interior building spaces from further damage.

Title: Poughkeepsie– Bldg 802 VVT Automation
Description: Upgrade existing HVAC system with controls.
Justification: Tie existing HVAC equipment serving Bldg 802 into new controls system. This will reduce energy use and improve equipment down time and maintenance.

Title: Poughkeepsie– Bldg 810 Control Center HVAC Upgrade
Description: Replace existing heat pumps with RTU's and new ductwork.
Justification: The existing heat pump system does not serve the area well. We have multiple maintenance issues with the equipment that is installed and maintenance on this equipment is very difficult at best as it resides in 30' high ceilings. Installing RTU's will improve comfort issues and will reduce maintenance and comfort issues currently faced in system operations as well as the alternate call center. This system will also be tied into new controls and improve energy efficiency.

Title: Poughkeepsie– Bldg 801 – VVT Automation
Description: Install controls on existing HVAC system feeding Bldg 801.
Justification: Tie existing HVAC equipment serving Bldg 801 into new controls system. This will reduce energy use and improve equipment down time and maintenance.

Title: Stanfordville – Replace Maglocks on exterior doors.
Description: Replace multiple maglocks with crash bars on all exterior doors.
Justification: Maglocks are against code and should all be replaced to allow for easy exit and

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entry. Replacing maglocks will bring doors up to current code and provide safe egress to and from the buildings.

Title: Stanfordville - Install new HVAC system
Description: Install new HVAC system in Stanfordville office.
Justification: Office is currently fed by spilt systems that are inefficient and ineffective. New system will reduce maintenance costs and improve energy efficiency.

Title: Stanfordville – Replace boiler and heating system.
Description: Install new heating system in Stanfordville office and garage area.
Justification: Office and garage space is currently fed by a boiler that is inefficient and ineffective. The maintenance costs to keep the system running are not cost effective. New system will reduce maintenance costs and improve energy efficiency.

Title: Stanfordville – Install Ladies Restroom.
Description: Renovate current space to install new ladies room in main office.
Justification: Currently there is no ladies restroom in the office. Installing a woman's room will bring building up to current code and alleviate restroom issues faced during day to day operations and storm operations.

Title: Stanfordville – Repave Front and Side Parking Lot.
Description: Repave the main driveway and the side parking lot areas.
Justification: There is a long section along the main driveway where the pavement is cracking and damaged. The area should be cut out and repaved. For safety of vehicles and employees.

Title: Newburgh – Replace Pole Piles.
Description: Install new pole racks at the Newburgh district office.
Justification: Existing pole piles are weathered and deteriorated. Existing condition of pole piles is unsafe. Install new pole racks will improve safety and storage of poles and keep them off the ground, improving overall conditions.

Title: Fishkill – Pave front lot
Description: Repave the damaged area in the employee parking lot at the Fishkill office.
Justification: There is a damaged and cracking area of approximately 900 square feet that needs to be corrected in the parking lot. This area should be cut out and repaved in order to prevent further deterioration and more costly work in the future.
Title: Fishkill – Replace Pole Piles.
Description: Install new pole racks at the Fishkill district office.
Justification: Existing pole piles are weathered and deteriorated. Existing condition of pole piles is unsafe. Install new pole racks will improve safety and storage of poles and keep them off the ground, improving overall conditions.

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Title: Fishkill – Install Roof over Wire storage area.
Description: Install roof over wire storage area to protect and keep spools out of weather.
Justification: Installing a roof over this area will allow materials to be put under cover and will protect the spools from rotting and getting damaged. This will also reduce the chances of accidents occurring and improve safety of the employees using these items.

Title: Kingston – Replace Roof – 1/3 Back Building
Description: Replace built up roof with EPDM roof on back building.
Justification: The current roof has been patched and repaired multiple times. It is not cost effective and multiple leaks exist creating interior building envelope issues. Replacing a portion of the roof each year will lead to better protection of the items stored inside and will help eliminate safety issue from rain creating puddles on floor.

Title: Elting Corners – Replace Loading Dock and install roof
Description: Replace a portion of the loading dock and install a roof over this area.
Justification: Existing loading dock in disrepair due to age of concrete. Replacement and install of a roof over this area will improve work conditions and facilitate loading and unloading of materials in a more efficient manner. It will also provide more storage out of the weather and safer work conditions.

Title: Ellenville – Enlarge Loading Dock and Install Leveler
Description: Enlarge loading dock area and install a dock leveler.
Justification: Increasing the size of the loading dock will facilitate safer loading and unloading of materials from tractor trailers. Installing dock leveler will allow for loading and unloading of materials from different size vehicle providing a safer work environment for the storeroom employees. Increasing the size of the platform will allow for better and safer maneuverability of materials to and from vehicles.

Title: Ellenville – Pole Barn along South side of property
Description: Install a pole barn on the South side of the property approximately 40'x 80' x 15'.
Justification: Building a pole barn will allow for materials and equipment currently stored out in the weather to be put under cover during bad weather. This will eliminate wear and tear on multiple pieces of equipment and reduce replacement costs on these vehicles in the long run. This will also allow for multiple connex boxes to be reduced and for materials to be secured indoors. This will help eliminate theft of

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materials in connex boxes and parts off certain pieces of equipment currently stored outdoors.

Title: Daily Operations – Electrical
Description: Capital required for daily operations and maintenance at all locations.
Justification: Money must be set aside for daily operations and unplanned maintenance tasks that are sure to occur throughout the year.

Title: Daily Operations – Flooring/Carpeting
Description: Capital set aside to cover flooring issues at all locations.
Justification: Money must be seat aside to cover any flooring or carpeting damage that may occur throughout the year. Damages to high traffic areas will create safety hazards for employees and will need to be addressed in a timely fashion.

Title: Daily Operations – HVAC
Description: Capital set aside to cover HVAC issues at all locations.
Justification: Money must be seat aside to cover any HVAC capital replacements that may occur throughout the year.

Title: Daily Operations – Unanticipated Projects
Description: Capital set aside to cover unforeseen projects.
Justification: Unplanned issues are inevitable throughout each year. Money should be allocated to a collection that will cover emergencies and crucial projects that may need to be undertaken.

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2016 SPECIAL PROJECTS

Title: Construct a new Transportation and Storage building at Fishkill HQ
Description: Add a building to the existing property to allow for additional storage and vehicle maintenance.
Justification: This project will significantly reduce down time of vehicles and travel time during material shipments. This will allow for more specialized stocking of inventories. This is the beginning of the construction phase of the project.

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Title: Poughkeepsie– Roof Replacement Bldg 808
Description: Complete replacement of Bldg 808 roof with EPDM.
Justification: Based on the survey completed by Tremco, the roof is beyond its lifespan. We have had multiple leaks that have been repaired in the past, but a full replacement is required to help eliminate water infiltration into the building.

Title: Poughkeepsie– Bldg 806 – Resurface and Restripe Garage Floors
Description: Resurface and restripe existing garage surface in lineman's and gas mechanic's garage.
Justification: The existing garage surface is showing signs of wear and cracking. Resurfacing will help extend the life of the garage slab as well and protect it from water and other chemicals. Restriping will help eliminate backing issues and reduce the chances of backing accidents.

Title: Poughkeepsie– Window Replacements
Description: Replace windows in building 808 and throughout site.
Justification: The windows located in building 807/808, storeroom, and at other locations throughout the South Road campus are very old and a source of continuous concern. The windows have bad seals around the casings and in many locations the widows are damaged and unable to fully close. In order to drastically reduce heating costs, these windows should be removed and replaced with more efficient, double-pain windows.

Title: Poughkeepsie- Curbing Replacement
Description: Replace the concrete curbing with garnet or with concrete
Justification: The concrete curbing throughout the South Road complex has been deteriorated due to all of the salt that is used during winter. This project is to evaluate the condition of the curbing and replace it as necessary. In areas that are in plan public view

Title: Poughkeepsie – Replace Street Lights
Description: Replacement of streetlight poles throughout the South Road site.
Justification: Light poles around the site are weathered and malfunctioning. To maintain adequate lighting coverage throughout the site, the decorative wooden pole in front of building 800 and 801 will be replaced.

Title: Newburgh - Drainage
Description: Improve Drainage around the Newburgh Headquarters
Justification: The current grading around the Newburgh Headquarters does not provide sufficient

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slope to allow water to properly run off the parking lot. This project is to re-grade around the side and rear of the building to alleviate the standing water problem.

Title: Newburgh – Pole Barn
Description: Build a basic 2500 – 5000 sq. foot pole barn for equipment storage in the Newburgh yard.
Justification: Currently there is no pole barn at the Newburgh location to protect material and heavy equipment from the elements. A shed should be installed to prevent accelerated corrosion of the equipment. A study will be performed prior to completing the final design and sizing of the building. The building will be designed to house all vehicles, equipment and materials that should be protected from the weather that are currently stored outside.

Title: Newburgh - Replace Windows front and North side
Description: Replace the windows in the older section of the Newburgh Office.
Justification: The windows are drafty and difficult to operate in the front section of the Newburgh Office. They should be replaced with a modern, energy efficient window to reduce draft and heat loss, as well as keep cooling in.

Title: Kingston – Replace Roof – 1/3 Back Building
Description: Replace built up roof with EPDM roof on back building.
Justification: The current roof has been patched and repaired multiple times. It is not cost effective and multiple leaks exist creating interior building envelope issues. Replacing a portion of the roof each year will lead to better protection of the items stored inside and will help eliminate safety issue from rain creating puddles on floor.

Title: Stanfordville – Build Pole Barn on NE side of building.
Description: Build a basic pole barn for equipment storage at Stanfordville office.
Justification: Currently there is no pole barn at the Stanfordville location to protect material and heavy equipment from the elements. A shed should be installed to prevent accelerated corrosion of the equipment. A study will be performed prior to completing the final design and sizing of the building. The building will be designed to house all vehicles, equipment and materials that should be protected from the weather that are currently stored outside.

Title: Fishkill – Carpet replacement main building and training room
Description: Replace the aging carpet in the main building and training room.
Justification: The carpet in the office and the training room area gets heavy traffic from muddy work boots and daily traffic and is in need of replacement.

Title: Ellenville – Enlarge Transformer Dock and Install new roof

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Description: Enlarge loading dock area and install new roof over this area.
Justification: Increasing the size of the loading dock will facilitate safer loading and unloading of materials from vehicles. Installing new roof over this area will allow for loading and unloading of materials under the cover and out of weather providing a safer work environment for the storeroom employees. Increasing the size of the platform will allow for better and safer maneuverability in this area.

Title: Daily Operations – Electrical
Description: Capital required for daily operations and maintenance at all locations.
Justification: Money must be set aside for daily operations and unplanned maintenance tasks that are sure to occur throughout the year.

Title: Daily Operations – Flooring/Carpeting
Description: Capital set aside to cover flooring issues at all locations.
Justification: Money must be seat aside to cover any flooring or carpeting damage that may occur throughout the year. Damages to high traffic areas will create safety hazards for employees and will need to be addressed in a timely fashion.

Title: Daily Operations – HVAC
Description: Capital set aside to cover HVAC issues at all locations.
Justification: Money must be seat aside to cover any HVAC capital replacements that may occur throughout the year.

Title: Daily Operations – Unanticipated Projects
Description: Capital set aside to cover unforeseen projects.
Justification: Unplanned issues are inevitable throughout each year. Money should be allocated to a collection that will cover emergencies and crucial projects that may need to be undertaken.

2017 SPECIAL PROJECTS

Title: Kingston – Complete the front building at the Kingston Headquarters
Description: The Kingston headquarters was first occupied in 2008; however, approximately 13,000 sq. ft. in the front building was intentionally left unfinished so at the opportunity to lease the space remained available. There is no longer a desire to lease that space. This project will complete the unfinished area with conference and training facilities down stairs and office space upstairs. The upstairs will include a second set of restroom facilities.

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Justification: The training and conference facility will provide the opportunity to host training sessions for large groups of employees. It will also provide an alternate location, to the South Road Auditorium, for large meetings or public gatherings. The upstairs will be finished to allow for more individual and open office space.

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Title: Poughkeepsie – Bldg 802/807/810 – Awning Installs
Description: Install awning over drafting entrance Bldg 802, customer service entrance Bldg 807 and back entrance of Bldg 810.
Justification: The install of these awnings will protect doorways from weather and improve safety at entrances during bad weather. Installing awnings will also alleviate wear and tear on doors and frames and prolong replacement costs.

Title: Poughkeepsie – Bldg. 808 Fluid Containment Mechanics Garage
Description: Install a fluid containment system in the garage for accidental spillage of new and recycled fluids.
Justification: As part of an insurance audit it was suggested that Central Hudson install a berm or

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some sort of containment system for the 55 gallon drums of waste and new materials stored in the garage bay near the office. This will reduce accidental spillage of these materials from spreading and will also reduce safety issues. This is also a way to reduce insurance rates.

Title: Poughkeepsie – Replace Bldg 801 50 ton RTU.
Description: Replace the RTU with more efficient unit and hook up to controls system.
Justification: Based on age of the unit and the amount of money spent to maintain it, it would be more cost effective to replace to this unit with a new energy efficient model and hook up to the current controls system. This will allow for better control and management of space temperatures and easier and more cost effective maintenance.

Title: Poughkeepsie – Roof Walkway & Cafeteria outdoor seating
Description: Install a raised concrete tile surface over the existing roof that will support 100 people with tables and chairs to allow outdoor seating during nice weather. The project will also involve installing railing around the edge of the parapet walls for safety and around the rooftop HVAC Unit.
Justification: The enhanced outdoor dining area will entice more employees to utilize the cafeteria during nice weather and provide an area for small company functions during nicer weather.

Title: Poughkeepsie – Bldg 803 Call Center Break Room Renovation
Description: Replace cabinets and countertop as well as sink, flooring, tables, etc.
Justification: The break area is in disrepair and due to amount of use items above are past their useful life. Upgrading this area will make items safer to use and a renovation of the area will improve overall conditions and cleanliness in this area.

Title: Greenville – Swing Arm for Transformer Platform
Description: Install a motorized swing arm for the transformer platform at the Greenville office.
Justification: Installing a remote controlled swing arm for the transformer platform at the Greenville District Office will reduce safety concerns and improve loading and unloading of the transformers. This install will help eliminate strains and sprains that are caused by manually pushing/pulling transformers while loading and unloading.

Title: Kingston – Replace Roof – 1/3 Back Building
Description: Replace built up roof with EPDM roof on back building.
Justification: The current roof has been patched and repaired multiple times. It is not cost effective and multiple leaks exist creating interior building envelope issues. Replacing a portion of the roof each year will lead to better protection of the items stored inside and will help eliminate safety issue from rain creating puddles on floor.

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Title: Newburgh - Paving
Description: Pave back parking lot near lineman's garage.
Justification: This area is deteriorated due to age and weight of trucks constantly driving over it. Replacement will create a smoother surface and safer driving conditions.

Title: Rifton - Replace ice machine in garage.
Description: Install a new ice machine at Rifton in the garage.
Justification: This is the main source of ice for all meetings and activities held at the Rifton site. The existing ice machine keeps breaking down and is not reliable.

Title: Rifton – Replace Front and side Door on Cottage
Description: Replace deteriorated doors and frame on the Rifton Cottage
Justification: Much of the wooden frame and the doors show signs of deterioration and are in need of replacement. They should both be replaced with a maintenance-free composite product it available or metal.

Title: Rifton - Paving
Description: Pave the front circle of the lodge and the roadway in from the main road.
Justification: This area is deteriorated due to age and weight of vehicles constantly driving over it. Replacement will create a smoother surface and safer driving conditions.

Title: Rifton – Basement Drainage - Cottage
Description: Install new drain piping to improve the drainage of runoff water in the basement of the cottage.
Justification: The cottage has constant issues with moisture and mildew due to water conditions in the basement. Installing drain piping will help alleviate the water issues and improved drainage in the basement. This will also save replacement costs for equipment that could possibly be damaged due to flooding.

Title: Eltings Corners – Man door Replacements
Description: Replace man doors on main building and transportation garage
Justification: These doors do not close properly due to age and wear and tear. Replacing these doors will improve safety and security of the building.

Title: Eltings Corners – Replace Storm Drains
Description: Replace damaged storm drains around the EC property.
Justification: The storm drains are deteriorated and in need of replacement. This will improve the drainage around the property and improve driving conditions around the parking lot.

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Title: Eltings Corners – Renovate Restrooms – Main Building
Description: Renovate and upgrade the main building men's and women's restrooms.
Justification: The bathrooms in the main building are deteriorated and items are past their useful life. Upgrades will improve bathroom conditions and bring bathrooms up to code.

Title: Eltings Corners – Remove old steam and water pipes in main building.
Description: Remove old steam and water lines from old steam system, including asbestos insulation under the floor and in the pits in the floor.
Justification: Old boiler system was removed and pipe is no longer needed. Removing this pipe and insulation will clean up areas and remove asbestos in pits.

Title: Eltings Corners – Upgrade Transformer Shop
Description: Renovate transformer shop area.
Justification: The transformer shop is in need of upgrades including windows, doors, lighting, etc. This upgrade will improve working conditions and safety of employees and materials.

Title: Daily Operations – Electrical
Description: Capital required for daily operations and maintenance at all locations.
Justification: Money must be set aside for daily operations and unplanned maintenance tasks that are sure to occur throughout the year.

Title: Daily Operations – Flooring/Carpeting
Description: Capital set aside to cover flooring issues at all locations.
Justification: Money must be seat aside to cover any flooring or carpeting damage that may occur throughout the year. Damages to high traffic areas will create safety hazards for employees and will need to be addressed in a timely fashion.

Title: Daily Operations – HVAC
Description: Capital set aside to cover HVAC issues at all locations.
Justification: Money must be seat aside to cover any HVAC capital replacements that may occur throughout the year.

Title: Daily Operations – Unanticipated Projects
Description: Capital set aside to cover unforeseen projects.
Justification: Unplanned issues are inevitable throughout each year. Money should be allocated to a collection that will cover emergencies and crucial projects that may need to be undertaken.

2018 SPECIAL PROJECTS

Title: Kingston – Complete the front building at the Kingston Headquarters
Description: The Kingston headquarters was first occupied in 2008; however, approximately 13,000 sq. ft. in the front building was intentionally left unfinished so at the

Land and Buildings Capital Budget Project Descriptions

opportunity to lease the space remained available. There is no longer a desire to lease that space. This project will complete the unfinished area with conference and training facilities down stairs and office space upstairs. The upstairs will include a second set of restroom facilities.

Justification: The training and conference facility will provide the opportunity to host training sessions for large groups of employees. It will also provide an alternate location, to the South Road Auditorium, for large meetings or public gatherings. The upstairs will be finished to allow for more individual and open office space.

2019 Project Descriptions

Title: Poughkeepsie – Lighting Upgrade - Storeroom
Description: Replace the storeroom high bay lights with energy efficient lighting.
Justification: The existing high bay lights do not light the area sufficiently. Installing energy efficient lighting will improve safety and reliability.

Title: Poughkeepsie – Replace / Upgrade Bldg 803 RTU's
Description: Install new RTU's on Bldg 803 that serves S1 & S2.
Justification: Existing units are past there useful life. Multiple maintenance issues and increased costs in maintaining these units makes it more cost effective to replace them with upgraded more energy efficient models.

Title: Poughkeepsie – Replace PK training room HVAC unit and install controls.
Description: Replace existing HVAC unit with energy efficient model. Also install controls and tie into existing BMS system.
Justification: Existing unit maintenance costs are increasing and it is difficult to get parts for it. Replacing the existing unit with an energy efficient unit will reduce down time and maintenance costs and tie-in to the controls system will help alleviate comfort issues and reduce tie spent on trouble shooting.

Title: Poughkeepsie – Pave Pole and Equipment Area.
Description: Pave the area by Fox Street where the pole and equipment yard is.
Justification: This area is not paved and uneven. Paving this area will increase safe footing and improve conditions for loading and unloading poles.

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Title: Poughkeepsie – Replace carpeting – call centers.
Description: Replace carpet tile in the calls centers.
Justification: The existing carpet tiles are worn and deteriorated due to age and amount of traffic. The carpet tiles are also lifting causing tripping hazards. Replacing carpet tiles will improve safety and condition of area.

Title: Fishkill – Upgrade Lighting – mechanic's garage
Description: Replace the mechanic's high bay lights with energy efficient lighting
Justification: The existing high bay lights do not light the area sufficiently. Installing energy efficient lighting will improve safety and reliability.

Title: Fishkill – Install New Signs
Description: Install new sign on the main building to replace existing.
Justification: The existing sign is deteriorated due to age and weather exposure.

Title: Kingston – HVAC Controls System
Description: Install controls on the HVAC equipment in Kingston.
Justification: Installing controls will allow for easier trouble shooting from off site and better maintenance of the units. Installing controls will allow for off-site control and will improve energy efficiency.

Title: Kingston – Install Office/ Cubicle Space
Description: Install additional office and cubicle space in the open area on level 2 of the main building in Kingston.
Justification: There is not adequate space for additional employees and additional space is needed to accommodate these employees. Outfitting this space will allow for cubicles and offices and required by groups adding people and will also allow for movement of smaller groups from PK.

Title: Newburgh – HVAC Controls System
Description: Install controls on the HVAC equipment in Newburgh.
Justification: Installing controls will allow for easier trouble shooting from off site and better maintenance of the units. Installing controls will allow for off-site control and will improve energy efficiency.

Title: Rifton – Replace Pavilions and bath house roofs
Description: Replace the roofs on the pavilions and bath house at the Rifton Training Center.
Justification: The existing roofs are at the end of lifecycles and should be replaced to reduce leaks and maintain dry conditions in these areas.

Land and Buildings Capital Budget Project Descriptions

Title: Catskill – Replace exhaust fan in lineman's garage
Description: Replace existing exhaust fan with new and install new control.
Justification: The existing fan is not working and out of service. Installing a new fan will improve ventilation and exhaust air during the summer months for better air quality in the garage and storeroom areas.

Title: Eltings Corners – Pave Parking Lot
Description: Repave the parking at the EC district office.
Justification: The existing parking lot is in disrepair. Paving the areas will improve wear and tear on vehicles and equipment and also improve conditions for walking and working in these areas. Paving will improve safety of the lot as well.

Title: Eltings Corners – Lighting Upgrade - Storeroom
Description: Replace the storeroom high bay lights with energy efficient lighting.
Justification: The existing high bay lights do not light the area sufficiently. Installing energy efficient lighting will improve safety and reliability.

Title: Eltings Corners – Storeroom generator
Description: Install a natural gas generator to fully reserve the electric load in the Central Storeroom at Eltings Corners.
Justification: Currently the Central Storeroom does not have back-up generation. In the event of a significant storm, the storeroom could have to operate for an extended period without electric power. This has occurred for short periods of time several times in the past; however, the possibility exists that the outage could be much longer lasting. This would slow productivity and could present a safety hazard to our employees.

Title: Daily Operations - Electric
Description: Capital required for daily operations and maintenance at all locations.
Justification: Money must be set aside for daily operations and unplanned maintenance tasks that are sure to occur throughout the year.

Title: Daily Operations – Flooring/Carpeting
Description: Capital set aside to cover flooring issues at all locations.
Justification: Money must be seat aside to cover any flooring or carpeting damage that may occur throughout the year. Damages to high traffic areas will create safety hazards for employees and will need to be addressed in a timely fashion.

Title: Daily Operations – HVAC
Description: Capital set aside to cover HVAC issues at all locations.
Justification: Money must be seat aside to cover any HVAC capital replacements that may occur throughout the year.

Land and Buildings Capital Budget Project Descriptions

Title: Daily Operations – Unanticipated Projects
Description: Capital set aside to cover unforeseen projects.
Justification: Unplanned issues are inevitable throughout each year. Money should be allocated to cover emergencies and crucial unbudgeted projects that may need to be undertaken.

Land and Buildings Capital Budget Project Descriptions

2019 SPECIAL PROJECTS

Title: Kingston – Complete the front building at the Kingston Headquarters

Description: The Kingston headquarters was first occupied in 2008; however, approximately 13,000 sq. ft. in the front building was intentionally left unfinished so at the opportunity to lease the space remained available. There is no longer a desire to lease that space. This project will complete the unfinished area with conference and training facilities down stairs and office space upstairs. The upstairs will include a second set of restroom facilities.

Justification: The training and conference facility will provide the opportunity to host training sessions for large groups of employees. It will also provide an alternate location, to the South Road Auditorium, for large meetings or public gatherings. The upstairs will be finished to allow for more individual and open office space.

EDP Equipment

Major Projects

- Annual Planned PC Replacements
- Annual Planned Mobile Computer Replacements
- Annual Planned Monitor & Printer Replacements
- Annual Planned Server Replacements
- Annual Planned Network Hardware Replacements
- Annual Security System Replacements

Software

Major Projects

- Enterprise Content Management
- Cognos BI tool
- OSM Replacement
- Mobility Upgrades
- Cyber Security

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4220	Wires Down, Damage Assessment - Phase 1 (Jeff C)	System Enhancement	0	0	0	0	0	0	0	0	0
4222	Hardware Minors	Maintain Standards	105	56	56	112	119	127	135	144	638
4222	PC and Laptop Replacements	Maintain Standards	315	163	163	326	343	361	379	553	1962
4222	Mobile (Pen) Computing Replacements	Maintain Standards	263	81	81	163	166	170	173	221	893
4222	Monitors, Network Printers-Adds/Repl.	Maintain Standards	105	51	51	102	104	106	108	111	531
4222	Server Replacements and Storage Upgrades	Maintain Standards	1105	357	357	713	779	796	812	829	3930
4222	Network Infrastructure Upgrades/Replacements	Maintain Standards	289	153	153	306	260	265	271	332	1433
4222	Cyber Security	Reduces Risk	0	31	31	61	62	64	65	77	330
4222	Copiers (new budget line item requested by Tim B)	Maintain Standards	0	71	183	255	52	53	54	55	469
4222	Legacy Replacement - hardware	Reduces Risk	1024	0	0	0	0	0	0	554	554
4222	GIS - equipment for Estimating Design phase	Improve Reliability	1024	0	0	0	54	0	0	0	54
4220	Business Intelligence (Cognos)	System Enhancement	0	410	383	784	784	802	819	831	4021
4220	Enterprise Content Management - Phase II	Improve Reliability	0	656	0	628	0	0	0	0	628
4220	Enterprise Content Management - Phase III	System Enhancement	0	0	623	638	638	0	0	0	1276
4220	Enterprise Content Management - Phase IV	System Enhancement	0	0	0	0	638	653	0	0	1290
4220	Enterprise Content Management - future Phases	Improve Reliability	0	0	0	0	0	267	546	554	1368
4220	Legacy Replacment - software	Reduces Risk	614	0	0	0	0	0	0	10526	10526
4220	Cyber Security	Reduces Risk	154	164	153	314	314	321	328	332	1609
4220	VoIP	Maintain Standards	307	109	102	209	157	160	164	166	857
4220	Mobility Upgrade (Tim H)	System Enhancement	154	0	0	0	1568	1070	0	0	2638
4220	ARCOS - Mobility Interface (Tim H)	System Enhancement	1024	82	26	105	0	0	0	0	105
4220	Emergent Software Packages/Upgrades	Maintain Standards	102	328	306	628	627	642	656	665	3217
4220	EmpCenter Phase 2 (IT estimate)	System Enhancement	0	82	77	157	0	0	0	0	157
4220	Wires Down, Damage Assessment - Phase 1 (Jeff C)	System Enhancement	0	0	0	0	0	0	0	0	0
4220	Wires Down, Damage Assessment, Phase II (Tim H)	System Enhancement	0	109	179	288	0	0	0	0	288
4220	Transmission Outage app	Reduces Risk	0	0	0	0	0	0	0	0	0
4220	Electric GIS- Environment (Hal T)	Improve Reliability	0	24	680	720	73	0	0	0	793
4220	Electric GIS- Estimating Design (Hal T)	Improve Reliability	0	0	0	0	535	48	0	0	583
4220	Electric GIS- Underground manhole (Hal T)	Improve Reliability	102	0	0	0	0	0	328	332	660
4220	AP Automation System upgrade (Joe C)	System Enhancement	0	0	102	105	0	0	0	0	105
4220	PowerPlant upgrade (Joe C)	System Enhancement	0	0	0	0	0	0	492	0	492
4220	New Maintenance Request System (Eric K)	Maintain Standards	0	0	102	105	0	0	0	0	105
4220	PowerPlant - Construction Budgeting upgrades (Chris R)	System Enhancement	0	0	102	105	105	0	0	0	209
4220	Crew Constant Time measurment and dashboarding utilizing existing technology (mobility, rocket modems	System Enhancement	0	0	0	0	209	0	0	0	209
4220	Operator scheduling software that automates compliance verification with all DOT-PHMSA hours on- and o	Reduces Risk	0	0	143	146	0	0	0	0	146
4220	Taurigma Automated Fault Location and Event Retriever (Eric L)	System Enhancement	0	0	56	58	26	64	66	66	280
4220	GL Essentials Upgrades (IT estimate)	Maintain Standards	0	0	0	0	209	0	0	0	209
4220	Clarity Replacement/Upgrade (Stan K - coincide w FAS legacy repl)	System Enhancement	0	0	0	0	0	0	0	554	554
4220	ARCOS - Crew Manager Software (Tim H)	System Enhancement	0	0	0	0	105	0	0	0	105
4220	OMS Replacement (Tim H)	Maintain Standards	0	0	0	0	0	0	1093	1662	2755
4220	Cognos Enterprise Level License	System Enhancement	0	0	511	523	0	0	0	0	523
4220	EMS JUMP	System Enhancement	0	0	0	0	0	0	0	0	0
4222	Ops Services Integration	0	102	0	0	0	0	0	0	0	0
4222	Other Customer Services (IVR, Arcos integration, FCS upgrade)	0	255	0	0	0	0	0	0	0	0
HW/SW	Subtotal Hardware & Software		7044	2929	4619	7548	7926	5970	6489	18565	46498

IT Summary ** Project totals are not adjusted for overheads*

Initiative	Priority	Achieve Departmental Mission / Improve KPI Performance	Initiative Description Including: · **(Measurable) Desired Outcome** · **(Relevant) Alignment to Mission and Strategy** · **(Time bound) Initiative Resolution**	2014	2015	2016	2017	2018	2019
Enterprise Content Management	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phase initiative - Phase 2 OpenText implementation to roll out the core system to the entire Company will continue through Q2 2015. Additional functionality will be rolled out in subsequent phases in accordance with the ECM Strategy document. · Expected capital investment for 2015 approximated at $1.247M. · Project Manager – Vicki Wheeler; Project Sponsor – Stacy Renner; Project Team – Maureen Kverek, Laura Butler, Kim Short, Daemyian Watson, Andrea Balga, Barbara MacIsaac, Casey Gunther, System Integrator – Locus Systems, business area resources as needed. · Milestones, Deliverables, Timelines: o Phase II: § Wave 6 Go Live: January 2015 § Wave 7 Go Live: March 2015 § DIS and Stellent migrations into Content Central: April 2015 § Email Management implementation: April 2015 o Phase III § Workflows § Everywhere module for mobile devices	3,102,418	1,210,000	1,220,000	860,000	500,000	500,000
Business Intelligence	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-year initiative to enhance the organization's data exploitation and analytical capabilities · Expected investment for 2015 approximated at $773k PLUS Cognos Enterprise License @ $500K · Project Manager – Suzette Mazurowski; Project Sponsor – Vicki Wheeler; Project Team – Antonio Martinez, Casey Gunther, External Resources as needed · Milestones, Deliverables, Timelines: o Prioritization, Definition and assignment of projects monthly in accordance with ITSC meeting schedule o Various additional projects released to Production (December)	701,000	1,250,000	750,000	750,000	750,000	750,000
Cyber Security	High	Directly related to enabling our group mission to support the organization by providing safe and secure solutions.	· Projects to address the remaining items from the Cyber Security Action Plans. · Expected investment for 2015 approximated at $370k. · IT will provide continued representation on the Cyber Security Working Group.	676,514	360,000	360,000	360,000	360,000	370,000
Systems Integration Strategy with Services Oriented Architecture (SOA)	High	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phased initiative to define requirements and to implement a shared services SOA platform. This will be a foundational investment allowing us to provide a flexible, scalable, secure, and reliable environment poised for current and anticipated information and technology demands coupled with a continued focus on digital (Web, mobile, social, IVR), self-service oriented offerings to increase overall customer engagement. · Project Manager – TBD; Project Sponsor – Mark Holtermann · Milestones, Deliverables, Timelines: o Identify, select and secure a SOA solution o Software selection and purchase o Compile strategy roadmap for future rollouts o Pilot services	TBD	TBD	TBD	TBD	TBD	TBD

Application Testing Automation Strategy	High	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phased initiative to increase quality, reduce defects, and shorten development cycle times across all application environments. This is a foundational investment to ensure effective, timely, and consistent delivery of applications. · Project Manager – TBD; Project Sponsor – Mark Holtermann · Milestones, Deliverables, Timelines: o Identify, select, and secure an automated testing solution(s) o Tool selection and procurement o Compile strategy roadmap and implementation plan o Identify partner in the development of test scripts (pre-requisite before automation) o Compile automated scripts o Pilot tools	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Disaster Recovery Enhancements	Med	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Our existing Newburgh Disaster Recovery (DR) hardware environment requires enhancements in order to be able to support restoration of critical server applications in the event of a disaster. · Expected investment for 2015 approximated at $440k. · Milestones, Deliverables, Timelines: o Mainframe Storage o TSM Storage o IBM V7000 storage unit		440,000					
Network Strategy	Med	This initiative will improve our 'Availability of IT Infrastructure'	· This multi-million dollar initiative led by Ray Abrial aims to create a Central Hudson owned Information System Communications Infrastructure for our transmission and distribution assets. · IT will provide support as needed including continued participation on the Network Strategy Committee. · Lead responsibility: R. A'Brial and D. Dittmann							
VOIP Enhancements	Med	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Continue to add enhanced functionality for our VOIP systems. · Expected investment for 2015 approximated at $206k. · Milestones, Deliverables, Timelines: o IVR Green Belt Enhancements (3Q 2015) o IVR Speech recognition (4Q 2015) · Project Manager – John Chrysler; Project Sponsor – Rick McGowan		200,000	150,000	150,000	150,000		150,000
Electric GIS	Med	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· The Electric GIS Project provides a data warehouse of geographic electric data. · Investment for 2015 approximated at $860K as defined by Frank Bailey. · Milestones, Deliverables, Timelines as defined by Engineering: o Integration with Engineering modeling software (DEW): June 2015 o Electric GIS staging environment complete: September 2015 o Schneider ArcFM implementation complete: December 2015; Includes equipment for Design Phase in 2016 · Lead responsibility: H. Turner and F. Bailey ; IT Lead: J. Robinson	263,750	688,450	633,250	45,000	300,000		300,000
Logistics Software / Damage Assessment	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Damage assessment activities are critical during storm restoration. Software packages were considered in order to improve damage assessment activities and respond to PSC commission recommendations. The first phase of an emergency logistics tracking program, to be implemented in 2014, includes the automation of data collection of damage assessment operations, reporting and restoration package creation. The second phase of an emergency logistics tracking program to be implemented in 2015 includes: o Materials and Poles o Trees o Service Wire (Loop) Operations o Resources – Labor o Lodging o Meals · Investment for 2015 approximated at $283K · Lead responsibility: J. Cito; IT Project Manager: C. Robertson	420,000	275,000					

Integration of ARCOS and MWM	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Streamline the business process to improve the efficiency and performance of Customer Services supervision by using ARCOS data to populate MWM. This will reduce administrative time and increase assignment accuracy through a direct connection between a personnel database and the Mobile Workforce Management system. · Investment for 2015 approximated at $103K · Milestones, Deliverables, Timelines: o Integration mapping, SOW development, and IT Steering and CARE approvals 3/1/15. (Torcello/Collins) o Contract development and application development follow 6/30/15. o Testing and implementation 12/31/15. · Lead responsibility: J. Collins	100,000						
ARCOS - Crew Manager Software (Tim H)	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Lead responsibility: T. Hayes		100,000					
EmpCenter Phase 2	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Implementation of a work breakdown structure within EmpCenter as defined by Green Belt team led by Lora Gescheidle in 2014. · Investment for 2015 approximated at $155K · Lead responsibility: TBD		150,000					
AP Automation System Upgrade/Phase II (Automated Distribution)	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Lead responsibility: TBA		100,000					
New Maintenance Request System	Low	`	· Investment for 2015 approximated at $103K · Lead responsibility: E. Kiszkiel		100,000					
PowerPlant - Construction Budgeting upgrades	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $103K · Lead responsibility: N. Komar		100,000	100,000	450,000			
Crew Constant Time Measurment and Dashboarding	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Utilizing existing technology (mobility, rocket modems, GPS tracking devices) or other new technology · Lead responsibility: James K.			200,000				
Operator scheduling software for Compliance Verification	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $144K · Lead responsibility: D. Dittmann		140,000					
Taurigma Automated Fault Location and Event Retriever	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $57K · Lead responsibility: E. Loeven		55,000	25,000	60,000	60,000	60,000	
Transmission Outage app	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.		206,000						0
Clarity Replacement/Upgrade	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment of $500K, contingent upon Legacy Replacement decision · Lead responsibility: Stan K.							500,000
GL Essentials Upgrades	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.				200,000				
OMS Replacement	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment will be refined after an RFP process · Lead responsibility: T. Hayes					1,000,000	1,500,000	
Mobility Upgrade / Redesign	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment will be refined after an RFP process · Lead responsibility: T. Hayes			1,500,000	1,000,000			
Emergent Software Packages/Upgrades	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Misc expected software imlementations and/or upgrades.	10,000	600,000	600,000	600,000	600,000	600,000	600,000

IT Transformation / Legacy Replacement	High	Strategic	· Further analysis needed before strategy is refined · Year one of a multi-year transformation effort · Lead responsibility: M. Holtermann						10,000,000
Infrastructure Optimization and Lifecycle Intiatives	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Hardware Minors, PC and Laptop Replacements, Mobile (Pen) Computing Replacements, Monitors, Network Printers-Adds/Repl., Server Replacements and Storage Upgrades, Network Infrastructure, Upgrades/Replacements Copiers	2,064,506	1,940,000	1,755,000	1,770,000	1,785,000	2,030,000

EMS

Major Projects

- Network Strategy
- New Distribution Management System
- EMS Upgrades

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4230	DMS	System Enhancement	1224	0	0	0	0	0	0	0	0
4230	ACC Video Wall - Blackboard Enhancement	System Enhancement	433	0	0	0	0	0	0	0	0
4230	EMS Backup and Restore	System Enhancement	0	0	0	0	0	0	0	0	0
4230	EMS FEP DIGI Replacement	System Enhancement	0	0	0	0	0	0	0	0	0
4230	EMS Server Upgrade - Hardware associated with the JUMP Upgrade	System Enhancement	0	0	0	0	312	0	0	0	312
4230	Miscellaneous Hardware and Software Failures	System Enhancement	0	26	26	51	52	53	54	55	266
4230	EMS Active Directory Server Implementation (PCC and ACC)	System Enhancement	0	68	0	66	0	0	0	0	66
4230	EMS Corporate Cluster Server Replacement for External View Only EMS Access	System Enhancement	153	0	31	31	0	0	0	0	31
4230	EMS Network Upgrade (Includes Firewalls and Switches not Upgraded with R15)	System Enhancement	0	0	0	0	312	0	0	0	312
4230	EMS Sophos Antivirus Upgrade from SEPM	System Enhancement	0	0	0	0	52	0	0	0	52
4230	EMS DTS Video Wall/Blackboard Software - Operator Training Enhancements	System Enhancement	0	0	0	0	331	0	0	0	331
4230	EMS ACC Video Wall - Blackboard Enhancement	System Enhancement	0	0	434	434	0	0	0	0	434
4230	EMS eDNA Historian Upgrade	Improve Reliability	0	0	0	0	0	0	0	0	0
4230	EMS eDNA Historian Redundancy Package	Improve Reliability	0	0	0	0	94	0	0	0	94
4230	EMS PCC Mapboard Replacement (Video Wall)	System Enhancement	0	0	0	0	0	0	0	2771	2771
4230	EMS Software Upgrade (non-JUMP)	System Enhancement	0	0	0	0	0	0	869	0	869
4230	Network Strategy Pilot Project	Reduces Risk	0	83	0	82	0	0	0	0	82
4230	Network Strategy Implementation Pilot	Reduces Risk	0	0	2088	2091	4226	4292	4942	4179	19730
4230	DMS - New Distribution Management System and D-Scada	Improve Reliability	0	104	510	613	6345	0	0	0	6959
4230	DMS - Three Video Walls (one per DSO)	System Enhancement	0	0	0	0	0	1436	0	0	1436
4230	DMS - Software Upgrade	System Enhancement	0	0	0	0	0	0	0	0	0
4230	System Operations Room Reconfiguration & Construction	System Enhancement	0	0	0	0	0	160	0	0	160
4230	Subtotal EMS		1810	281	3088	3369	11724	5940	5865	7006	33904

Network Strategy Summary:

Network Strategy is a well-defined plan to leverage technologies for current and future communication needs. This is a long-term cost effective strategy to establish robust systems that provide reliable and secure communications that we can control, monitor and maintain 24x7x365. The scope of Network Strategy is communication with Central Hudson's fixed assets. Central Hudson's fixed assets included in the scope are corporate offices, gas gate and regulator stations, electric substations, electric system distribution automation equipment, mobile radio towers, and large customer meter installations. Central Hudson's planned topology is a tiered network. Tier 1 is the high bandwidth backbone connecting our most critical sites, including our most critical substations. Tier 1 will be a combination of existing and new fiber optic cables and microwave connections. Most of the sites on the Tier 1 network will also serve as gateways for connection to the Tier 2 network. Tier 2 is the medium bandwidth network. Tier 2 will be a mesh radio network for communication with distribution automation equipment, electric substations, gas regulator stations and large customer meter installations. Provision would be made available for a future Tier 3 low bandwidth network that could reach further into our territory for future needs.

Security

Includes the following planned purchases

Cameras and Intrusion Detection Equipment

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4240	Eltings corners access add/camera upgrade	System Enhancement	357	0	0	0	0	0	0	0	0
4240	Poughkeepsie HR/DR River Crossing pump house cameras	System Enhancement	41	0	0	0	0	0	0	0	0
4240	Poughkeepsie Mail Room Card Reader additions	System Enhancement	10	0	0	0	0	0	0	0	0
4240	Rock Tavern Sub SMART Cameras Add	System Enhancement	0	0	0	0	0	637	0	0	637
4240	Security Guard Booths District Offices	System Enhancement	0	0	0	0	364	0	0	0	364
4240	License Plate Cameras District Offices	System Enhancement	0	0	0	0	249	0	0	0	249
4240	Mahopac Gas Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	88	88
4240	Pleasant Valley Gas Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	92	0	92
4240	Fishkill Plains Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	108	0	108
4240	Smithfield Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	111	111
4240	Rifton Training Center Cameras	System Enhancement	0	51	51	102	0	0	0	0	102
4240	Poughkeepsie Gas Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	0	0
4240	Poughkeepsie River Crossing Pump House	System Enhancement	0	0	0	0	0	0	103	155	258
4240	Subtotal Security		408	51	51	102	613	637	303	354	2,009

Tools and Transportation

- Transportation
  - Planned Fleet Replacements

Transportation and Tools 2015-2019 Forecast

COMMON :	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	← Actuals									Budget	Forecast →				
Tools															
4-43BL (Blankets)				$ 153	$ 198	$ 209	$ 189	$ 185	$ 159	$ 130	$ 130	$ 130	$ 130	$ 130	$ 130
4-4311- (Minors)				$ 402	$ 238	$ 388	$ 417	$ 649	$ 505	$ 685	$ 685	$ 701	$ 719	$ 737	$ 755
subtotal	**$ 453**	**$ 568**	**$ 462**	**$ 555**	**$ 436**	**$ 597**	**$ 606**	**$ 834**	**$ 664**	**$ 815**	**$ 815**	**$ 831**	**$ 849**	**$ 867**	**$ 885**
Transportation															
4-4511- vehicles				$ 1,879	$ 1,139	$ 1,404	$ 1,539	$ 1,614	$ 2,087	$ 1,071	$ 2,142	$ 2,209	$ 2,189	$ 2,557	$ 2,961
4-4521- mobil tools				$ 135	$ 49	$ 501	$ 233	$ 382	$ 804	$ 1,370	$ 869	$ 906	$ 910	$ 1,066	$ 1,224
4-4522- POE				$ 2,456	$ 1,345	$ 2,843	$ 2,753	$ 3,269	$ 2,553	$ 2,920	$ 3,637	$ 4,416	$ 5,176	$ 4,904	$ 4,455
subtotal	**$ 3,669**	**$ 4,944**	**$ 4,387**	**$ 4,470**	**$ 2,533**	**$ 4,748**	**$ 4,525**	**$ 5,265**	**$ 5,444**	**$ 5,361**	**$ 6,648**	**$ 7,531**	**$ 8,275**	**$ 8,527**	**$ 8,640**
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Total Cat 43 and 45	**$ 4,122**	**$ 5,512**	**$ 4,849**	**$ 5,025**	**$ 2,969**	**$ 5,345**	**$ 5,189**	**$ 6,099**	**$ 6,108**	**$ 6,176**	**$ 7,463**	**$ 8,362**	**$ 9,124**	**$ 9,394**	**$ 9,525**

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
43	Small Tools	Maintain Standards	816	407	407	815	831	849	867	885	4246
44	Communication	Maintain Standards	204	102	102	204	208	212	217	221	1062
45	Transportaion	Maintain Standards	5363	3324	3324	6648	7531	8275	8527	8640	39621

Transportation 5 Year Capital Forecast

2015-2019

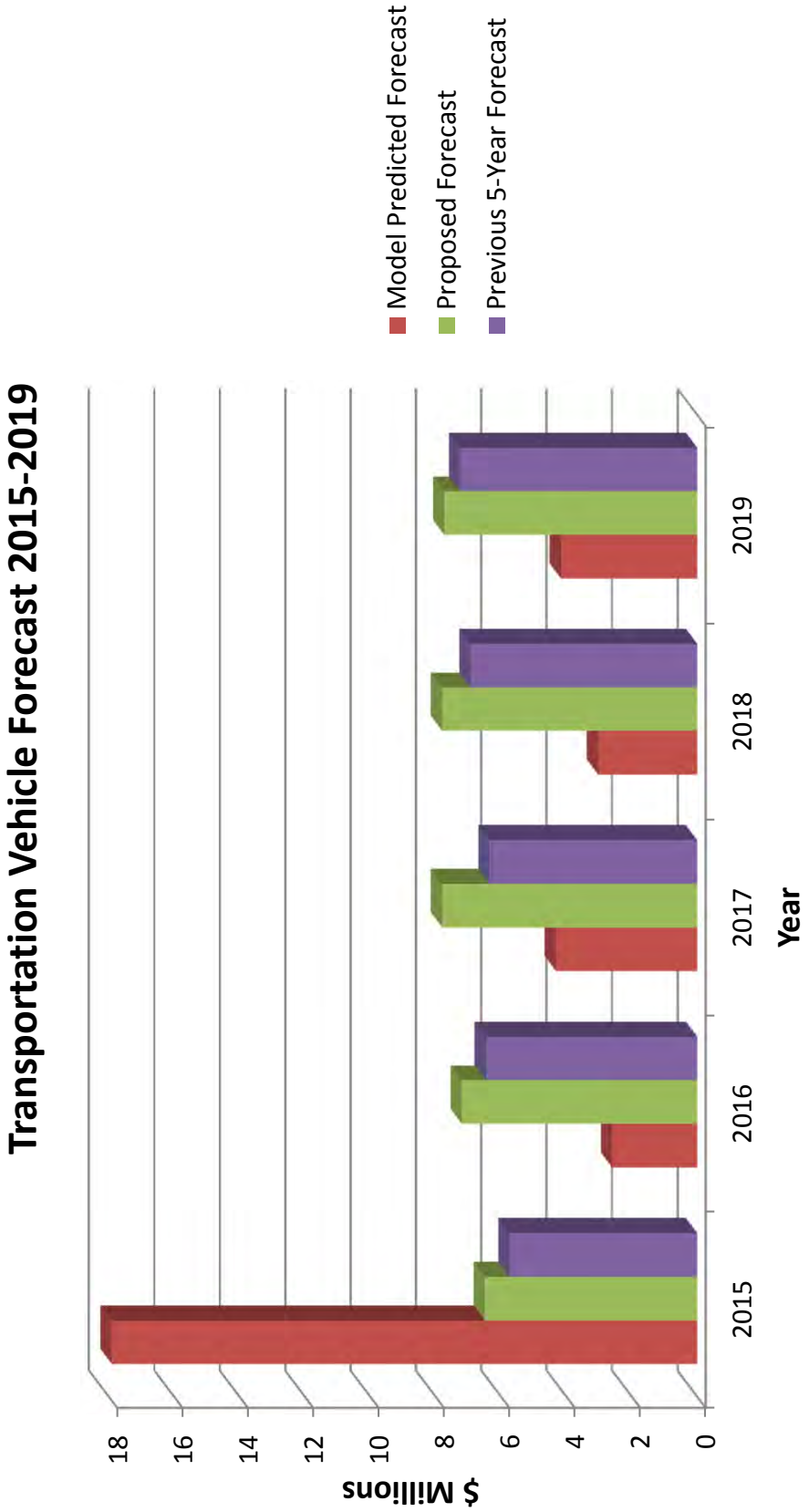
Fleet Status

- Past replacement practices
  - 10 years
  - 100,000 Miles
  - Operating hours not considered
- Current average fleet age is 8 years, but:
  - 176 units (~20%) of the fleet meet above requirements; cost to replace just 176 units is $22M. Cost over 5 years would be $42M to maintain criteria
  - Some units do not meet mileage or age, but meet operating hour retirement criteria
  - Industry average fleet age in Utility sector is 5-6 years; we are behind.

5 Year Forecast Development

- Applied new criteria to fleet in a financial model
  - 12 year replacement age
  - 120,000 mileage replacement
  - 9,500 engine hour replacement
- Yielded a $32M spend over 5 years to replace vehicles older than 12 years; heavily weighted to first year ($18M)
- Added $1M / year for replacing non-road equipment
- Spend is proposed to be levelized over the next 5 years
- Reduces average fleet age and *"caps"* fleet age at 12 years
- Age is currently main driver of fleet replacement; this budget would "flush" the fleet
- With new mileage and hour tracking systems being installed, fleet can be managed on utilization – most vehicles will be replaced before they reach 12 years old

5 Year Forecast



Radio Communication

Radio Major Projects

- Additional Radio and RF Link- Tannersville
- C-soft Console Additions
  - Kingston
  - Catskill
  - Newburgh
- Kingston Emergency Radio Replacement
- South Road Radio Network Recorder

Office Equipment

Includes the following planned purchases

Miscellaneous Furniture – System Wide

Office Chair Replacement Program

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
421	South Road - Daily Operations - Larger Projects	Maintain Standards	66	33	33	66	68	69	70	72	345
421	South Road - Misc. Furniture	Maintain Standards	41	20	20	41	42	42	43	44	212
421	South Road - Office Chair Replacement Program	Maintain Standards	36	18	18	36	36	37	38	39	186
421	Greenville Furniture replacement	Maintain Standards	10	0	0	0	0	0	0	0	0
421	New Office Furniture - Conference Center	Maintain Standards	20	0	0	0	0	0	0	0	0
421	Additional Cubicles - Lake Katrine	Maintain Standards	25	0	0	0	0	0	0	0	0
421	New Office Furniture - OMS Office Area	Maintain Standards	0	5	5	10	0	0	0	0	10
421	New Office Furniture - S-1 IT Office Area	Maintain Standards	0	5	5	10	0	0	0	0	10
421	Upgrade Office Furniture - Fishkill	Maintain Standards	0	25	25	51	0	0	0	0	51
421	New Office Furniture (Stanfordville)	Maintain Standards	0	0	0	0	31	0	0	0	31
421	Subtotal Office Equipment		199	107	107	214	177	149	152	155	846

Central Hudson Gas & Electric Corporation
Case Nos. 14-E-0318 & 14-G-0319
Response to Interrogatory / Document Request

Request No: DPS-1, IR-061
From: DPS
Date of Request: July 29, 2014
Subject: Capital Projects

Question:

For each budgeted electric and common capital expenditure project or blanket grouping, provide:

a. a detailed description, including all studies and alternative analysis of project or blanket grouping;
b. a justification of project and expenditure;
c. a cost breakdown;
d. the current schedule, with major milestones and in-service dates; and,
e. the cost/benefit analysis.

Response:

Based on our 9/17/2014 meeting with DPS and subsequent discussion, the following information is being provided as supplemental information to DPS-1, IR-061:

Geographic Map showing Transmission/Substation Assets:
See "CHGE Response to DPS-061 Supplemental-Attachment A-Electric Transmission Map" included.

Danskammer Storm Hardening:
"CHGE Response to DPS-061 Supplemental-Attachment B-Danskammer Storm Hardening" provides a general description and the basis for the project including the estimated repair costs following Superstorm Sandy. Further work in scoping has occurred since the document provided in DPS-061 Supplemental Attachment B was developed that has altered the initial scope slightly. Danskammer is not in a floodplain or existing FEMA mapping, so there are no definite criteria for the required elevation of the storm hardened substation. This project will implement a best practices approach to raise the substation above the Sandy storm surge level of approximately 40" above existing grade. It is proposed that the new control house floor be five feet (60") above approximate existing grade if possible. Central Hudson, through its contractor, is in the process of reviewing the existing FEMA mapping, investigating the storm hardening elevation practices being utilized by other utilities (including Con Ed and PSE&G). The incremental cost difference between a 1' (from 4' to 5' above existing grade)

change to the proposed new control house elevation would be de minimis when compared to the overall project costs.

"CHGE Response to DPS-061 Supplemental-Attachment C-Danskammer Storm Hardening" provides the preliminary cost estimate as the project is in the scoping/early design phase presently.

"CHGE Response to DPS-061 Supplemental-Attachment D-Danskammer Storm Hardening" provides a preliminary electrical layout.

"CHGE Response to DPS-061 Supplemental-Attachment E-Danskammer Storm Hardening" provides the study detailing the System load serving capability for cable outage scenarios.

Circuit Breaker Replacement Program:
Please note that the updated material provided in this response should be placed in the Budget Book provided previously in the Substation Section - Tab #20.

"CHGE Response to DPS-061 Supplemental-Attachment F-Breaker Program" provides an update to the circuit breaker replacement program.

"CHGE Response to DPS-061 Supplemental-Attachment G-Breaker Program" provides a basis for prioritization of replacements and justification for linking to other projects as well as pro forma cost estimates for the different types of circuit breaker replacements (i.e. based on voltage class, breaker type).

"CHGE Response to DPS-061 Supplemental-Attachment H-Breaker Program" provides a three year history of circuit breaker replacement cost data.

Freehold Substation:
"CHGE Response to DPS-061 Supplemental-Attachment I-Freehold Substation" provides a preliminary electrical layout for the proposed substation rebuild.

Transformer test cycle / watch list:
Central Hudson's current transformer test cycle for substation power transformers includes doble power factor testing on a 5 year cycle and dissolved gas analysis (DGA) for moisture, combustible gases, interfacial tension etc on an annual basis. "CHGE Response to DPS-061 Supplemental-Attachment J-Transformer Watch List" (provided at the 9/17/2014 meeting) is a copy of our current Transformer Watch List.

Central Hudson Gas & Electric Corporation
Case Nos. 14-E-0318 & 14-G-0319
Response to Interrogatory / Document Request

Montgomery Street Substation:
"CHGE Response to DPS-061 Supplemental-Attachment K-Montgomery Street Substation" (Draft copy provided at the 9/17/2014 meeting) is a copy of the planning recommendation memo for this project as requested.

Rhinebeck Substation:
"CHGE Response to DPS-061 Supplemental-Attachment L-Rhinebeck Substation" is a copy of the Rhinebeck circuit integration study as requested.

"CHGE Response to DPS-061 Supplemental-Attachments M1,M2,M3,& M4-Rhinebeck Substation" includes the One-line diagram prior to the ongoing substation upgrade work (Attachment M1 & M2) and depicting the final configuration (Attachment M3 & M4).

G Line North:
Part 102C timing – Central Hudson's current plans are to submit simultaneously to the PSC and to Town of Lagrange or Town of Pleasant Valley (depending who takes on "Lead Agency" for SEQRA Review) around February 25, 2015.
We will also be pursuing submittal of building permits for Todd Hill Substation Expansion with the current plan is to submit necessary filing with Town of Lagrange in March 2015.

Knapps Corners Substation:
"CHGE Response to DPS-061 Supplemental-Attachments N1 & N2-Knapps Corners Substation" depict the substation one-lines for the following phases: existing and potential final configuration (after completion of the potential G Line East-West project) and following infrastructure rebuild (interim phase), respectively.

There are no incremental costs to the infrastructure project that are being included due to the potential G East-West Project since the 115kV position is required on the ring for the 115/69kV transformer regardless. Further, should the 115kV G Line project not be approved, there would be the incremental cost to install an additional 69kV circuit breaker to support the continued existence of the 69kV G Line.

WH-1 & 2 Line:
Part 102C timing – Central Hudson's current plans are to submit to the Town of Wawarsing and the PSC simultaneously around December 15, 2014.

Central Hudson Gas & Electric Corporation
Case Nos. 14-E-0318 & 14-G-0319
Response to Interrogatory / Document Request

HPR:
The 2015/2016 work plans and past three years historic cost data will be included in response to DPS-4, IR-502.

ROW (Deficiencies):
The data requested (2015/2016 work plans and past three years historic cost data) will be included in response to DPS-4, IR-507.

Please see “CHGE Response to DPS-061 Supplemental-Attachment O-WM Line” for details regarding the property acquisitions for the WM Line Project.

P & MK Lines:
The data requested (detail on the work plans for the P & MK Lines) will be included in response to DPS-4, IR-503.

Sturgeon Pool Substation:
“CHGE Response to DPS-061 Supplemental-Attachment P-Sturgeon Pool Substation” depicts the Sturgeon Pool area system both as the existing and the post-New Sturgeon Substation.

Area load data (copy provided at the 9/17/2014 meeting) as requested is included as “CHGE Response to DPS-061 Supplemental-Attachment Q-Sturgeon Pool Substation”.

LTC:
The LTC program as constituted presently does not have an exact sequence of deployment. At this time, the stations needing upgrades have been identified, and the level of upgrade required has been determined to support fully Distribution Automation. The high-level schedule has been developed such that construction is slightly out in front of the Distribution Automation Roadmap. Preliminary cost estimates to perform the upgrades/installations have been developed, but are subject to refinement as more details become available for each project. Please see “CHGE Response to DPS-061 Supplemental-Attachment R-LTC Program” for the list of stations, the level of work required at each station, the estimated costs, and the proposed schedule.

Category 15:
The data requested (historic spending levels for specific budget line items for Category 15) will be included in response to DPS-4, IR-409.

Central Hudson Gas & Electric Corporation
Case Nos. 14-E-0318 & 14-G-0319
Response to Interrogatory / Document Request

"CHGE Response to DPS-061 Supplemental-Attachment S-Distribution Automation Infrastructure Replacement" includes the data for historic and forward-looking recloser replacements and examples of infrastructure projects completed as a part of the normal budget plan vs those that will be completed via the Distribution Automation Program.

The distribution pole age by decade information was included (page 55) in the Long Range Electric System Plan provided at the 9/17/2014 meeting is included as "CHGE Response to DPS-061 Supplemental-Attachment T-Distribution Automation Infrastructure Replacement."

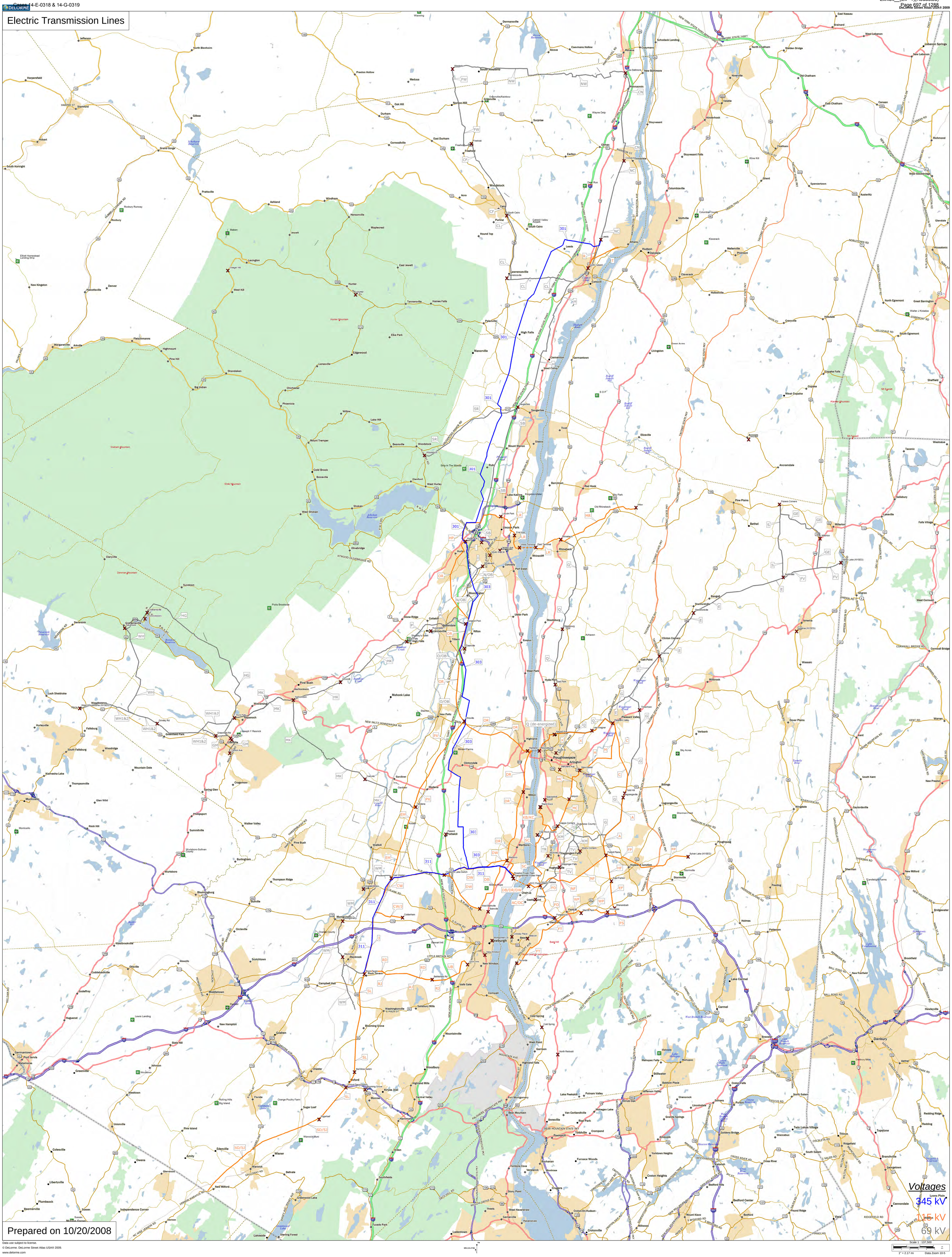
Category 14:
A summary of the methodology used for the development of the Category 14 New Business budget that was provided at the 9/17/2014 meeting is included as "CHGE Response to DPS-061 Supplemental-Attachment U-Category 14 Key Assumptions Summary Sheet."

Additional Note:
The updated Todd Hill 115/69 kV Transformer sheet that was provided at the 9/17/2014 meeting should replace the existing sheet in the Substation Section – Tab 23.

Response by: Paul Haering
Title: Vice-President – Engineering & System Operations
Date of Response: September 24, 2014

DeLorme Street Atlas USA® 2009

Electric Transmission Lines


Jefferson
North Blenheim
Harpersfield
Stamford
Gilboa
Hobart
Grand Gorge
South Kortright
Schoharie Reservoir
Preston Hollow
Medusa
Oak Hill
Durham
Cornwallville
East Durham
Freehold
Greenville
Norton Hill
South Westerlo
Westerlo
Alcove Reservoir
Alcove
Coeymans Hollow
Dormansville
Ravena
Coeymans
Schodack Landing
New Baltimore
Hannacroix
Surprise
Wayne Delp
Earlton
Climax
Stuyvesant
Stuyvesant Falls
Kinderhook
Valatie
Nivervile
North Chatham
Malden Bridge
Old Chatham
East Chatham
Canaan
Richmond
West Stockbridge
Chatham
Kline Kill
Ghent
Columbiaville
Spencertown
Austerlitz
Glendale
Housatonic
Woodstock
Acra
Cairo
South Cairo
Catskill Valley Airpark
Purling
Round Top
Windham
Ashland
Prattsville
Roxbury Runway
Roxbury
Hensonville
Maplecrest
Maben
Jewett
East Jewett
Lexington
Vinegar Hill
Hunter
West Kill
Tannersville
Haines Falls
Elliott Homestead Landing Strip
New Kingston
Halcottsville
Denver
Lawrenceville
Leeds
Athens
Hudson
Oakdale
Catskill
Claverack
Mellenville
Philmont
Kleverack
Columbia County
Stottville
Hollowville
Great Barrington
North Egremont
Walter J Koladza
Crarryville
Hillsdale
South Egremont
Palenville
High Falls
Manorville
Elka Park
Hunter Mountain
Margaretville
Arkville
Fleischmanns
Highmount
Pine Hill
Shandaken
Big Indian
Chichester
Phoenicia
Lanesville
Edgewood
Cementon
West Camp
Germantown
Livingston
Green Acres
Copake Falls
Copake
West Copake
Sheffield
Mt Everett
Alander Mountain
Mt Fussell
Weatogue
Taconic
Ancramdale
Elizaville
Accram Lake
Tivoli
Saugerties
Glasco
Mount Marion
Willow
Lake Hill
Mount Tremper
Bearsville
Woodstock
Graham Mountain
Slide Mountain
Cold Brook
Bolceville
Glenford
West Hurley
Ruby
Ship In The Woods
Barrytown
Red Hook
Lake Katrine
Kingston-Ulster
Old Rhinebeck
Rhinebeck
Rhinecliff
Lincoln Park
Milton
Pine Plains
Bethel
Millerton
Lakeville
Falls Village
Salisbury
Sundown
Clarryville
Denman Mountain
Olivebridge
West Shokan
Ashokan Reservoir
Hurley
Connelly
Port Ewen
Bloomington
Stone Ridge
Cottekill
Rosendale
Lawrenceville
Shawangunk Kill
Rifton
Tillson
Clashville
Esopus
Ulster Park
Staatsburg
Arhaven
Hyde Park
East Park
West Park
Mohonk Lake
Stanton
New Paltz
Modena
Gardiner
Clintondale
Highland
Poughkeepsie
Arlington
Manchester
Milton
Marlboro
Wallkill
Platekill
Chelsea
Fishkill
Merritt Park
Wiccopee
Glenham
Forgebrook
Hopewell Junction
Pleasant Valley
Tinkertown
Van Wagner
Wappinger Falls
Myers Corners
Sylvan Lake (NYSEG)
Stormville
Pawling
Sharon
West Cornwall
Amenia
Amenia (NYSEG)
Wassaic
Millbrook
Dover Plains
Verbank
Sky Acres
Kent
Warren
Bangall
Stanfordville
Clinton Corners
Salt Point
Pine Bush
Kerhonkson
Wawarsing
Napanoch
Ellenville
Loch Sheldrake
Woodbourne
West Woodbourne (NYSEG)
Hurleyville
Fallsburg
South Fallsburg
Woodridge
Greenfield Park
Joseph Y Resnick
Mohonk Lake
Lake Minnewaska
Lake Peekskill
Putnam Valley
Shrub Oak
Jefferson Valley
Mahopac
Mahopac Falls
Stillwater
Baldwin Place
Croton Falls
North Salem
Somers
Lincolndale
Purdys
Titicus
Twin Lakes Village
Goldens Bridge
Waccabuc
Ridgefield
Redding Ridge
Redding
Topstone
South Kent
New Preston
Branchville
Georgetown
Gaylordsville
Cross River
South Salem
Lagrangeville
Billings
Sherman Field
Wingdale
Bedford Hills
Bedford Center
Bedford
Pound Ridge
Vista
Cannondale
Lyons Plain
Wilton
Danbury
Danbury Mnte
Brewster
Lake Peaksill
Putnam Valley
Van Cortlandville
Annsville
Roa Park
Crompond
Peekskill
Toddville
Buchanan
Furnace Woods
Tomkins Cove
Verplanck
Montrose
Crugers
Croton-On-Hudson
Croton Heights
Yorktown Heights
Amawalk
Granite Springs
Shenorock

Expedite the completion of its substation risk mitigation study. (Moreland Commission)

Central Hudson performed a substation risk mitigation study based on both a review of substations within the 100 year flood zone within our service territory and the recent storm events including Tropical Storm Sandy. The 100 year flood review identified the following substations within the potential flood zone: Converse Street, Neversink, Sturgeon Pool, Forgebrook, the HR/DR 115kV transmission cable river crossing terminal (east side terminal) and the LR 115kV transmission cable river crossing terminal (west side terminal). Based on our experiences during Tropical Storm Sandy, the following substations were identified as potential risks due to tidal/coastal flooding: Danskammer switchyard, LR river crossing terminal (west side terminal) and the HR/DR river crossing terminal (east side terminal). Of all the sites identified, the Converse Street, Neversink, Sturgeon Pool and Forgebrook facilities are classified as "non-critical" on the CHGE Critical Infrastructure Facilities List. This list was developed based on the TSA December 2010 Pipeline Security Guidelines. In addition, no flooding has ever been experienced at the Converse Street, Neversink or Forgebrook Substations. A planned Sturgeon Pool Substation rebuild project will remove the existing distribution assets from the flood zone. The Danskammer Switchyard is identified as critical on the CHGE Critical Infrastructure Facilities List. Short term plans have been developed to de-energize the switchyard if severe flooding is eminent. Longer term plans to mitigate the effects of tidal flooding at the Danskammer Switchyard include a budget project which encompasses a more permanent solution (see below).

All three river crossing cables (LR, DR and HR) are non-critical, and the loss of the cables would not limit our overall load serving capacity. However, budget projects have been developed to mitigate the effects of severe coastal flooding by either raising the critical equipment or berming these locations.

Incorporate the conclusions of its storm hardening study into its future designs and capital plans. (Moreland Commission)

Central Hudson has incorporated storm hardening practices in design and capital plans for a number of years. The attached document outlines Central Hudson's current storm hardening practices.

Take immediate steps to harden its infrastructure against the effects of severe flooding, including the potential relocation of substations away from forecasted flood zones. (Moreland Commission)

As noted, Central Hudson's 115kV Danskammer Substation, located in the Town of Newburgh along the Hudson River, experienced flooding during Super Storm Sandy due to tidal surge. A review of the station loading and potential risk of de-energizing the switchyard in the event of predicated flooding similar to during storm Sandy was completed. Based on this review, if the threat of flooding above a pre-determined threshold (above the lower terminal blocks within the control house), the station will be de-energized until the threat subsides or any damage is addressed/mitigated. This will have no impact on Central Hudson's ability to serve customers.

In order to mitigate the risk of future flooding, it is estimated that critical equipment will need to be raised 24"-36" above its current elevation. The current plan includes installing an elevated Power Control Center (PCC) 3 feet above grade. The PCC will house new relay and control equipment for the substation. New cabling to the yard devices with a new trench system and an overhead cable tray into the PCC will be included. This work will be incorporated as a budget project to be completed in the 2015-2016 timeframe.

Plans to address the two 115kV cable transition stations within the flood prone areas along the Hudson River that were affected by Super Storm Sandy are also being developed. The plans will evaluate the installation of more permanent berms in these locations or the feasibility of raising sensitive equipment above the flood level. This work will be incorporated as budget projects to be completed in the 2014-2015 timeframe.

Danskammer Storm Hardening Project

- Sandy storm surge 40” above existing grade, 20” above control house floor.
- Existing station is about 65 years old.

Project scope:

1. Installing a new, elevated control house
2. Replacing aged oil-filled breakers with SF6 gas breakers
3. Raising elevation of yard stone
4. Installing cable trench
5. Upgrading protection & controls





Danskammer Storm Hardening Project

Project Cost Estimate

(High Level Budgetary Cost, in $1k)

Scope Item	Design	Construction Material	Construction Labor	Construction Total	Total
Control House	170	1,800	360	2,160	2,330
Breakers	110	720	360	1,080	1,190
Raising grade	20	100	150	250	270
Cable Trench, Foundations	60	490	180	670	730
Protection & Controls	100	290	250	540	640
Miscellaneous	40	210	110	320	360
Total	500	3,610	1,410	5,020	5,520

Danskammer Storm Hardening Project

Projected Expenditure by Year

(High Level Budgetary Cost, in $1k)

2014	2015	2016	Total
100	3,870	1,550	5,520





DANSKAMMER STORM HARDENING PROJECT
PROPOSED CONTROL HOUSE LOCATION
CONCEPTUAL PLAN: NORTH END OF STATION SHOWN

EXISTING OIL FILLED BREAKER TO BE REPLACED WITH SF6 GAS BREAKERS ON ELEVATED SUPPORTS (TYP. 5 LOCATIONS TOTAL)

PULLBOX, USED FOR CABLE TRENCH TRANSITIONS

PRECAST CONCRETE CABLE TRENCH TO SPAN ENTIRE SUBSTATION.

EXISTING CONTROL HOUSE TO REMAIN.

NEW CONTROL HOUSE, ELEVATED 5' ABOVE GRADE. SIZE TBD.

PLAN SECTION F-F

Cases 14-E-0318 & 14-G-0319

Exhibit__(EIP-1)(Redacted)
Page 703 of 1288

Copy to: Mr. P. E. Haering
Mr. J. J. McCloskey
Mr. E. A. Loeven
Mr. J. M. May
E. P. #2013-019

October 15, 2013

Mr. H. W. Turner:

System Load Serving Capability for Cable Outage Scenarios

Introduction

Due to the high water from Super Storm Sandy, Dynergy's Danskammer Plant was flooded; Dynergy subsequently notified the New York State Department of Public Service of their intent to retire the plant. A study was undertaken to examine if opening some or all of the 5 underwater cables, including AC, DC, DR, HR and ER, would result in higher system load serving capability.

System Load Serving Capability

With zero Danskammer generation, system load serving capability was examined for the conditions shown in the following table.

Pre-contingency Condition	Load Serving Capability (MW)	Limit	Contingency
Normal System	1313	HF Line	EF Line
AC, DC, DR, ER, HR Lines Out (Attachment 1)	1063	HF Line	EF Line
AC, DC, DR, ER, HR Lines Out; E. Fishkill Trans 2 In.	878	HF Line	EF Line
AC, DC, DR Lines Out	997	C Line	M Line
DR and HR Lines Out	1256	HF Line	EF Line

Table 1.

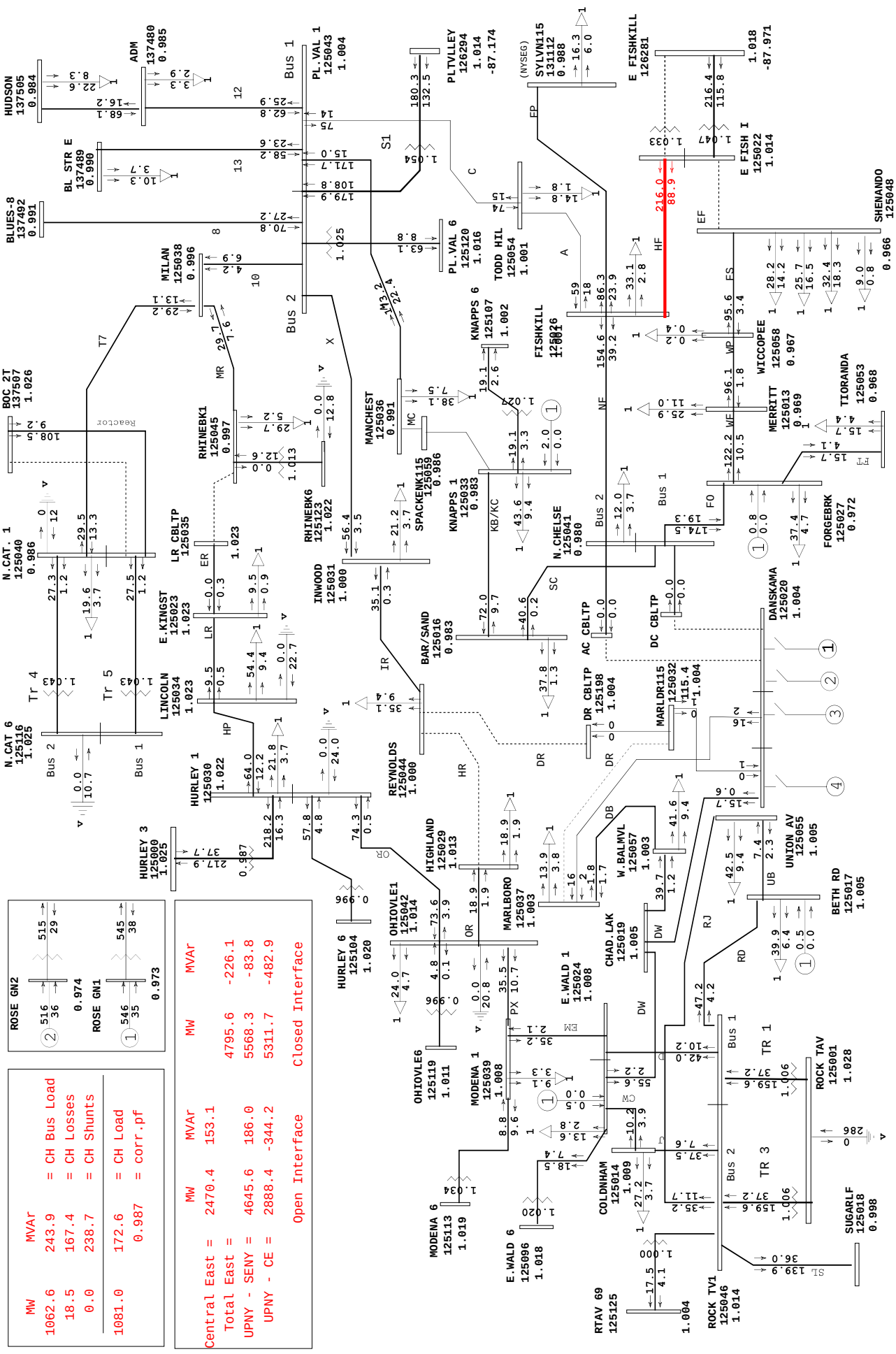
Table 1 shows that the thermal system load serving capability for each cable open scenario studied is lower than that under normal system conditions. Since no scenario showed an improvement in load serving capability, voltage analysis was not performed.

Conclusion

Opening some or all of the underwater cables will not result in higher system load serving capability.

Bryan Kang

Attachment


HUDSON 137505 0.984
ADM 137480 0.985
BL STR E 137489 0.990
BLUES-8 137492 0.991
MILAN 125038 0.996
BOC 2T 137507 1.026
N.CAT. 1 125040 0.986
N.CAT 6 125116 1.025
HURLEY 3 125000 1.025
HURLEY 1 125030 1.022
LINCOLN 125034 1.023
E.KINGST 125023 1.023
LR CBLTP 125035
RHINEBK1 125045 0.997
RHINEBK6 125123 1.022
INWOOD 125031 1.000
REYNOLDS 125044 1.000
HURLEY 6 125104 1.020
OHIOVLE1 125042 1.014
OHIOVLE6 125119 1.011
MODENA 1 125039 1.008
MODENA 6 125113 1.019
E.WALD 6 125096 1.018
E.WALD 1 125024 1.008
COLDNHAM 125014 1.009
RTAV 69 125125
ROCK TV1 125046 1.014
SUGARLF 125018 0.998
ROCK TAV 125001 1.028
MARLBORO 125037 1.003
HIGHLAND 125029 1.013
BAR/SAND 125016 0.983
MANCHEST 125036 0.991
SPACKENK115 125059 0.986
KNAPPS 1 125033 0.983
KNAPPS 6 125107 1.002
PL_VAL 1 125043 1.004
PL_VAL 6 125120 1.016
TODD HIL 125054 1.001
PLTVLLEY 126294 1.014 -87.174
SYLVN115 131112 0.988
FISHKILL 125026 1.001
N.CHELSE 125041 0.980
AC CBLTP
DC CBLTP
DR CBLTP 125198 1.004
MARLDR115 125032 115.4 1.004
DANSKAMA 125020 1.004
FORGEBRK 125027 0.972
MERRITT 125013 0.969
WICCOPEE 125058 0.967
TIORANDA 125053 0.968
E FISHKILL 126281 1.018 -87.971
E FISH I 125022 1.014
SHENANDO 125048 0.966
W.BALMVL 125057 1.003
CHAD LAK 125019 1.005
UNION AV 125055 1.005
BETH RD 125017 1.005
ROSE GN2
ROSE GN1
0.974
0.973
Bus 1
Bus 2
TR 1
TR 3
Tr 4
Tr 5
T7
Reactor
Central East = 2470.4 153.1 4795.6 -226.1
Total East = 5568.3 -83.8
UPNY - SENY = 4645.6 186.0 5311.7 -482.9
UPNY - CE = 2888.4 -344.2 Closed Interface
MW MVAr = CH Bus Load
1062.6 243.9 = CH Losses
18.5 167.4 = CH Shunts
0.0 238.7 = CH Load
1081.0 172.6 = corr.pf
0.987

Breaker Replacement Program - 2015

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
MANCHESTER	115 kV	MC-1554-M	GENERAL ELECTRIC	OilBreaker	1952	50%	FK-439-115-3500-1
NORTH CHELSEA	115 kV	SC-1566	ALLIS CHALMERS	Oil Breaker	1972	62%	BZO-115-10000
HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	OilBreaker	1952	46%	FZO-151-69F
HONK FALLS	69 kV	GM-737	GENERAL ELECTRIC	OilBreaker	1963	39%	FK-69-2500-5
HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	OilBreaker	1953	49%	FZO-151-69F
EAST PARK	15 kV	CKT 6073	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	28%	KS-500-12-B
EAST PARK	15 kV	TD-6074	SIEMENS	OilBreaker	1971	29%	SDO-15-500
EAST PARK	15 kV	TD-6075	SIEMENS	OilBreaker	1984	29%	SDO-15-500
BOULEVARD	15 kV	CKT 1014	WESTINGHOUSE	RecloserOil		68%	ESM
OHIOVILLE	15 kV	CKT 5021	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	33%	KS-500-12-B
OHIOVILLE	15 kV	CKT 5022	GENERAL ELECTRIC	OilBreaker	1966	32%	FKD-15.5-18000-4
OHIOVILLE	15 kV	CKT 5023	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	33%	KS-500-12-B
OHIOVILLE	15 kV	CKT 5024	ALLIS CHALMERS	OilBreaker	1972	32%	SDO-15-500
OHIOVILLE	15 kV	W-1537	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	31%	KS-500-12-B
OHIOVILLE	15 kV	W-1600	GENERAL ELECTRIC	OilBreaker	1966	31%	FKD-15.5-18000-4
OHIOVILLE	15 kV	W-1602	GENERAL ELECTRIC	OilBreaker	1966	32%	FKD-15.5-18000-4
HONK FALLS	15 kV	TD-3071	COOPER	OilRecloser	1998	0%	WE
HONK FALLS	15 kV	TD-3072	COOPER	OilRecloser	1998	0%	WE

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Breaker Replacement Program - 2016

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age Priority)	(Breaker Duty)	model
DANSKAMMER	115 kV	AC-1051	ALLIS CHALMERS	OilBreaker	1964	91%	BZO-115-7500
DANSKAMMER	115 kV	DC-1411	ALLIS CHALMERS	OilBreaker	1965	91%	BZO-115-7500
DANSKAMMER	115 kV	DR-1421	ALLIS CHALMERS	OilBreaker	1966	87%	BZO-115-7500
DANSKAMMER	115 kV	DC-1061	ALLIS CHALMERS	OilBreaker	1967	90%	BZO-115-7500
DANSKAMMER	115 kV	W-1424	GENERAL ELECTRIC	OilBreaker	1958	90%	FK-439-115-5000-5
FORGEBROOK	115 kV	FT-882-WF	GENERAL ELECTRIC	OilBreaker	1968	74%	FK-439-115-5000-1
HURLEY AVENUE	69 kV	SB-233	GENERAL ELECTRIC	Oil Breaker	1963	58%	FK-69-2500-5
HURLEY AVENUE	69 kV	I-442	GENERAL ELECTRIC	OilBreaker	1963	53%	FK-69-2500-5
HURLEY AVENUE	69 kV	W-142	GENERAL ELECTRIC	OilBreaker	1963	40%	FK-69-2500-6
FORGEBROOK	15 kV	TD-8011	WESTINGHOUSE	Air Breaker	1961	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8012	WESTINGHOUSE	Air Breaker	1965	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8013	WESTINGHOUSE	Air Breaker	1969	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8014	WESTINGHOUSE	Air Breaker	1959	77%	150-DH-500A
FORGEBROOK	15 kV	TD-8015	WESTINGHOUSE	Air Breaker	1959	77%	150-DH-500A
FORGEBROOK	15 kV	TD-8016	WESTINGHOUSE	AirBreaker	1989	77%	150-DH-500
FORGEBROOK	15 kV	W-1486	WESTINGHOUSE	AirBreaker	1973	74%	150-DH-500A
FORGEBROOK	15 kV	CM-1488	WESTINGHOUSE	Air Breaker	1959	72%	150-DH-500A
FORGEBROOK	15 kV	BF-1489	WESTINGHOUSE	Air Breaker	1959	56%	150-DH-500A
FORGEBROOK	15 kV	W-1527	WESTINGHOUSE	Air Breaker	1959	56%	150-DH-500A
FORGEBROOK	15 kV	W-994	WESTINGHOUSE	AirBreaker	1989	57%	150-DH-500
MANCHESTER	15 kV	TD-6091	WESTINGHOUSE	Air Breaker	1960	56%	150-DH-500E
MANCHESTER	15 kV	TD-6092	WESTINGHOUSE	Air Breaker	1960	56%	150-DH-500E
MANCHESTER	15 kV	TD-6093	WESTINGHOUSE	Air Breaker	1964	56%	150-DH-500E
MANCHESTER	15 kV	TD-6094	WESTINGHOUSE	AirBreaker	1968	56%	150-DH-500E
MANCHESTER	15 kV	TD-6095	WESTINGHOUSE	AirBreaker	1979	56%	150-DH-500E
MANCHESTER	15 kV	TD-6096	WESTINGHOUSE	AirBreaker	1982	56%	150-DH-500E
MANCHESTER	15 kV	TD-6097	WESTINGHOUSE	AirBreaker	1982	56%	150-DH-500E
MANCHESTER	15 kV	MS-1457	WESTINGHOUSE	Air Breaker	1960	52%	150-DH-500E
MANCHESTER	15 kV	W-648	WESTINGHOUSE	AirBreaker	1968	52%	150-DH-500E
MANCHESTER	15 kV	W-650	WESTINGHOUSE	AirBreaker	1968	51%	150-DH-500E
MANCHESTER	15 kV	W-1458	WESTINGHOUSE	AirBreaker	1980	52%	150-DH-500E
UNION AVENUE	15 kV	TD-4041	WESTINGHOUSE	Air Breaker	1964	89%	150-DH-500E
UNION AVENUE	15 kV	TD-4042	WESTINGHOUSE	Air Breaker	1956	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4043	WESTINGHOUSE	Air Breaker	1957	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4044	WESTINGHOUSE	Air Breaker	1969	89%	150-DH-500E
UNION AVENUE	15 kV	TD-4045	WESTINGHOUSE	Air Breaker	1956	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4046	WESTINGHOUSE	Air Breaker	1958	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4049	WESTINGHOUSE	AirBreaker	1967	89%	150-DH-500E
UNION AVENUE	15 kV	UN-594	WESTINGHOUSE	Air Breaker	1957	94%	150-DH-250A
UNION AVENUE	15 kV	UW-1494	WESTINGHOUSE	Air Breaker	1958	94%	150-DH-500A
UNION AVENUE	15 kV	W-1095	WESTINGHOUSE	Air Breaker	1961	41%	150-DH-500E
UNION AVENUE	15 kV	W-1105	WESTINGHOUSE	AirBreaker	1961	41%	150-DH-500E
UNION AVENUE	15 kV	W-837	WESTINGHOUSE	AirBreaker	1964	45%	150-DH-500E

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Breaker Replacement Program - 2017

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
ROCK TAVERN	115 kV	W-681	GENERAL ELECTRIC	Oil Breaker	1971	19%	FK-121-43000-2
ROCK TAVERN	115 kV	W-814	GENERAL ELECTRIC	Oil Breaker	1971	37%	FK-121-43000-3
ROCK TAVERN	115 kV	RD-809	ALLIS CHALMERS	OilBreaker	1971	47%	BZO-115-10000
ROCK TAVERN	115 kV	RJ-818	ALLIS CHALMERS	OilBreaker	1971	47%	BZO-115-10000
ROCK TAVERN	115 kV	D-448	ALLIS CHALMERS	OilBreaker	1971	43%	BZO-115-10000
ROCK TAVERN	115 kV	SL-684	ALLIS CHALMERS	OilBreaker	1971	39%	BZO-115-10000
ROCK TAVERN	115 kV	J-788	ALLIS CHALMERS	OilBreaker	1971	38%	BZO-115-10000
ROCK TAVERN	69 kV	WM-1675	GENERAL ELECTRIC	Oil Breaker	1964	23%	FK-69-2500-6
FISHKILL PLAINS	15 kV	TD-8091	WESTINGHOUSE	AirBreaker	1963	73%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8092	WESTINGHOUSE	AirBreaker	1963	71%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8093	WESTINGHOUSE	AirBreaker	1963	73%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8094	WESTINGHOUSE	AirBreaker	1963	74%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8095	CUTLER-HAMMER	VacBreaker	1963	42%	150-DH-VR-500
FISHKILL PLAINS	15 kV	TD-8096	CUTLER-HAMMER	VacBreaker	1963	42%	150-DH-VR-500
FISHKILL PLAINS	15 kV	W-975	WESTINGHOUSE	AirBreaker	1963	34%	150-DH-500E
FISHKILL PLAINS	15 kV	W-976	WESTINGHOUSE	AirBreaker	1963	34%	150-DH-500E
FISHKILL PLAINS	15 kV	W-1000	WESTINGHOUSE	AirBreaker	1963	32%	150-DH-500E
HURLEY AVENUE	15 kV	CKT 2091	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2092	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2093	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2094	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	W-1575	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	29%	15HK-500
HURLEY AVENUE	15 kV	W-252	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	44%	15HK-500
WOODSTOCK	15 kV	TD-3011	ALLIS CHALMERS	AirBreaker	1972	23%	FC-500A
WOODSTOCK	15 kV	TD-3012	GENERAL ELECTRIC	AirBreaker	1947	46%	AM-15-250-1
WOODSTOCK	15 kV	TD-3013	GENERAL ELECTRIC	AirBreaker	1947	46%	AM-15-250-1
WOODSTOCK	15 kV	TD-3014	ALLIS CHALMERS	AirBreaker	1972	26%	FC-500A
WOODSTOCK	15 kV	W-1091	GENERAL ELECTRIC	AirBreaker	1947	44%	AM-15-250
WOODSTOCK	15 kV	W-1059	ALLIS CHALMERS	AirBreaker	1972	22%	FC-500A
WOODSTOCK	15 kV	W-25	GENERAL ELECTRIC	AirBreaker	2001	49%	AM-15-250-1

New PCC to be installed to replace all 15kV breakers.

Breaker Replacement Program - 2018

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
HURLEY AVENUE	345kV	30151	WESTINGHOUSE	SF6Breaker	1976	37%	362-SFA-40
HURLEY AVENUE	345kV	30353	WESTINGHOUSE	SF6Breaker	1976	24%	362-SFA-40
NORTH CHELSEA	115 kV	AC-1086	PENNSYLVANIA TRAN	Oil Breaker	1968	57%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	B-2651	GENERAL ELECTRIC	Oil Breaker	1964	63%	FK-115-10000
NORTH CHELSEA	115 kV	B-2652	PENNSYLVANIA TRAN	Oil Breaker	1968	63%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	B-2653	PENNSYLVANIA TRAN	Oil Breaker	1968	63%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	DC-1414	PENNSYLVANIA TRAN	Oil Breaker	1968	57%	AHJ-54-115-10000
WEST BALMVILLE	115 kV	DW- 662	ALLIS CHALMERS	OilBreaker	1965	30%	BZO-115-7500
UNION AVENUE	115 kV	RJ 52	GENERAL ELECTRIC	OilBreaker	1952	40%	FK-439-115-3500-3
MONTGOMERY ST	15 kV	NM-384	WESTINGHOUSE	Air Breaker	1958	45%	150-DH-500A
MONTGOMERY ST	15 kV	NB-385	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4001	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4002	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4003	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-507	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-508	WESTINGHOUSE	AirBreaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-509	WESTINGHOUSE	AirBreaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	R-350	WESTINGHOUSE	Air Breaker	1958	58%	150-DH-500A
MONTGOMERY ST	15 kV	F-351	WESTINGHOUSE	Air Breaker	1958	58%	150-DH-500A
MONTGOMERY ST	15 kV	B-352	WESTINGHOUSE	Air Breaker	1958	60%	150-DH-500A
MONTGOMERY ST	15 kV	W-359	WESTINGHOUSE	Air Breaker	1958	60%	150-DH-500A
MONTGOMERY ST	15 kV	WN-486	WESTINGHOUSE	Air Breaker	1958	61%	150-DH-500A
MONTGOMERY ST	15 kV	W-489	WESTINGHOUSE	Air Breaker	1958	49%	150-DH-500A

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Breaker Replacement Program - 2019

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
HURLEY AVENUE	345kV	30354	WESTINGHOUSE	SF6Breaker	1976	37%	362-SFA-40
PLEASANT VALLEY	115 kV	RX-4	ALLIS CHALMERS	OilBreaker	1968	53%	BZO-115-10000-2
PLEASANT VALLEY	115 kV	R-81	ALLIS CHALMERS	OilBreaker	1968	43%	BZO-115-10000-2
PLEASANT VALLEY	115 kV	PVL-R-10	ALLIS CHALMERS	OilBreaker	1980	63%	BZO
PLEASANT VALLEY	115 kV	PVL-R-61	MCGRAW EDISON	OilBreaker	1973	35%	OHT-54
PLEASANT VALLEY	115 kV	PVL-R-62	ALLIS CHALMERS	OilBreaker	1980	45%	BZO
HURLEY AVENUE	115 kV	HP-1643	ALLIS CHALMERS	OilBreaker	1969	29%	RXE
HURLEY AVENUE	115 kV	W-389	ALLIS CHALMERS	OilBreaker	1973	28%	FK-143
HURLEY AVENUE	115 kV	OR-1640	ALLIS CHALMERS	OilBreaker	1969	25%	BZO-121-50-6
HURLEY AVENUE	115 kV	A-2451	ALLIS CHALMERS	OilBreaker	1973	21%	BZO-121-40-3PST
SAND DOCK	15 kV	BP-1296	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-902	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-909	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-910	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	W-116	WESTINGHOUSE	VacBreaker	1973	75%	150-VCP-W-750
SAND DOCK	15 kV	BP-1570	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	GB-1468	WESTINGHOUSE	VacBreaker	1986	28%	150-VCP-500
SAND DOCK	15 kV	SH-886	WESTINGHOUSE	VacBreaker	1983	50%	150-DVP-750
SAND DOCK	15 kV	SH-911	WESTINGHOUSE	VacBreaker	1983	50%	150-DVP-750
SAND DOCK	15 kV	TD-6011	WESTINGHOUSE	VacBreaker	1986	41%	150-VCP-500
SAND DOCK	15 kV	W-1449	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-1453	WESTINGHOUSE	AirBreaker	1973	42%	150-DHP-500
SAND DOCK	15 kV	W-1467	WESTINGHOUSE	VacBreaker	1986	29%	150-VCP-500
SAND DOCK	15 kV	W-1568	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-1573	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-857	MCGRAW EDISON	OilBreaker	1984	41%	Rmag
COXSACKIE	15 kV	TD-1071	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1072	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1076	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1074A	GENERAL ELECTRIC	AirBreaker	1969	67%	AM-13.8-500-6H
COXSACKIE	15 kV	W-1398	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-296	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-484	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-51	ITE CIRCUIT BREAKER	AirBreaker	1972	42%	15HK-500

Revised May 2014

Central Hudson Gas & Electric

Electric Circuit Breaker Replacement Program

2015-2019

Overview

Central Hudson's electric power system consists of transmission lines, substations, and distribution lines. These lines, as well as the substation equipment, are protected by relays and power circuit breakers. Power circuit breakers are critical parts of the electric system. Many of the existing power circuit breakers on the Central Hudson electric system have been in service for over forty years now; some of the breakers have exceeded their duty limits, while others no longer have spare parts for maintenance. These breakers need to be replaced with new power circuit breakers to keep the Central Hudson electric system functioning properly. Central Hudson has developed an Electric Circuit Breaker Replacement Program to address these issues.

Selection Criteria

The selection of these breakers for the replacement program is prioritized as follows:

Breaker Duty: All power circuit breakers within three percent of their rating have been selected with highest priority given to breakers exceeding 100% of their duty rating.

Condition: The power circuit breakers recommended by Operation Services are selected second. These recommendations are based upon reports of failures or poor testing results.

Obsolescence: Several of the circuit breakers on our system employ outdated technology specifically relating to interrupter design. Other breakers suffer from extended service lives as well as the inability to obtain parts for maintenance.

Other Factors: Other power circuit breakers on the Breaker Replacement Program List meet the above criteria however, they have not been selected for this replacement program because they will be replaced with new breakers as part of new substation construction projects or major substation rebuilds. Examples include circuit breakers at the Saugerties, Knapps Corners, and Rhinebeck substations.

As a result of these selection criteria, the following types of circuit breakers have been identified as candidates for the replacement program:

345kV – General Electric Type ATB

Merlin Gerin Type FA2-R

COMPLETED REPLACEMENT OF THESE BREAKERS

115kV – General Electric Type FK

69kV – Allis Chalmers Type FZO

Westinghouse Type GO

15kV- General Electric Type AM

General Electric Type FK

Westinghouse Type 150-DH

Allis Chalmers Type SDO

Program Maintenance: It is envisioned that this program will represent a living process. The breakers selected at the present time represent equipment that we feel, given the current information and conditions, will require replacement. Should system conditions change, failures occur or testing results indicate problems with specific types of breakers, additional breakers may need to be added to the program and/or the order of replacements may need to be modified.

Breaker Replacement Program
Proforma Estimated Costs

	2011 Estimate	2014 Estimate
345 kV	$700,000	$750,000
115 kV	$230,000	$220,000
69 kV	$230,000	$200,000
15kV (freestanding)	$100,000	$112,000
15 kV (roll in replacement)	$36,000	$26,000

The 345kV Breaker estimate has been updated based on actual replacement costs for 345kV breakers replaced at Rock Tavern in 2012 and 2013. Construction manhours for the proforma estimate have been reduced.
The 115kV Breaker estimate has been updated to reflect the information in the most recent memo on the topic; "115kV Circuit Breaker Replacement Proforma Estimate" by Marvyn James on May 4th, 2011.
The 69 kV Breaker estimates have also been adjusted to reflect recent projects.
The 15kV Breaker estimate for freestanding breakers have been increased slightly to match recent project data.
The 15kV Breaker estimate for roll-in breakers have been decreased slightly to match recent project data. Also, these projects include numerous breakers. So, those cost savings are imbedded in the Proforma.

Some of the breaker replacement projects from previous lists have been advanced and some have been deferred due to other emergent work, as well as revised condition assessments, priorities, and scheduling availability. Examples can be seen below.

Action	Description
DEFERRED	The Lincoln Park 15 kV breaker replacements were originally scheduled for 2013 however, they were deferred to 2014 and are currently in progress. Breaker TD-2012 was added to the project to coincide with the current work.
DEFERRED	Bethlehem Road 15 kV breaker replacements were deferred from 2013 and are currently in progress. Breaker TD-4093 was added to coincide with the current work.
DEFERRED	All Beacon breakers were removed from the BRP due to the substation's retirement.
DEFERRED	Knapps Corner breakers were removed from the BRP due to the plans to build a new station scheduled for 2017 in service.
DEFERRED	Ohioville breaker OR-1075 was deferred from 2013 to 2014 and 115 kV breaker PX-1659 was added due to operational concerns.
DEFERRED	Rhinebeck Substation breakers W-258 and Q-1471 were deferred from 2013 to coincide with a substation upgrade project scheduled for 2015.
DEFERRED	Ohioville Substation 15 kV breakers were deferred from 2014 to 2015 due to construction constraints.
DEFERRED	Balmville Substation (3) 15 kV breaker replacements were removed from the BRP due to the substation's retirement
ADVANCED	Myers Corners Substation (12) 15 kV breakers advanced to 2012.

Location (Substaion)	Class (kV)	# of Breakers Replaced	Position (Device ID)	In Service Date	Work Order	Pro-Forma Cost	Book Total Work Order: A	Book Total Work Order: R	Cost per Breaker	Notes
Milan	115 kV	2	RT-7 & R-10	06/01/2014	0677-E	$220,000.00	$327,731	$38,690	$183,211	
FISHKILL PLAINS	115 kV	1	A-1498	06/01/2014	7519-D	$220,000.00	$67,283	$0	$67,283	
EAST WALDEN	15 kV	1	EWD-CKT 5042	04/12/2014	8621-D		$81,440	$4,077	$85,517	
REYNOLDS HILL	115 kV	3	DR-1418, IR-1143, & W	04/02/2014	8630-D	$220,000.00	$578,597	$70,442	$216,346	
PULVERS CORNERS	15 kV	2	7091 & 7092	08/02/2013	6982AR		$248,390	$8,709	$128,550	Replaced with Vipers EACH HAS 3 PHASES
DANSKAMMER	115 kV	1	DB-1171	06/27/2013	0428AR	$220,000.00	$121,414	$13,133	$134,547	
STANFORDVILLE	15 kV	2	CKT 7072 & CKT 7071	06/20/2013	6985AR		$166,638	-$7,543	$79,548	Replaced with Vipers EACH HAS 3 PHASES
ROCK TAVERN 345 kV	345 kV	2	4255 & 31154	05/02/2013	7706AR	$750,000.00	$1,347,299	$169,657	$758,478	
OHIOVILLE	69 kV	2	OB-1244 & O-1078	02/26/2013	7018A	$200,000.00	$223,766	$15,690	$119,728	
NORTH CHELSEA	115 kV	1	W-1572	02/07/2013	6747AR	$220,000.00	$133,470	$32,677	$166,147	
WEST BALMVILLE	115 kV	1	WBA-MW-421	01/01/2013	6005-D	$200,000.00	$172,664	$7,518	$180,182	
MYERS CORNERS	15 kV	11	multiple Roll-ins	12/18/2012	7078AR	$36,000.00	$212,150	$68,025	$25,470	
EAST WALDEN	15 kV	1	CKT 5041	07/28/2012	8429A/R	$36,000.00	$22,483	$0	$22,483	
DANSKAMMER	115 kV	1	W-1224	05/24/2012	7849AR	$220,000.00	$123,753	$24,757	$148,510	
ROCK TAVERN 345 kV	345 kV	2	37751 & 31153	05/02/2012	5645AR	$750,000.00	$1,194,120	$135,400	$664,760	

Total Cost 2014 to Date	$1,168,260
Total Cost 2013	$2,653,482
Total Cost 2012	$1,780,688

Exhibit__(EIP-1)(Redacted)
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BRUNING 12259

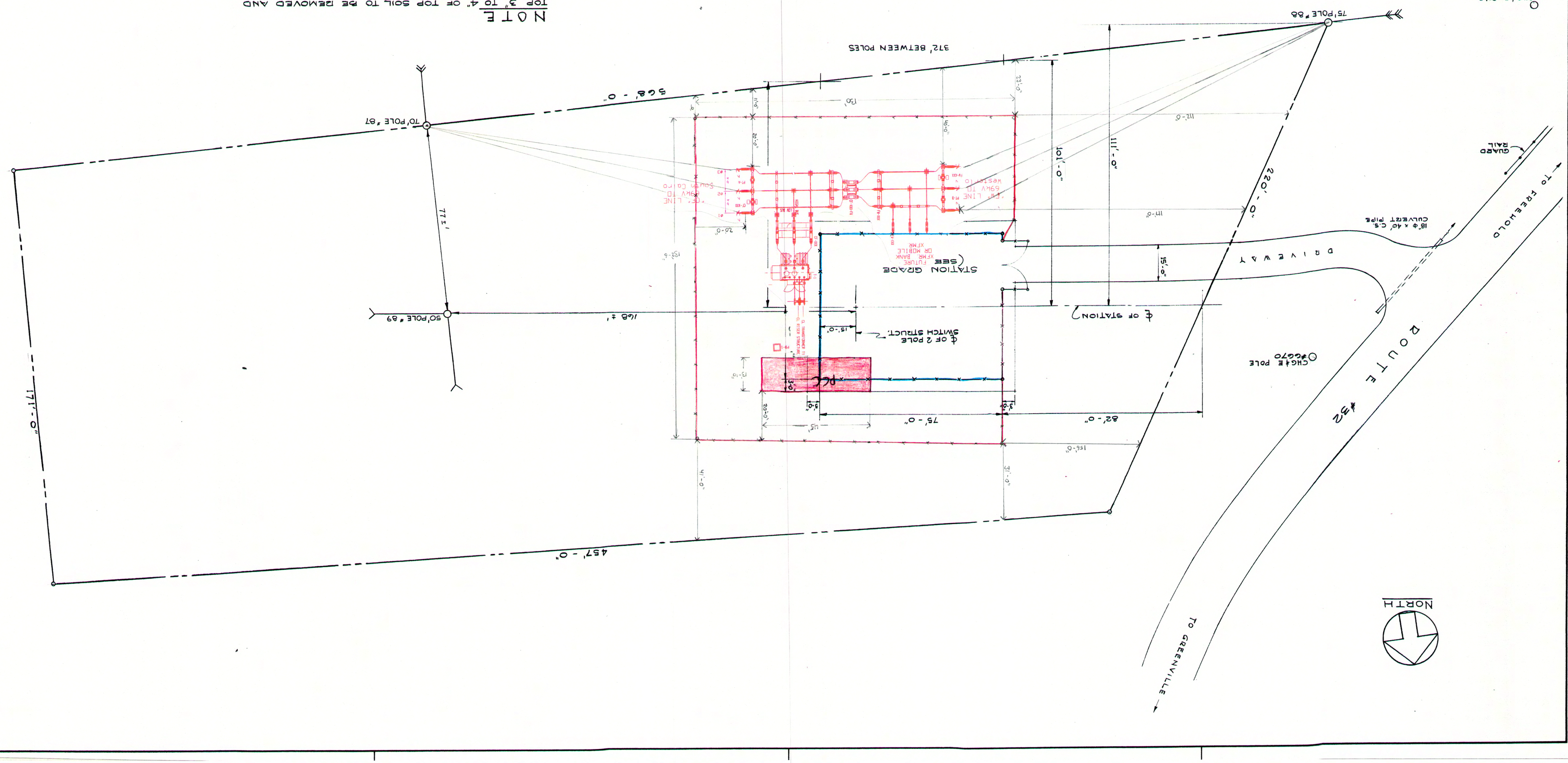
REVISIONS
① 11-15-72 R/W BLOCK PER HIGHWAY DEPT.

CENTRAL HUDSON GAS & ELEC. CORP.	
SCALE 1" = 20.00'	FREEHOLD SUB.
DATE 7-12-72	NEW
REVISION NO.	PLOT PLAN
FILE NO.	132A A
SH. NO. OF	72258

W.O. NO. 81002 A	CHECKED [illegible]
PROJ. NO. 72-670	CLEARED [illegible]
DRAWN [illegible]	R/W
SUPV. [illegible]	APPROVED [illegible]

REFERENCE DWGS.
FOUNDATION PLAN — 132 A - F - 72219
ELECTRICAL LAYOUT — 132 A - E - 72217

NOTE
TOP 3" TO 4" OF TOP SOIL TO BE REMOVED AND STATION AREA TO BE LEVELED. ENTIRE STATION TO BE SURFACED WITH CRUSHED STONE TO A MINIMUM DEPTH OF 4".



Cases 14-E-0318 & 14-G-0319

SUBSTATION	TRANSFORMER DESIGNATION	SERIAL #	YEAR MANUFACTURED	MANUFACTURER	T-DRAWING	VOLTAGE CLASS (kV)	CAPACITY (MVA)	PREVIOUS PF TEST DATE	PF TEST RESULTS	DGA ANALYSIS	OIL QUALITY	OVERALL TRANSFORMER HEALTH	FORECAST
Freehold	TR #1	5001975	1935	GE	T-8500-1	66/14.8	8.5/11.3	04/15/2010	CL consistently high (0.8%), all other insulation acceptable.	Historic overheating (oil)	IFT - 24, Neut - 0.12	Bad	Transformer Replacment - 2015
Montgomery St	TR #2	5879248	1938	GE	T-4500-2	13.2/4.16	4.5/6	11/30/2011	All insulation PF values are elevated (> 1.0%)	Overheating (oil & paper)	Rel Sat - 63%	Bad	Transformer Replacement - 2016
Montgomery St	TR #1	5879247	1938	GE	T-4500-2	13.2/4.16	4.5/6	11/09/2011	CL consistently high at (1.56%), CH elevated to (1.34%)	Overheating (oil & paper)	IFT - 25	Bad	Transformer Replacement - 2016
North Chelsea	TR #1 PH 2	4081320	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are high (1.7% - 4.5%)	Overheating (oil)	IFT - 25	Bad	N/A
North Chelsea	TR #1 PH 1	4081321	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are consistently high (1.6% - 2.6%)	All gasses are very high	IFT - 22	Bad	N/A
North Chelsea	TR #1 PH 3	4081319	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are consistently elevated, CT (2.78%) especially high	TCG high but stable, Overheating (oil)	Acceptable	Bad	N/A
Ohioville	TR #3 PH 1	5062193	1951	Westinghouse	T-6667-1	115/69/13.8	6.667/8.88	09/02/2010	CT (1.17%) elevated but stable	Good	Rel Sat - 30%	Bad	Transformer Removal - 2015
Ohioville	TR #3 PH 2	5062194	1951	Westinghouse	T-6667-1	115/69/15	6.667/8.88	09/02/2010	CT (0.92%) elevated but stable	Overheating (oil)	Rel Sat - 17%	Bad	Transformer Removal - 2015
Beacon	TR #2	5469527	1937	GE	T-1500-7	13.2/4.33	1.5/2	03/15/2011	Data not sufficient, internal ground connections.	Good	Acceptable	Acceptable	Station Retirement - 2016
Boulevard	TR #2	6190899	1940	GE	T-8500-2	66/14.85	8.5/11.33	05/07/2008	Readings increased slightly, still acceptable.	Good	Acceptable	Acceptable	Transformer Replacment - 2017
Clinton Avenue	TR #1 TAP CHN	C505063	1957	GE	T-5000-9	67/4.36	5/6.25	07/22/2013	CI (1.27%) historically high, but stable	Good	Acceptable	Acceptable	N/A
Coxsackie	TR #1	C656684	1957	GE	T-10000-3	69/13.8	10/13.3	12/27/2011	CH is high, all other insulation is acceptable	Good	Acceptable	Acceptable	N/A
Dashville	TR #2	C184483	1956	GE	T-3750-4	67/4.356	3.75/4.687	06/25/2013	Acceptable	Overheating (paper)	Acceptable	Acceptable	N/A
Greenfield Road	TR #1 PH 3	5959797	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	CL slightly elevated, all other insulation acceptable	Good	IFT - 26	Acceptable	N/A
Greenfield Road	TR #1 PH 2	5959798	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	Acceptable	Good	IFT - 25	Acceptable	N/A
Greenfield Road	TR #3	8110261	1950	GE	T-2000-8	66/4.156	2/2.5	12/19/2011	Acceptable	Good	Acceptable	Acceptable	N/A
Greenfield Road	TR #1 PH 1	5959799	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	CL continues to be elevated, all other insulation acceptable	Good	Acceptable	Acceptable	N/A
Grimley Road	TR #1	C184399	1955	GE	T-3750-6	69/13.2	3.75/4.687	05/22/2012	Acceptable	Good	Acceptable	Acceptable	N/A
Hurley Avenue	SST-1	5960031	1939	GE	T-2000-5	66/14.4	2/2.5	10/21/2008	Acceptable	Good	IFT - 27	Acceptable	N/A
Kerhonkson	HK LINE	4087889	1949	Westinghouse	T-VR-1	69	20	03/25/2008	Acceptable	Good	IFT - 27	Acceptable	N/A
Kerhonkson	MK LINE	4087888	1949	Westinghouse	T-VR-1	69	20	08/11/2009	Acceptable	Good	Acceptable	Acceptable	N/A
Montgomery	TR #1	8800860	1954	GE	T-2000-10	66/4.38	2/2.5	06/10/2009	Acceptable	Good	Acceptable	Acceptable	N/A
North Catskill	TR #4	5063135	1951	Westinghouse	T-26400-1	110/68	26.4/33	10/24/2011	Acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
North Catskill	TR #5	6530626	1956	Westinghouse	T-26400-2	115/68	26.4/33	10/19/2011	CT (0.56%) is slightly elevated but still acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
Reynolds Hill	TR #4	B498168	1952	GE	T-20000-1	110/14.85/4.38	20/26.7/33.3	04/02/2012	Acceptable	Good	Acceptable	Acceptable	Transformer Replacement - 2016
Rhinebeck	GRD TRANS #1	C503095	1957	GE	T-2000-19	13.8/7.98	2	12/13/2012	Acceptable	Good	Acceptable	Acceptable	Station Upgrade - 2015
Rhinebeck	TR #1 PH 2	5244080	1936	GE	T-2880-2	69/14.4/2.4	2.88/3.6	02/07/2011	CL (0.87%) elevated but stable, all other insulation is acceptable	Good	Acceptable	Acceptable	Station Upgrade - 2015
Smithfield	TR #1	5069073	1953	Westinghouse	T-3750-1	66.83/13.09	3.75/4.687	04/01/2008	CH (0.66%) slightly elevated, but stable	Overheating (paper)	Acceptable	Acceptable	N/A
Stanfordville	TR #1	6531840	1955	Westinghouse	T-3750-7	67/13.8	3.75/4.687	01/06/2010	Acceptable	Overheating (paper)	Acceptable	Acceptable	N/A
Tinkertown	TR #1	D203741	1958	GE	T-10000-6	67/14.4/8.5	10/12.5	01/09/2009	Acceptable	Good	Acceptable	Acceptable	N/A
Tinkertown	TR #2	39667-1	1957	PennTransformer	T-10000-4	67/14.4/4.8	10/12.5	03/08/2011	Acceptable	Good	Acceptable	Acceptable	N/A
Union Avenue	TR #1	6533064	1957	Westinghouse	T-20000-3	115/14.8/4	20/26.7/30.6	03/06/2012	Acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
Van Wagners	TR #1	8800859	1951	GE	T-2000-10	66/4.8	2/2.5	12/02/1995	Acceptable	Good	Acceptable	Acceptable	Station Retirement - 2015
Balmville	TR #1	B364278	1951	GE	T-2000-13	13.2/4.16	2/2.3	11/15/2012	All PF increased from previous test, but still acceptable (< 0.6%)	Good	Rel Sat - 22%, IFT - 26	Monitor	Station Retirement - 2015
Beacon	TR #1	5589416	1937	GE	T-1500-7	13.2/4.33	1.5/2	03/15/2011	Data not sufficient, internal ground connections.	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2016
Boulevard	TR #1 PH 3	2790840	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Boulevard	TR #1 PH 2	2790841	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Boulevard	TR #1 PH 1	2790842	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Converse Street	TR #2	C160454	1956	GE	T-3750-8	13.8/4.36	3.75/4.687	05/13/2010	Consistently high readings in all insulation, CL >7 in 2010	Overheating (oil)	Acceptable	Monitor	N/A
Forgebrook	TR #1	6534949	1958	ABB	T-20000-4	115/14.85	20/26.7/31	11/29/2012	Acceptable	TCG high but stable, Overheating (oil & paper)	IFT - 22	Monitor	N/A
Grimley Road	TR #2	2669278	1955	Allis Chalmers	T-5000-3	65.2/13.09	5	05/22/2012	Consistently high readings in all insulation except CH, stable	Good	Rel Sat - 16%	Monitor	N/A
Kerhonkson	TR #2	5589893	1937	GE	T-6000-3	66/14.8	6/7.5	03/22/2011	Acceptable	TCG high but stable, Overheating (oil)	IFT - 20	Monitor	Station Upgrade -2016
Maryland Avenue	TR #1	C160448	1955	GE	T-3750-3	13.8/4.36	3.75/4.687	03/02/2005	CL Increasing (0.37 to 0.44 to 0.54)	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2016
Maryland Avenue	TR #2	C160459	1955	GE	T-3750-14	13.8/4.36	3.75/4.687	06/05/2006	CH, CL and CHL are high (0.8% range) but stable	Good	Acceptable	Monitor	Station Retirement - 2016
Mckinley Street	TR #1	B686695	1954	GE	T-2000-18	14.4/4.16	2/2.3	12/07/2006	CH (0.51%) and CL (0.63%) slightly eleveated, but stable	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2015
Mobile Sub	MOBILE (5MVA) XFMR	6532438	1955	Westinghouse	T-5000-4	67/13.8	5	09/30/2011	Acceptable	Overheating (paper)	Rel Sat - 30%	Monitor	N/A
Ohioville	TR #3 PH 3	8275175	1951	GE	T-6667-2	110/63.5/68	6.667/8.88	09/02/2010	CT (0.63%) slightly elevated but stable	Good	Rel Sat - 35%	Monitor	Transformer Removal - 2015
Pulvers Corner	TR #1	6531841	1955	Westinghouse	T-3750-7	67/13.8	3.75/4.687	04/22/2013	CT (0.69%) slightly elevated but stable	Overheating (paper)	Acceptable	Monitor	N/A

Reynolds Hill	TR #3	B686277	1954	GE	T-20000-2	110/14.8/4.4	20/26.7/33.3	04/04/2012	All insulation PF values slightly elevated (0.59% - 0.784%)	High CO2 but stable	Acceptable	Monitor	Transformer Replacement - 2016
Rhinebeck	TR #2	4680322	1931	GE	T-10000-1	66/14.85/4.8	10/12.5	12/13/2012	Acceptable	Overheating (oil & paper)	Rel Sat - 25% IFT - 25	Monitor	Station Upgrade - 2015
Rhinebeck	TR #1 PH 1	4497738	1956	GE	T-2880-1	69/14.4/2.4	2.88/3.6	02/07/2011	Consistently high historical results in all insulation, improved in 2010/11 testing	Overheating (paper)	Rel Sat - 21%	Monitor	Station Upgrade - 2015
Rhinebeck	TR #1 PH 3	4497737	1956	GE	T-2880-1	69/14.4/2.4	2.88/3.6	02/07/2011	Consistently high historical results in all insulation, improved in 2010/11 testing	Overheating (paper)	Rel Sat - 20%	Monitor	Station Upgrade - 2015
Smith Street	TR #2	C156560	1954	GE	T-3750-2	13.2/4.36	3.75/4.687	12/03/1998	Data not sufficient, internal ground connection on LV.	TCG high, overheating (paper)	IFT - 26	Monitor	Station Retirement - 2014
Smith Street	TR #1	C156559	1954	GE	T-3750-2	13.2/4.36	3.75/4.687	12/02/1998	Data not sufficient, internal ground connection on LV.	TCG high but stable, Overheating (paper)	Acceptable	Monitor	Station Retirement - 2014

Copy to:	Mr. P. Harpolis	Mr. D. L. DuBois	Mr. R. B. Wright	E. P. #2013-016
	Mr. C. A. Freni	Mr. J. Ferrara	Mr. D. G. Langseder	
	Mr. J. M. May	Mr. P. E. Haering	Mr. C. Ritacco	
	Ms. J. Caserto	Mr. D. Morales	Ms. E. M. Schultz	

September 18, 2014

Ms. H. M. Adams
Mr. H. W. Turner

Re: Montgomery Street Transformer Replacement

References:
1. E.P. #2010-013 Montgomery Street Substation Breaker Replacement

Overview

The two Montgomery Street Substation transformers are both 75 years old and at the end of their useful lives. Power factor test results for both transformers indicate both high and low-side dielectric breakdown. DGA lab results for Transformer #2 indicate high relative saturation as well as possible overheating of the cellulose paper insulation. Both transformers feed the low voltage pocket in the City of Newburgh, which includes the Newburgh Network. Outside of the network, this load is primarily residential and significant load growth is not anticipated. Therefore, Distribution Planning has no plans in the foreseeable future of converting this area to high voltage.

Area Loading

The firm rating of this station is currently limited to 5.76 MVA due to the size of the Transformer #1 low side cable (see E.P. #2010-013). Load checks and station ammeter readings prior to 2012 indicated an approximate 4.16kV station summer peak load of 4.5 MVA. In 2012, more accurate load data was obtained from microprocessor relays that were installed with new breakers as part of the 2011 breaker replacement program.

The 2012 and 2013 4.16kV station summer peak was 4.98 MVA and 5.38 MVA, respectively. The increase was due to temporary load transfers that were made during the retirement of the New Windsor 4.16kV circuits and the integration of the new Union Avenue 4054 circuit, and is not indicative of any new business or increased load growth activity. Since the summer peak, permanent load transfers that were intended as part of the 4054 circuit integration have been completed, bringing the total 2013 peak 4.16kV load to its normal level of approximately 4.8MVA. Table 1 below is a summary of the loads that contribute to the 14.4kV cable flows.

	MVA
Balmville Sub Load	1.7
Montgomery St. Sub 13.8kV Load	6.6
Montgomery St. Sub 4.16kV Load	4.8[1]
Load Tapped off the 14.4kV Loop	1.7
Total 14.4kV Loop Load	14.8

Table 1 – 2013 Newburgh 14.4kV Loop Summer Peak Load

The total 2013 summer peak load on the 14.4kV loop was 14.8 MVA, which is approximately 6% higher than its firm capacity rating of 14.0 MVA[2]. Transfer of the Balmville Substation load off of the loop (approximately 1.7 MVA) will address this loading issue before the 2014 summer peak. It should be noted that an anticipated Saint Luke's Hospital expansion will potentially bring the load above its firm rating again by 2016.

[1] Montgomery St. Sub 4.16kV load without the temporary transfers that occurred during the 4054 ckt. integration.
[2] The firm rating of the 14.4kV loop is based on the 1st contingency loss of West Balmville bus #1.

Recommendation

Based on the recommendation in E.P. #2010-013, both Montgomery Street transformers should be replaced with similar sized transformers near a SLTE of 9 MVA with LTC, since the old air induction regulators have been retired. It is recommended that these transformers be replaced in 2016 due to their age and poor test results.

It is also recommended that the total Montgomery Street 4.16kV station load be kept below 5.0 MVA utilizing existing low-voltage ties with the neighboring Union Avenue 4051 circuit and the West Balmville 4013 circuit. This will ensure that the 14.4kV loop load will not exceed its firm rating. The District has verified that there is currently sufficient step-down capacity to accommodate this. This limit would need to remain in effect until the loop firm capacity is increased with cable upgrades.

Once the firm capacity of the 14.4kV loop is increased, then the Montgomery St. Substation 4.16kV load can exceed 5.0 MVA. It will still be limited to 5.76 MVA due to the Transformer #1 low-side cable. It is recommended to replace the limiting low-side cable at the time the transformers are replaced to realize the true firm capacity of both new 4.16kV transformers.

Future Considerations

Based on the load versus the rating of the loop under first contingency conditions, it is recommended that the 14.4kV loop firm capacity be increased. An updated PSLF load flow analysis will be conducted and a revised replacement plan will be developed in early 2015.

N. Conza

Nicholas Conza
Engineer, Electric Construction Standards

Copy to: Mr. T. Burns, Mr. L. Cambalik, Mr. D. DuBois, Mr. M. Englishby, Mr. C. Freni, Mr. C. Hay, Mr. P. Haering, Mr. P. Harpolis, Mr. R. Hawthorne, Mr. D. Langseder, Mr. E. Loeven, Mr. J. May, Mr. K. Post, E. P. #2013-020

November 5, 2013

Ms. H. Adams
Mr. H. Turner

Re: Rhinebeck Substation - Integration Study

Overview

Transformer #2 at the Rhinebeck Substation will be replaced with a 115-13.8kV, 20/26.7/33.3 MVA transformer. The upgrade will increase the summer firm rating of the Rhinebeck Substation to 50 MVA. New 13.8 kV switchgear will also be installed with 8 distribution circuit positions.

The substation design currently provides 2 manholes (manhole #1 and manhole #2). The four even numbered circuits fed from bus #2 will be constructed to manhole #2. The four odd numbered circuits will be constructed to manhole #1. The scope of this study is to provide the underground circuit exit layout from manhole #1 and #2 and the overhead circuit integration with the existing six Rhinebeck distribution circuits. The study also provides for the integration of the 2 new Rhinebeck distribution circuits (7057 and 7058).

Underground Circuit exits

A sketch of the proposed underground circuit exit layout is provided as Attachment #1. Circuits 7051, 7056 and 7058 should be constructed directly to their riser poles from manhole #1 and #2.

A manhole and conduit system needs to be constructed to establish circuits 7052, 7053, 7054, 7055 and 7057 along Route 9 and in the Dutchess County Fairgrounds. It is recommended that two 2 x 3 duct banks be constructed from manhole #1 and #2 approximately 260 feet to 2 additional manholes (manhole #3 and #4) located by the substation entrance road near Route 9. Circuits 7053, 7055 and 7057 should be constructed from manhole #1 to manhole #3. Circuits 7052 and 7054 should be constructed from manhole #2 to manhole #4. Circuits 7054, 7055 and 7057 should be constructed directly to their riser poles along Route 9 from manhole #3 and #4.

A bore under Route 9 will be required to establish circuits 7052 and 7053 in the Dutchess County Fairgrounds to facilitate tying into the existing double circuit. It is recommended that a 2 x 2 duct bank be built under Route 9. A 2 x 2 duct bank will provide for both circuits and leave each circuit riser with a spare duct.

The riser cable for each circuit should utilize 750 MCM Cu. Cable. The 750 MCM Cu riser cable would have the following ratings with three loaded ducts:

Summer Normal/ Emergency	Winter Normal/ Emergency
513 amps/ 616 amps	585 amps/ 667 amps

Overhead Circuit Integration

There will be only one minor change to where the existing Rhinebeck circuits feed in order to maintain the knowledge of operating personnel. Attachment #2 provides a sketch of the proposed overhead circuit integration:

7051 - Circuit 7051 will rise on the west side of the substation where it presently rises and tie into the existing 7051 circuitry that feeds north towards Upper Red Hook and Tivoli. Approximately 2.0 MVA of load in the Upper Red Hook area will be transferred to Milan circuit 7062 during 2014 when the capital project to extend it along Turkey Hill Road to Route 9 is complete.

7052 - Circuit 7052 will rise east of Route 9 in the Dutchess County Fairgrounds. Circuit 7052 will then tie into the existing 7052 circuitry that feeds east to Route 308. Circuit 7052 will still be the top circuit of the existing double circuit to Route 308. The sectionalizer at pole # 70513 will no longer be required and should be removed since circuit 7052 will only feed in one direction. The portion of circuit 7052 that currently runs cross lot west of the substation to the Northern Dutchess Hospital, Montgomery Street and River Road will become circuit 7058.

7053 - Circuit 7053 will rise east of Route 9 in the Dutchess County Fairgrounds. Circuit 7053 will then tie into the existing 7053 circuitry that feeds east to Route 308. Circuit 7053 will still be the bottom circuit of the existing double circuit to Route 308.

7054 - Circuit 7054 will rise on Route 9 at pole # 84051. Circuit 7054 will then tie into the existing circuit 7054 circuitry that feeds north to the Village of Red Hook.

7055 - Circuit 7055 will rise on the south side of the substation entrance road where it currently rises. Circuit 7055 will then tie into the existing 7055 circuitry that feeds south to the Village of Rhinebeck.

7056 - Circuit 7056 will rise on the west side of the substation where it presently rises and tie into the existing 7056 circuitry that feeds north on Route 9G.

7057 - Circuit 7057 will rise on Route 9 one section north of the circuit 7054 riser. As described in the "Future Capital Budget Projects" section, the District plans to submit a budget project to double circuit the existing circuit 7054 pole plant along Route 9 to the Route 9 and 9G intersection. A double circuit to the Route 9 and 9G intersection would allow a 7051/7057 tie to be created and provide the ability to easily switch out the 7051 and 7056 double circuit pole plant that runs cross lot from the substation. A 7054/7056 tie already exists. Until the budget project is built, circuit 7057 will only be used to supply circuit 7054 during substation contingencies or maintenance.

7058 - Circuit 7058 will rise on the west side of the substation where circuit 7052 currently rises and tie into the existing 7052 circuitry that feeds cross lot to supply the Northern Dutchess Hospital, Montgomery Street and River Road.

Circuit Loads

Circuit loads are expected to be as follows when the new Rhinebeck Substation is complete:

Circuit	2013 summer load estimate	2015 summer load estimate	Design Criteria*	Comments
Rhinebeck 7051	7.0 MVA	5.0 MVA	6/9 MVA	2.0 MVA of Upper Red Hook x-ferred to new Milan ckt 7062
Rhinebeck 7052	5.3 MVA	3.2 MVA	6/9 MVA	N.Dutchess Hospital Montgomery St. & River Rd. x-ferred to ckt 7058- 2.1 MVA total
Rhinebeck 7053	3.8 MVA	3.8 MVA	6/9 MVA	
Rhinebeck 7054	5.2 MVA	4.4 MVA	6/9 MVA	Ckt 7057 to pick up load from Sub. to Rt 9 & 9G intersection-0.8 MVA
Rhinebeck 7055	4.8 MVA	4.8 MVA	6/9 MVA	
Rhinebeck 7056	5.8 MVA	5.8 MVA	6/9 MVA	
Rhinebeck 7057	N/A	0.8 MVA	6/9 MVA	
Rhinebeck 7058	N/A	2.1 MVA	6/9 MVA	
Milan 7062	N/A	2.0 MVA	6/9 MVA	

* A 12 MVA emergency rating can only apply to tie points adjacent to the substation. Some circuit hardening may be needed on a given circuit to achieve a 12 MVA emergency rating at other tie points. The design criteria is subject to change upon finalizing the Distribution Planning Guides.

Alternate Bus Circuit Ties

Rhinebeck Substation Bus #1 will supply the odd number circuits and Bus #2 will supply the even number circuits. The circuit integration pairs alternate bus circuits to facilitate maintenance and contingency switching. The underground design provides sufficient capacity to classify each of the Rhinebeck distribution circuits as 6/12 MVA with respect to using the alternate bus ties that will be established adjacent to the substation. However, as noted above, the circuits will be labeled as 6/9 MVA to maintain

consistency with existing practices. It is also recommended that each circuit riser disconnect utilize a 600 amp three phase stick operated loadbreak switch and that 350 MCM Cu tap wire be used at the circuit risers. Open point switches should also utilize 600 amp switches adjacent to the substation.

Circuits 7051 and 7056- Currently, circuits 7051 and 7056 roll vertical to a double circuit configuration one pole west of their risers. In order to establish a 7051/7056 open point adjacent to the substation, each circuit should remain on separate pole plants for two more sections west of their risers. A 600 amp vertical gang switch should be installed one pole west of their risers to create the alternate bus open point. The circuits can then be rolled vertical to a double circuit configuration after the third pole from their risers. A gravel road should be built to facilitate the construction. The road should be maintained to allow crews to operate the riser disconnect switches and the open point switch. Maintaining the road will also facilitate the installation of grounds during contingencies on the circuit 7051 and 7056 double circuit.

Circuits 7052 and 7053- Circuit 7052 will rise on the east side of Route 9 near the fence surrounding the Dutchess County Fairgrounds. Circuit 7053 will rise one pole east of the circuit 7053 riser in the bottom circuit location. At pole # 70513 a vertical gang switch can be installed to create the alternate bus circuit open point once the sectionalizer is removed.

Circuits 7054 and 7057- Circuit 7057 will rise north on Route 9 on pole # 68929. Circuit 7057 will continue for two more sections in the lower circuit position and dead end. Circuit 7054 will rise one pole south of the circuit 7057 riser at pole # 84051 in the upper circuit position. A vertical gang switch can be installed at pole # 68930 to create the alternate bus circuit open point.

Circuits 7055 and 7058- Circuit 7055 will rise on the south side of the substation entrance road. Circuit 7058 will rise on the west side of the substation. The existing overhead conductor between these risers can be utilized to create an alternate circuit open point by installing a horizontal gang switch at pole # 165511.

Cost

Typically the substation budget (Category 13) pays for substation upgrades to and including the first manhole(s) outside of the substation fence. Therefore, the substation cost estimate should include the cost to construct the two 2 x 3 duct banks, manhole # 3 and #4 and the necessary 750 MCM Cu. riser cable. The substation estimate should also include the cost to run the riser conduits and cable directly from manhole # 1 and #2 to the circuit 7051, 7056 and 7058 riser poles.

The Distribution Improvement Budget (Category 15) costs associated with this project should include the costs associated with construction past manhole #3 and #4. This would include riser conduit and cable to the circuit 7052, 7053, 7054, 7055 and 7057 riser poles, the cost of the bore under Route 9, the riser poles, riser disconnect

switches, tie switches and other distribution construction costs. The Category 15 cost will be approximately $400,000 which is consistent with the 2014-2015 Capital Budget Plan and based on similar costs associated with the recently completed Saugerties Substation Project.

Future Capital Budget Projects (will be submitted at a later time)

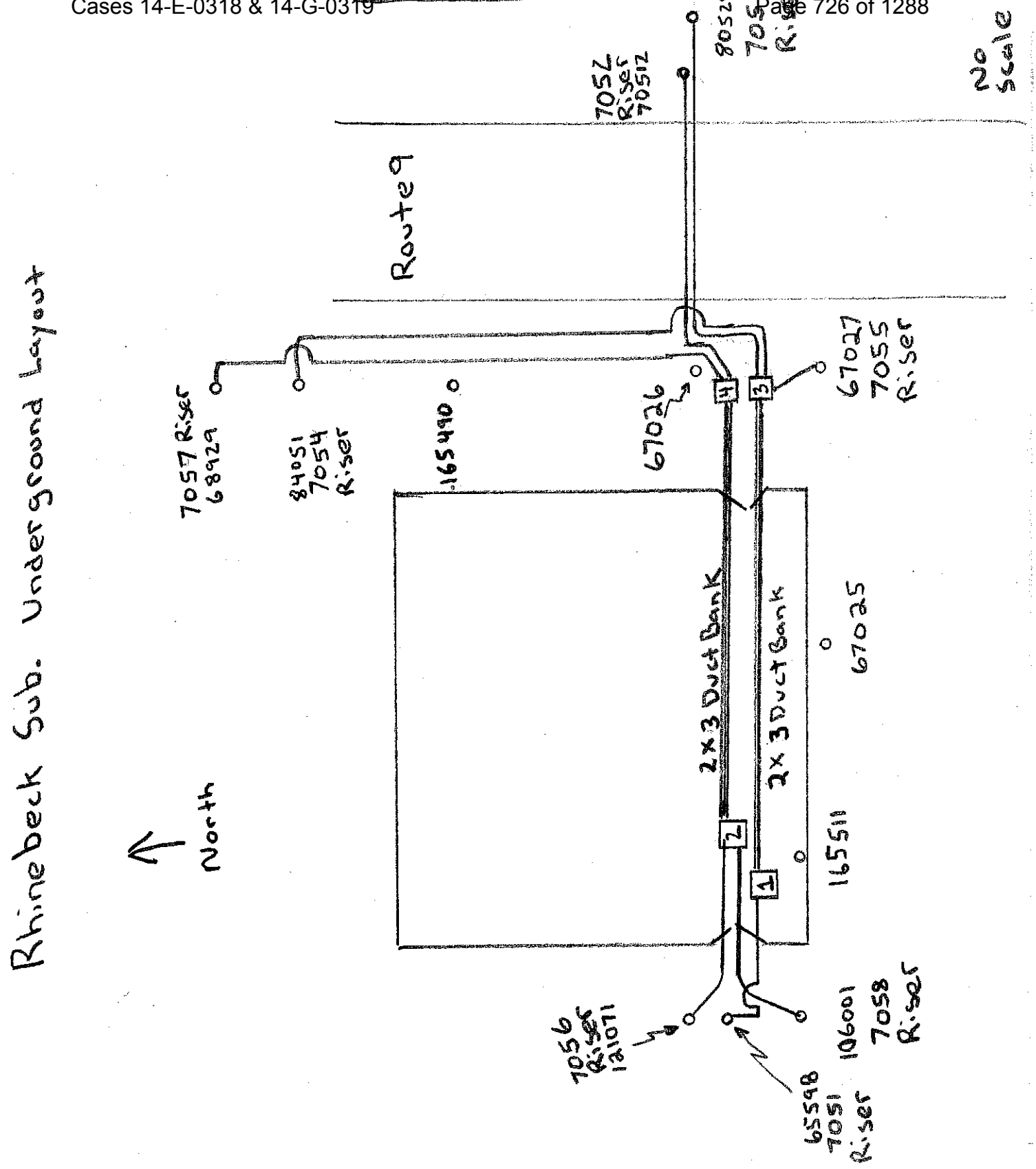
The District plans to submit a budget project to double circuit the existing circuit 7054 pole plant with circuit 7057 along Route 9 to the Route 9 and 9G intersection. A double circuit to the Route 9 and 9G intersection would allow a 7051/7057 tie to be created and provide the ability to easily switch out the 7051 and 7056 double circuit pole plant that runs cross lot from the substation. A 7054/7056 tie already exists. These ties could also be automated to allow either double circuit to reserve the other.

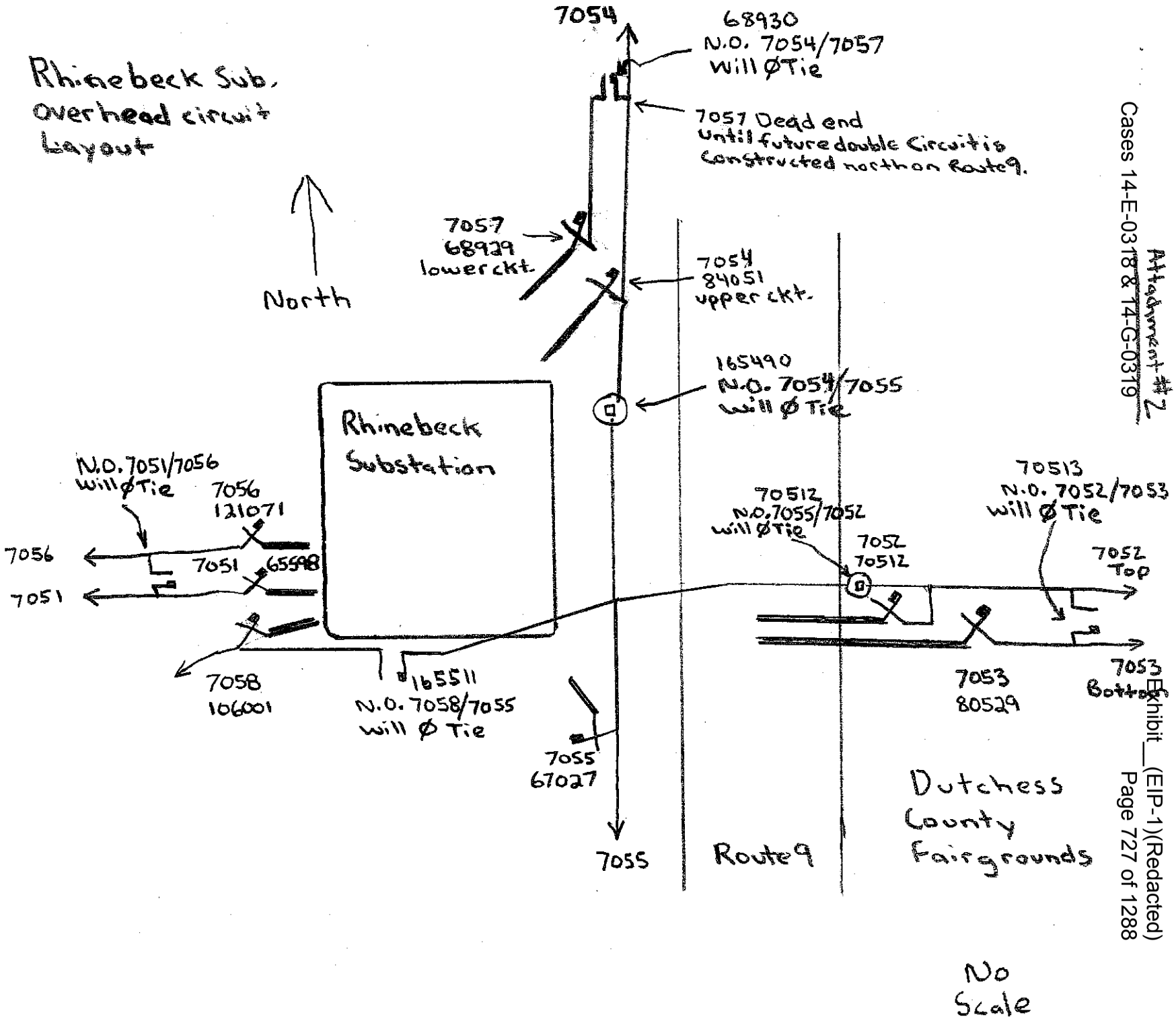
A double circuit could be constructed south on Route 9 and an alternate bus open point could be established a few sections south of the substation using a vertical gang switch should loads develop south in the Village of Rhinebeck.

Summary of Recommendations

- Complete construction of the circuit exits as outlined in this report to coincide with the Rhinebeck substation upgrades during 2014 and 2015.
- Complete the Capital Budget Project to extend Milan circuit 7062 along Turkey Hill Road to Route 9 during 2014.
- The Poughkeepsie District should submit a year 2015 Capital Budget Project Proposal to double circuit Route 9 north to the Route 9 & 9G intersection using circuits 7054 and new circuit 7057.

11/7/2013


Rhinebeck Sub. Underground Layout
North
No Scale
Route 9
7052 Riser 70512
80529 7053 Riser
7057 Riser 68929
84051 7054 Riser
165490
67026
67027 7055 Riser
2x3 Duct Bank
2x3 Duct Bank
67025
165511
7056 Riser 181071
63598 7051 Riser
106001 7058 Riser
1
2
3
4



Attachment #2
Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 727 of 1288

"MR" LINE TO MILAN

N

MR-647
1200 AMP;
61kA MOM

795 MCM AA

PCA-S
115 kV 550 kV BIL
1000/600:1

PT-A

1200 AMP TYPE MD 2 FREQ

85 kHz
155 kHz

5 FREQ LINE TUNER JZ 78.64

DTT XMTR

FUTURE

Hybrid

XMTR 155kHZ
RCVR 157kHZ

115kV

MR-660
600 AMP;
40kA MOM
(89-1)

98kV

795 MCM AA

28" AL. IPS

SI

TRANSF. #3
115/69kV;
50/66.7/83.3//93.3 MVA @ 55//65°C;
550/350kV BIL;
±10% LTC, ±5% NLTC

1200/5 MR 400/5 TAP
2000/5 MR 400/5 TAP
800/5 SR Ø1
1200/5 SR
1200/5 MR

60kV

LDC

63 SPR
63X SEAL IN

600/5 MR

MR-557
1200 AMP;
61kA MOM
(89-2)

2000/5 MR 1200/5 TAP

79-A 50A18
52 a
ER-835
2-TA 50A

S.MDB
21.21N.25.27
50.50N.67N.79
kV.kW kVAR
95P-ER SEL-311C

21.21N.50 50N.67N
95BU-ER D60

ER-830-MR
1600 AMP;
10,000 MVA;
INTER;
3 CYCLE

95P-ER/830MR SEL-351A
50.50N.62

2000/5 MR 1200/5 TAP

5/5A

95P-MR SEL-311C
95BU-MR D60

ER-831
1200 AMP;
61kA MOM
(89-6)

MRT-1 MR-5

ER-835
1200 AMP;
61kA MOM
(89-3)

TRANSF. #4
115-13.8kV;
550-110kV BIL;
±5% NLTC-±10% LTC;
20/26.67/33.33 MVA @ 55°C

1200/5MR 400/5 TAP
1200/5MR 1200/5 TAP

(1) Ø1
2000/5 MR 2000/5 TAP
12kV
10A
TO METERING SEE SHT. 2
5A

FUTURE

1200 AMP TYPE MD 2 FREQ

70 kHz
110 kHz

PCA-S (Ø3)
115kV 550kV BIL
1000/600:1
TEVF-115 (Ø1&Ø2)
115kV 550kV BIL
1000/600:1

PT-B

ER-806
1200 AMP;
61kA MOM
(89-4)

5 FREQ LINE TUNER JZ 78.64

HYBRID MIXER
CARRIER UNBLOCK
XMTR 110 kHz
RCVR 108 kHz

DTT CARRIER
XMTR 72 kHz
RCVR 71 kHz

TO METERING POT. SEE SHT. 2

TO W-1238 14.4 kV BUS #2 CT'S SEE SHT. 2

"ER" LINE TO EAST KINGSTON

W-258
600 AMP;
1500 MVA INTER;
8 CYCLE

W-273
1200 AMP;
40kA MOM

W-38
1200 AMP;
40kA MOM

Q-1472
1200 AMP;
40kA MOM

Q-1471
600 AMP;
1500MVA INTER;
8 CYCLE

Q-1470
1200 AMP;
40kA MOM

69kV

W-365
600 AMP;
40kA MOM

69 kV 12.25 MVAR RATED
14.4 MVAR(NOMINAL)
3-SERIES GROUPS OF 8 PARALLEL CAPACITOR UNITS PER PHASE

1003 10W
RES
800/250
ALARM
2-167 kVAR
86CB-1 86CB-2 LOR
52NPCB UP
100/5
103 1000W
52NBUCB BE1-52N
60 kV
50CB SC
W-1669
600 AMP;
40kA MOM
86CB-LOR
86CB-2 LOR
W-1668
1200 AMP;
61kA;
MOM
T.C.
S.T.
T.P.S.
94CB AR
52-E TD-E
800/5 MR 600/5 TAP
50CB SC
50/51 CO-8
50/51 CO-9
PT TYPE TEVF 350/120:1
MTS
52/SG CO-9
94-Q AR
SGN /SIN CO-9
600/5 MR 600/5 TAP
82 a (Q-1487)
BF LPS1.0V
79 ACR
TC
CC
R
S
795 MCM AA
4/0 CU
4/0 AL
Ø1
Ø3
52 CB 202 (Q-1487)
94CB AR
52-E TD-E
52CB AR(Q-1487)
59CB AR(Q-1487)

TRANSF. #2
66kV-14.85kV-4.8kV;
(-)10%-(-)10% NLTC-(±)5%NLTC;
10/12.5 MVA @ 55°C

PT-6
8400-120V;
70:1
12kV
10A
2T-2 AGR
(1) Ø3

TO W-367 14.4kV BUS#2 CT'S-SEE SHT. 2

TO W-367 A.C.B. (SH. 2)

"Q" LINE TO STAATSBURG

336.4 MCM ACSR

Q-1487
1200 AMP;
61kA;
MOM
(89-5)

27/SY-1 CV-7
CLT TYPE 150:69 350/600:1

Q-1340
600 AMP;
40kA;
MOM

SMD-1 12SE
AG-1
600 AMP;
40kA;
MOM

4/0 CU
60kV

TRANSF. #1(3-1Ø)
66-13.8-4.83kV;
8.64/10 MVA @ 55°C;
3-2.88/3.6 MVA @ 55°C;
(-)10%NLTC- ±5% NLTC- ±5%NLTC

3kV
15kV
1200/5 SR
12kV
T.I.P.S.

GROUNDING TRANSF.
13.8-13.8kV;
110-110 kV BIL;
(±)10%NLTC- ±5% NLTC;
2000 kVA @ 55°C

3-1/C 750 MCM XLPE

TO W-1017 A.C.B. (SH. 2)

* SEE TRIPPING SCHEDULE(SHEET 4)

Record Print

REDRAWN ON CADAM 11/24/92 FROM SIGNED ORIGINAL -DOM

REVISIONS
9 11-8-10 FIELD REV. TRANSFORMER #4 INSTALLATION RAB/AFB/JID/EMS
8 3-20-06 1088A/R 05-678 ER LINE RELAY UPGRADE JFT/AFB/RC/JAK/DJW
7 REM. 2-GE DTT/RBT-1000 JFT/JEC/STV/JD
6 11/02 6386A/R 02-677 MR LINE RELAYING UPGRADE CDT/BND/EGA/CJM/HNN
5 12-14-99 3692A 98-668 JFT/BND/MEH
4 5-7-98 W.O. 3051A/R 97-669 INS. XFMR. #3 REM. MOBILE XFMR TCJ/BND/JAK/AFB/MDR/TCD/RJW
3 1-28-98 W.O. 3051A/R 97-669 INS. MOBILE XFMR. RECORDED TCJ/BND/JAK/MDR/TCD/RFR/RJW
2 11-29-95 WO 2190A/R 94-760 ADD VOLTAGE XDUCER CMC BND JAK RFR DJD TCD RJW
1 1/5/93 W.O. 9357A INSTALL 345/138kV BANK DGW/JFT BND/LJS CDG DJD TCD KAM

CENTRAL HUDSON GAS & ELEC. CORP.		SCALE N.T.S.
RHINEBECK SUBSTATION ONE LINE DIAGRAM		DATE 11-23-77
		REV. NO. 9
		FILE NO. 30C C
W.O. NO. 9326A	CHECKED DVB KAM	7928
PROJ. NO. 74-729	CLEARED EJM RFR HL	
DRAWN MER	R/W	
SUPV. PK	APPROVED PJV	SH. NO. 1 OF 3

CAD DRAWING
DO NOT REVISE MANUALLY

Exhibit (EIP-1)(Redacted)
Page 728 of 1288

TO TRANSF #2
(SEE SHEET #1)

TO 87T2/HU-1 RELAY
(SEE SHEET #1)

TO TRANSF. #1
(SEE SHEET #1)

12 kV
1200/5 S.R.
5A
3A
87B2 CA4
86B2 LOR *
1200/5 S.R.
1A
MTS
2A
AMP
Ø3
10A
6A
W-367
1200 AMP
500 MVA INTER
5 CYCLE
(UNIT #9)
52b
2-T12 AGA
79 HGA
1200/5
67 IRV-6 (3)
TO TRANSF. #4 METERING CIRCUIT SEE SH. 1
TD
kW (G) CCW
kVAR (G) CCVAR
kWH DSGG
VS
VM Ø1 Ø3
S3-1 MG-G (NOTE 1)
PT OUT OF SERVICE 14.4kV-120V UNIT #5
SST-2 1-50 kVA 14.4 kV-13.8 kV UNIT 8
EJO-1 5E
250 A
W-1067
1200 AMP
DUMMY BREAKER
UNIT #6
1200/5 S.R.
1200/5 S.R.
14.4 kV BUS #2
1200 AMP
95 kV BIL
95 kV BIL BUS DUCT
1200 AMP
95 kV BIL
W-1280
1200 AMP
500 MVA
5 CYCLE
UNIT #11
SI
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000 A 95 kV BIL
3-1/c 750 MCM PCLC
1200/5 S.R.
10A
AMP
600/5 S.R.
3A
STATION SVC. 120/240V
ATS NOTE 2
MTS
Ø3
AMP
S
NO
W-1017
1200 AMP
500 MVA
5 CYCLE
UNIT #1
SS-2
200 A SAFETY SW.
SS-1
200 A SAFETY SW.
67 HCR (3)
1A
1.5A
1200/5 S.R.
250A
SST-1
1-50 kVA
14.4 kV-13.8 kV
UNIT 1B
EJO-1
5E
W-1066
1200 AMP
500 MVA
5 CYCLE
UNIT #4
1200/5 S.R.
1200/5 S.R.
14.4 kV BUS #1
1200 AMP
95 kV BIL
EJ-1
5E
PT-1
8400-120/70V
UNIT #1B
VM
Ø1
AMP-KW-2
TD
AMP (G) #2
TD
TO
1A
3A
50N/51N CO-11
50/51 CO-11 (3)
1200/5 S.R.
5/10A
MTS
5 MDB
kW kVAR
2A
5/5A
50/51 50N/51N 79
95P-7056 SEL-251
SI
TC
CC
TD-7053
1200 AMP
500 MVA INTER
5 CYCLE
UNIT #8
79 RC
TD-7051
1200 AMP
500 MVA
5 CYCLE
UNIT #7
TD-7052
1200 AMP
500 MVA
5 CYCLE
UNIT #3
79 NLR
TD-7056
1200 AMP
500 MVA
5 CYCLE
UNIT #2
TD-7054
1200 AMP
500 MVA
5 CYCLE
UNIT #1A
79 RC
3A
15A
1200/5 S.R.
95U-7051/56 SEL-501
X
Y
50/51 50N/51N
50/51 50N/51N
95P-7051 SEL-251
1200 AMP 95 kV BIL
2000 A 95 kV BIL
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2500A CELL UNIT #12
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
W-1238
2500 A
500 MVA
5 CYCLE
UNIT #10
79 HGA
2-T4 AGA
CC
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
EJ-1 1E
PT-2
8400-120V
UNIT #14
10A
120V - 70V
10A
TD-7055
1200 AMP
500 MVA
5 CYCLE
UNIT #13
79 RC
1200/5 S.R.
50/51 50N/51N CO-11
BEI-BSI
50N/51N CO-11
FUT. MTRS
TD
AMP ADM-2
2000/5 S.R.
(2)
51B/N2 CO-9
51N/G1 CO-9
86B2 BU HEA *
(2)
51B/N2 CO-9
51N/G1 BU CO-9
86B1 BU HEA *
3-1/c 500 MCM KERITE
1-1/c 350 MCM W.R. NEUT.
1-3/c 500 MCM PCLC
1000 MCM KERITE ALUM.
1500 MCM KERITE 2/Ø
1-3/c 500 MCM PCLC
1-1/c 4/0 NEUT.
1-3/c 500 MCM PCLC
3-1/c 500 MCM KERITE
1-1/c 350 MCM WR NEUT
TO CIRCUIT 7053
TO CIRCUIT 7051
TO CIRCUIT 7055
TO FUTURE TRANSFORMER
TO TRANSF. #1 (SEE SHEET #1)
TO 87T4 HU (SEE SH. 1)
TO CIRCUIT 7052
TO CIRCUIT 7056
TO CIRCUIT 7054

*- SEE TRIPPING SCHEDULE (SHEET 4)

Record Print

NOTE:
1- AUTO-THROWOVER PT-1 PREFFERED SOURCE.
2- STA. SERV. AUTO-THROWOVER BUS #2 PREFFERED SOURCE.

REVISIONS
- 5-30-85 WO 8122AR DIST. CKT. TD 7052 CONT. ADDED
- 10-25-85 W.O. 8383 E. ADD 51N/51N TO 95U-7051/56 SEL 351A UNIT ADDED
- 3-9-86 WO 8522AR RECORDED AS BUILT
- 11-25-85 WO 8169/E 94-320 ADD DIST. CKTS TO-7051, 7056 CHG ABC PHASING PER DRG 1700
- 8-10-86 W.O. 8629AR/R 94-320 RECORDED AS BUILT
- 4-23-90 W.O. 9051A/R UPGRADE STATION SERVICE TO 15kVA
- 4-23-90 W.O. 9051A/R 97-669 TO 75kVA
- 10-29-90 PRINT CORRECTION
- 12-20-02 FIELD REVISION KTS
- 7-20-10 FIELD REVISION LIGHTNING ARRESTOR REMOVALS LINE-RIBB/MFB/JTD/EMS

CENTRAL HUDSON GAS & ELEC. CORP.	SCALE
RHINEBECK SUBSTATION	DATE 1-4-79
14.4 KV ONE LINE DIAGRAM	REVISION NO. 10
	FILE NO. 30C C
W.O. NO. 9326A	CHECKED DVB
PROJ. NO. 74-729	CLEARED
DRAWN MER	R/W
SUPV. PK	APPROVED
	7928
	SH. NO. 2 OF 3

BRUNING 44-141 24816-2

Cases 14-E-0318 & 14-G-0319

Exhibit_(EIP-1)(Redacted)
Page 729 of 1208

N

"MR" LINE TO MILAN

MR-647
1200 AMP;
61kA MOM
(89-8)

PCA-5
115 kV 550 kV BIL
1000/600:1

TRANSF. #5
115-13.8kV;
550-110kV BIL;
±5% NLTC-±10% LTC;
22.4/29.87/37.3 MVA @ 65°C

1200 AMP
TYPE MD
2 FREQ

85 kHz
155 kHz

2 FREQ LINE TUNER JZ 78.64

PIT TOP XMTR

MR-660
600 AMP;
40kA MOM
(89-1)

98kV

TRANSF. #3
115/69kV;
50/66.7/83.3/93.3 MVA @ 55//65°C;
550/350kV BIL;
±10% LTC; ±5% NLTC

795 MCM AA

24" AL. IPS

1200/5 MR 400/5 TAP
2000/5 MR 1200/5 TAP

60kV

800/5 SR
1200/5 SR
1200/5 MR

600/5 MR

LDC

63 SPR

63X SEAL IN

MR-701
1200 AMP;
61kA MOM
(89-9)

115kV

95P-T5
SEL-587
50/51
50N/51N
87

95BU-T5
T60
50/51
50N/51N
87

Hybrid
XMTR 155kHZ
RCVR 157kHz

TO W-1017
& PT-D 13.8kV
BUS #2
SEE SHEET 2

MR-557
1200 AMP;
61kA MOM
(89-2)

79-4 MBA18

ER-835

2000/5 MR
1200/5 TAP

21.21N.25.27
50.50N.67N.79

kV,kW
kVAR

95P-ER
SEL-311C

S.MDB

21.21N.50
50N.67N

95BU-ER
D60

ER-830-MR
1600 AMP;
10,000 MVA;
INTER;
3 CYCLE

(52-1)

95P-MR
SEL-311C

95BU-MR
D60

95BE-ER830MR
SEL-351A

50.50N.62

ER-831
1200 AMP;
61kA MOM
(89-6)

ER-835
1200 AMP;
61kA MOM
(89-3)

98kV

FUTURE

1200 AMP
TYPE MD
2 FREQ

70 kHz
110 kHz

PCA-5 (Ø3)
115kV 550kV BIL
1000/600:1
TEVF-115 (Ø1&Ø2)
115kV 550kV BIL
1000/600:1

TRANSF. #4
115-13.8kV;
550-110kV BIL;
±5% NLTC-±10% LTC;
20/26.67/33.33 MVA @ 55°C

1200/5MR 400/5 TAP
1200/5MR 1200/5 TAP

95BU-T4
T60
50/51
50N/51N
87

95P-T4
SEL-587
50/51
50N/51N
87

TO PT-C
(SH. 2)

TO W-1238
V.C.B.
(SH. 2)

ER-806
1200 AMP;
61kA MOM
(89-4)

2 FREQ LINE TUNER JZ 78.64

HYBRID MIXER

CARRIER UNBLOCK
XMTR 110 kHz
RCVR 108 kHz

DTT CARRIER
XMTR 72 kHz
RCVR 71 kHz

TO W-1238
13.8kV BUS #1
CT'S SEE SHT. 2

"ER" LINE TO
EAST KINGSTON

89 kV 12.25 MVAR RATED
14.4 MVAR(NOMINAL)
3-SERIES GROUPS
OF 8 PARALLEL
CAPACITOR UNITS
PER PHASE

W-1669
600 AMP;
40kA;
MOM

60 kV

(89-CB)

TO CAP. BANK GATE

W-1668
1200 AMP;
61kA;
MOM

87V,59NP,62
50,51,50N,51N

95BU-CB
GE-C70

95P-CB
SEL-487V

"Q" LINE TO
STAATSBURG

336.4 MCM ACSR

Q-1487
1200 AMP;
61kA;
MOM
(89-5)

(52-2)
Q-1471
69kV-1200 AMP;
40kA

Q-1472
1200 AMP;
40kA;
MOM

Q-1470
1200 AMP;
40kA;
MOM

W-273
1200 AMP;
40kA;
MOM
(89-7)

W-38
1200 AMP;
40kA;
MOM

69kV

95P-Q
SEL-311C
S.MDB

21.21N.25.27.79
51.51N.50.50N.81

kV,A,kW
kVAR

95BU-Q
D-60

21.21N.50.50N
51.51N

95P-T3
SEL-387E
S.MDB

87,50,51
50/51N

kV,A,kW
kVAR

95BU-T3
T60

87,50,51
50/51N

REDRAWN ON CADAM 11/24/92 FROM SIGNED ORIGINAL -DOM

REVISIONS
(10) 4-17-13 MCM 67459/R UPGRADE & RECONFIGURE STATION. VOID SH. 3 PLE/
(9) 11-8-10 FIELD REV. TO AS-BUILT INSTALLATION R&B/MFB/JD/EMS
(8) 3-20-06 10888A/R 05-698 ER LINE RELAY UPGRADE REN/MFB/JD/EMS
(7) 11-2-05 09006A/R 05-699 REN.KF, INS.BEI-IPS100 JFT/JEC/STV/JD
(6) 11/02 6386A/R 02-677 MR LINE RELAYING UPGRADE CDT/BND/SPA/CJM/HNN
(5) 12-14-99 3692A 98-688 REVISED JFT/BND/MEH
(4) 5-7-98 W.O. 3051A/R 97-669 INS.XFMR,MIS REN.MOBIL XFMR TCJ/BND/JAK/RFR/MBR/TCD/RJM
(3) 1-28-98 W.O. 3051A/R 97-669 INS. MOBILE XFMR, RELOCATED TCJ/BND/JAK/RFR/MBR/TCD/RJM
(2) 11-29-95 WO 2190A/R 94-760 ADD VOLTAGE XDUCER DWG END SHT RFR
(1) 6/93 M.O. 9657A REPLACE CAPACITOR BANK DOM/JFT BND/LJS CDB ELV DJD TCD KAH

CENTRAL HUDSON GAS & ELEC. CORP.

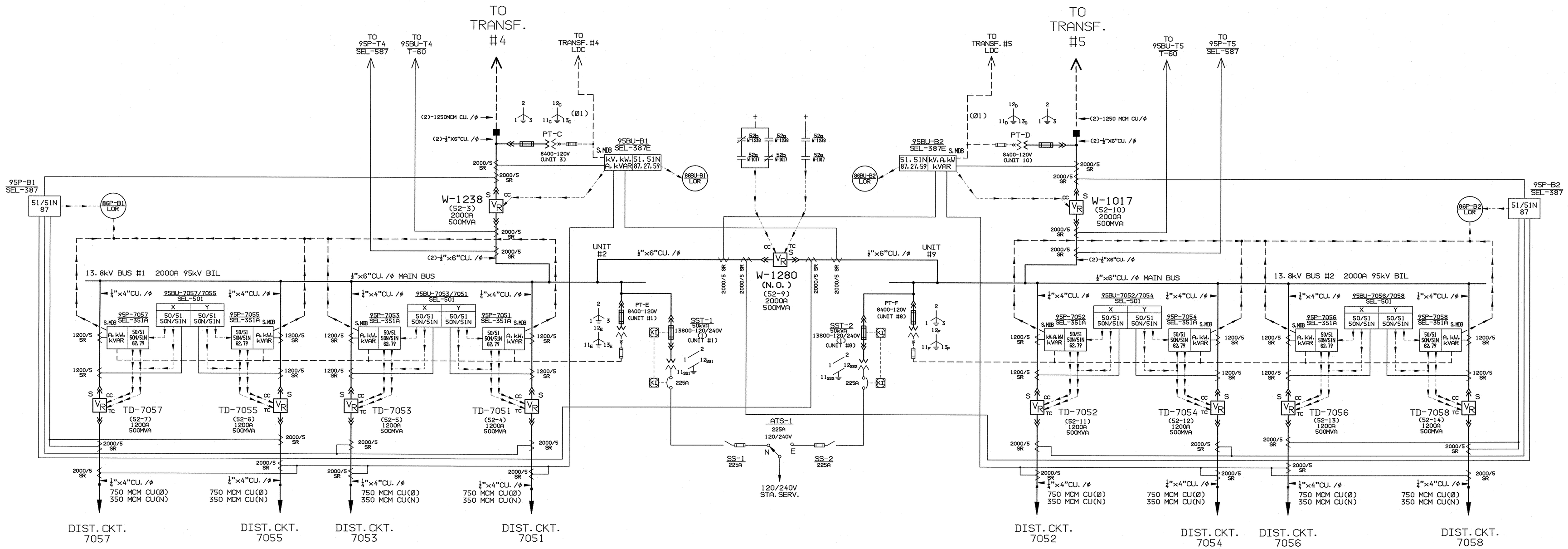
RHINEBECK SUBSTATION
ONE LINE
DIAGRAM

SCALE	N.T.S.
DATE	11-23-77
REV. NO.	10
FILE NO.	30C C
W.O. NO.	9328A
PROJ. NO.	74-729
DRAWN	MER
SUPV.	PK
CHECKED	DVB KAM
CLEARED	EJM RFR HL
R/W	
APPROVED	PJV
	7928
SH. NO.	1 OF 2

CAD DRAWING
DO NOT REVISE MANUALLY

Cases 14-E-0318 & 14-G-0319

Exhibit_(EIP-1)(Redacted)
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LEGEND:

- P.T. CIRCUIT
- C.T. CIRCUIT
- D.C. CIRCUIT
- CONDUCTOR TRANSITION
- MDB METER DATA BASE
- KI KEY INTERLOCK(STATION SERVICE)

REVISIONS

1. 10-25-85 W.O. 5583 R. Ba 11/4/85 STA. SERV. SEL 3 TO UP 1&2 2/4/86
2. 9-30-86 W.O. 5222 A/R RECORD ONLY
3. 11-24-93 W.O. 94-340 ADD DIST. DIST. TD-7057, 7055 CMC 12/9/93
4. 8-10-94 W.O. 94-340 REVISED CMC 10/13/94
5. 9-22-95 W.O. 95-INR UPGRADE TO 1200A CMC 10/2/95
6. 9-19-96 W.O. 95-INR/R 97-664 TO 1200A CMC 10/7/96
7. 7-15-99 PRINT CORRECTION CMC 7/16/99
8. 12-20-02 FIELD REVISION KTS/BW/BM
9. 7-20-10 FIELD REVISION LIGHTNING ARRESTOR REMOVAL & NEW LIGHTNING ARRESTOR IN 14 LDC UNIT/RGB/MFB/JD/DRG
10. 4-17-13 W.O. 67456/R UPDATE & RECONFIGURE STATION, VOID SH. 3 PJB/

CENTRAL HUDSON GAS & ELEC. CORP.

RHINEBECK SUBSTATION

14⁴ KV ONE LINE DIAGRAM

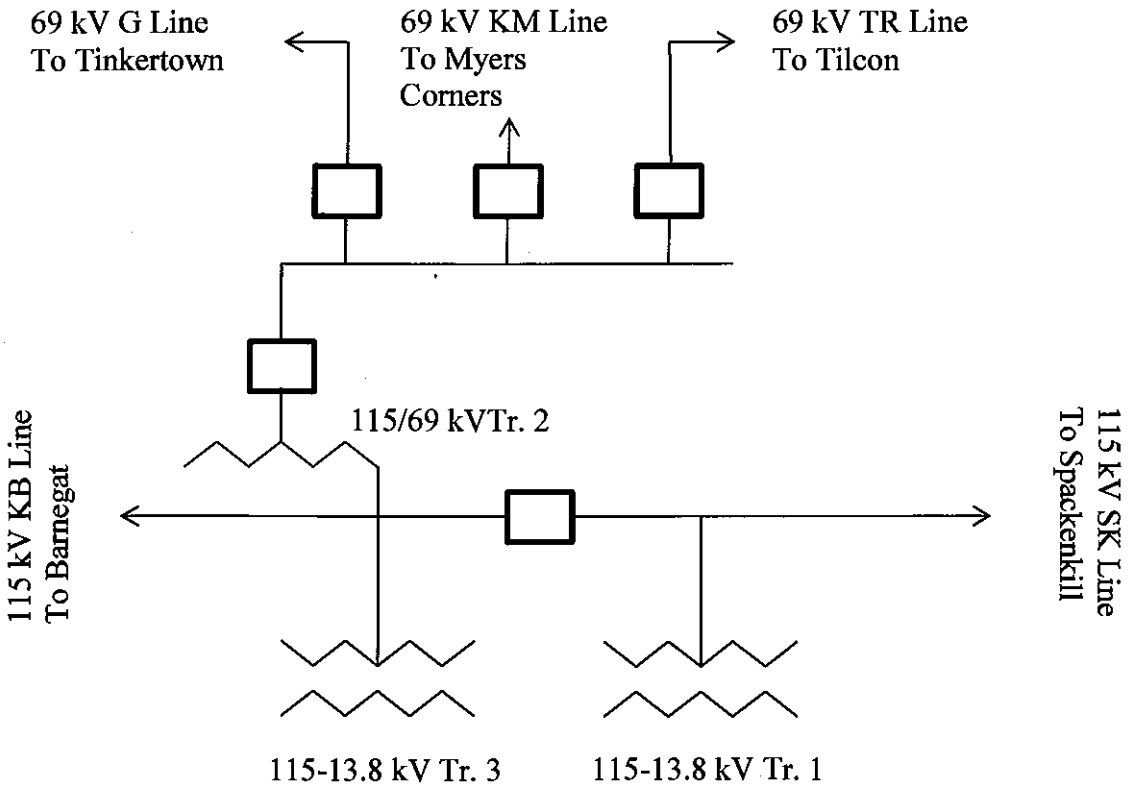
W.O. NO. 5326A	CHECKED DVB
PROJ. NO. 74-729	CLEARED
DRAWN MER	R/W
SUPV. PK	APPROVED

SCALE
DATE 1-4-79
REVISION NO. 11
FILE NO. 300 C
7928
SH. NO. 2 OF 2

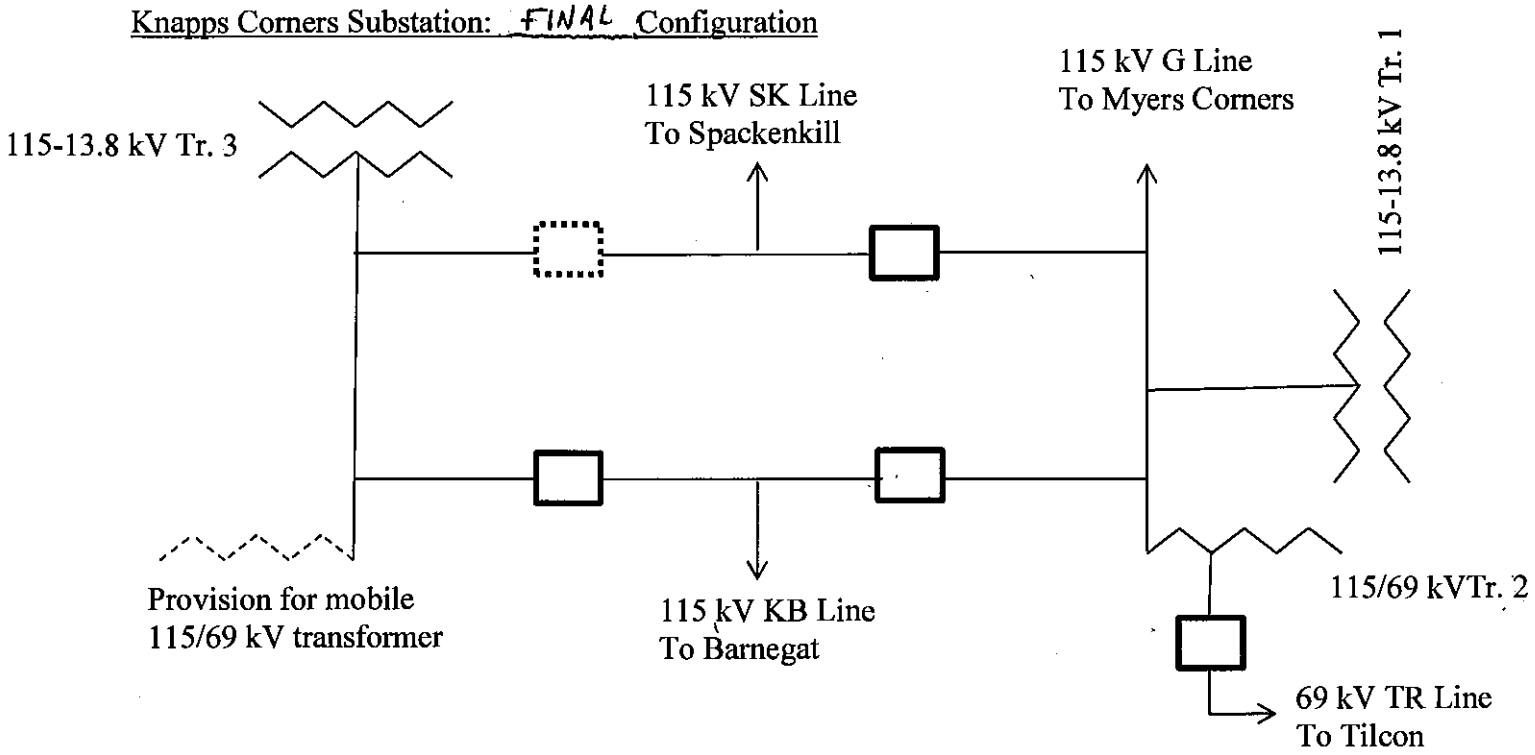
BRUNING 44-141 24816-2

Attachment #1

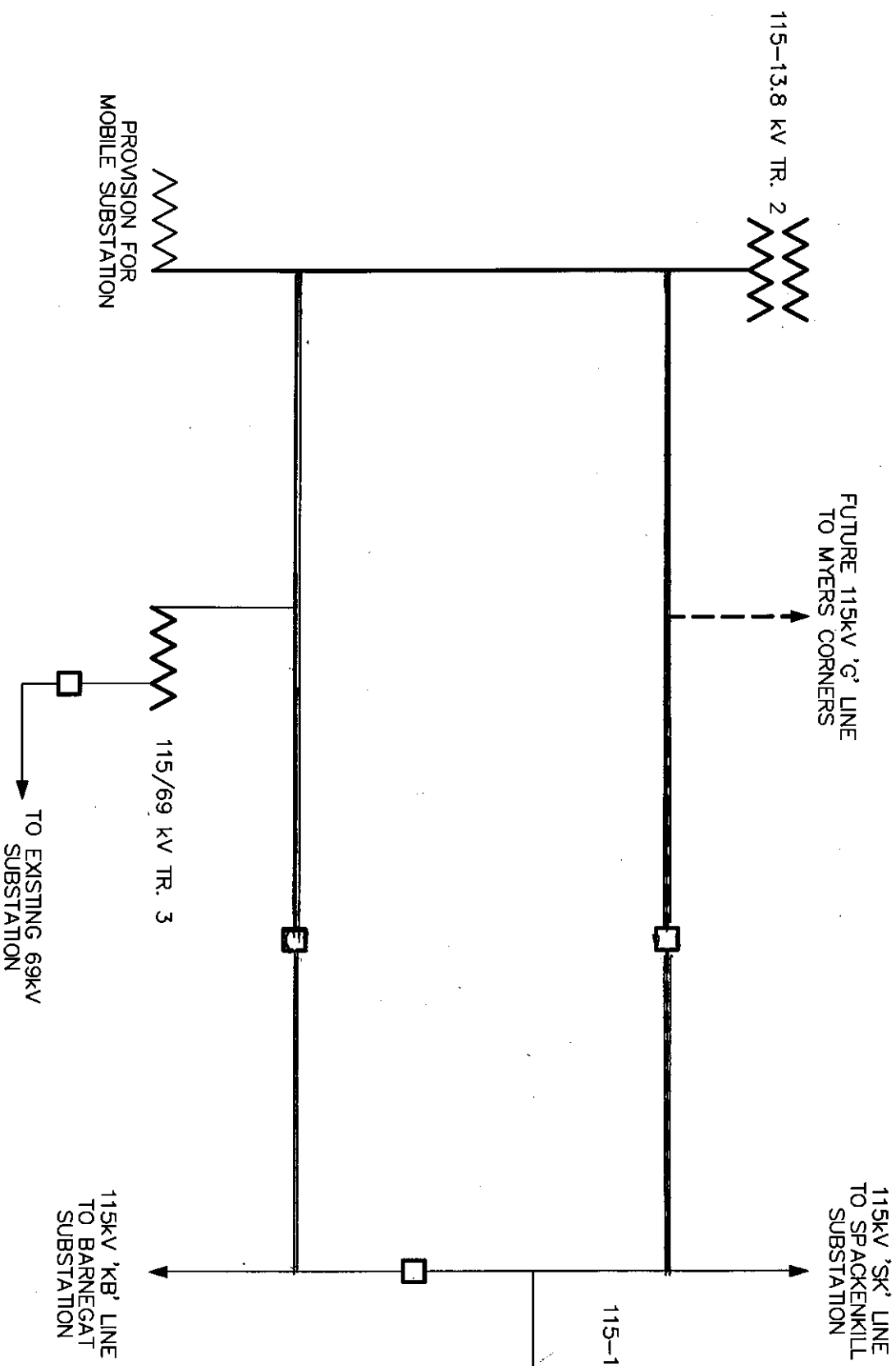
Knapps Corners Substation: Current Configuration



Knapps Corners Substation: FINAL Configuration



KNAPPS CORNERS SUBSTATION: INTERIM CONFIGURATION



WM Transmission Line Rebuild - Parcels Purchased or Obtained Additional Easement

SBL	Grantor	Fee	Easement	Parcel Acres	Appraisal Amount	Amount Paid
12-1-48.1	121.9 LLC		Y	1.080	$27,000	$27,000
203-1-14.21	9 Factory Street		Y	1.940	$38,800	$38,800
203-1-14.22	9 Factory Street		Y	0.420	$12,600	$12,600
210-6-6	Amanti		Y	0.030	$7,800	$26,000
33-1-91	Armentano		Y	0.910	$27,300	$27,300
113-1-7.22	Baer	Y		0.570	$280,000	$280,000
315-3-2	Barilli		Y	0.250	$12,500	$15,000
313-3-4	Big Apple Circus		Y	2.470	$37,000	$77,400
3-1-26.22	Blackburn		Y	0.050	$250	$500
215-1-27	Blades		Y	0.070	$19,600	$19,600
210-6-8	Blashka		Y	0.030	$7,800	$40,000
36-1-10.1	Bowers		Y	0.140	$7,700	$7,700
207-2-1.3	Buononato		Y	0.140	$21,000	$40,000
210-6-7	Byrnes		Y	0.030	$7,800	$7,800
12-1-34.1	Capozzi		Y	1.050	$17,850	$31,500
210-6-11	Champion		Y	0.030	$7,800	$12,000
33-1-97	CJM Enterprises		Y	2.590	$160,000	$188,000
20-1-30	Coleman		Y	0.110	$8,800	$10,800
12-1-29.20	Concors		Y	0.050	$1,250	$1,250
33-1-30.1	Conroy		Y	0.100	$5,500	$5,500
14-1-35.3	Crist Brothers		Y	3.910	$23,460	$78,200
14-1-38.2	Crist Brothers		Y	1.880	$11,280	$37,600
312-10-4	Curassi	Y		1.300	$67,500	$125,000
29-1-79	D'Amato		Y	0.420	$5,040	$6,200
33-1-78.2	Dellaporte		Y	0.020	$2,000	$2,000
29-1-54.1	Devitt		Y	0.250	$17,500	$17,570
313-1-2	Donovan & Newhard	Y		0.940	$47,000	$95,000
210-6-3	Duval		Y	0.030	$7,800	$35,000
33-1-76	Giudice		Y	0.300	$39,000	$55,000
33-1-11.2	Greene		Y	0.010	$550	$1,000
20-1-31	Grobstein		Y	0.100	$3,000	$8,000
33-1-16	Hoeffner		Y	0.210	$11,550	$14,000
33-1-77	Irto		Y	0.004	$500	$2,500
36-1-11.23	J. Drennan		Y	0.400	$12,000	$15,000
36-1-11.221	J.& M. Drennan		Y	0.560	$22,400	$27,200
13-3-25.2	Jennings		Y	0.160	$12,800	$12,800
312-9-8	Kamrowski		Y	0.030	$3,300	$4,000
36-1-11.1	Kelleher		Y	0.630	$18,900	$21,500
29-1-53.22	Kim		Y	0.210	$14,700	$17,000
313-1-3.112	Kissaroo LLC		Y	1.770	$44,100	$60,000
3-1-18	Kohol		Y	0.120	$8,400	$10,500
215-1-44	Kopaskie		Y	0.060	$16,800	$20,800
217-5-1	Lakeside at Montg HOA Inc.		Y	1.130	$20,340	$25,000
20-1-32.2	Lansperry		Y	1.060	$5,300	$10,000
13-3-28	Leybra		Y	0.090	$7,200	$9,000
12-1-29.31	Lundquist Corp.		Y	0.750	$18,750	$18,750
215-1-40	Lyman		Y	0.050	$14,000	$14,000
33-1-92.2	Malley		Y	3.420	$15,390	$15,390
3-1-41	Malley		Y	0.100	$6,500	$8,000
33-1-80	Martin		Y	0.130	$13,000	$16,250
215-1-50	Mazza & Matthews		Y	0.090	$25,200	$25,200
36-1-33	Mid Hudson Industrial Park		Y	2.440	$85,400	$140,000
203-11-14.1	Montgomery Mt. Assoc.		Y	0.470	$9,400	$9,400
20-1-39	Murphy		Y	0.830	$3,735	$3,735
36-1-11.211	Myers		Y	0.080	$2,800	$4,000
113-1-5.1	Narkaj		Y	0.070	$9,800	$12,500
3-1-17.16	Nimue Realty LLC		Y	1.740	$22,125	$40,000
33-1-11.1	Normandin		Y	0.160	$8,800	$12,000

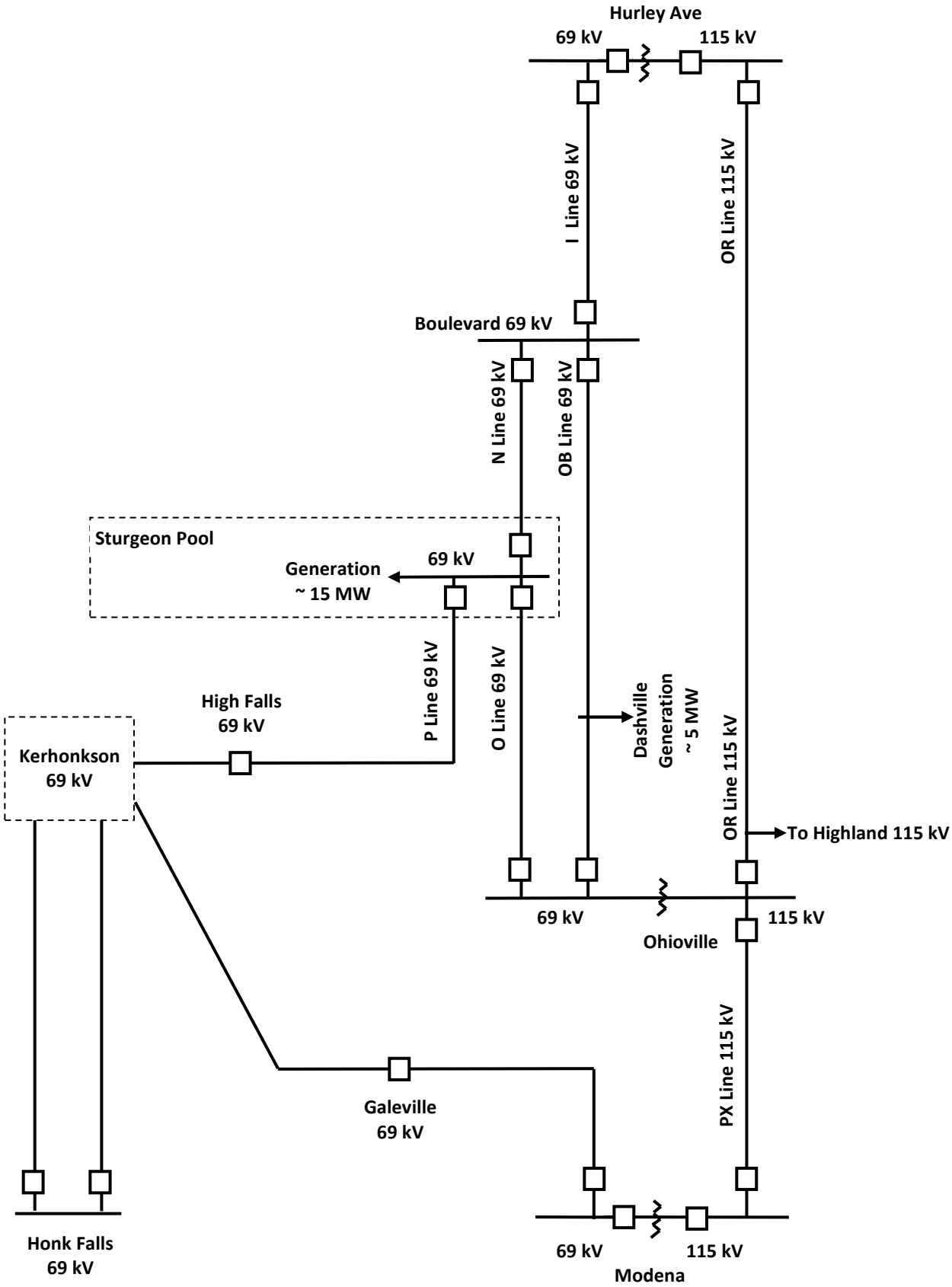
315-4-4	Northeast Hub Inc.		Y	0.650	$16,250	$16,250
215-1-26	O'Brien	Y		0.280	$280,000	$340,000
12-1-39	Pagano		Y	0.460	$7,820	$12,000
210-6-10	Pastore		Y	0.030	$7,800	$7,800
113-1-13	Patel		Y	0.780	$31,200	$52,500
210-6-4	Prior		Y	0.030	$7,800	$25,000
29-1-2.2	Purple Pond Inc.		Y	0.950	$17,100	$17,100
33-1-12	Raabe		Y	0.190	$550	$10,450
13-3-26	Riley & Gioia		Y	0.220	$16,000	$19,600
215-1-39	Roche	Y		0.280	$270,000	$340,000
215-1-43	Rodriques		Y	0.050	$14,000	$19,750
3-1-43	Rosenthal		Y	0.110	$6,050	$8,000
20-1-38.22*	Rotwein		Y	0.050	$11,400	$65,000
20-1-38.1*				0.600		
3-1-32.22	Rowe			0.710	$5,100	$25,000
13-3-25.3	Rywalt & Galante		Y	0.150	$9,900	$14,000
33-1-78.1	Santiago		Y	0.002	$550	$1,200
312-10-2	Scadura		Y	0.010	$1,100	$1,100
215-1-49	Schofield		Y	0.020	$5,600	$5,600
29-1-53.21	Serrano		Y	0.120	$14,400	$18,000
210-6-5	Seward		Y	0.030	$7,800	$12,000
13-3-28	Soudani		Y	0.140	$11,200	$11,200
13-3-29	Stemmler		Y	0.150	$12,000	$12,000
29-1-78	Sutton		Y	0.160	$2,000	$2,000
20-1-98	Taylor		Y	0.340	$10,200	$10,200
36-1-39	Taylor Ind.		Y	5.430	$271,500	$271,500
33-1-13	Theis		Y	0.380	$20,900	$25,000
36-1-28.21	Tobias		Y	1.260	$37,800	$37,800
111-1-21**	Tobias		Y	0.110	$104,200	$175,000
113-1-5.3**				0.240		
36-1-28.22**				2.100		
113-1-1**				0.640		
312-10-3	Truffa Properties III, LLC		Y	0.970	$43,665	$43,665
33-1-31.1	Tweddle		Y	0.060	$7,700	$11,000
33-1-78.3	Valentin		Y	0.290	$29,000	$51,000
113-1-4	VanBlarcom		Y	0.010	$1,400	$5,000
29-1-77	VanDuynhoven		Y	0.040	$1,000	$1,000
33-1-17.31	Vantassell		Y	0.330	$18,150	$27,500
210-6-1	Veloce		Y	0.040	$10,400	$55,000
207.2-1-21	Wallis		Y	0.240	$36,000	$50,000
315-4-1	Way		Y	0.480	$21,600	$25,000
210-6-9	Weinrich		Y	0.030	$7,800	$19,500
210-6-2	Westerfield		Y	0.030	$7,800	$55,000
313-1-1.1	Willard		Y	0.030	$1,500	$1,500

Notes:

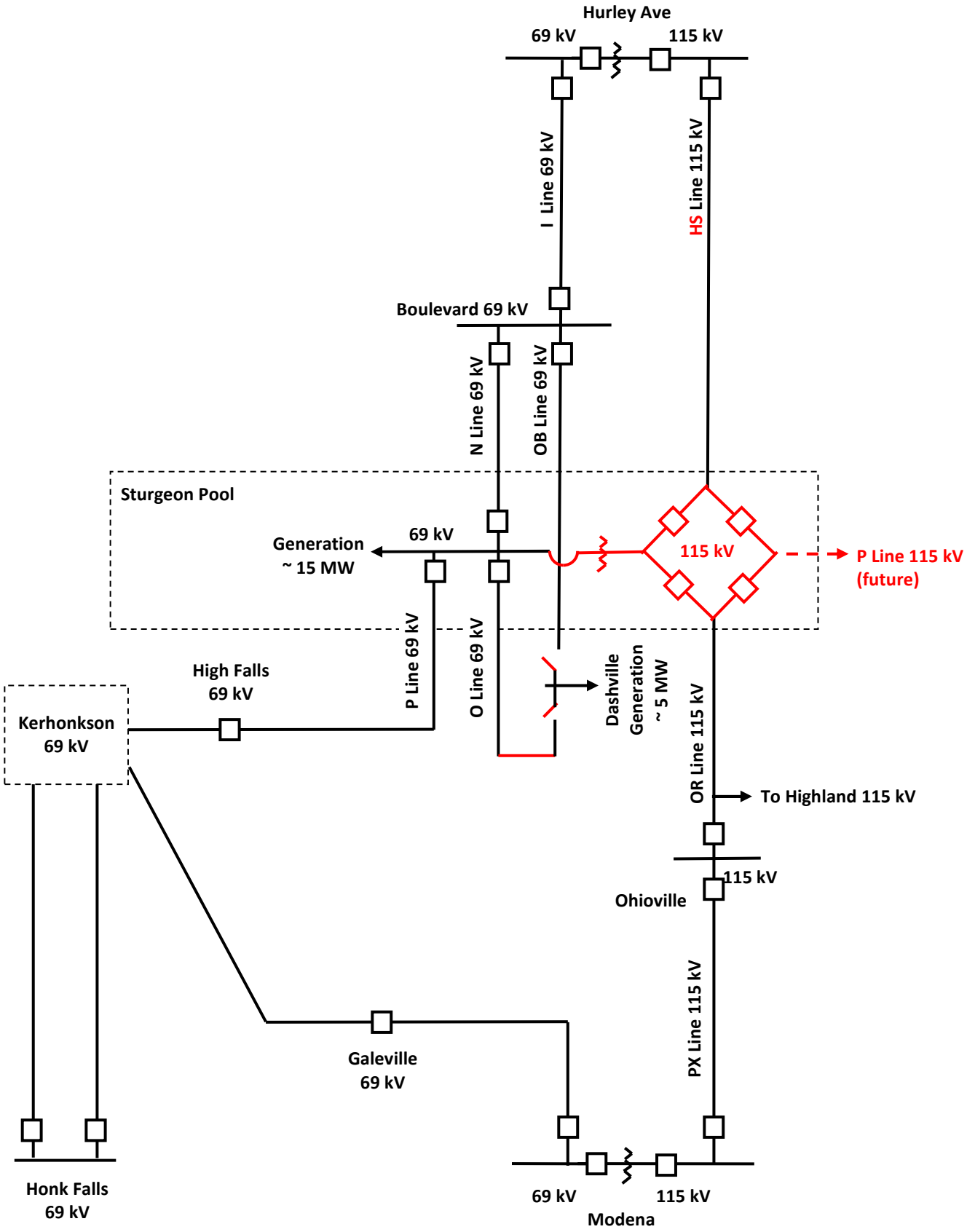
* - Parcels were combined into one transaction and, easement was purchased jointly for both parcels.

** - Parcels were combined into one transaction, and easement was purchased jointly for 4 parcels.

Existing Sturgeon Pool Area System



Post-New Sturgeon Pool Rebuild



P & MK — **Summer (MW) Coincident**

P - Line Loads	Source	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988
Rosendale	Est	Retired in 2010				*0.5*	1.1	*1.30*	*1.3*	*1.9*	1.7	1.8	1.9	1.9	1.5	1.7	1.7	1.8	1.6	1.4	1.4	2.6	1.8	2.6	1.9	2.3	2.0
Accord	Est	Retired in 2012			0.7	0.5	0.7	0.68	0.6	*0.8*	0.7	0.7	0.8	0.8	0.7	1	0.7	0.7	0.7	0.7	0.8	0.8	0.6	0.8	0.6	0.7	0.6
Kerhonkson-HK 3081	Charts	4.8	4.8	5.546	*4.8*	4.5	4.8	4.86	4.8	2.9	2.5	3	5.9	5.7	5.4	6.2	5.8	4.6	4.6	4.5	4.4	4.5	3.9	4.3	3.5	4.5	4.1
High Falls	EMS	18.9	17.5	18.56	18.6	14.4	15.9	16.07	17.6	14.8	11.4	9.2	11.3	8.7	8.5	10.5	6.8	8.5	7.3	9.7	7.2	8.6	7.5	8.2	7.8	7.7	7.6
MK Line Loads																											
Kerhonkson-MK 3082	Charts	4.5	4.5	4.981	*5.3*	4.5	4.8	4.5	5.1	6.4	3.8	4.4	2.9	1.6	1.2	1.3	1.3	1.6	1.4	1.5	2	1.9	1.3	1.7	1.7	1.9	1.5
Galeville	EMS	7.05	8.4	7.09	8.8	7.3	9.0	9.81	10.0	9.1	7.1	6.1	6.2	5.9	4.5	5	4.1	3.6	3	3.6	3.5	4.2	2.5	4	3.5	3.5	3
Modena 69 kV	EMS	-	-	-	-	-	-	-	-	-	8.8	9.1	8	8.3	8.5	9.8	9.5	9.1	7.8	8.1	9.2	9	7.6	7.8	7.6	7	6.6
Ellenville Loads																											
Clinton Ave	MV-90	*1.3*	0.9	0.93	1.0	0.9	1.8	2.50	2.7	2.8	2.4	2.4	2.5														
Honk Falls	EMS	6.1	5.8	4.75	5.9	5.5	5.5	5.80	6.5	6.2	5.3	5	6.5	6.3	6	1.7	1.8	1.9	1.3	1.4	1.3	1.6	1.6	1.6	1	0.9	0.8
Grimley Road	Est	4.5	4.5	5	4.3	*4.3*	3.6	*4.08*	*3.9*	*2.6*	2.4	1.8	2.4	1.7	1.5	1.9	1.5	1	2	2	2.4	3.7	3.7	3.7	2.5	3	3
Greenfield Road[1]	Charts	7.7	7.9	9	6.5	7.4	7.4	7.34	7.9	7.4	6.1	6.5	7.6	17.4	17.3	22.5	20.8	21.1	20.7	21.6	19.8	20.8	19.3	21.2	13.8	16.6	18.7
Schrade	MV-90	0.05	0.07	0.07	0.1	0.1	0.1	0.05	0.1	0.2	0.2	0.6	1														
VAW	MV-90	-	-	-	-	-	-	1.28	3.1	6.4	2.7	4.5	1														
Neversink	Charts	3	3	3	3.1	2.7	2.5	*1.20*	2.8	2.7	2.6	2.6	2.6	2.6	2.8	2.2	2.9	3	2.8	3.2	1.8	1.7	1.6	1.8	2.3	1.8	1.5
Total Ellenvile,P&MK Loads		57.9	57.4	58.9	59.1	52.5	57.2	59.47	66.2	64.2	57.7	57.7	60.6	60.9	57.9	63.8	56.9	56.9	53.2	57.7	53.8	59.4	51.4	57.7	46.2	49.9	52.6
Total Ellenvile,P&MK Loads w/o Modena		57.9	57.4	58.9	59.1	52.5	57.2	59.47	66.21	64.2	48.9	48.6	52.6	52.6	49.4	54	47.4	47.8	45.4	49.6	44.6	50.4	43.8	49.9	38.6	42.9	45.9
1-Year Growth Rate[2]		0.92%	-2.64%	-0.29%	12.48%	-8.09%	-3.87%	-10.18%	3.13%	31.29%	0.62%	-7.60%	0.00%	6.48%	-8.52%	13.92%	-0.84%	5.29%	-8.47%	11.21%	-11.51%	15.07%	-12.22%	29.27%	-10.02%	-5.92%	-
3-Year Growth Rate[2]		-0.68%	2.97%	1.02%	-0.21%	-7.42%	-3.79%	6.74%	10.86%	6.87%	-2.40%	-0.54%	-0.87%	3.53%	1.10%	5.95%	-1.50%	2.34%	-3.42%	4.23%	-3.67%	9.30%	0.69%	3.05%			
5-Year Growth Rate[2]		0.26%	-0.72%	-2.30%	-1.64%	1.45%	3.30%	2.49%	4.71%	5.38%	-1.96%	0.50%	1.93%	2.99%	-0.08%	3.90%	-1.22%	1.76%	-1.87%	5.14%	0.78%	2.02%					
10-Year Growth Rate[2]		1.77%	0.87%	1.14%	1.81%	-0.27%	1.89%	2.21%	3.85%	2.61%	0.92%	-0.36%	1.85%	0.53%	2.50%	2.33%	0.39%										
Since 1988[2]		0.96%	0.96%	1.12%	1.19%	0.68%	1.14%	1.41%	2.09%	2.03%	0.44%	0.43%	1.03%	1.10%	0.67%	1.55%	0.39%	0.52%	-0.05%	1.21%	-0.37%	2.02%	-1.00%	3.05%	-8.00%	-5.92%	
Modena 115 kV	EMS	14.1	13.3	14.7	13.3	9.7	10.1	11.2	10.8	10.1																	
System Peaks		1203	1168	1225	1227	1107	1187	1185	1295	1204	1051	1078	1125	1048	943	1014.6	900.2	916.7	838.1	902.2	891.6	859.9	854.4	950.4	871.4	888.1	890.9
1-Year Growth Rate		3.00%	-4.65%	-0.16%	10.84%	-6.74%	0.17%	-8.49%	7.56%	14.56%	-2.50%	-4.18%	7.35%	11.13%	-7.06%	12.71%	-1.80%	9.38%	-7.10%	1.19%	3.69%	0.64%	-10.10%	9.07%	-1.88%	-0.31%	-
3-Year Growth Rate		-0.66%	1.80%	1.06%	1.17%	-5.09%	-0.47%	4.08%	6.30%	2.29%	0.10%	4.56%	3.50%	5.20%	0.95%	6.58%	-0.07%	0.93%	-0.85%	1.83%	-2.11%	-0.44%	-1.28%	2.18%			
5-Year Growth Rate		0.27%	-0.29%	-1.11%	0.38%	1.04%	1.95%	1.04%	4.32%	5.01%	0.71%	3.67%	4.18%	4.57%	0.89%	2.62%	0.92%	1.42%	-2.48%	0.70%	0.08%	-0.71%					
10-Year Growth Rate		1.10%	0.38%	1.57%	2.67%	0.88%	2.80%	2.60%	4.45%	2.93%	1.66%	2.29%	2.79%	0.98%	0.79%	1.34%	0.10%										
Since 1988		1.21%	1.13%	1.39%	1.47%	1.04%	1.45%	1.51%	2.10%	1.79%	1.04%	1.28%	1.68%	1.26%	0.47%	1.19%	0.10%	0.32%	-0.76%	0.18%	0.01%	-0.71%	-1.04%	2.18%	-1.10%	-0.31%	

Denotes in MVA

1. Prior to 2002 includes Greenfield Rd. 4kV and 13.2kV, Clinton Ave., Schrade and VAW

2. Percentages computed with Modena load excluded because it was transferred out of the Ellenville area in 2005

3. The 2009 load estimate for Rosendale and Grimley Road is in MVA, provided by the Kingston EOE

4. The 2010 load for Kerhonkson, Neversink, Grimley Road and Greenfield Road is obtained from GridSense and the 2010 load for Galeville is obtained from eDNA

5. The 2010 load for Accord Substation and Neversink Circuit 391 was estimated by the Kingston EOE

6. The 2012 load for Grimley Rd was estimated by the Kingston EOE

7. The 2013 load for Clinton Avenue, Kerhonkson and Neversink was estimated by the Kingston EOE

Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 738 of 1288

	Station	Ckt #	Tr #	Existing LTC Type Primary	Existing LTC Type Back Up	New LTC Type Primary	New LTC Type Back Up	Modification	Need RTU?	Cost	Year
1	East Park*	6074 6075	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	YES	$110,000	1
2	Hurley Ave	2093 2094	4	No Regs		M-2001D	M-0329B	Full install	NO	$80,000	1
3	E. Kingston	1021	1	M-2001B	M-0329	M-2001D	M-0329	1 for 1 Retrofit	NO	$20,000	1
4		1022 1024	2	M-2001B	M-0329	M-2001D	M-0329	1 for 1 Retrofit			
5	Merritt Park	8062	1	M-2001B		M-2001D	M-0329B	1 for 1 Retrofit+ BU	NO	$40,000	1
6		8065 8066	2	M-2001B		M-2001D	M-0329B	1 for 1 Retrofit + BU			
7	Forgebrook	8015	1	Ckt. Regs		M-2001D	M-0329B	Full install	NO	$150,000	2
8		8016	2	Ckt. Regs		M-2001D	M-0329B	Full install			
9	Myers Corners	8043 8045	1	M-2001C	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO	$20,000	2
10		8044 8046	2	M-2001C	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit			
11	N. Chelsea	8052 8056	2	M-2001B	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO	$15,000	2
12	Tioranda	8086	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	YES	$110,000	2
13	Coldenham	4027	2	M-0067E	M-0329	M-2001D	M-0329	Adapter Plate	YES+	$130,000	2
14	Highland	5081 5083	1	M-0067E	M-0329A	M-2001D	M-0329A	Adapter Plate	NO	$65,000	2
15		5084K	2	M-2001C	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit			
16	Marlboro	5001	2	M-0067E	M-0329A	M-2001D	M-0329A	Adapter Plate			
17		5002	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	NO	$90,000	2
18	Union Ave	4047	1	M-2001C	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO	$20,000	2
19		4051	3	M-2001B	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit			
20	Inwood Ave.	6061	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	NO	$60,000	3
21	Hibernia	7011 7012	1	M-2001		M-2001D	M-0329B	1 for 1 Retrofit + BU	YES	$75,000	3
22	Manchester	6092	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	NO	$90,000	3
23		6093	2	M-0067E	M-0329A	M-2001D	M-0329A	Adapter Plate			
A	Rhinebeck	7053	4	VRR/LDC		M-2001D	M-0329B	Substation Upgrade	NO	$0	
24	Staatsburg	7041 7042	1	M-2001B	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO	$15,000	3
25	Tinkertown	7023 7025	1	Bus Regs		M-2001D	M-0329B	Full install	NO	$95,000	3
26		7024	2	M-2001C	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO		
B	Knapps Corners	8021 8022 8023 8024		M-2001B		M-2001D	M-0329B	New Sub	NO	$0	
C	Boulevard	1011 1014	1/3	Ckt. Regs Ckt. Regs		M-2001D	M-0329B	New XFMRs	NO	$0	
D		1012	2	Ckt. Regs		M-2001D	M-0329B	New XFMRs			
E	Clinton Ave.	396		No Regs		M-2001D	M-0329B	To be Retired	NO	$0	
27	Greenfield Rd.	3076/78	2	Ckt. Regs		M-2001D	M-0329B	Full install	YES	$130,000	3
28	High Falls	3021	2	M-2001	M-0329	M-2001D	M-0329	1 for 1 Retrofit	YES	$65,000	3
29	Lincoln Park	2015	3	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	NO	$60,000	4
F	Freehold	2061 2071	1	Ckt. Regs Ckt. Regs		M-2001D	M-0329B	New Sub	NO	$0	
30	Lawrenceville	2385		Ckt. Regs		M-2001D	M-0329B	Full install	NO	$80,000	4
31	N. Catskill	2001 2003	7	M-0067E	M-0329A	M-2001D	M-0329A	Adapter Plate	YES+	$160,000	4
32		2004 2005 2006	6	M-0067E	M-0329A	M-2001D	M-0329A	Adapter Plate			
33	Hunter	1081	2	No Regs		M-2001D	M-0329B	Full install	YES	$200,000	4
34		1082	1	No Regs		M-2001D	M-0329B	Full install			
35		1083	-------	-------							
36	South Cairo	2041 2042 2043	1	VRR/LDC		M-2001D	M-0329B	Adapter Plate + BU	YES	$110,000	4
37	Vinegar Hill	2389	1	No Regs		M-2001D	M-0329B	Full install	YES	$130,000	4
38	Westerlo	1091 1092	1	M-2001B	M-0329B	M-2001D	M-0329B	1 for 1 Retrofit	NO	$15,000	4
									TOTAL	$2,135,000	

Year	Cost
1	$250,000
2	$600,000
3	$530,000
4	$755,000

RTU adder	$50,000
RTU+ adder (sub RTUs also)	$80,000
Full Installation 1 XFMR (F1)	$80,000
Full Installation 2 XFMRs (F2)	$150,000
Adapter Panel 1 XFMR (AP1)	$50,000
Adapter Panel 2 XFMRs (AP2)	$80,000
1 for 1 retrofit on 1 XFMR (R1)	$15,000
1 for 1 retrofit on 2 XFMRs (R2)	$20,000
BU relay adder	$10,000

Notes: *East Park has been advanced to Year 1 due to existing planned project work.

Distribution Automation Infrastructure Replacement

Follow-up from September 17, 2014 Meeting

1. A question was asked regarding historical and forward-looking recloser replacements. The following is a chart addressing that request:

Year	# Reclosers Replaced (or To Be Replaced):
2008	2
2009	46
2010	13
2011	13
2012	13
2013	13
2014	13
2015	13
2016	13
2017	7 (scaled down temporarily as Distribution Automation ramps up)
2018	7
2019	13 (per year until completion)

2. A question was raised regarding infrastructure projects completed as a part of the normal budget plan vs. those that will be completed via the Distribution Automation program.

   Our routine infrastructure replacement is more focused on age/condition, safety, accessibility, and reliability/resiliency through newer pole plant and wire. On the other hand, the Distribution Automation program focuses on larger ties that often require a Distribution Management System to control and place a greater emphasis on system efficiency.

   Attached are two projects that demonstrate the distinction in project benefits and needs for infrastructure replacements through the routine and Distribution Automation programs and demonstrate these distinctions.

ATTACHMENT 1

Title: 7091 ckt. – Relocate circuitry on-road & convert to 13.2kV, Hall Hill Rd.

History:

Hall Hill Rd., which is fed from the 7091 circuit via a 167kVA stepdown transformer, has had a history of thermal and voltage issues. Load checks taken in Summer 2010 indicate that the stepdown is at 125% of its rated capacity. A 100A regulator is installed 1.9 miles downstream from the stepdown for voltage support. However, it has been found that low voltage still persists in this area during summer peak.

This portion of the 7091 circuit has also had its history of reliability issues. Much of the circuitry along Hall Hill Rd. runs cross-lot and is difficult to access by bucket truck. Over the last 5 years, this area has experienced 13 outages in the off-road circuitry alone. Much of the infrastructure along Hall Hill Rd. is 1940s vintage and is in poor condition. The circuitry is also all 4.8kV delta, presenting safety issues.

Solution: (refer to the attached circuit maps)

Convert to 13.2 kV circuitry and rebuild on-road 2.0 miles of Hall Hill Rd. and 0.2 miles of Siegler Rd. using 1/0 WR AA open wire circuitry. Install a stepdown transformer at pole 43595 to feed Siegler Rd, and a stepdown transformer at pole 52572 to feed the remaining portion of Hall Hill Rd. Convert all other spurs to 13.2kV operation.

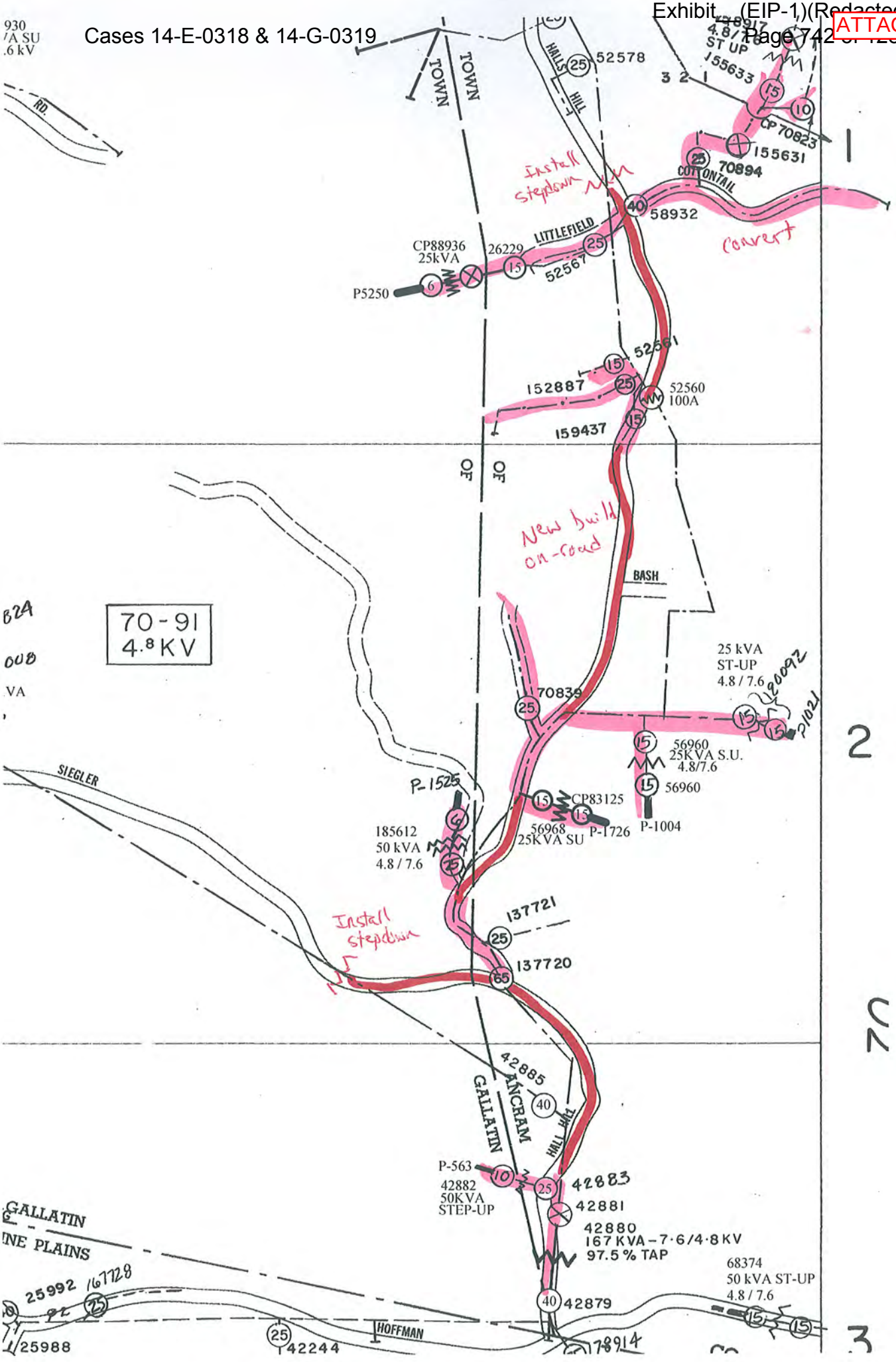
Cost: (refer to the attached circuit maps)

- Rebuild on-road & convert to 13.2kV operation 2.2 miles of circuitry along Hall Hill Road and Siegler Rd..... $ 220,000
- Install two stepdown transformers to feed remaining area..... $ 20,000
- Convert all spurs to 13.2kV operation..... $ 120,000

Total Cost (Capital) = $ 360,000

Summary:

Rebuild and convert 3.4 miles of delta 4.8kV circuitry to 13.2kV circuitry along Hall Hill Rd. Install a stepdown transformer at pole 43595 to feed Siegler Rd, and a stepdown transformer at pole 52572 to feed the remaining portion of Hall Hill Rd. Convert all other spurs to 13.2kV operation. This project will improve the condition of the pole plant, and relieve the thermal and voltage issues currently present. It will also reduce frequency and duration of tree-related outages, and would decrease the cost to trim the line in the future. The historical $/COA for the line relocation portion of this project is $720, and feeds 100 customers.


930
/A SU
.6 kV
RD.
TOWN
TOWN
HALLS
HILL
25
52578
3 2
155633
15
10
CP 70823
155631
25
70894
COTTONTAIL
1
Install
stepdown
40
58932
Convert
LITTLEFIELD
CP88936
25kVA
26229
15
25
52567
P5250
6
52561
15
152887
25
52560
100A
15
159437
OF
OF
New build
on-road
BASH
B2A
008
VA
70-91
4.8 KV
25 kVA
ST-UP
4.8 / 7.6
70839
25
15
15
P1021
15
56960
25KVA S.U.
4.8/7.6
15
56960
SIEGLER
P-1525
15
CP83125
15
185612
50 kVA
4.8 / 7.6
25
56968
25KVA SU
P-1726
P-1004
2
Install
stepdown
137721
25
137720
65
42885
ANCRAM
40
GALLATIN
HALL HILL
P-563
10
42882
50KVA
STEP-UP
25
42883
42881
42880
167 KVA – 7·6/4·8 KV
97.5 % TAP
68374
50 kVA ST-UP
4.8 / 7.6
GALLATIN
INE PLAINS
25992
167728
25
40
42879
15
15
HOFFMAN
25
42244
25988
78914
3

Title: Kerhonkson - High Falls "Superloop"
District: Kingston

History:

The Kerhonkson 3082 circuit and the High Falls 3023 and 3024 circuits combine to feed over 4,000 customers in the Towns of Rochester, Marbletown and Olive on the north side of Rt. 209. The mainline of the three circuits are quite long with a combined total of 38 circuit-miles. This amount of exposure and the fact that the circuits are built along rural roads with an above-average level of tree density has led these circuits to have consistently below average reliability. The three circuits combined have appeared on the Central Hudson Worst Circuit Report eight times over the past five years. The mainline circuitry within the proposed "Superloop" is comprised mainly of #4 Cu, #2 Cu and #2 ACSR conductors totaling approximately 25.5 circuit-miles. This circuitry has an ampacity rating of 230A. The combined loading of the pocket is approximately 9 MVA or 400 amps.

Solution: (refer to the attached circuit maps)

To dramatically improve the reliability of the over 4,000 customers served from within the Kerhonkson-High Falls "Superloop," a Smart Grid project has been proposed to reconductor the mainline circuitry within this loop along with replacing all protective devices within this pocket with electronic reclosers.

The project is proposed within the Smart Grid proposal for the following reasons:

- Due to the distance between devices, a conventional peer-to-peer autonomous ALT system is communication limited.

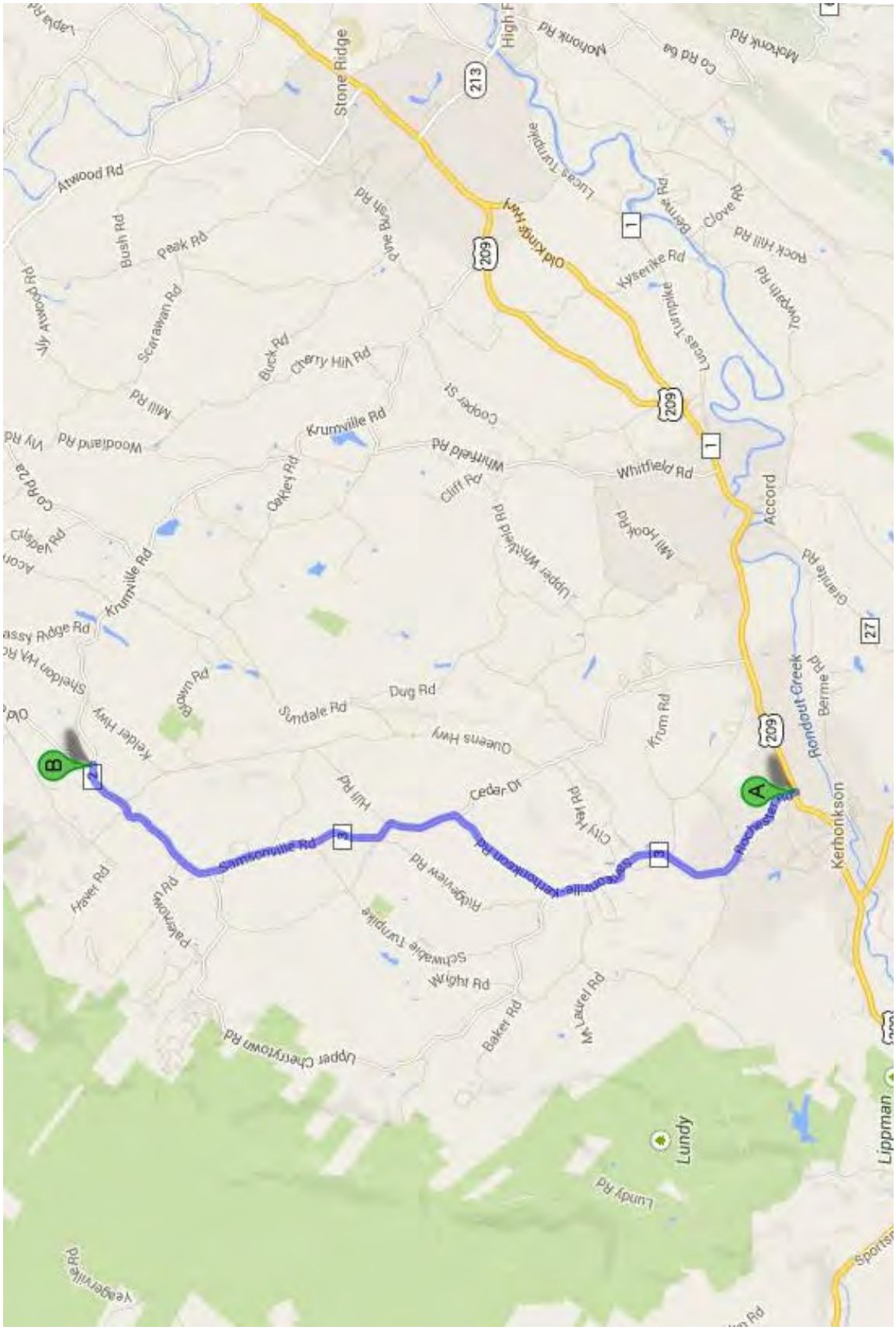
- A centralized DMS is needed to provide area-wide real-time voltage and thermal analysis to ensure no thermal or voltage violations would occur during a reconfiguration event.

- A centralized DMS is needed to coordinate real-time system protection settings changes to the proposed electronic reclosers within the loop to maintain coordination and ensure operations caused by load current would not occur.

- A centralized DMS is needed create this self-healing "Superloop" that would be able to detect faults within the loop and automatically be able to isolate the faulted section and reconfigure the circuitry within the five-minute outage threshold.

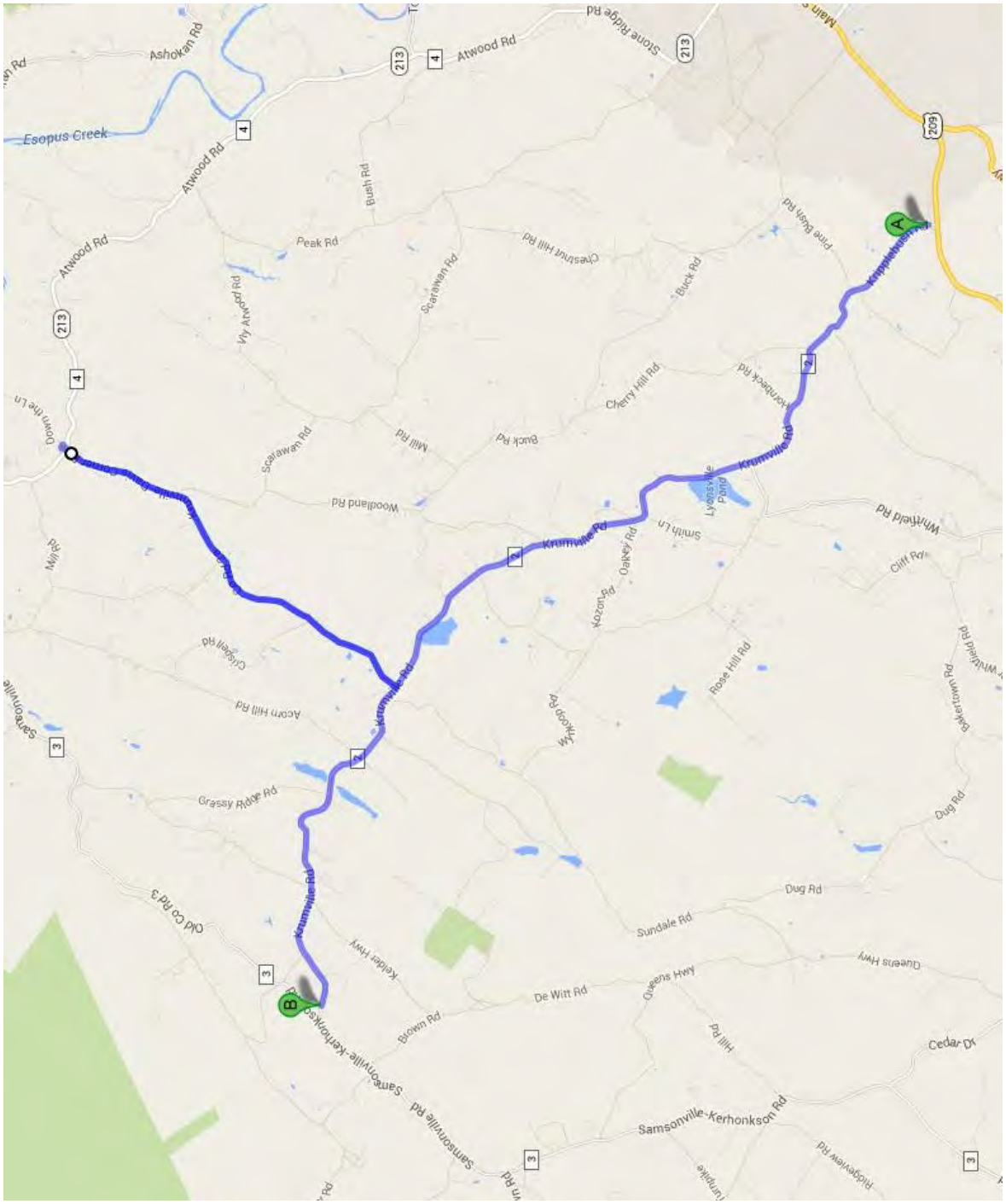
ATTACHMENT 2

Kerhonkson 3082 Circuit Mainline

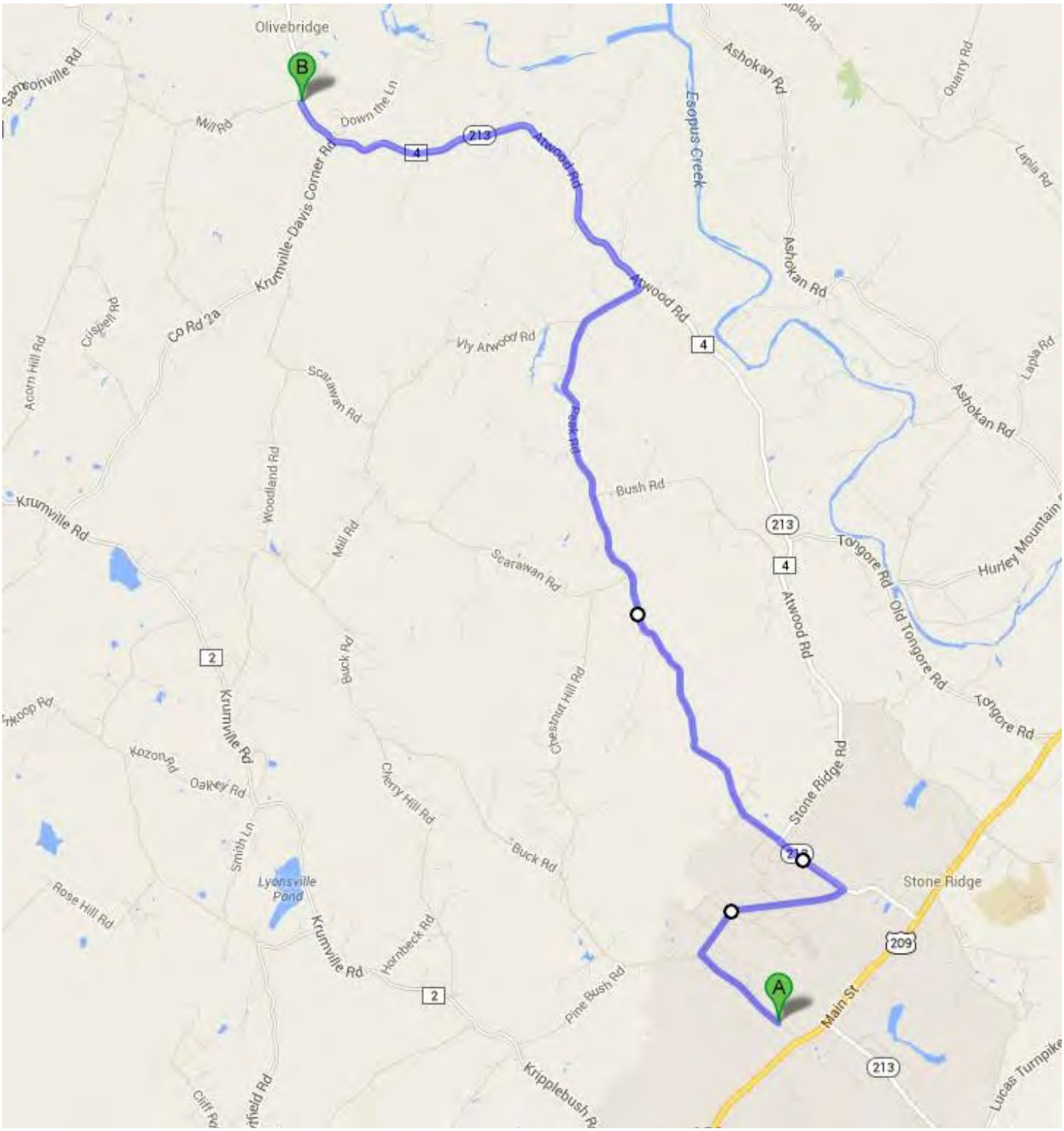


ATTACHMENT 2

High Falls 3024 Circuit Mainline



High Falls 3023 Circuit Mainline



	II	Within 1 year	195
	III	Within 3 years	3,926
	IV	N/A	17,195
2011	I	Within 1 week	63
	II	Within 1 year	145
	III	Within 3 years	2,083
	IV	N/A	15,788
2012	I	Within 1 week	32
	II	Within 1 year	119
	III	Within 3 years	1,617
	IV	N/A	7,559

In addition, comprehensive thermal inspections of the three phase distribution system are completed on an annual basis.

3.5.2 Equipment

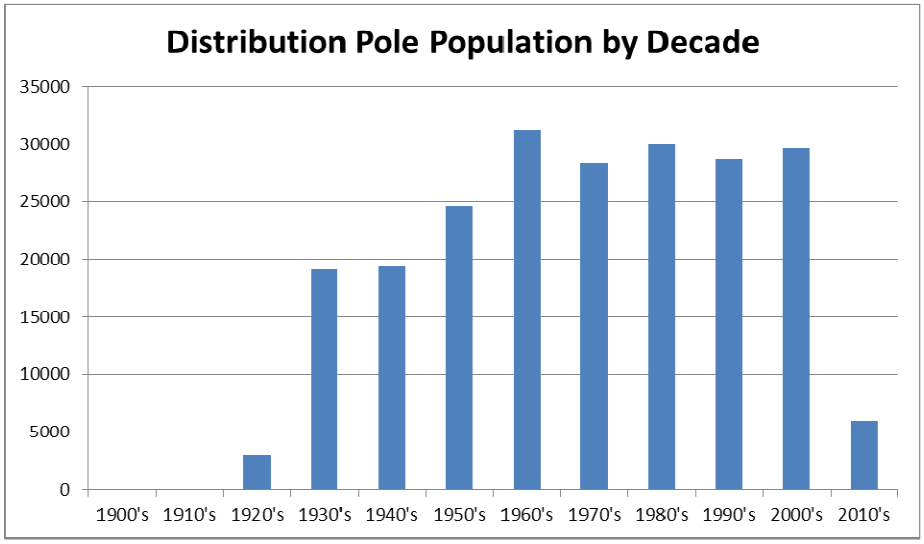
3.5.2.1 Wood Poles

Inventory

Central Hudson currently has approximately 220,147 distribution poles. With the exception of a hand full of specific special installations, the distribution poles on our system are wood.

Age and Condition

The following chart depicts the age of our poles. The average age of the distribution pole plant is 40 years old.



Key Assumptions Summary Sheet

(In Thousands)	2011 Actual	2012 Actual	2013 Actual	2014 Forecast	2015 Budget	2016 Budget	2017 Budget	2018 Budget	2019 Budget
Energy Sales (gWh)	5,184	5,073	5,109	4,892	4,920	4,915	4,893	4,858	4,818
Energy Sales Increase (Decrease) %	-0.6%	-2.1%	0.7%	-4.24%	0.57%	-0.10%	-0.45%	-0.72%	-0.82%
Customer Growth Rates %	0.19%	-0.31%	0.21%	0.11%	0.16%	0.13%	0.13%	0.11%	0.10%
# Customers	300,538	299,591	300,226	300,556	301,035	301,434	301,813	302,137	302,432
Capital Expenditures Actuals/Budget	4,564	5,360	3,899	3,500	3,678	3,924	3,986	4,293	3,345

Request No.:	DPS-3, IR-366
Requested by:	DPS
Date of Request	August 28, 2014
Witness:	Paul Haering
Subject:	Capital Projects

Question:

In response to IR 60, filename "2015-2019 Capital Forecast Electric NB Meters Trans Projects", the Company provided forecast expenditures for New Business Category 14, Transformers Category 16, and Meters Category 17 for the calendar years 2014-2019. Provide the budget and actual expenditures in similar format for the years 2009 - 2013 in an Excel document.

a) Where actual expenditures vary from budgeted expenditures significantly (i.e. 20% or more), describe in detail the reasons for the variance.
b) Explain the difference between New Business - Blanket URD Combo and New Business - Blanket URD categories.

Response:

Please see IR-366 Attachment 1 titled "DPS-3, IR-366 Attachment A" which provides the budget and actual expenditures for the years 2009 - 2013.

a) Also within DPS-3, IR-366 Attachment A please find explanations for any variance that is greater than 20% of budget.
b) The definitions for New Business - Blanket URD Combo and New Business - Blanket URD categories are as follows:
    - New Business - Blanket URD Combo – Refers to all minor URD (underground) projects were there is both electric and gas facilities being installed.
    - New Business - Blanket URD – Refers to all minor URD (underground) projects that only have electric facilities being installed.

Document(s) Attached:

IR-366 Attachment 1

Response by:	Paul Haering
Title:	VP Engineering & System Operations
Date of Response:	September 24, 2014

Case 14-E-0318 & 14-G-0319 DPS-3, IR-366 Attachment A

		$K	2013		2012		2011		2010		2009	
Catergory 14:	Budget		5,410		5,719		5,411		6,797		6,200	
	Actual		3,899		5,360		4,564		5,401		5,068	
	delta		28%	1	6%		16%		21%	6	18%	
Catergory 16:	Budget		5,375		6,073		5,944		6,182		6,071	
	Actual		3,381		4,718		4,740		5,673		5,667	
	delta		37%	2	22%	3	20%		8%		7%	
Catergory 17:	Budget		2,021		1,426		1,443		1,618		1,450	
	Actual		1,934		2,618		1,998		1,606		1,904	
	delta		4%		(84%)	4	(38%)	5	1%		(31%)	7

1 2013 New Business expenditures were less then what was originally forecasted, budgeted dollars were transferred to category 15.

2 2013 Transformers budget was created based off of prior spending, but actuals came in under historical levels in part due to underruns in New Business.

3 2012 Transformer budget was based off of prior year budget plus 2% inflation, expenditures were consistent with New Business.

4 2012 Meter expenditures were higher due to ERT's program for the city of Newburgh which was not included in the meter budget.

5 2011 Meter expenditures were higher due to ERT's program for the city of Newburgh which was not included in the original meter budget.

6 2010 New Business expenditures were less than what was originally forecasted.

7 2009 Meter budget was based off of 2008 actuals. 2009 actuals reflect increase in level of meters required for lowered threshold of the Mandatory Hourly Pricing Porgram and the purchase of meters for the time test requirements.

Request No.: DPS-4, IR-409
Requested by: DPS
Date of Request September 12, 2014
Witness:
Subject: Capital Projects

Question:

In response to IR DPS-61, filename "2015-2019 Capital Forecast Electric Distribution Detail Projects", the Company provided forecast expenditures for the calendar years 2014-2019 for the following categories: Distribution Improvement Blankets (15BL-01), Relocation Blankets (15BL-02), Distribution Improvement Minors (1511-0X), Distribution Improvement Conversions (1521-0X), Road Rebuild Relocation Projects (1531-0X), Distribution Improvement (1551-0X) – Thermal, Distribution Improvement (1551-0X) – Reliability, and Distribution Improvement (1551-0X) - Operating. Provide the annual budget and actual expenditures for each category in similar format for the years 2009 – 2013, as well as actual expenditures for each category year-to-date for 2014, in an Excel document.

Response:

Please see IR-409 Attachment 1 captioned "DPS-4, IR-409 Attachment A" which provides the budget and actual expenditures for the years 2009 – 2013 and YTD 2014.

a) The blankets and minors will have significant variability from year to year based on many factors including emergent replacement work, number of inspection repairs and unidentified small reliability projects. As such for years 2009 through 2013 actual expenditures vary per budgeted line item, but combined total variances were less than 20% for all years except for 2010. In 2010 there was a higher level of specific projects budgeted, which offset the level of minor and blanket project funding. Actual minor and blanket expenditures came in higher than budget and which was offset by a reduction in specific project work. As a whole total Distribution Improvement category expenditures for 2010 were $349K above the $17.5M budget. The year to date expenditure variance for 2014 is primarily timing related and is projected to be on budget at year-end.

Document(s) Attached:

IR-409 Attachment 1

Response by: Paul E. Haering
Title(s): Vice President Engineering & System Operations
Date of Response: October 1, 2014

Case 14-E-0318 & 14-G-0319 DPS-4, IR-409 Attachment A

	2014		
Project Description	Budget	YTD Aug	Variance
Distribution Improvement Minors (1511-0X)	582,682	9,403	(573,279)
Distribution Improvement Blankets (15BL-01)	7,477,709	4,078,170	(3,399,539)
Distribution Improvement Conversions (1521-0X)	291,339	20,171	(271,168)
Relocation Blankets (15BL-02)	169,949	62,549	(107,400)
Road Rebuild Relocation Projects (1531-0X)	543,829	343,645	(200,184)
Distribution Improvement (1551-0X) - Thermal / Voltage	2,606,522	2,593,707	(12,815)
Distribution Improvement (1551-0X) - Reliability	1,325,589	877,209	(448,380)
Distribution Improvement (1551-0X) - Operating	2,510,370	2,864,376	354,006
Total	**15,507,989**	**10,849,230**	**(4,658,759)**

	2013				20	
% Variance	Budget	Actual	Variance	% Variance	Budget	Actual
-98%	462,072	442,879	(19,193)	-4%	441,447	758,195
-45%	7,537,039	7,474,431	(62,608)	-1%	6,210,258	7,225,424
-93%	277,244	113,948	(163,296)	-59%	294,622	46,724
-63%	161,722	125,987	(35,735)	-22%	114,703	(22,514)
-37%	277,244	268,404	(8,840)	-3%	745,722	322,659
0%	1,936,086	2,106,982	170,896	9%	1,098,301	1,187,764
-34%	1,030,424	2,176,736	1,146,312	111%	1,549,400	1,334,535
14%	1,621,884	1,406,611	(215,273)	-13%	544,805	335,930
-30%	**13,303,715**	**14,115,978**	**812,263**	**6%**	**10,999,258**	**11,188,717**

12		2011				20	
Variance	% Variance	Budget	Actual	Variance	% Variance	Budget	Actual
316,748	72%	455,009	546,904	91,895	20%	-	159,882
1,015,166	16%	6,095,008	5,794,571	(300,437)	-5%	6,520,000	7,823,390
(247,898)	-84%	305,009	-	(305,009)	-100%	-	-
(137,217)	-120%	122,003	149,148	27,145	22%	250,000	250,312
(423,063)	-57%	305,009	945,788	640,779	210%	-	-
89,463	8%	1,550,002	1,217,233	(332,769)	-21%	-	-
(214,865)	-14%	2,255,009	1,805,752	(449,257)	-20%	-	-
(208,875)	-38%	465,009	214,993	(250,016)	-54%	-	-
189,459	**2%**	**11,552,058**	**10,674,389**	**(877,669)**	**-8%**	**6,770,000**	**8,233,584**

10		2009			
Variance	% Variance	Budget	Actual	Variance	% Variance
159,882	100%	300,000	532,650	232,650	78%
1,303,390	20%	4,599,000	6,039,858	1,440,858	31%
-	0%	300,000	58,732	(241,268)	-80%
312	0%	120,000	147,805	27,805	23%
-	0%	120,000	18,342	(101,658)	-85%
-	0%	833,000	522,457	(310,543)	-37%
-	0%	-	-	-	0%
-	0%	1,500,000	986,787	(513,213)	-34%
1,463,584	**22%**	**7,772,000**	**8,306,631**	**534,631**	**7%**

Request No.: DPS-4, IR-410
Requested by: DPS
Date of Request September 12, 2014
Witness:
Subject: Stray Voltage Testing

Question:

In response to IR DPS-1, under the Revenue Requirements Panel, filename "Stray Voltage Testing" the Company provided forecast expenditures for the Stray Voltage testing program. Provide work papers showing how forecast expenditures for both testing and mitigation were calculated, including at a minimum; planned units of work to be completed on an annual basis, cost per unit, and anticipated mitigation workload.

Response:

Expected costs associated with the stray voltage program can be broken into three asset sub categories: Distribution (Overhead, Underground, and Substation Fences), Street Lights/Traffic Signals, and Transmission. Since the Stray Voltage program is entering its tenth year, it has established itself as a mature program with no changes anticipated in the foreseeable future.

To calculate costs associated with the stray voltage testing of distribution facilities and street lights/traffic signals, the 2013 historical per unit costs of each asset class were used as a baseline. Due to the stable nature of the testing program, the standard 2.1% inflation rate was applied to the previous per unit costs of each asset class to establish a 2014 baseline cost.

Transmission stray voltage testing does not have a per unit cost and is charged per hour due to the specialized skill set and equipment needed to perform this testing. 2014 contract hourly rates were used for the 2014 baseline cost. For 2015, 2016, and 2017; the 2.1% inflation rate was applied to 2014 baseline costs for each asset class.

In addition to the per unit and per hour costs for each asset class, there are common costs for the entire program consisting of program management, software licenses and support costs associated with the data management, data correction, QA/QC program costs, testing equipment, and miscellaneous costs. These costs were split between the three asset classes based upon the percentage of overall population size of each asset class to be tested each year.

Please refer to the attached spreadsheet marked as IR-410 Attachment 1 and entitled "IR 410 - Stray Voltage Testing Projections.xlsx" for the forecasted

expenditures methodology and cost breakouts for each asset class for testing.

To project mitigation costs, our current contractor was contacted via email to provide pricing to perform corrective actions on our system as mitigation in line with their current work process. Using the costs provided by the contractor, in addition to YTD (up to 4/20/2014) find rates for ground wire and ground molding deficiencies, a cost projection for the 2014 calendar year was generated. The 2014 stray voltage testing program experienced a delayed program start due to poor weather conditions at the beginning of the year. As a result, the 2015 mitigation dollars were adjusted to normalize the mitigation costs to 50% for each half of the calendar year. After a baseline cost for 2015 was established, 2016 and 2017 rates were calculated using the 2.1% inflation rate as applied to 2015 baseline costs.

Please refer to the attached spreadsheet marked as IR-410 Attachment 2 and entitled “IR 410 – Mitigation Costs Projections.xlsx” for the forecasted expenditures methodology and cost breakouts for mitigations.

Document(s) Attached:

IR-410 Attachment 1
IR-410 Attachment 2

Response by:	Paul E. Haering
Title(s):	Vice President of Engineering and System Operations
Date of Response:	September 26, 2014

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Breakout of 2013 Stray Voltage Program Per Unit Costs
(Transmission is per hour charge)

Description	Average Cost/Unit
Cost to perform Distribution Inspections OH, UG, Manholes, Substation Fences	$ 4.56
Cost to perform Street Light/Traffic Signal Testing	$ 5.59
Total	

Number of Units to Target for the Year

Asset Class	Time F 1/1-6/30
Overhead Distribution Poles	15,470
Offroad Distribution Poles	2,730
Underground Padmounts	1,320
Street Lights	3,450
Traffic Signals	413
Manholes	500
Substation Fences	12
Total	***23,895***

Breakout of 1/1 to 6/30 Expenses
Distribution Overhead/Underground
(Cost/Unit equivalent to 2013 rate with 2.1% inflation rate)

ıit costs were based on historical averages. Each unit has multiple cost specifiers associated with them.

Description	Cost/Unit
Units to be tested Distribution (OH, Pads, MH's, Substation Fences)	$ 4.66
Common Costs Spread (~80%)	

Breakout of 1/1 to 6/30 Expenses
Street Lights/Traffic Signals
(Cost/Unit equivalent to 2013 rate with 2.1% inflation rate)

Description	Cost/Unit
Per Unit Price Street Lights	$ 5.71
Common Costs Spread (~14%)	

Breakout of 1/1 to 6/30 Expenses
Transmission Costs (2 FTEs, Pay for 1)

Description	Cost/Hour
Labor	$ 66.84
Vehicle Use	$ 17.84
Common Costs Spread (~6%)	

1/1 to 6

2015 Calendar Year

Description	Time F 2015: 1/1-6/30
OH/UG (realign with 55% before 6/30) with 2.1% Inflation	$ 238,154
SL/TS (realign with 60% before 6/30) with 2.1% Inflation	$ 50,287
Transmission (same hours with 2.1% Inflation)	$ 48,242
Total	***$ 336,683***

2016 Calendar Year

Description	Time F 2016: 1/1-6/30
OH/UG with 2.1% Inflation from 2015	$ 243,155
SL/TS with 2.1% Inflation from 2015	$ 51,343
Transmission with 2.1% inflation from 2015	$ 49,255
Total	***$ 343,753***

14 Stray Voltage Testing

Units	Cost
55,589	$ 253,227
6,801	$ 38,024
62,390	***$ 291,251***

Period	
7/1-12/31	Year Total
23,205	38,675
4,095	6,825
1,980	3,300
2,300	5,750
413	825
750	1,250
8	20
32,751	***56,645***

Units	Cost
20,032	$ 93,264
	$ 123,802
Total	***$ 217,066***

Units	Cost
3,863	$ 22,045
	$ 19,598
Total	***$ 41,643***

Hours	Cost
430	$ 28,741
430	$ 7,671
	$ 10,837
Total	***$ 47,249***

/30 Total Costs $ 305,958

2015, 2016, 2017 Foreca

Period	
2015: 7/1-12/31	**Year Total**
$ 258,936	$ 497,090
$ 29,860	$ 80,147
$ 39,126	$ 87,368
$ 327,922	***$ 664,605***

Period	
2016: 7/1-12/31	**Year Total**
$ 264,374	$ 507,529
$ 30,487	$ 81,830
$ 39,948	$ 89,202
$ 334,808	***$ 678,561***

Forecasting

Detail of 2013 Distribution OH/UG Stray voltage Program Per Unit Costs

Description	Average Cost/Unit	Units
Cost to perform OH Distribution SV Testing and Fences	$ 4.31	52,336
Cost to perform UG Padmount SV Testing	$ 4.30	2,009
Cost to perform Manhole SV Testing	$ 15.15	1,244

Common Costs Distirbution
OH/UG, Street Lights/Traffic Signals, and Transmission
(Costs split based on population size and specific requirements of each asset)

	Time Period	
Description	**1/1-6/30**	**7/1-12/31**
Software License $12,500/month	$ 73,500	$ 73,500
Software Upgrades/Data Correction	$ 4,750	$ 5,600
Program Manager (40 hours/week @ $54.86/hr)	$ 50,000	$ 50,000
QA/QC	$ 21,600	$ 13,400
Equipment, Conferences, Cell Charges, Misc	$ 4,200	$ 6,000
Total	***$ 154,050***	***$ 148,500***

Breakout of 7/1 to 12/31 Expenses
Distribution Overhead/Underground
(Cost/Unit equivalent to 2013 rate with 2.1% inflation rate)

Description	Cost/Unit	Units
Units to be tested Distribution (OH, Pads, MH's, Substation Fences)	$ 4.66	30,038
Common Costs Spread (~80%)		
		Total

Breakout of 7/1 to 12/31 Expenses
Street Lights/Traffic Signals
(Cost/Unit equivalent to 2013 rate with 2.1% inflation rate)

Description	Cost/Unit	Units
Per Unit Price Street Lights	$ 5.71	2,713
Common Costs Spread (~14%)		
		Total

Breakout of 7/1 to 12/31 Expenses
Transmission Costs (2 FTEs, Pay for 1)

Description	Cost/Hour	Hours
Labor	$ 66.84	360
Vehicle Use	$ 11.36	360
Common Costs Spread (~6%)		
		Total

1/1 to 6/30 Total Costs

sting

2016 Rate Year

	Time Period	
Description	**2015: 7/1-12/31**	**2016: 1/1-6/30**
OH/UG (realign with 55% before 6/30) with 2.1% Inflation	$ 258,936	$ 243,155
SL/TS (realign with 60% before 6/30) with 2.1% Inflation	$ 29,860	$ 51,343
Transmission (same hours with 2.1% Inflation)	$ 39,126	$ 49,255
Total	***$ 327,922***	***$ 343,753***

2017 Rate Year

	Time Period	
Description	**2016: 7/1-12/31**	**2017: 1/1-6/30**
OH/UG (realign with 55% before 6/30) with 2.1% Inflation	$ 264,374	$ 248,261
SL/TS (realign with 60% before 6/30) with 2.1% Inflation	$ 30,487	$ 52,421
Transmission (same hours with 2.1% Inflation)	$ 39,948	$ 50,289
Total	***$ 334,808***	***$ 350,972***

Cost
$ 225,752
$ 8,630
$ 18,846

Year Total
$ 147,000
$ 10,350
$ 100,000
$ 35,000
$ 10,200
$ 302,550

Cost
$ 139,850
$ 116,974
$ 256,824

Cost
$ 15,484
$ 21,371
$ 36,855

Cost
$ 24,062
$ 4,090
$ 10,169
$ 38,321

$ 331,999

RY Total
$ 502,091
$ 81,203
$ 88,381
$ 671,675

RY Total
$ 512,635
$ 82,908
$ 90,237
$ 685,780

Repair	Function Number	Quantity/Costs as of 4/20/2014 Qty	DRG PPU	DRG Total Cost	Find Rate	2014 Forecast Projected Qty	DRG 2014 Cost
Ground Wire Reconnected	92022-1-862	68	$ 45.00	$ 3,060	0.96%	439	$ 19,738
Ground Wire repaired	92022-1-862	64	$ 45.00	$ 2,880	0.91%	413	$ 18,577
Ground Molding Replaced	92022-1-862	428	$ 45.00	$ 19,260	6.07%	2,761	$ 124,232
Ground Molding Stapled	92022-1-862	192	$ 3.11	$ 597	2.72%	1,238	$ 3,852
Materials for Minor Repairs	92022-1-862	1	$ 2,883.07	$ 2,883		1	$ 18,355
				Current Total	$ 28,680	Projected Total	$ 184,753

Expected Number Locations with 2 Conditions/1 $45 Charge	6% Population	217	$ 9,753	***Grand Total*** ***$ 175,000***

Work Schedule (Pads/Poles)		
Asset Class	through 4/20/14	Targeted
Poles	7,054	45,500

Projected Costs

	Calendar Year 2014*	2015*	2016	2017
1/1 to 6/30 Costs	$ 60,000	$ 90,000	$ 91,890	$ 93,820
7/1 to 12/31 Costs	$ 115,000	$ 90,000	$ 91,890	$ 93,820
Year Total	*$ 175,000*	*$ 180,000*	*$ 183,780*	*$ 187,640*

	Rate Year 2015*	2016	2017
Ending 6/30	$ 205,000	$ 181,890	$ 185,710

*2014 costs are higher in second half of year due to delayed start of stray testing program. 2015 numbers are adjusted to return program to 50% of distribution mitigations in each half of calendar year. This alters 2014 and 2015 projected costs.

Request No.: DPS-4, IR-411
Requested by: DPS
Date of Request September 12, 2014
Witness:
Subject: Stray Voltage Testing

Question:

For the Facility Inspection program, provide actual and budgeted expenditures, and actual and planned units of work completed for the years 2009-2013. Provide the same information for 2014 year-to-date.

Response:

Please refer to the attached spreadsheet marked as IR-411 Attachment 1 and entitled "IR 411 – Facility Inspections.xlsx" for the 2009 to 2013 historical and year to date distribution inspections expenditures.

Costs have fluctuated each year for a few reasons. In 2011, Central Hudson fully transitioned from a targeted three year distribution inspection cycle to a five year inspection cycle. In addition, the Order revision issued in March 2013 no longer required the inspector to open the padmount transformer to perform an inspection. As a result of these two changes, yearly contract inspection costs incurred on the inspections programs were reduced for each year. On the other hand, costs per unit increased in 2014 based upon a new contract negotiation and general loss of synergies after implementation of the new Order, but overall Stray Voltage and Inspections program costs are in line with those proposed in the petition that resulted in the Order revision in March 2013.

In addition, Central Hudson attempts to capture synergies with other programs in an effort to reduce overall company costs. For example, most overhead distribution and padmount inspections are performed at the same time as a stray voltage test. Another cost savings practice is to coordinate ROW maintenance trimming on transmission lines with transmission structure inspections when possible.

Each year, different service areas of the company are targeted for inspections in an effort to minimize travel time between locations. Each area of the service territory has different geological, terrain, and facility density characteristics. These characteristics change each year and will cause additional fluctuation in actual costs.

Transmission Inspections were included in the activities associated with the Enhanced Transmission Infrastructure Maintenance Program. The table below

summarizes the actual and budgeted expenditures for the years 2009 through 2013 as well as the first eight months of 2014:

	2009	2010	2011	2012	2013	YTD 2014
Budget	$206,700	$139,462	$143,000	$345,000	$171,736	$141,872
Actual	$150,524	$173,315	$143,674	$283,380	$243,209	$118,327

The four work activities that comprise the transmission inspection program include comprehensive ground inspections, quarterly aerial patrols, comprehensive aerial inspection, and infrared aerial inspections. The planned and actual units of work completed for the years 2009 through 2013 as well as the first eight months of 2014 are summarized in the table below:

	2009	2010	2011	2012	2013	YTD 2014
Comprehensive Ground Inspection						
Planned	116.1 mi.	116.1 mi.	116.1 mi.	116.1 mi.	116.1 mi	116.1 mi.
Actual	69.6 mi.	160.3 mi.	108.7 mi.	129.6 mi.	165.4 mi.	114.7 mi.
Quarterly Aerial Patrols						
Planned	2,205.6 mi.	2,321.7 mi.	2,321.7 mi.	1,973.4 mi.	2,321.7 mi.	1,160.8 mi.
Actual	2,321.7 mi.	2,145.8 mi.	2,321.7 mi.	2,039.7 mi.	2,217.1 mi.	1,160.8 mi.
Comprehensive Aerial Inspection						
Planned	116.1 mi.	0 mi.	0 mi.	348.3 mi.	0 mi.	0 mi.
Actual	0 mi.	175.9 mi.	0 mi.	282 mi.	104.6 mi.	0 mi.
Infrared Aerial Inspection						
Planned	580.42 mi.	0 mi.	0 mi.	0 mi.	0 mi.	0 mi.
Actual	604 mi.	0 mi.	70.4 mi.	0 mi.	0 mi.	0 mi.

Document(s) Attached:

IR-411 Attachment 1

Response by: Paul E. Haering
Title(s): Vice President of Engineering and System Operations
Date of Response: September 29, 2014

AP Exp

	2009				2010				2011		
Description	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed
UG Inspections	$ 86,471	$ 64,500	4,556	$ 18.98	$ 113,887	$ 64,500	7,122	$ 15.99	$ 56,553	$ 80,000	3,226
OH Inspections	$ 75,047	$ 141,000	60,796	$ 1.23	$ 115,211	$ 129,000	74,023	$ 1.56	$ 65,307	$ 88,000	41,810

penditures/Budget

	2012				2013				2014 (through Aug)			
Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit
$ 17.53	$ 49,473	$ 76,000	2,752	$ 17.98	$ 6,138	$ 68,444	1,350	$ 4.55	$ 3,954	$ 70,000	2,731	$ 1.45
$ 1.56	$ 67,942	$ 83,500	45,911	$ 1.48	$ 68,631	$ 85,582	44,733	$ 1.53	$ 88,985	$ 85,535	35,358	$ 2.52

Request No.: DPS-4, IR-412
Requested by: DPS
Date of Request September 12, 2014
Witness:
Subject: Stray Voltage Testing

Question:

For the Facility Inspection program, provide forecast expenditures for inspections and maintenance repairs for 2015, TME June 30, 2016, TME June 30, 2017, and TME June 30, 2018. Provide work papers showing how these forecast expenditures were calculated, including at a minimum; annual planned units of work to be completed, costs per unit, and anticipated repair workload.

Response:

To establish the forecasted expenditures for 2015, the 2014 rates were used as a baseline. In 2014, distribution overhead poles have a cost of $2.52/unit and padmount transformers have a cost of $1.45/unit. See IR-411 Worksheet for cost/unit information for 2014. Using the 2.1% inflation rate per calendar year, the projected cost/location in 2015 will be $2.57/unit for distribution poles and $1.48/unit for padmount transformers. The same inflation rate was applied to calendar years 2016, 2017, and 2018.

It should be noted that Facility Inspections were included in the inflation pool because they were part of a mature program and minor enough to be managed as a part of ordinary business. Therefore, increases in costs beyond inflation are driven by the reasons described in the response to IR-411 and are not reflected in the rate forecast.

Please refer to the attached spreadsheet marked as IR-412 Attachment 1 and entitled “IR 412 - Inspections Projections 2014 - 2018.xlsx” for the forecasted distribution inspections expenditures for 2015, TME June 30, 2016, TME June 30, 2017, and TME June 30, 2018.

Similar to the distribution inspections, the transmission inspections were also included in the inflation pool. The forecasted expenditures for transmission inspections for 2015, TME June 30, 2016, TME June 30, 2017, and TME June 30, 2018 are provided in the table below:

	2015	TME 6/30/16	TME 6/30/17	TME 6/30/18
Budget	$452,750	$514,060	$763,455	$779,488

The annual planned units of work to be completed and cost per mile for each of

the four activities that comprise the transmission inspection program are provided in the table below:

	2015	TME 6/30/16	TME 6/30/17	TME 6/30/18
Comprehensive Ground Inspection	160.3 mi. $692/mi.	131.6 mi. $786/mi.	129.6 mi. $879/mi.	120.2 mi. $893/mi.
Quarterly Aerial Patrols	2,031.5 mi. $57/mi.	2,031.5 mi. $59/mi.	1,741.3 mi. $61/mi.	1,741.3 mi. $63/mi
Comprehensive Aerial Inspections	290.2 mi. $779/mi.	290.2 mi. $806/mi.	580.4 mi. $834/mi.	580.4 mi. $864/mi.
Infrared Aerial Inspection	0 mi. $95/mi.	580.4 mi. $98/mi.	580.4 mi. $102/mi.	580.4 mi. $105/mi.

Document(s) Attached:

IR-412 Attachment 1

Response by: Paul E. Haering
Title(s): Vice President of Engineering and System Operations
Date of Response: September 26, 2014

Inspections Forecasted Budget

	Calendar Year 2015			Rate Year Ending June 30, 2016			Rate Year Ending June 30, 2017			Rate Year Ending June 30, 2018		
	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures
Distribution Overhead	$ 2.57	46,300	$ 119,000	$ 2.60	46,300	$ 120,533	$ 2.66	46,300	$ 123,064	$ 2.71	46,300	$ 125,649
Distribution Underground	$ 1.48	3,300	$ 4,883	$ 1.50	3,300	$ 4,942	$ 1.53	3,300	$ 5,046	$ 1.56	3,300	$ 5,152

Central Hudson Gas & Electric Corporation
Case Nos. 14-E-0318 & 14-G-0319
Response to Interrogatory / Document Request

Request No.:	DPS-4, IR-477
Requested by:	DPS
Date of Request	September 12, 2014
Witness:	
Subject:	Network Strategy

Question:

Please provide the Network Communication Strategy cost benefit analysis spreadsheet.
(Eng_TelrcomCostBenefit_Option_NW_5yr spreadsheet).

a) Please explain in detail how the company determined that 1,380 radios will be needed. Does this differ than previously estimated quantities and if so, please indicate how the cost difference is captured in the filing. Provide all work papers, calculations and design documents.
b) Please explain the differences between radio installations using existing streetlights as compared to those requiring new streetlight arms, including how the units will be powered, and the basis for the cost estimates.
c) Please explain what the Engineering Services and Warranty cost covers and how it was derived?
d) Please explain what the $157 software license covers and how it was derived?
e) Please explain how the 70 substations were identified as needing radios and provide all plans for which substations will be receiving the radios by year.
f) Please provide support for the $30,000 estimated cost used for the substation radios and indicate why the annual calculation includes the $30,000 as well as a cost for a radio, engineering services and warranty, and software license.
g) Please identify how the company determined the 60/40 split between radios to be installed on existing streetlights and those needing streetlight arms, including why this ratio should be applied to all areas within the Company's territory. Provide all work papers, calculations and design documents.
h) Please provide the basis for using a 2.5% inflation factor.
i) Please provide the radio installation schedule including location by town and operating district and estimated start window. Please describe how the schedule was prioritized.

Response:

Please see attached file marked IR-477 Attachment 1 and titled: "CHGE Response to DPS-477 - Attachment 1 - Eng_Telecom Cost Benefit_Option _NW_5yr"

a) The calculation of the number of Tier 2 radios is located in Network

Strategy Presentation pages 24 through 27 In the attached powerpoint marked as IR-477 Attachment 2. Using a coverage ratio from the Targeted Deployment Project of 0.88 radios per square mile and a Tier 2 service area covered of 2,100 square miles, the number of Tier 2 radios was calculated as follows:

Targeted Deployment design (initial location)
110 radios for 125 square miles based on design
Coverage: 0.88 radios per square mile
Tier 2 Radio Estimate for Buildout
Service Area Covered 2,100 square miles
Remaining 2,100 – 125 = 1,975 square miles
At 0.88 coverage = 1,738 additional radios
Plus contingency of 462 radios (25% of 1,848 radios)
110 radios + 1,738 radios + 462 radios = 2,310 radios

The plan is for a total of 2,310 Tier 2 radios. Of this, 110 were associated with the Targeted Deployment project, 1,600 Tier 2 radios are associated with the Network Strategy build out and 600 radios are associated with distribution automation. The 1,600 Tier 2 radios for the Network Strategy build out include 70 radios located in substations, 140 radios located in gas regulator stations and 1390 radios located on the electric distribution system. This is the basis for the 1380 radios referenced in the question (there were 10 spare radios in the Targeted Deployment Project).

b) Radios installed using existing streetlight arms will be powered from the existing electrical utility service that powers the streetlight/equipment at that location. Radios requiring the installation of street lights will require a new service drop to an existing secondary service if available. If an existing utility service is not available, a transformer and new utility service will be installed. This cost associated with this work is the difference between having an existing streetlight and not having an existing streetlight.

c) Please refer to the [redacted]. Proposal for the Targeted Deployment Project (Attachment 3) page 41under the Tier 2 build section lines labeled Professional Services and Installation. Initially warranty services were included in the model, but after consideration it was determined that the basic one year warranty included with the purchase of the [redacted] radio was sufficient.

d) Please refer to the [redacted] Proposal for the Targeted Deployment Project (Attachment 3) page 41under the Tier 2 build section line labeled [redacted] Control Router License.

e) The Network Strategy Team collectively has identified the list of substations based on criticality and deemed these substations members of the Tier 1 network. The remaining substations that were not identified as Tier 1 stations serve as readily accessible points to utilize as part of the Tier 2 network. The 70 substations identified as needing radios are Tier 2

points.

At this time, the specific sequence of deployment of Tier 2 radios in the substations has yet to be determined. The plan as constituted presently is both to support the build out of the Tier 1 network as well as the Distribution Automation Roadmap locations identified. On a high-level, supporting these locations require radio installations at these substations at an average rate of 14 substations per year for 5 years.

f) The estimated $30,000 covers the costs of the additional equipment required to integrate the radios with the existing substation architecture. Such material includes new or upgraded network switches, routers, firewalls, etc.

g) A sample region of the Central Hudson service territory was selected to inventory pole locations where Tier 2 radios would be installed. This area consisted of 30 pole locations where pole top devices existed or were to be installed in the future. Each pole location was evaluated to determine if existing street lights or other equipment with utility service was available at the pole or on an adjacent pole. We felt this same area was reflective of the typical installations throughout our service territory. This resulted in the 60/40 split.

h) The 2.5% inflation that was used in the Network Strategy model was based off historical data at the time the model was created

i) The Tier 2 radio network will be deployed following the installation of the Tier 1 network in an area and in conjunction with Distribution Automation. This will reduce the workforce mobilization and number of trips required to an area of the system. The Tier 1 network deployment (see attachment 4) was prioritized and optimized over a four year period to consider a number of factors such as:

- Multiple, independent paths from Central Hudson's main headquarters in Poughkeepsie
- Link to the alternate control center at our Newburgh office
- Connections to 345kV and other critical substations
- Interface with existing fiber installations and planned transmission projects (with opportunity to install fiber)
- Distribution Automation projects that provide unique benefits, such as those that provide opportunity for large capital deferral

The Targeted Deployment Project area will consist of approximately 65 radios in the Town of Ulster. The rest of the Tier 2 network will be deployed over five years, following the installation of the Tier 1 network in the area. The project will commence in the Mount Beacon area, which contains several existing towers and is located in southern Dutchess County. It can be reached within 2 hops of our Poughkeepsie

headquarters, while enabling the infrastructure built nearby to traverse both sides of the Hudson River, and reach multiple 345 kV substations as well as the Newburgh headquarters in year one. The FT transmission line nearby Mount Beacon is a radial 115kV transmission line targeted for capital deferral through distribution automation, as described on Page 13 of the testimony provided by Mr. Paul E. Haering. The remainder of the service territory that will be reached by Network Strategy all consists of projects that can offer the other key benefits, such as distribution automation, and therefore the deployment prioritization is focused on the communications factors bulleted above for the remainder of the project.

Because the distribution feeders are not separated by town and precise radio locations must be determined based upon field conditions and path studies at the time of installation, it is not practical to determine locations by individual town, but instead by the area within an Operating Division that has more clearly defined electrical regions.

The following is a schedule for deployment by Operating District, consistent with our Grid Modernization Roadmap:

- Targeted Deployment Project – 110 Radios in the Town of Ulster.
- Rate Year 1 (July 1, 2015 – June 30, 2016) –Fishkill (southern) and Newburgh (eastern) Operating Districts (approximately 420 radios)
- Rate Year 2 (July 1, 2016 – June 30, 2017) – Fishkill and Newburgh (western/northern) Operating Districts (approximately 430 radios)
- Rate Year 3 (July 1, 2017 – June 30, 2018) –Fishkill (northern) and Poughkeepsie Operating Districts (approximately 440 radios)
- Year 4 (July 1, 2018 – June 30, 2019) –Poughkeepsie and Kingston (southern) Operating Districts (approximately 450 radios)
- Year 5 (July 1, 2019 – June 30, 2020) –Catskill and Kingston Operating Districts (approximately 340 radios)
- Year 6 (July 1, 2020 – December 31, 2020) –Catskill Operating District (approximately 120 radios)

Document(s) Attached:

IR-477 Attachment 1, CHGE Response to DPS-477 - Attachment A - Eng_Telecom Cost Benefit_Option _NW_5yr, Confidential
IR-477 Attachment 2, Confidential
IR-477 Attachment 3, Confidential
IR-477 Attachment 4, Confidential

Response by:	Paul E. Haering
Title(s):	Vice President – Engineering and System Operations
Date of Response:	September 26, 2014

Telecommunications Strategy - Network Strategy 5 Year Rollout
Cost Benefit Analysis

Tax Rate
Equity Cost
Pre-tax Debt
WACC (after-tax)

[redacted]

Year	Capital	Net Plant	Def Tax Bal	Theoretical Rate Base	AFTER-TAX WACC	Depreciation	Cur Exp	Fut Exp	Other	Total Revenue Req
1	[redacted]									
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
Total										
NPV										27,437,891

Costs Summary

Telecommunications Strategy - Network Strategy 5 Year Rollout

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Assumptions																											
FTE's																											
Maintenance Exp as Percent of CapEx																											
Inflation Rate																											
Depreciation Effect																											
Depreciation																											
Depreciation Tax Benefit																											
Total Depreciation Effect																											
Current Expense																											
Current Expense																											
Tax Benefit																											
Future Maintenance Costs (new expen																											
Project Management/System Operatio																											
System Maintenance																											
NOC System Management																											
Training																											
Tower Lease Fees																											
FCC Fees																											
Maintenance Costs -Other																											
Tax Benefit																											
Income / (Loss)																											
Less: Depreciation																											
Add: Dep Def Tax Benefit																											
Add: Project Capex																											

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Telecommunications Strategy - Network Strategy 5 Year Rollout
Depreciation Schedule

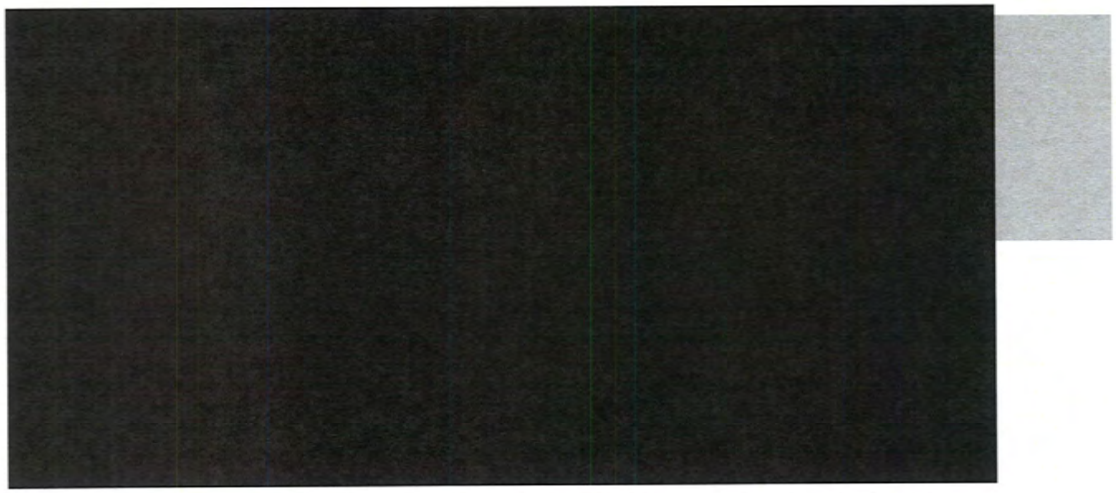
In Service Date	2015/2020
Book Depreciation Life	20

Date	[redacted]
2015	
2016	
2017	
2018	
2019	
2020	
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2022	
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2035	

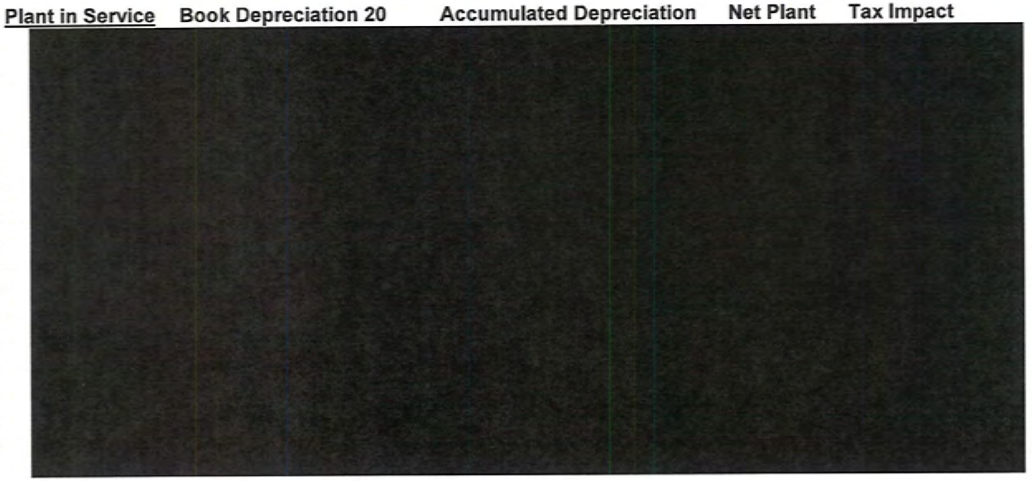
Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2016	[redacted]					
2017						
2018						

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2019	2019
2020	2020
2021	2021
2022	2022
2023	2023
2024	2024
2025	2025
2026	2026
2027	2027
2028	2028
2029	2029
2030	2030
2031	2031
2032	2032
2033	2033
2034	2034
2035	2035
2036	2036



Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2017		2017					
2018		2018					
2019		2019					
2020		2020					
2021		2021					
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					



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2034	2034
2035	2035
2036	2036
2037	2037

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2018	2018					
2019	2019					
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2019	2019					
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					

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2027	2027
2028	2028
2029	2029
2030	2030
2031	2031
2032	2032
2033	2033
2034	2034
2035	2035
2036	2036
2037	2037
2038	2038
2039	2039

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					

[redacted]

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Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2021		2021					
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
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2034		2034					
2035		2035					
2036		2036					
2037		2037					
2038		2038					
2039		2039					
2040		2040					
2041		2041					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					
2034		2034					

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2041	2041
2042	2042

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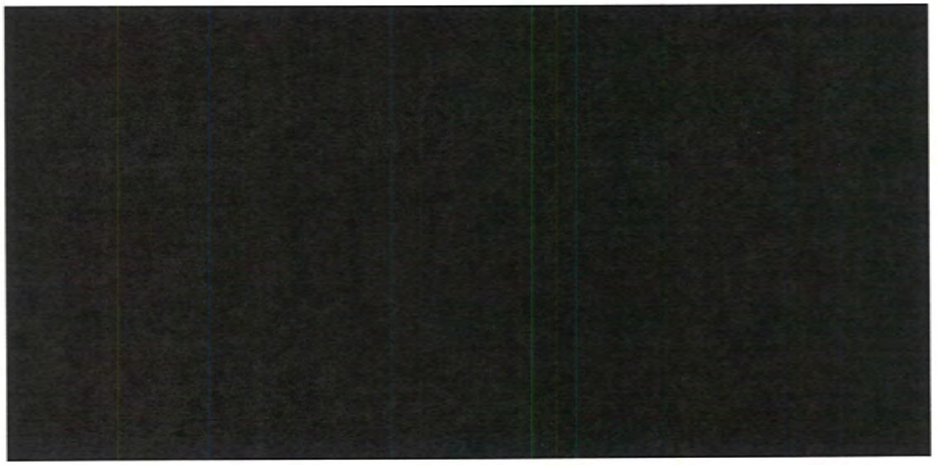
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2023		2023					
2024		2024					
2025		2025					
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2027		2027					
2028		2028					
2029		2029					
2030		2030					
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2041		2041					
2042		2042					
2043		2043					

[redacted]

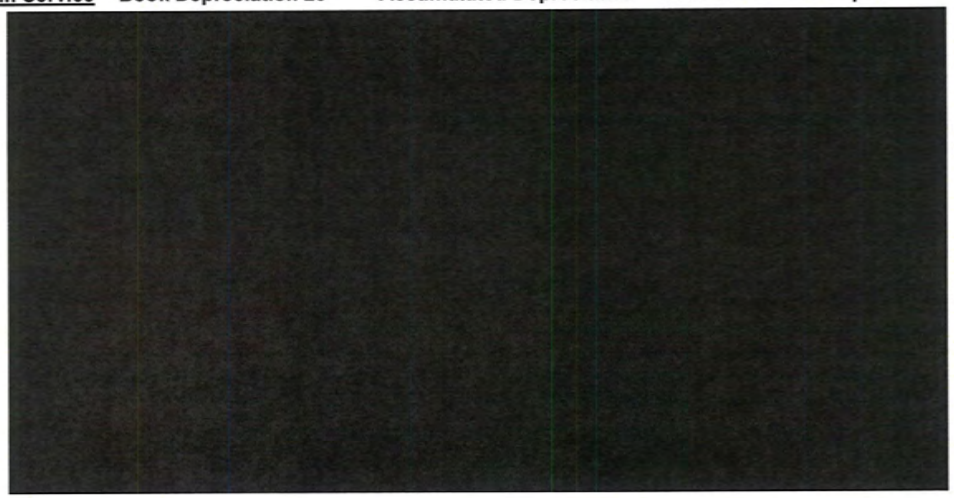
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2024		2024					
2025		2025					
2026		2026					
2027		2027					

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2028	2028
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2042	2042
2043	2043
2044	2044



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					
2041	2041					
2042	2042					



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2043	2043
2044	2044
2045	2045

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
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2039		2039					
2040		2040					
2041		2041					
2042		2042					
2043		2043					
2044		2044					
2045		2045					
2046		2046					

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
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2035		2035					

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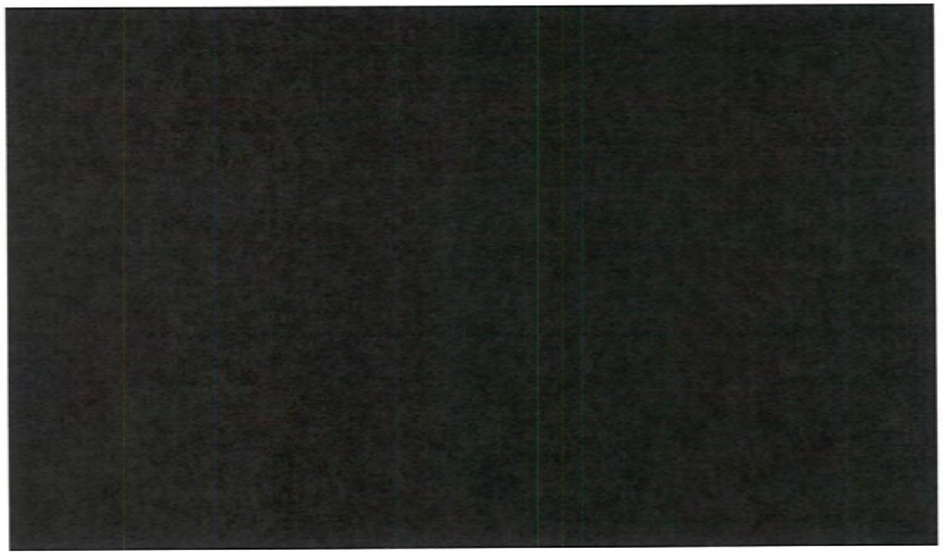
Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
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2038	2038					
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2040	2040					
2041	2041					
2042	2042					
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2046	2046					
2047	2047					
2048	2048					

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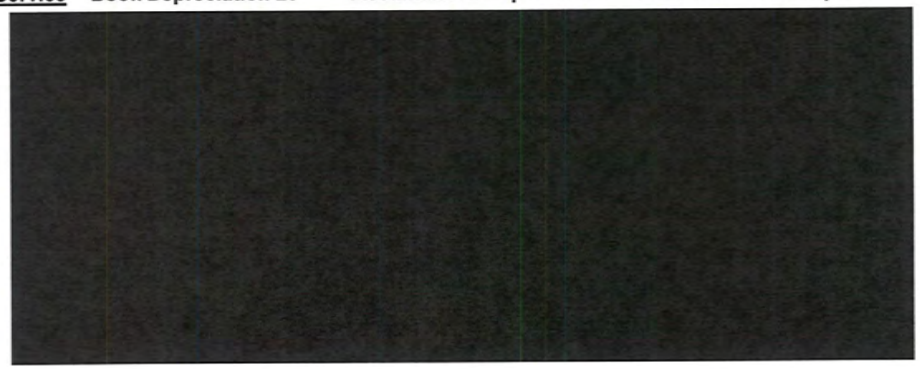
Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact

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2029	2029
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2049	2049



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2030	2030					
2031	2031					
2032	2032					
2033	2033					
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2035	2035					
2036	2036					
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2040	2040					
2041	2041					
2042	2042					
2043	2043					



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2044	2044	[redacted]				
2045	2045					
2046	2046					
2047	2047					
2048	2048					
2049	2049					
2050	2050					

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2031		[redacted]				
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Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2032	2032	[redacted]				
2033	2033					
2034	2034					
2035	2035					
2036	2036					

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2037	2037
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2049	2049
2050	2050
2051	2051
2052	2052

[redacted]

Date	Year
2033	2033
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2042	2042
2043	2043
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2049	2049
2050	2050
2051	2051

Plant

[redacted]

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2052	2052
2053	2053

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2034		2034					
2035		2035					
2036		2036					
2037		2037					
2038		2038					
2039		2039					
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2051		2051					
2052		2052					
2053		2053					
2054		2054					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2035		2035					
2036		2036					
2037		2037					
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2042		2042					
2043		2043					
2044		2044					

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2052	2052
2053	2053
2054	2054
2055	2055

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					
2041	2041					
2042	2042					
2043	2043					
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2056	2056					

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2037	2037					

[redacted]

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2038	2038
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2052	2052
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2054	2054
2055	2055
2056	2056
2057	2057

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2038		2038					
2039		2039					
2040		2040					
2041		2041					
2042		2042					
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2052		2052					

[redacted]

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2058	2058

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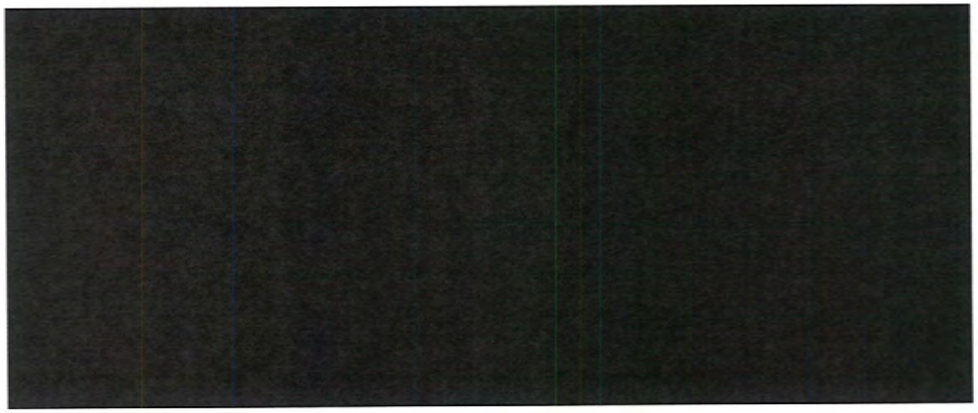
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2039		2039					
2040		2040					
2041		2041					
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2043		2043					
2044		2044					
2045		2045					
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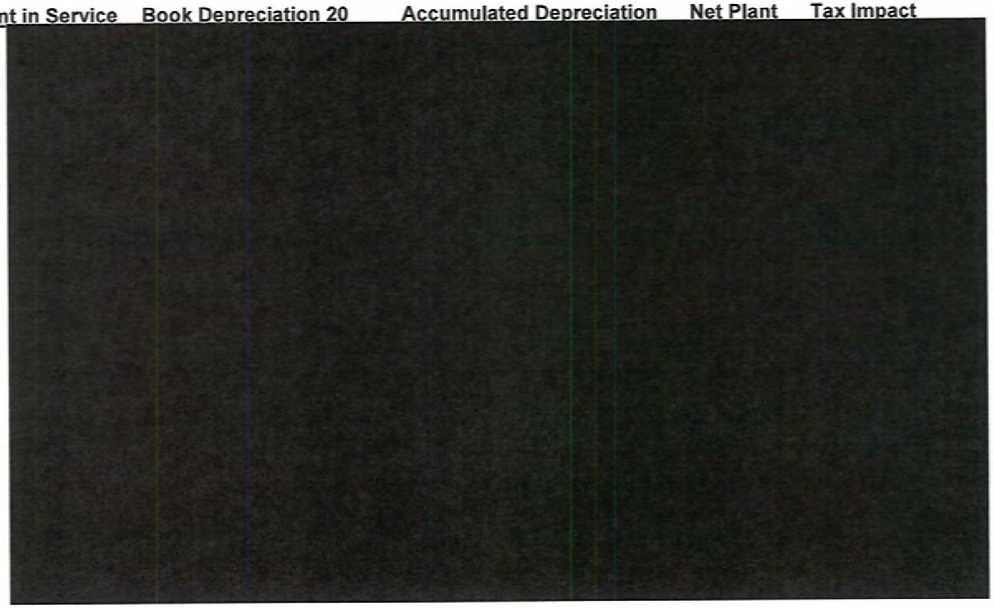
Date	Year		Pla
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2057	2057
2058	2058
2059	2059
2060	2060



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2041	2041					
2042	2042					
2043	2043					
2044	2044					
2045	2045					
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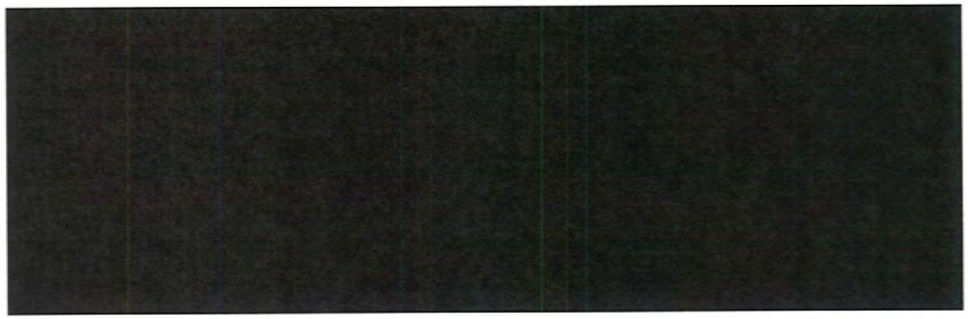
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2061	2061	$50,000	(1,250)	(50,000)	-	500

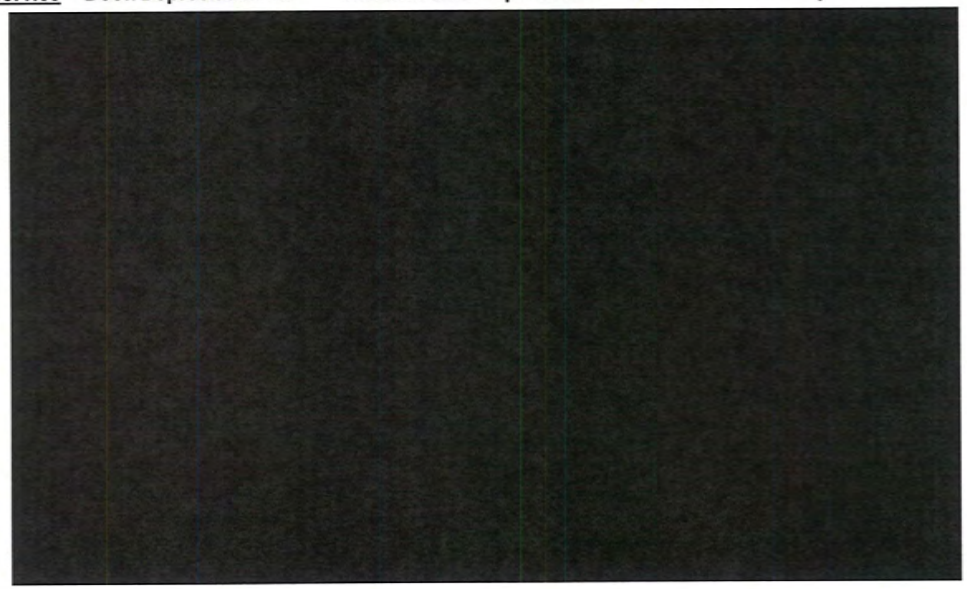
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2042		2042	[redacted]				
2043		2043					
2044		2044					
2045		2045					
2046		2046					
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2060		2060					
2061		2061					
2062		2062					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2043		2043	[redacted]				
2044		2044					
2045		2045					
2046		2046					
2047		2047					
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2050		2050					
2051		2051					
2052		2052					
2053		2053					

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Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2044	2044					
2045	2045					
2046	2046					
2047	2047					
2048	2048					
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2050	2050					
2051	2051					
2052	2052					
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2057	2057					
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2059	2059					
2060	2060					
2061	2061					
2062	2062					
2063	2063					
2064	2064					



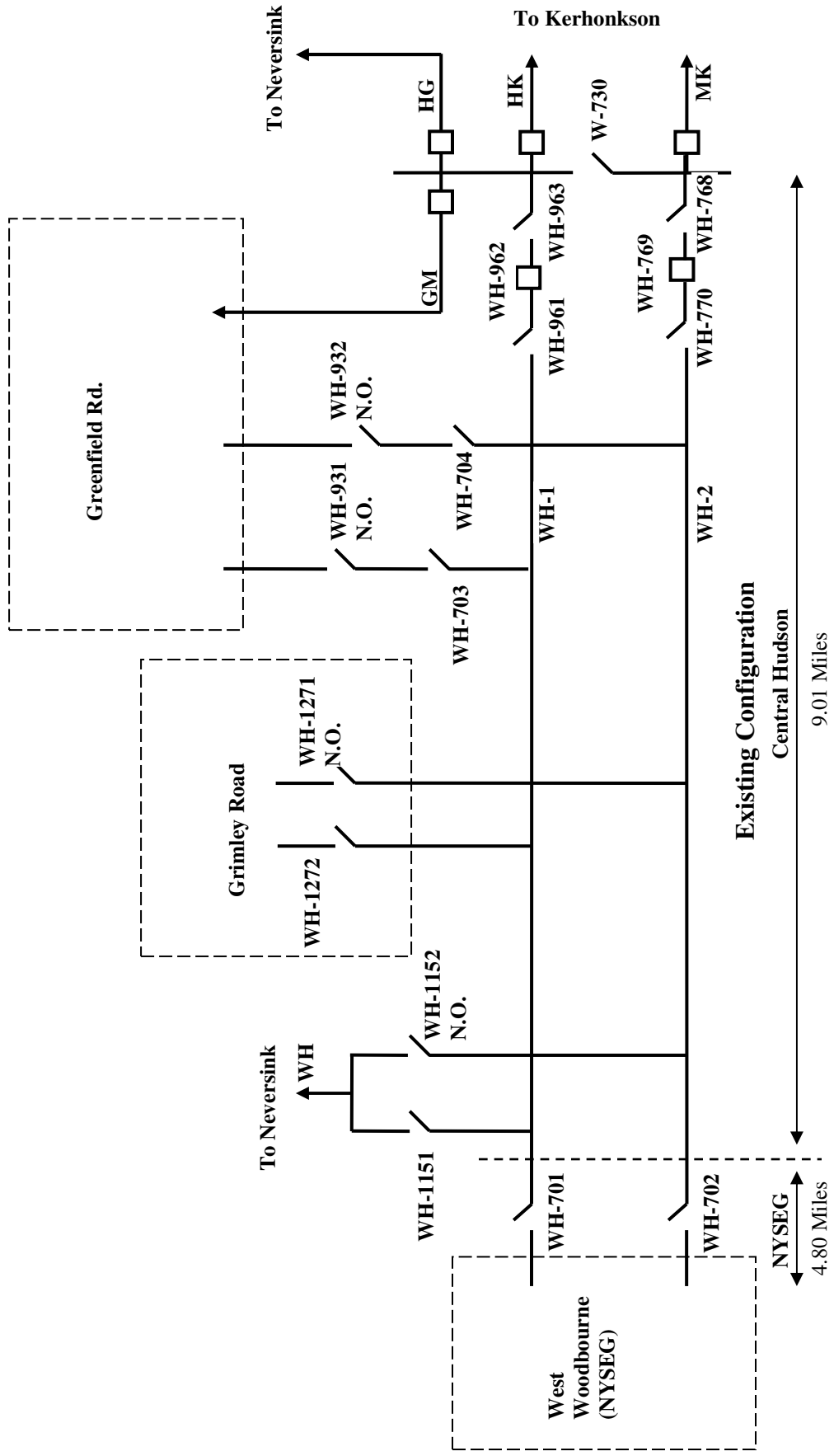
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Telecommunications Strategy - Network Strategy 5 Year Rollout
Depreciation Schedule

In Service Date	2015-2020
Tax Depreciation Life	7

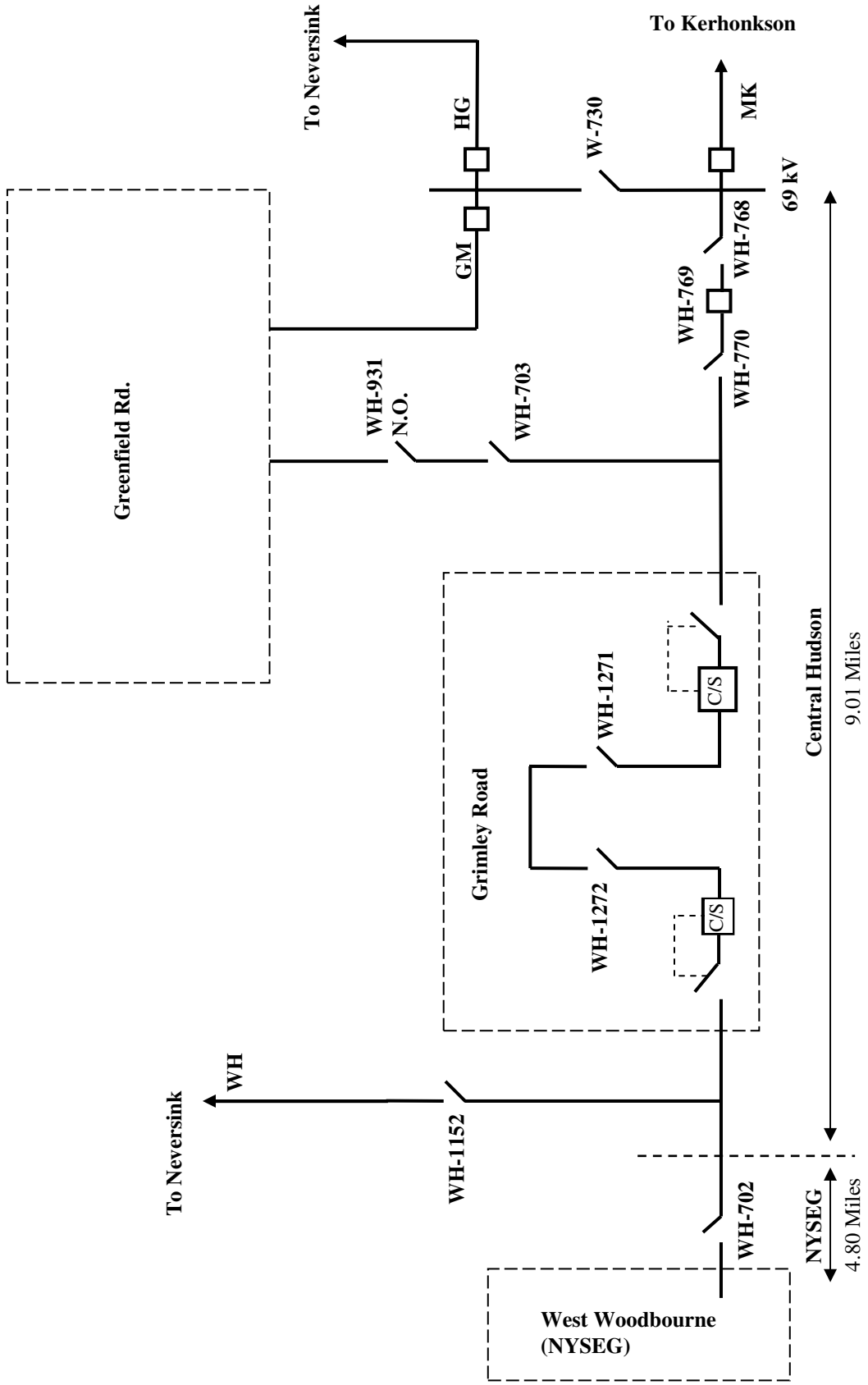
	14%	25%	17%	13%	9%	9%	9%	4%
Date	Year	Plant in Service	Tax Depreciation 7	Accumulated Depreciation	Net Plant	Tax Impact		Total Impact
12/31/2015	2015	$ [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2015	[redacted]
12/30/2016	2016						2016	
12/30/2017	2017						2017	
12/30/2018	2018						2018	
12/30/2019	2019						2019	
12/29/2020	2020						2020	
12/29/2021	2021						2021	
12/29/2022	2022						2022	
12/29/2023	2023						2023	
12/28/2024	2024						2024	
12/28/2025	2025						2025	
							2026	
Date	Year						2027	
12/31/2016	2016						2028	
12/31/2017	2017						2029	
12/31/2018	2018						2030	
12/31/2019	2019						2031	
12/30/2020	2020						2032	
12/30/2021	2021						2033	
12/30/2022	2022						2034	
12/30/2023	2023						2035	
12/29/2024	2024						2036	
12/29/2025	2025						2037	
12/29/2026	2026						2038	
							2039	
Date	Year						2040	
12/31/2017	2017						2041	
12/31/2018	2018							
12/31/2019	2019							

Attachment #2



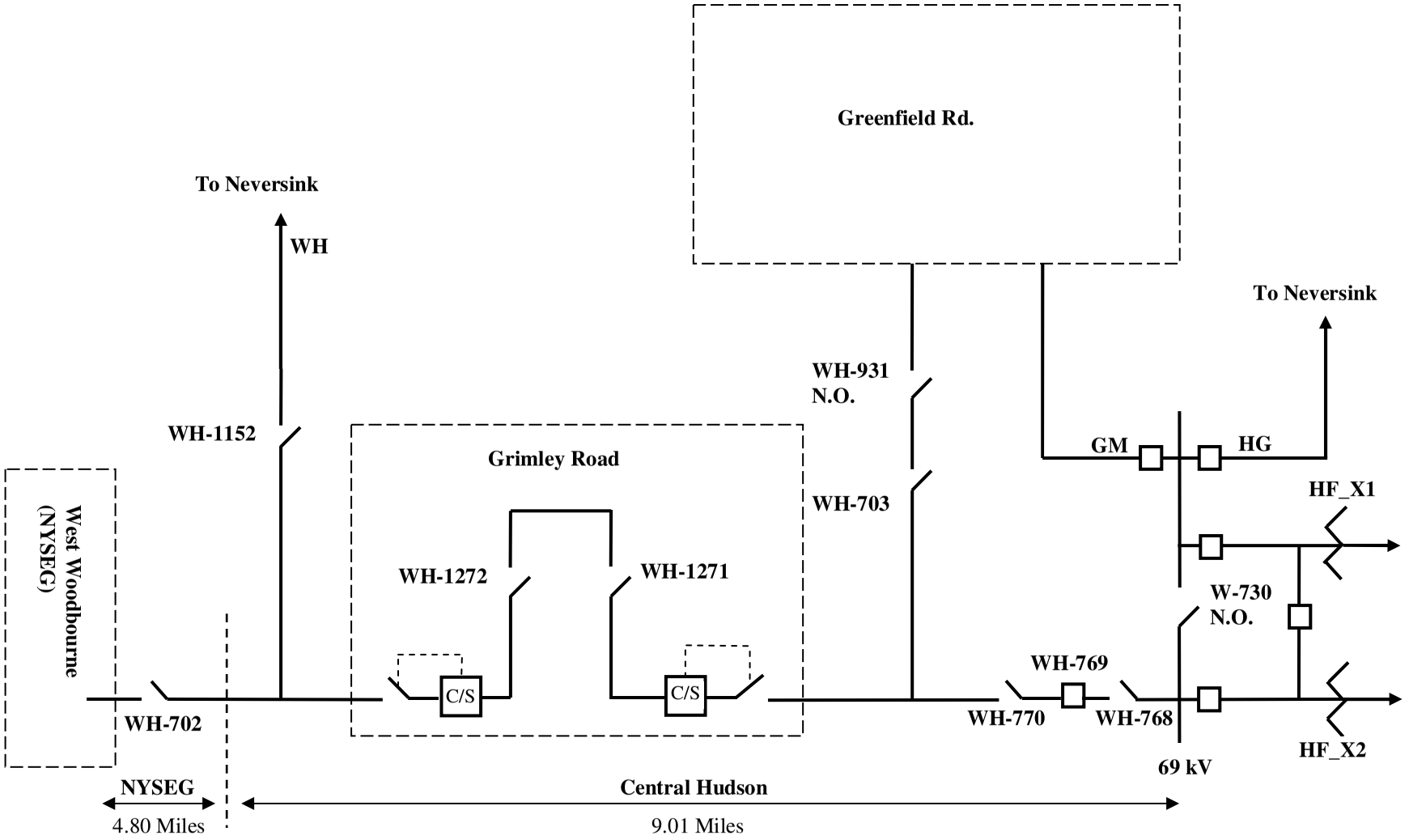
Attachment #3

Existing Configuration with single circuit WH-1 and WH-2 line

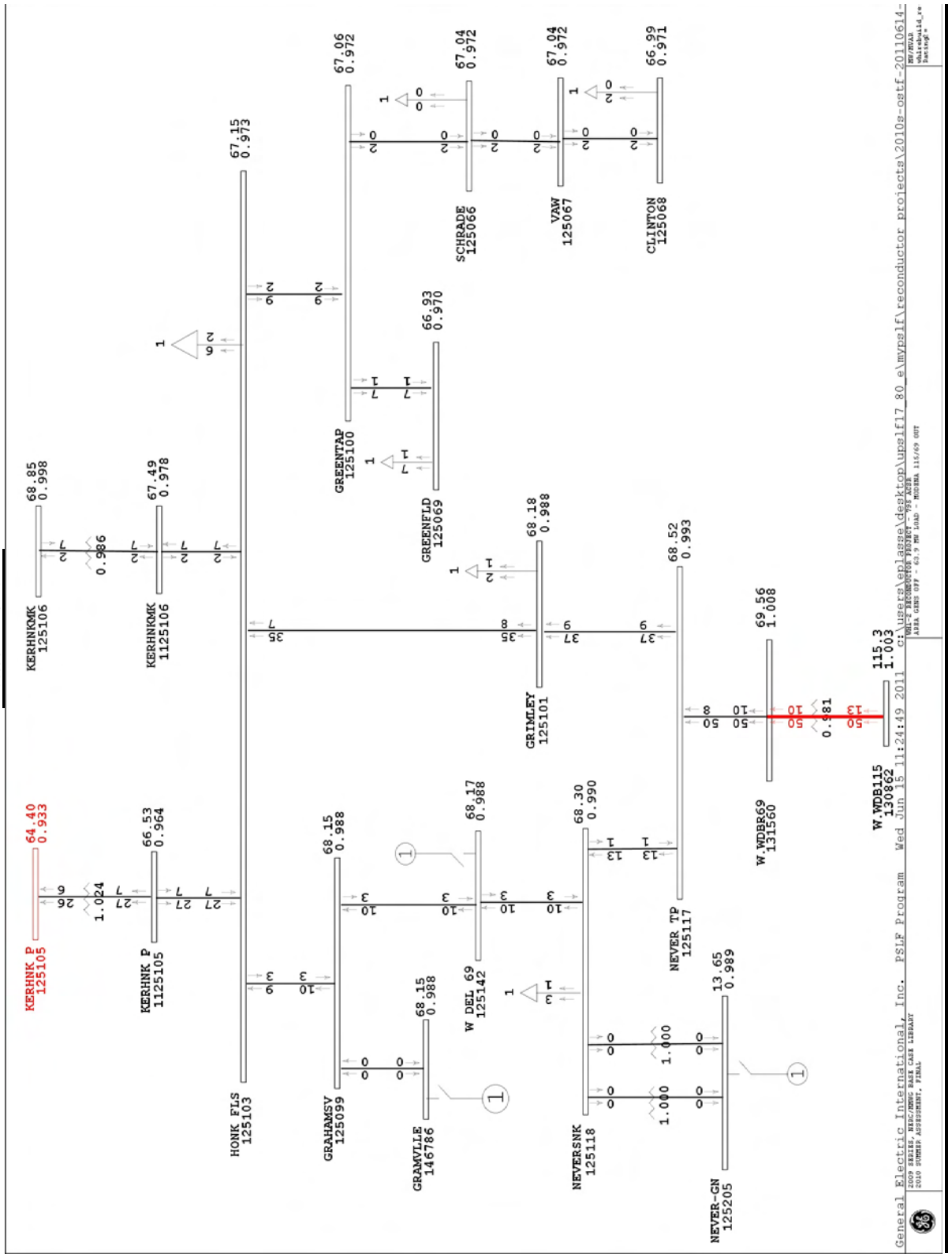


Attachment #4

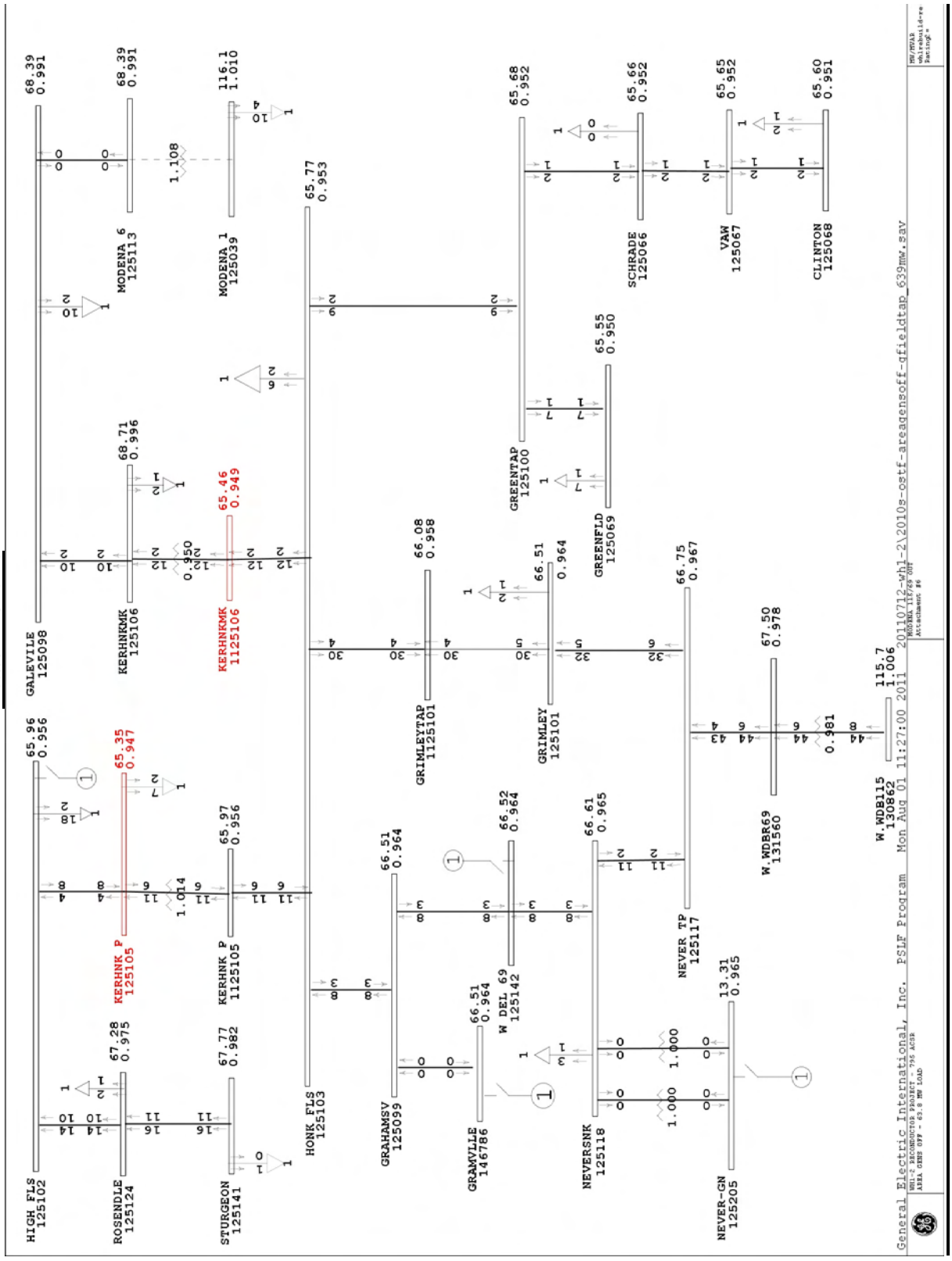
P/HK and MK/MG Upgrade Configuration with single circuit WH-1 and WH-2 line



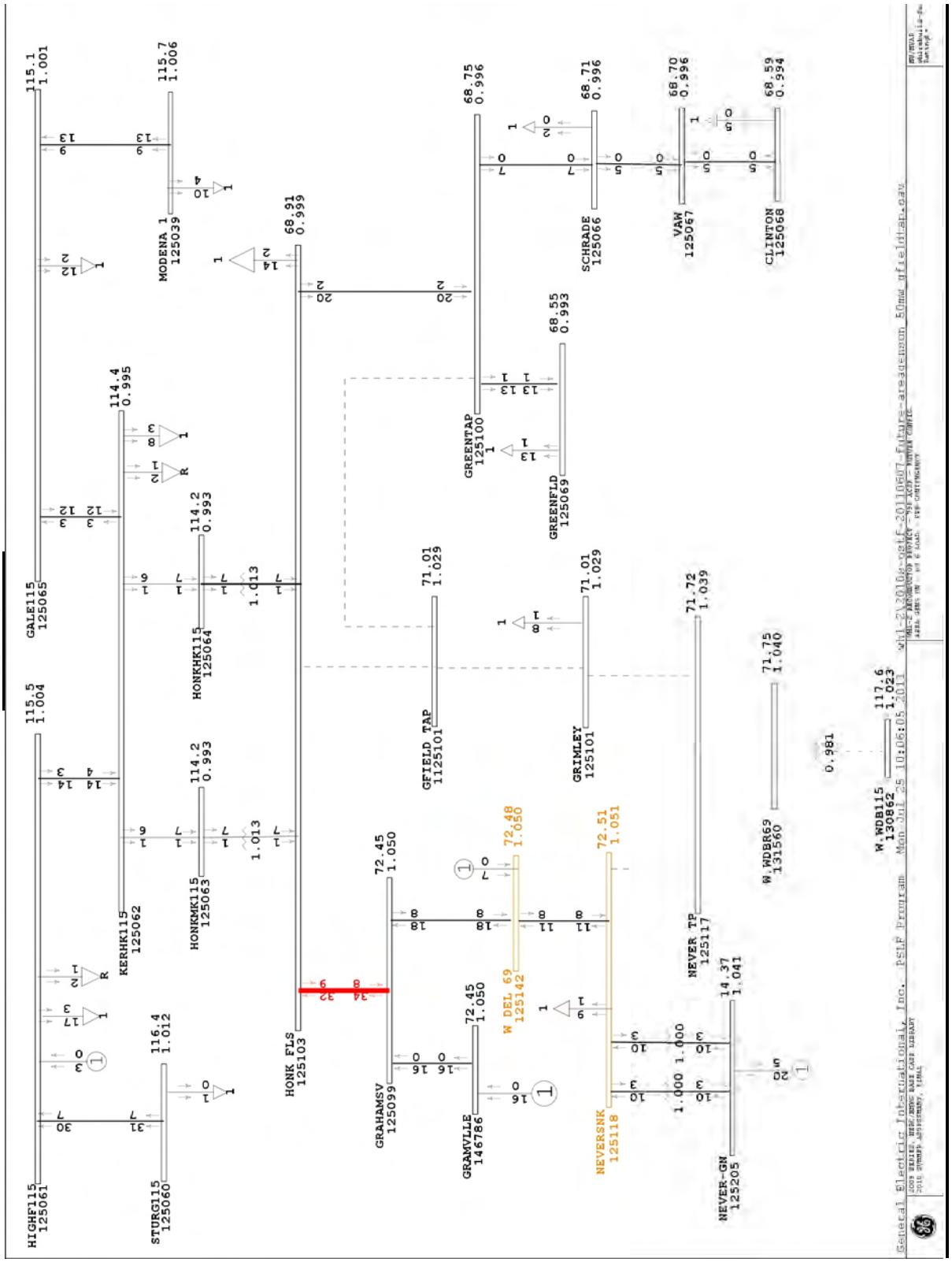
Attachment #5



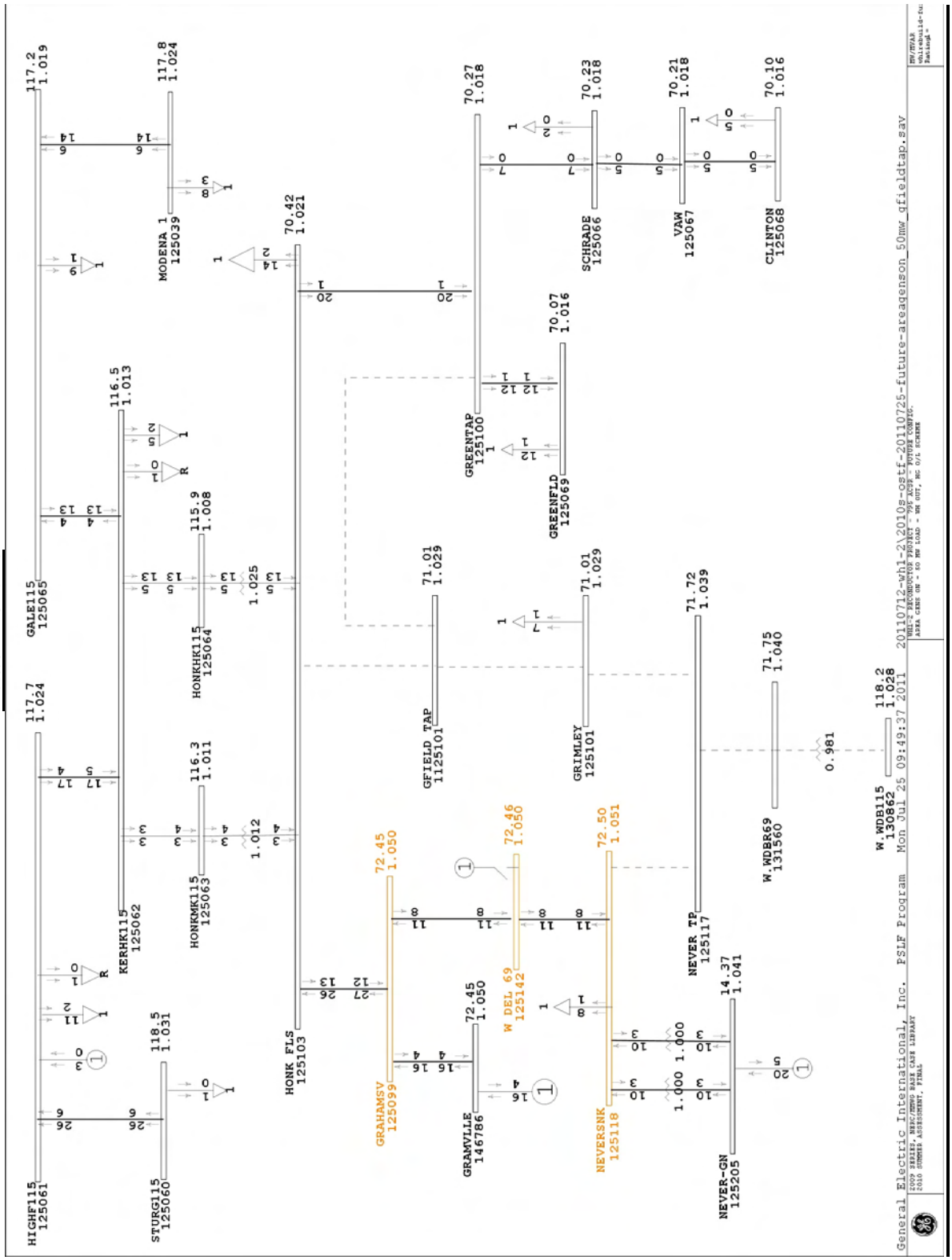
Attachment #6



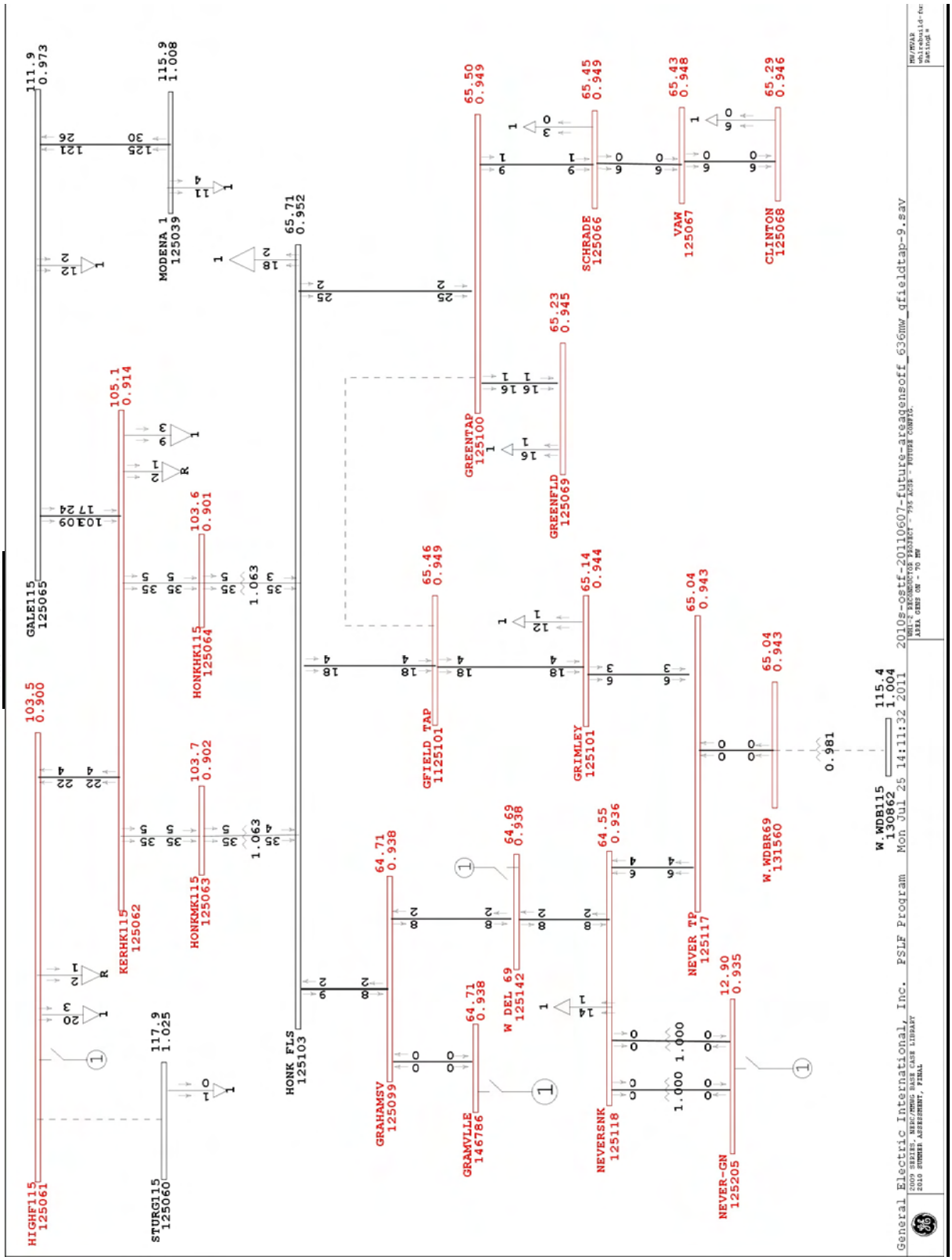
Attachment #7



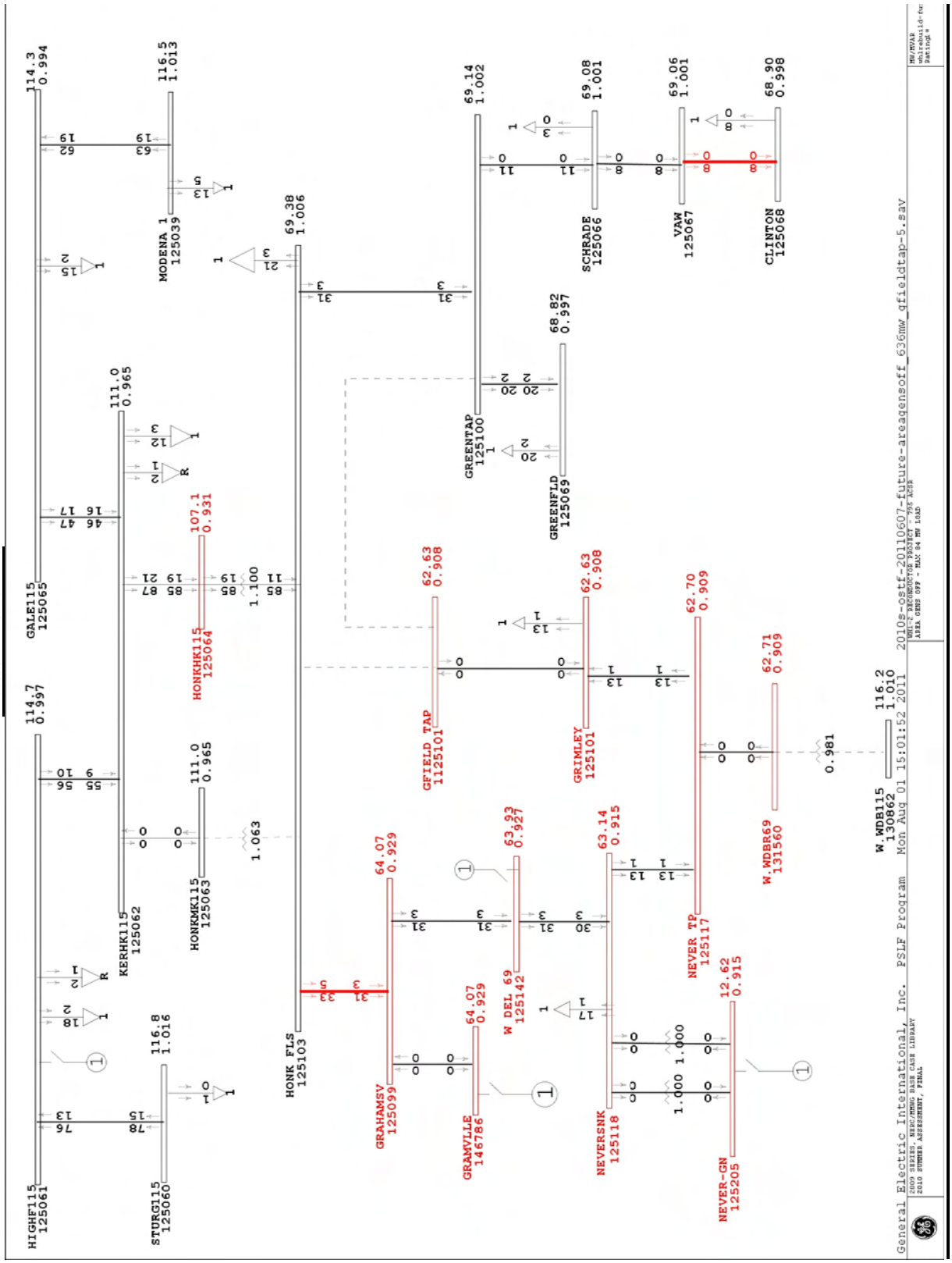
Attachment #8



Attachment #9



Attachment #10



PLANNING ESTIMATE

Attachemnt #11

Installation Estimate for Rebuilding WH1&2 Lines (OPTION #4 SINGLE POLE, SINGLE CIRCUIT)

Updated 8/2/2011

Location: *WH1&2 Lines*

By: R. K. Fournier

Project No:

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	UNIT COST LABOR MH/unit	UNIT COST LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (includes overheads) Material	Total (includes overheads) Labor
1	Building Access Road (stone, swamp mats, tree removal)	50,000	80	50	80	50,000	4,000	4,125	5,576	54,125	9,576
1	Erosion Control (silt fence, hay bales, etc.) and Restoration	50,000	60	50	60	50,000	3,000	4,125	4,182	54,125	7,182
50	Mobilize and Demobilize Equipment	0	60	50	3,000	0	150,000	0	209,100	0	359,100
120	Haul Materials Along ROW	0	18	50	2,160	0	108,000	0	150,552	0	258,552
0	Set Foundations	150,000	30	Contract	Contract	0	0	0	0	0	0
100	Dig Pole Hole (include auger & dewater)	100	6	50	600	10,000	30,000	825	41,820	10,825	71,820
20	Dig Rock Hole	3,000	30	Contract	Contract	60,000	0	4,950	0	64,950	0
120	Framing Wood / Steel Pole	0	24	50	2,880	0	144,000	0	200,736	0	344,736
120	Set Pole	0	16	50	1,920	0	96,000	0	133,824	0	229,824
96	Transfer Static and Conductors - 1 Structure (tangent, swing)	0	4	50	384	0	19,200	0	26,765	0	45,965
24	Transfer Static and Conductors - 1 Structure (deadend)	0	4	50	96	0	4,800	0	6,691	0	11,491
42	Install Conductor (per mile)	0	100	50	4,200	0	210,000	0	292,740	0	502,740
14	Install Static Wire/OPGW (per mile)	0	60	50	840	0	42,000	0	58,548	0	100,548
20	Install and Remove Grounds	0	4	50	80	0	4,000	0	5,576	0	9,576
25	Switching (Electricians Rate = 1.5)	0	4	75	100	0	7,500	0	10,455	0	17,955
14	OPGW installation (per mile, includes splicing)	35,000	1	Contract	Contract	490,000	0	171,500	0	661,500	0
1	Tree Trimming and Line Clearance	75,000	1	Contract	Contract	75,000	0	6,188	0	81,188	0
1	Special Equipment	100,000	1	Contract	Contract	100,000	0	35,000	0	135,000	0
1	Non Stock Materials (steel poles, wood poles, etc)	500,000	0	0	0	500,000	0	41,250	0	541,250	0
1	Non Stock Materials (insulators, wire, etc)	400,000	0	0	0	400,000	0	33,000	0	433,000	0
14	Non Stock OPGW (per mile)	27,000	0	0	0	378,000	0	31,185	0	409,185	0
120	Standard Stock Materials (average $ per structure)	2,000	0	0	0	240,000	0	84,000	0	324,000	0
	Management & Other Services										
1	Drafting	500	45	30	100	500	3,000	175	4,182	675	7,182
1	CH Engineering & Engineering Management	0				0	18,000	0	19,062	0	37,062
1	CH Environmental Management (DEC Reg. Wetlands)	0				0	5,000	0	5,295	0	10,295
1	CH Special Services Management	0				0	12,500	0	13,238	0	25,738
1	Permitting Consultant (including permitting fees)	175,000				175,000	0	14,438	0	189,438	0
1	Construction Supervision	0				0	50,000	0	69,700	0	119,700
1	Arrestor Study	7,000				7,000	0	578	0	7,578	
1	Right of Way Restoration	25,000				25,000	0	2,063	0	27,063	
	- SUBTOTALS -									2,993,900	2,169,042
	Total District M-hrs.(w/o contingency)				16,500						
	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.									2,993,900	2,169,042
	Accounting O.H. @14% of first $300k										42,000
	Estimated AFUDC										60,000
	Contingency @10%										516,294
	Grand Total										5,781,236
	Approximate				16,500						**5,781,000**
					16,500						

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Exhibit ___ (EIP-1)(Redacted)

Attachment #11

Removal Estimate for Rebuilding WH1&2 Lines (OPTION #4 SINGLE POLE, SINGLE CIRCUIT)

Location:

Project No:

Updated 8/2/201
By: R.K.Fournie

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	LABOR MH/unit	LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (Includes Overheads) Material	Total (Includes Overheads) Labor
240	Remove Wood/Steel Pole	0	20	50	4,800	0	240,000	0	334,560	0	574,56
42	Remove conductor wire (per mile)	0	25	50	1,050	0	52,500	0	73,185	0	125,68
14	Remove static wire (per mile)	0	25	50	350	0	17,500	0	24,395	0	41,89
14	Hauling/Dispoasal (Contract)	800	0	0	0	11,200	0	924	0	12,124	0
	Management & Other Services										
	Construction Supervision					0	10,000		13,940	0	23,94
	- SUBTOTALS -					11,200	320,000			12,124	766,08
	Total District M-hrs.(w/o contingency)				6,200						
	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.									12,124	766,080
	Grand Total				6,200						778,204
	Approximate				**6,200**						**778,000**

Case 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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PLANNING ESTIMATE

Attachment #12

Installation Estimate for Rebuilding ELLENVILLE TAP 8/11/2011

Location: *WH Line Ellenville Tap (1.3 miles)*

Project No: By: R. K. Fournier

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	LABOR MH/unit	LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (includes overheads) Material	Total (includes overheads) Labor
1	Building Access Road (stone, swamp mats, tree removal)	15,000	80	50	80	15,000	4,000	1,238	5,576	16,238	9,576
1	Erosion Control (silt fence, hay bales, etc.) and Restoration	15,000	60	50	60	15,000	3,000	1,238	4,182	16,238	7,182
10	Mobilize and Demobilize Equipment	0	60	50	600	0	30,000	0	41,820	0	71,820
24	Haul Materials Along ROW	0	18	50	432	0	21,600	0	30,110	0	51,710
48	Dig Pole Hole (include auger & dewater)	100	6	50	288	4,800	14,400	396	20,074	5,196	34,474
20	Dig Rock Hole	3,000	30	Contract	Contract	60,000	0	4,950	0	64,950	0
24	Framing Wood / Steel Pole	0	24	50	576	0	28,800	0	40,147	0	68,947
48	Set Pole	0	16	50	768	0	38,400	0	53,530	0	91,930
20	Transfer Static and Conductors - 1 Structure (tangent, swing)	0	4	50	80	0	4,000	0	5,576	0	9,576
4	Transfer Static and Conductors - 1 Structure (deadend)	0	4	50	16	0	800	0	1,115	0	1,915
6	Install Conductor (per mile)	0	100	50	600	0	30,000	0	41,820	0	71,820
2	Install Static Wire/OPGW (per mile)	0	60	50	120	0	6,000	0	8,364	0	14,364
4	Install and Remove Grounds	0	4	50	16	0	800	0	1,115	0	1,915
6	Switching (Electricians Rate = 1.5)	0	4	75	24	0	1,800	0	2,509	0	4,309
2	OPGW installation (per mile, includes splicing)	35,000	1	Contract	Contract	70,000	0	24,500	0	94,500	0
1	Tree Trimming and Line Clearance	12,000	1	Contract	Contract	12,000	0	990	0	12,990	0
1	Special Equipment	20,000	1	Contract	Contract	20,000	0	7,000	0	27,000	0
1	Non Stock Materials (steel poles, wood poles, etc)	130,000	0	0	0	130,000	0	10,725	0	140,725	0
1	Non Stock Materials (insulators, wire, etc)	35,000	0	0	0	35,000	0	2,888	0	37,888	0
2	Non Stock OPGW (per mile)	27,000	0	0	0	54,000	0	4,455	0	58,455	0
24	Standard Stock Materials (average $ per structure)	2,000	0	0	0	48,000	0	16,800	0	64,800	0
	Management & Other Services										
1	Drafting	500	10	30	10	500	300	175	418	675	718
1	CH Engineering & Engineering Management	0				0	2,000	0	2,118	0	4,118
1	CH Environmental Management (DEC Reg. Wetlands)	0				0	1,000	0	1,059	0	2,059
1	CH Special Services Management	0				0	2,000	0	2,118	0	4,118
1	Permitting Consultant (including permitting fees)	20,000				20,000	0	1,650	0	21,650	0
1	Construction Supervision	0				0	8,000	0	11,152	0	19,152
1	Arrestor Study	4,000				4,000	0	330	0	4,330	0
1	Right of Way Restoration	10,000				10,000	0	825	0	10,825	
	- SUBTOTALS -									576,459	469,704
	Total District M-hrs.(w/o contingency)				3,670						
	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.									576,459	469,704
	Accounting O.H. @14% of first $300k										42,000
	Estimated AFUDC										5,000
	Contingency @10%										104,616
	Grand Total										1,197,778
	Approximate				3,670						**1,198,000**
					3,670						

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Exhibit__(EIP-1)(Redacted)
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Inspections Forecasted Budget

	Calendar Year 2015			Rate Year Ending June 30, 2016			Rate Year Ending June 30, 2017			Rate Year Ending June 30, 2018		
	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures	Cost/Unit	Targeted Inspections	Expected Expenditures
Distribution Overhead	$ 2.57	46,300	$ 119,000	$ 2.60	46,300	$ 120,533	$ 2.66	46,300	$ 123,064	$ 2.71	46,300	$ 125,649
Distribution Underground	$ 1.48	3,300	$ 4,883	$ 1.50	3,300	$ 4,942	$ 1.53	3,300	$ 5,046	$ 1.56	3,300	$ 5,152

Telecommunications Strategy - Network Strategy 5 Year Rollout
Cost Benefit Analysis

Tax Rate
Equity Cost
Pre-tax Debt
WACC (after-tax)

[redacted]

Year	Capital	Net Plant	Def Tax Bal	Theoretical Rate Base	AFTER-TAX WACC	Depreciation	Cur Exp	Fut Exp	Other	Total Revenue Req
1	[redacted]									
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
Total										
NPV										27,437,891

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Costs Summary

Telecommunications Strategy - Network Strategy 5 Year Rollout

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Assumptions																											
FTE's																											
Maintenance Exp as Percent of CapEx																											
Inflation Rate																											
Depreciation Effect																											
Depreciation																											
Depreciation Tax Benefit																											
Total Depreciation Effect																											
Current Expense																											
Current Expense																											
Tax Benefit																											
Future Maintenance Costs (new expen																											
Project Management/System Operatio																											
System Maintenance																											
NOC System Management																											
Training																											
Tower Lease Fees																											
FCC Fees																											
Maintenance Costs -Other																											
Tax Benefit																											
Income / (Loss)																											
Less: Depreciation																											
Add: Dep Def Tax Benefit																											
Add: Project Capex																											

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Telecommunications Strategy - Network Strategy 5 Year Rollout
Depreciation Schedule

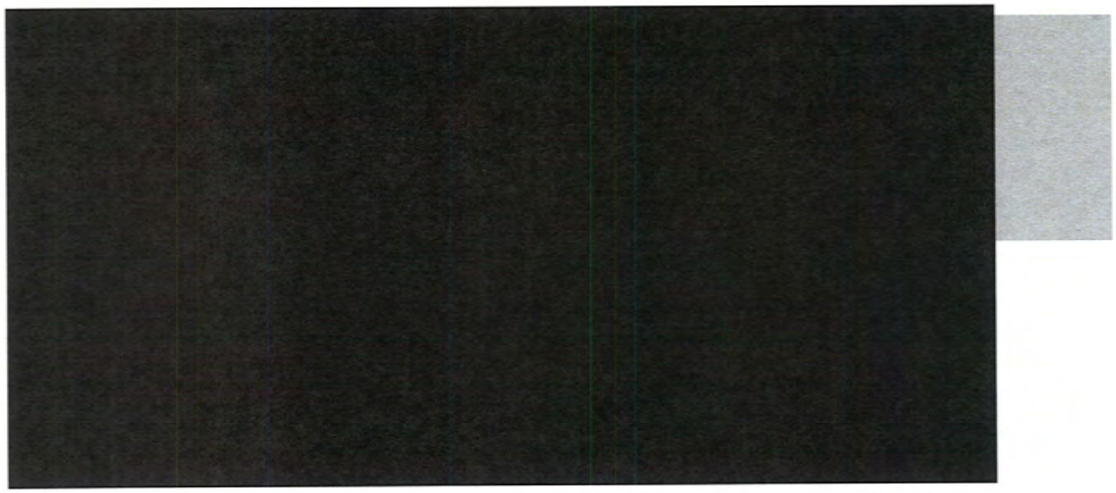
In Service Date	2015/2020
Book Depreciation Life	20

Date	[redacted]
2015	
2016	
2017	
2018	
2019	
2020	
2021	
2022	
2023	
2024	
2025	
2026	
2027	
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2033	
2034	
2035	

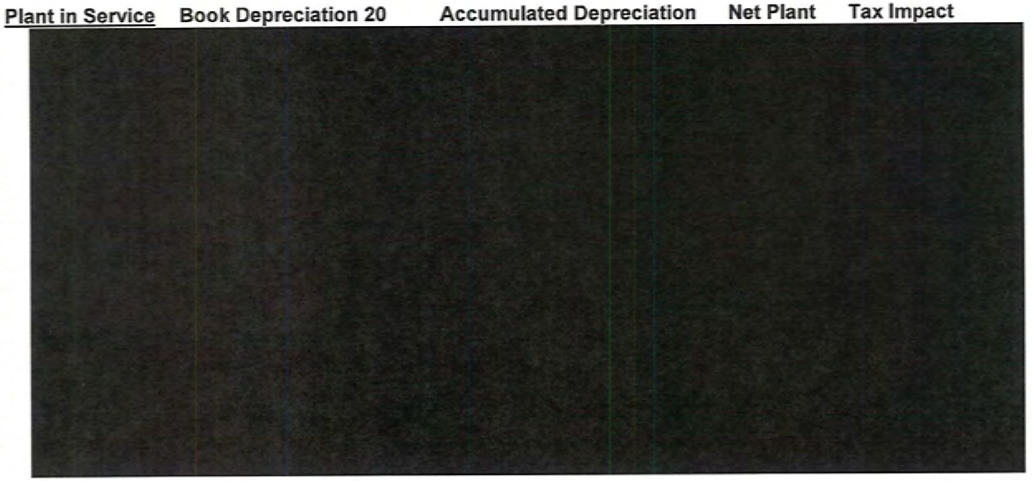
Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2016	[redacted]					
2017						
2018						

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2019	2019
2020	2020
2021	2021
2022	2022
2023	2023
2024	2024
2025	2025
2026	2026
2027	2027
2028	2028
2029	2029
2030	2030
2031	2031
2032	2032
2033	2033
2034	2034
2035	2035
2036	2036



Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2017		2017					
2018		2018					
2019		2019					
2020		2020					
2021		2021					
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					



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2034	2034
2035	2035
2036	2036
2037	2037

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2018	2018					
2019	2019					
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2019	2019					
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					

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2027	2027
2028	2028
2029	2029
2030	2030
2031	2031
2032	2032
2033	2033
2034	2034
2035	2035
2036	2036
2037	2037
2038	2038
2039	2039

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2020	2020					
2021	2021					
2022	2022					
2023	2023					
2024	2024					
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					

[redacted]

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Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2021		2021					
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					
2034		2034					
2035		2035					
2036		2036					
2037		2037					
2038		2038					
2039		2039					
2040		2040					
2041		2041					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2022		2022					
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					
2034		2034					

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2035	2035
2036	2036
2037	2037
2038	2038
2039	2039
2040	2040
2041	2041
2042	2042

[redacted]

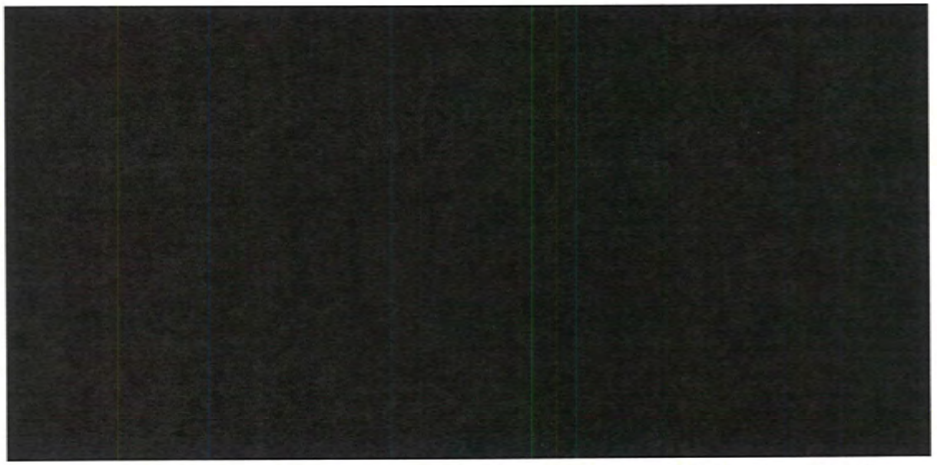
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2023		2023					
2024		2024					
2025		2025					
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
2031		2031					
2032		2032					
2033		2033					
2034		2034					
2035		2035					
2036		2036					
2037		2037					
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2041		2041					
2042		2042					
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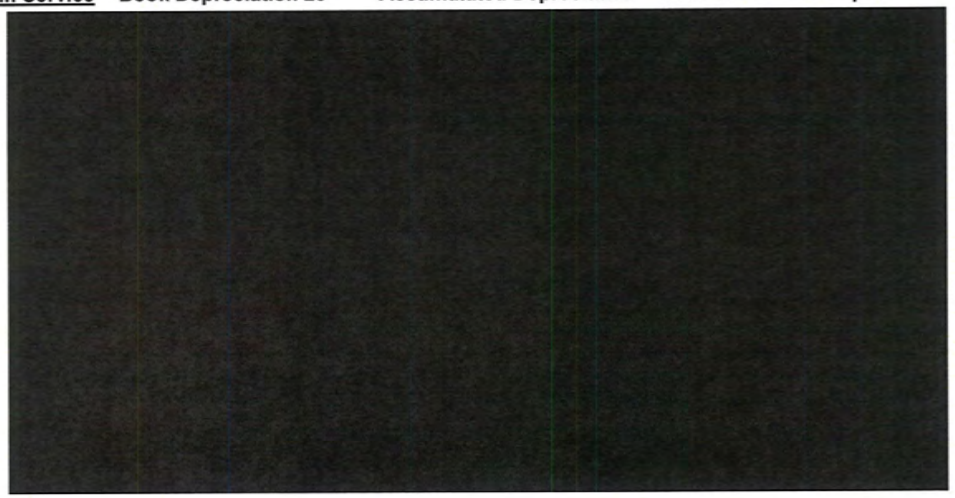
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2024		2024					
2025		2025					
2026		2026					
2027		2027					

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2028	2028
2029	2029
2030	2030
2031	2031
2032	2032
2033	2033
2034	2034
2035	2035
2036	2036
2037	2037
2038	2038
2039	2039
2040	2040
2041	2041
2042	2042
2043	2043
2044	2044



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2025	2025					
2026	2026					
2027	2027					
2028	2028					
2029	2029					
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					
2041	2041					
2042	2042					



IR-477 Attachment 1 PUBLIC REDACTED VERSION

2043	2043
2044	2044
2045	2045

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2026		2026					
2027		2027					
2028		2028					
2029		2029					
2030		2030					
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2039		2039					
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2041		2041					
2042		2042					
2043		2043					
2044		2044					
2045		2045					
2046		2046					

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
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2028		2028					
2029		2029					
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2031		2031					
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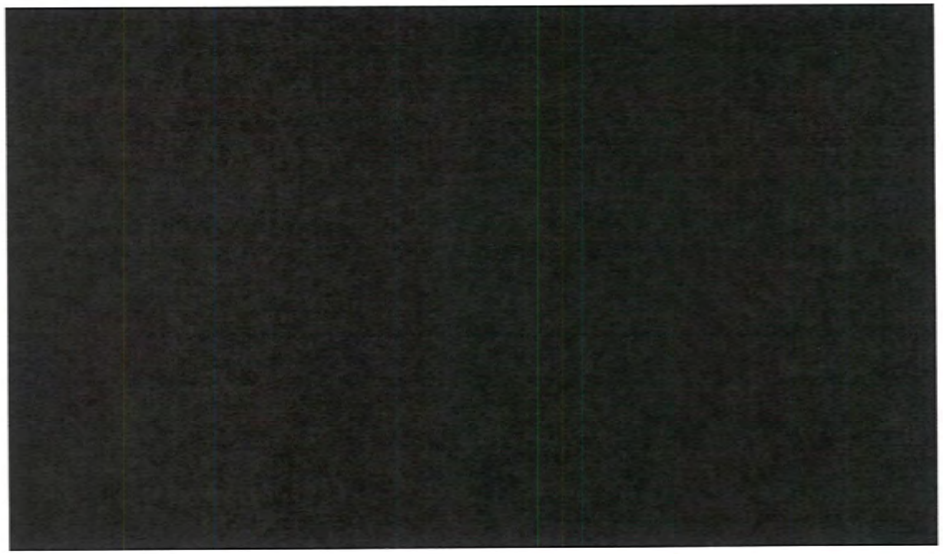
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2044	2044					
2045	2045					
2046	2046					
2047	2047					

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
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2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
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2038	2038					
2039	2039					
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2041	2041					
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2045	2045					
2046	2046					
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2048	2048					

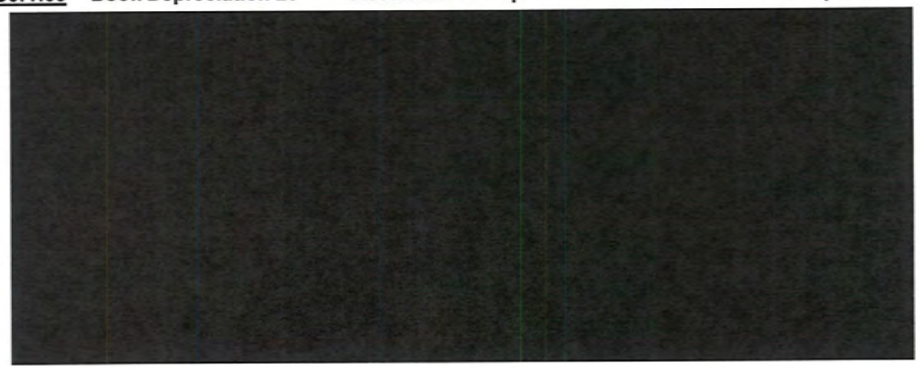
Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact

IR-477 Attachment 1 PUBLIC REDACTED VERSION

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2031	2031
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2038	2038
2039	2039
2040	2040
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2044	2044
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2046	2046
2047	2047
2048	2048
2049	2049



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2030	2030					
2031	2031					
2032	2032					
2033	2033					
2034	2034					
2035	2035					
2036	2036					
2037	2037					
2038	2038					
2039	2039					
2040	2040					
2041	2041					
2042	2042					
2043	2043					



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2044	2044	[redacted]				
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2046	2046					
2047	2047					
2048	2048					
2049	2049					
2050	2050					

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2031		[redacted]				
2032						
2033						
2034						
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2049						
2050						
2051						

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2032	2032	[redacted]				
2033	2033					
2034	2034					
2035	2035					
2036	2036					

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2037	2037
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2045	2045
2046	2046
2047	2047
2048	2048
2049	2049
2050	2050
2051	2051
2052	2052

[redacted]

Date	Year
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2036	2036
2037	2037
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2039	2039
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2042	2042
2043	2043
2044	2044
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2047	2047
2048	2048
2049	2049
2050	2050
2051	2051

Plant

[redacted]

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2052	2052
2053	2053

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2034		2034					
2035		2035					
2036		2036					
2037		2037					
2038		2038					
2039		2039					
2040		2040					
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2042		2042					
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2049		2049					
2050		2050					
2051		2051					
2052		2052					
2053		2053					
2054		2054					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2035		2035					
2036		2036					
2037		2037					
2038		2038					
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2041		2041					
2042		2042					
2043		2043					
2044		2044					

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2045	2045
2046	2046
2047	2047
2048	2048
2049	2049
2050	2050
2051	2051
2052	2052
2053	2053
2054	2054
2055	2055

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2036	2036					
2037	2037					
2038	2038					
2039	2039					
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2041	2041					
2042	2042					
2043	2043					
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2047	2047					
2048	2048					
2049	2049					
2050	2050					
2051	2051					
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2053	2053					
2054	2054					
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2056	2056					

[redacted]

Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2037	2037					

IR-477 Attachment 1 PUBLIC REDACTED VERSION

2038	2038
2039	2039
2040	2040
2041	2041
2042	2042
2043	2043
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2045	2045
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2049	2049
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2051	2051
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2053	2053
2054	2054
2055	2055
2056	2056
2057	2057

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2038		2038					
2039		2039					
2040		2040					
2041		2041					
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2043		2043					
2044		2044					
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2050		2050					
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2052		2052					

[redacted]

IR-477 Attachment 1 PUBLIC REDACTED VERSION

2053	2053
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2058	2058

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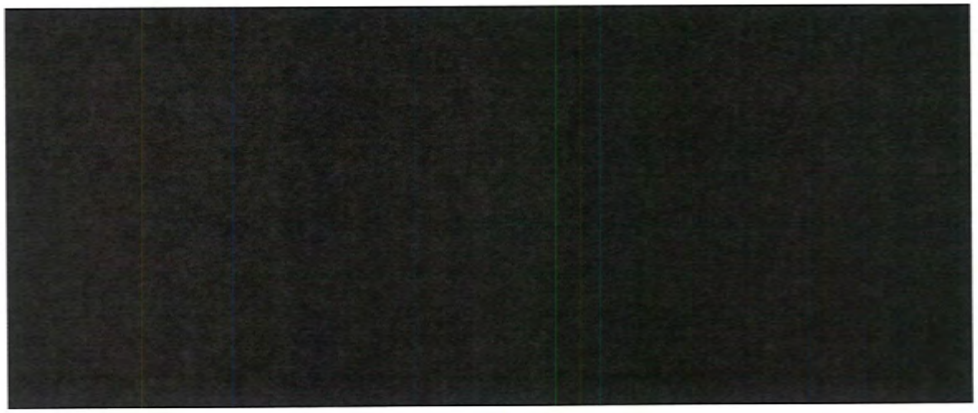
Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2039		2039					
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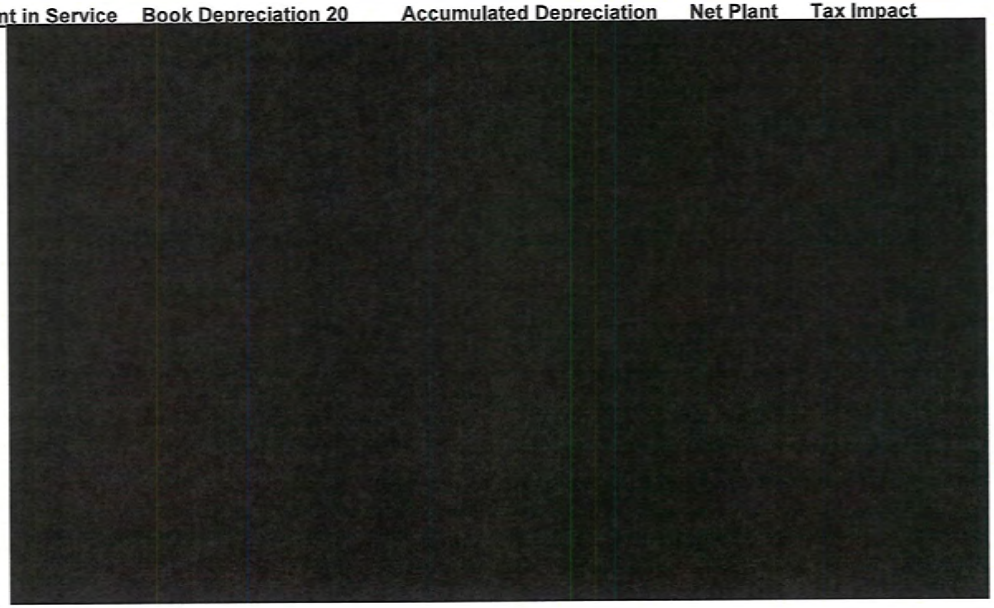
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IR-477 Attachment 1 PUBLIC REDACTED VERSION

2046	2046
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2058	2058
2059	2059
2060	2060



Date	Year	Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2041	2041					
2042	2042					
2043	2043					
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2059	2059					
2060	2060					



2061	2061	$50,000	(1,250)	(50,000)	-	500

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2042		2042	[redacted]				
2043		2043					
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2058		2058					
2059		2059					
2060		2060					
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2062		2062					

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2043		2043	[redacted]				
2044		2044					
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2051		2051					
2052		2052					
2053		2053					

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2054	2054
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2057	2057
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2059	2059
2060	2060
2061	2061
2062	2062
2063	2063

[redacted]

Date	Year		Plant in Service	Book Depreciation 20	Accumulated Depreciation	Net Plant	Tax Impact
2044		2044					
2045		2045					
2046		2046					
2047		2047					
2048		2048					
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2064		2064					

[redacted]

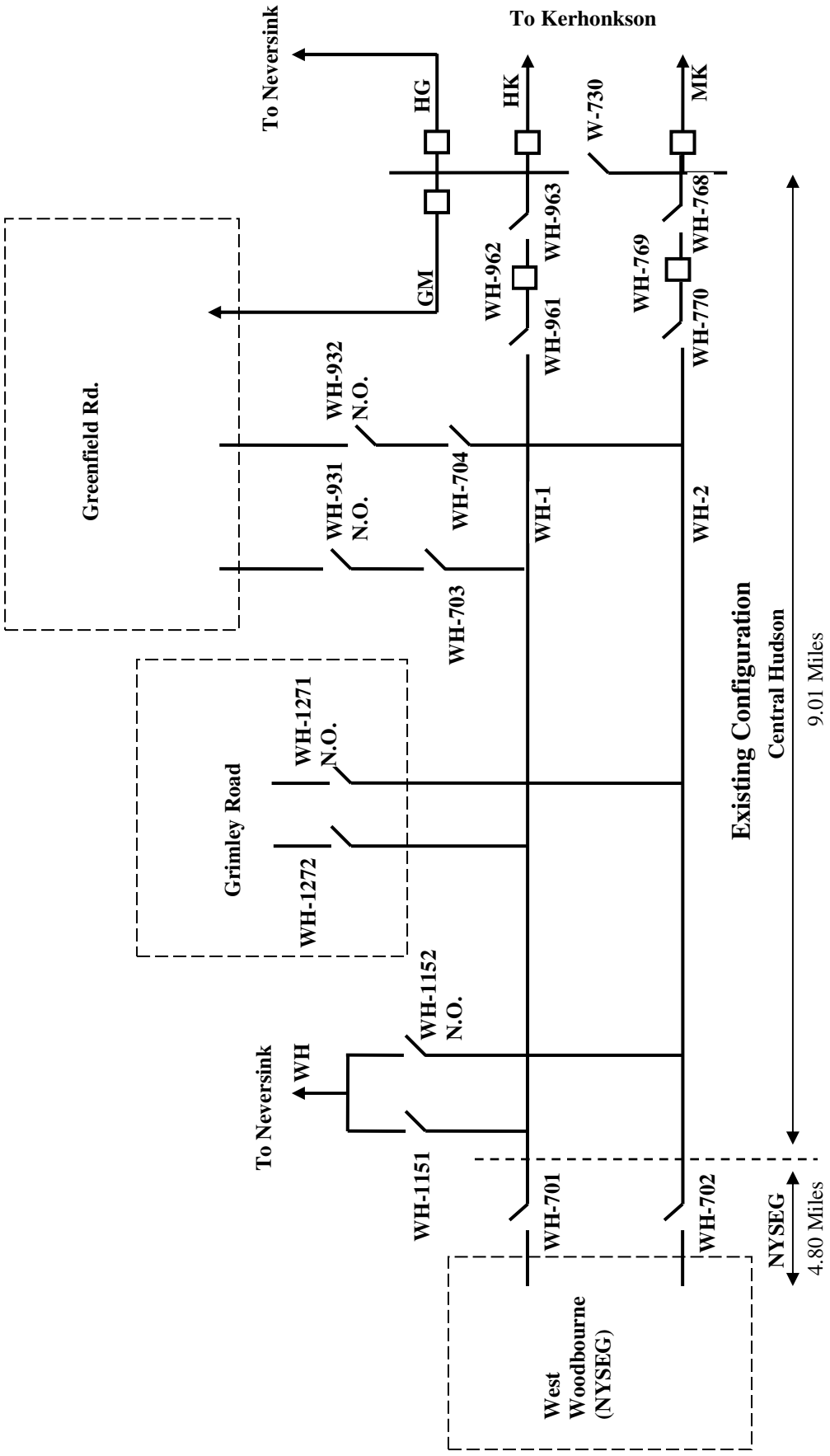
IR-477 Attachment 1 PUBLIC REDACTED VERSION

Telecommunications Strategy - Network Strategy 5 Year Rollout
Depreciation Schedule

In Service Date	2015-2020
Tax Depreciation Life	7

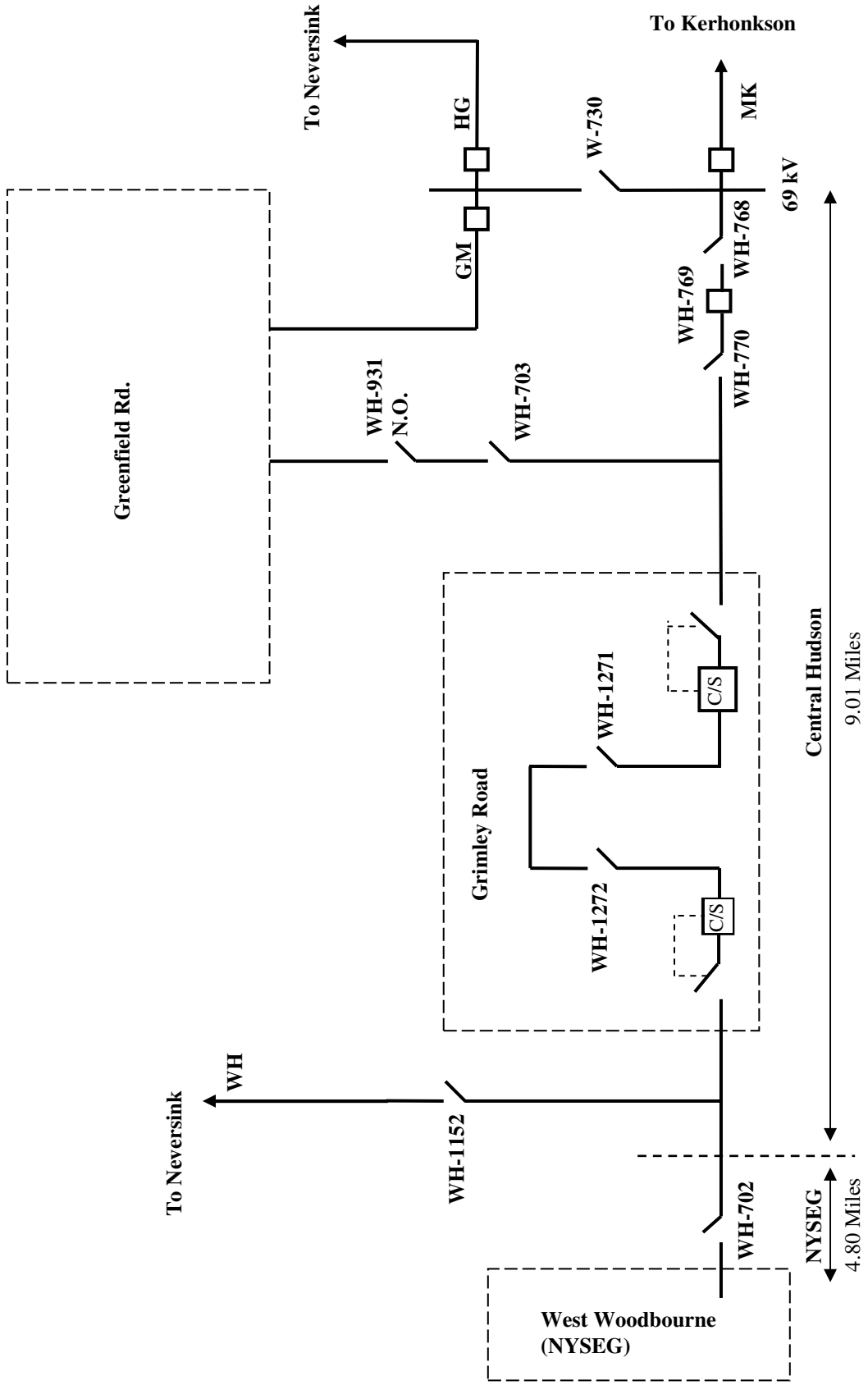
		14%	25%	17%	13%	9%	9%	9%	4%
Date	Year		Plant in Service	Tax Depreciation 7	Accumulated Depreciation	Net Plant	Tax Impact		Total Impact
12/31/2015	2015		$ [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2015	[redacted]
12/30/2016	2016							2016	
12/30/2017	2017							2017	
12/30/2018	2018							2018	
12/30/2019	2019							2019	
12/29/2020	2020							2020	
12/29/2021	2021							2021	
12/29/2022	2022							2022	
12/29/2023	2023							2023	
12/28/2024	2024							2024	
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								2026	
Date	Year							2027	
12/31/2016	2016							2028	
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12/30/2023	2023							2035	
12/29/2024	2024							2036	
12/29/2025	2025							2037	
12/29/2026	2026							2038	
								2039	
Date	Year							2040	
12/31/2017	2017							2041	
12/31/2018	2018								
12/31/2019	2019								

Attachment #2



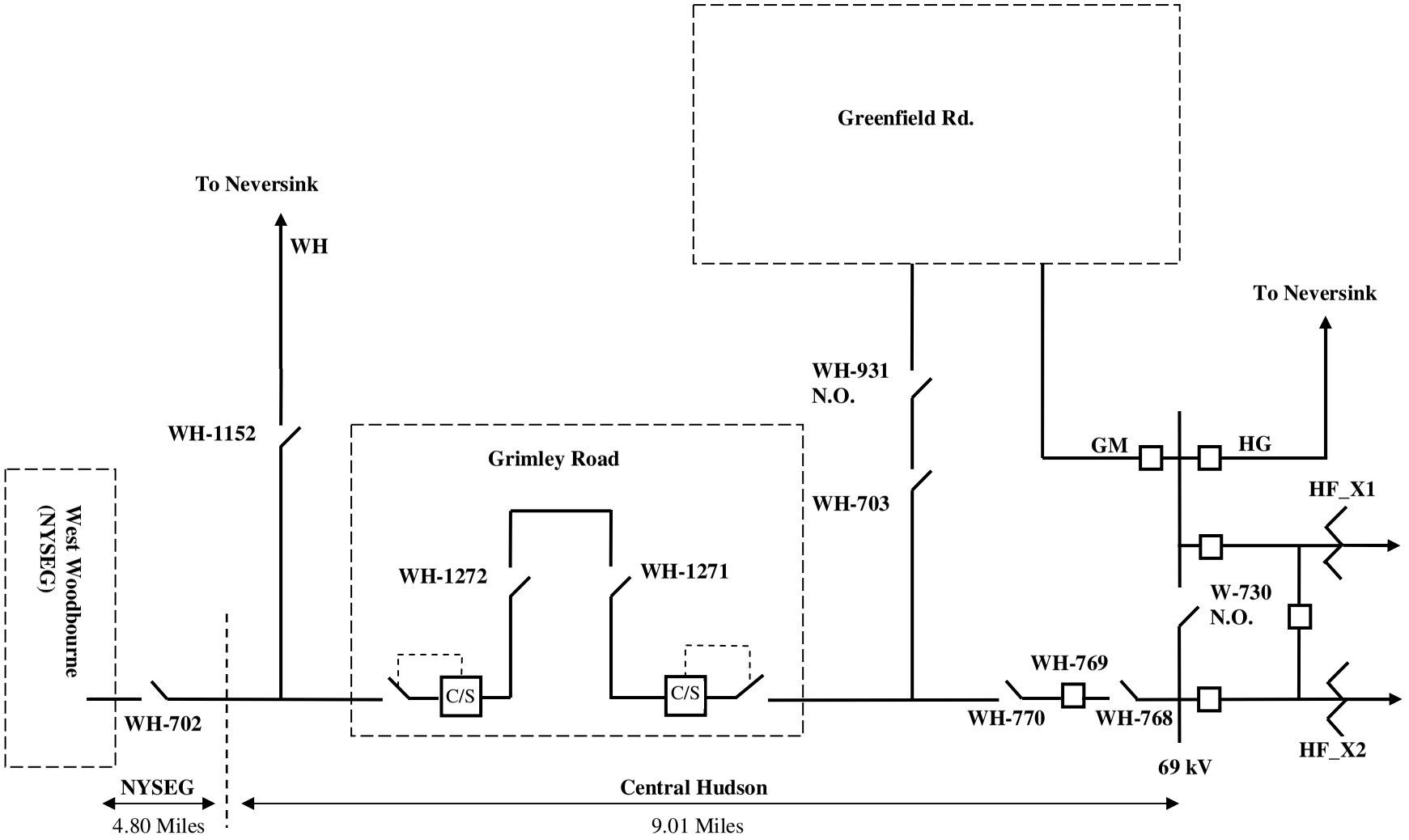
Attachment #3

Existing Configuration with single circuit WH-1 and WH-2 line

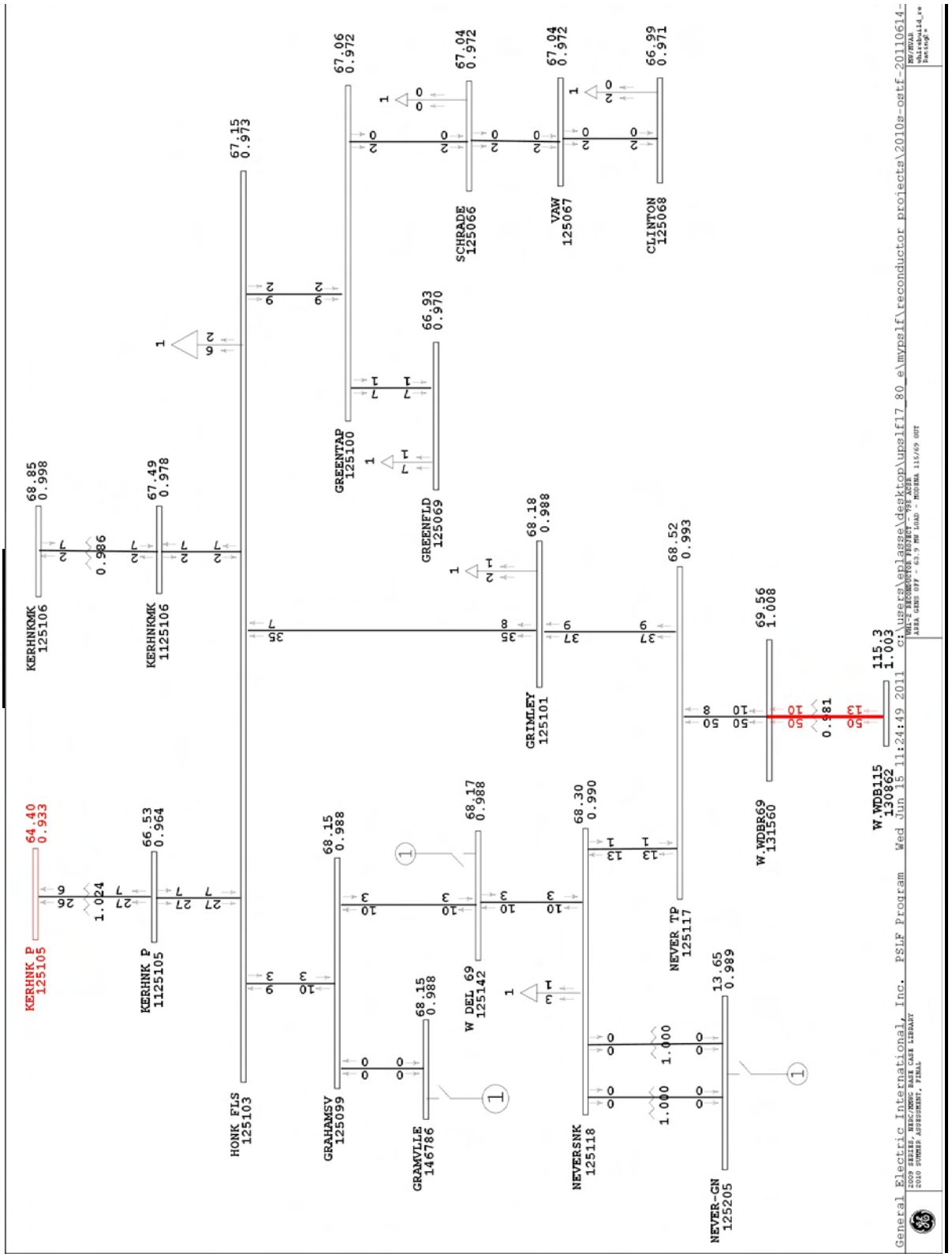


Attachment #4

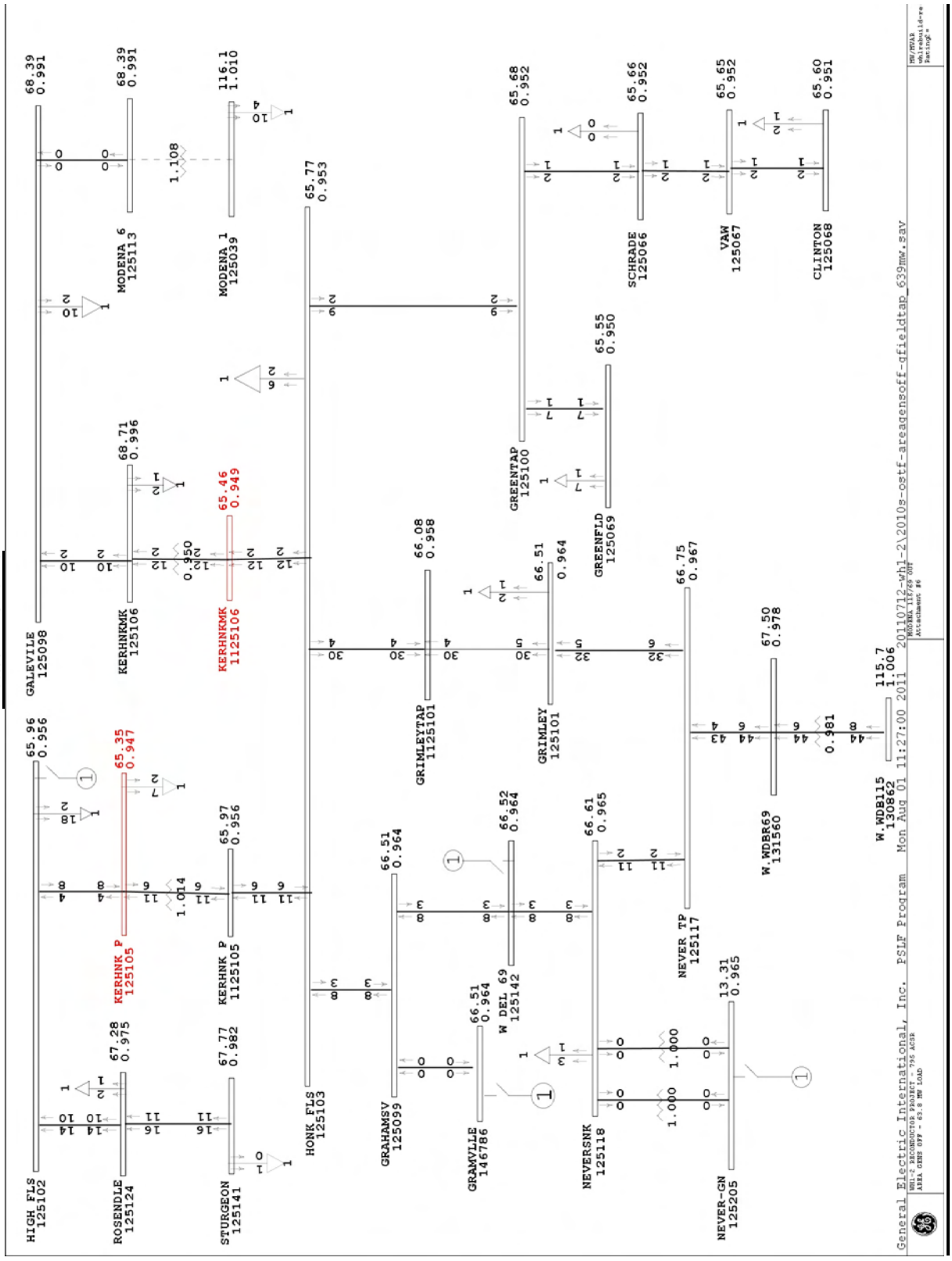
P/HK and MK/MG Upgrade Configuration with single circuit WH-1 and WH-2 line



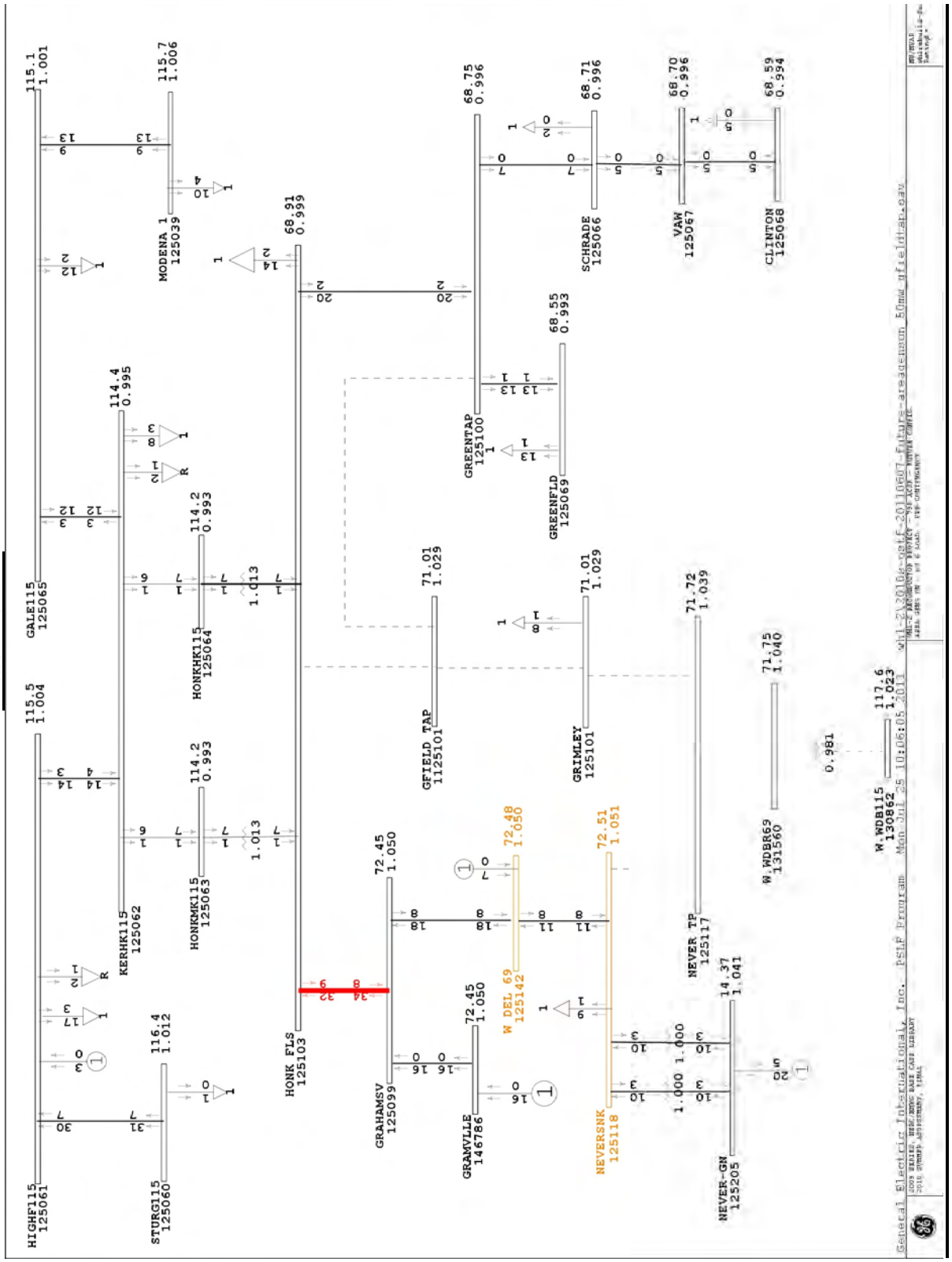
Attachment #5



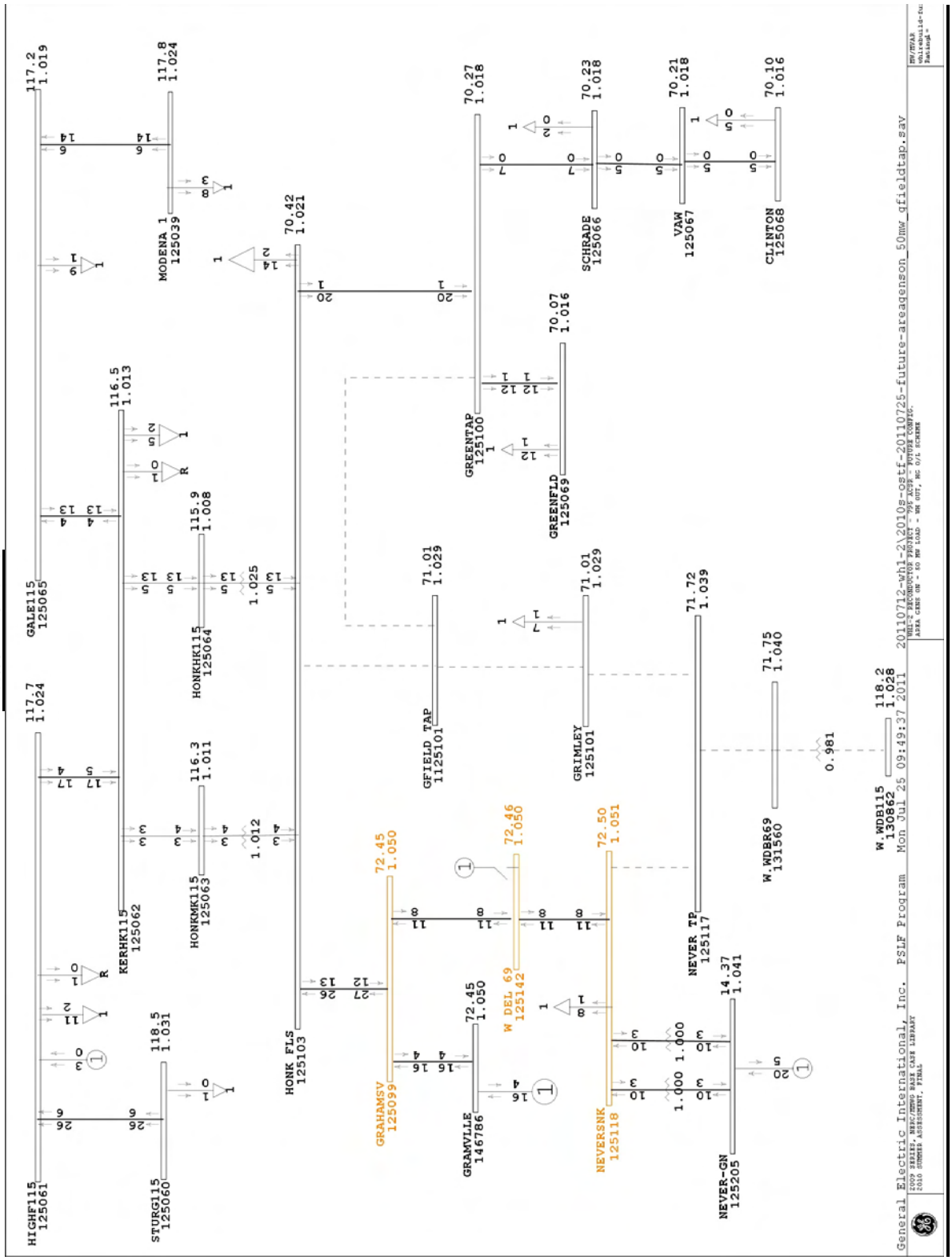
Attachment #6



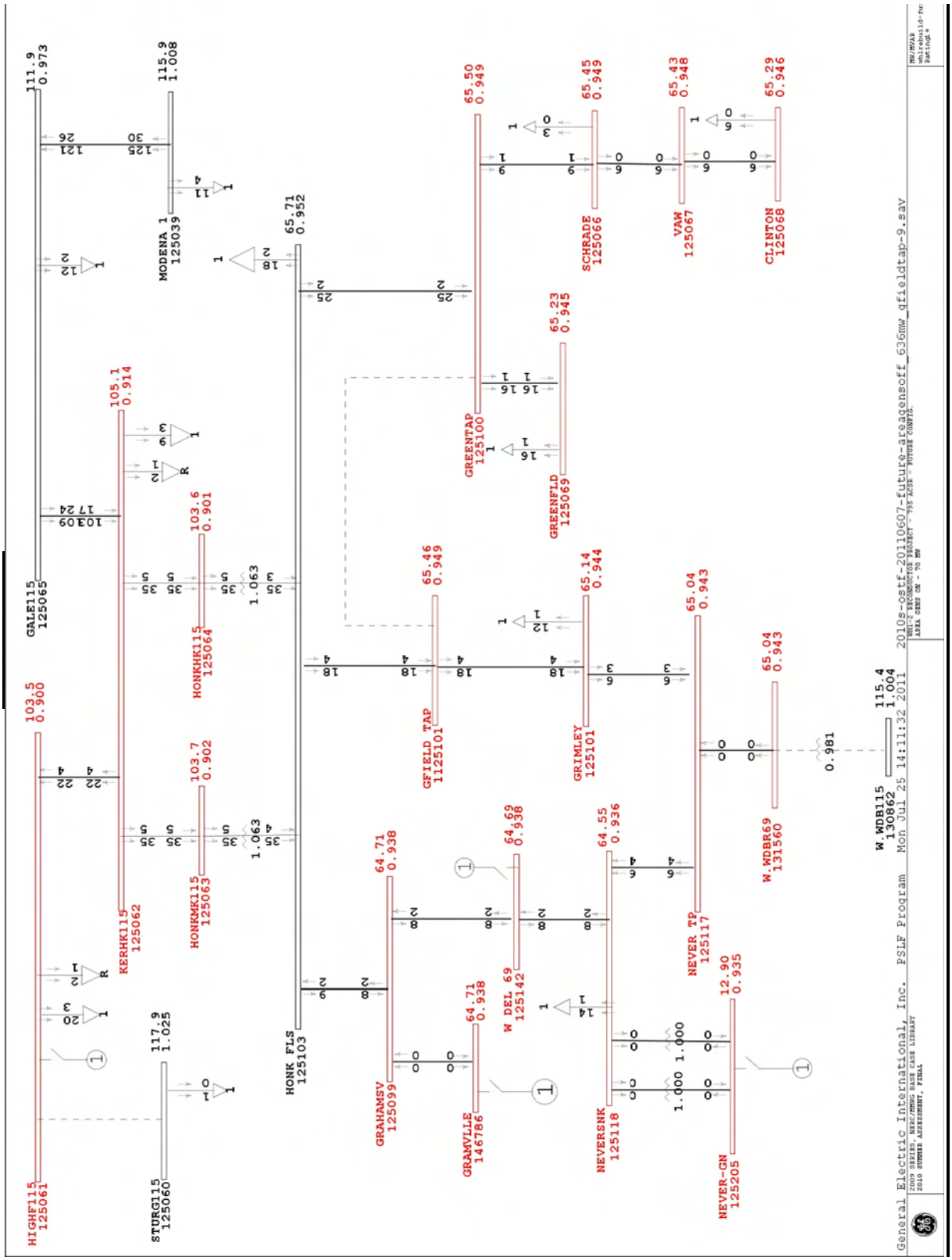
Attachment #7



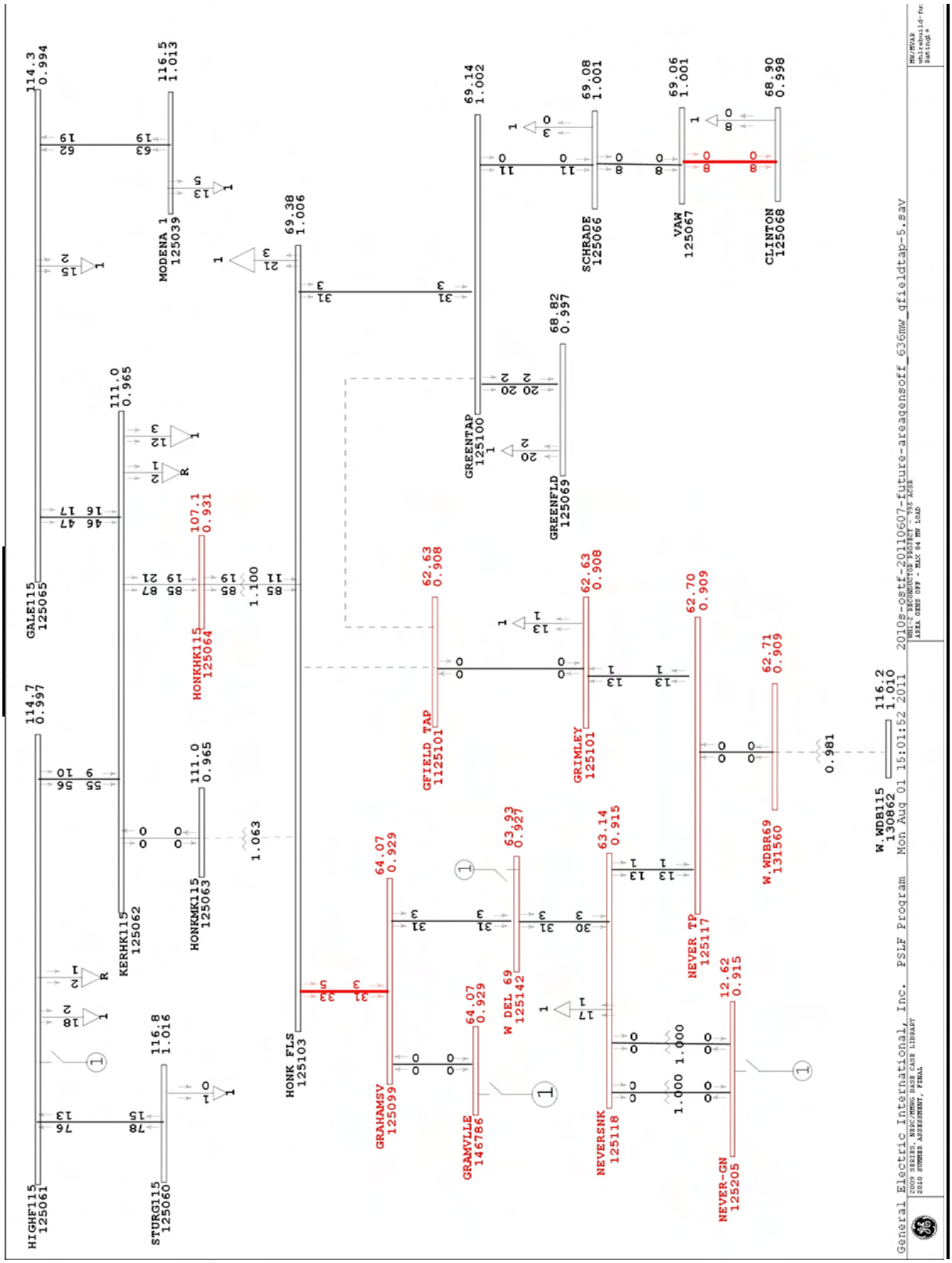
Attachment #8



Attachment #9



Attachment #10



PLANNING ESTIMATE

Attachemnt #11

Installation Estimate for Rebuilding WH1&2 Lines (OPTION #4 SINGLE POLE, SINGLE CIRCUIT)

Updated 8/2/2011

Location: *WH1&2 Lines*

By: R. K. Fournier

Project No:

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	UNIT COST LABOR MH/unit	UNIT COST LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (includes overheads) Material	Total (includes overheads) Labor
1	Building Access Road (stone, swamp mats, tree removal)	50,000	80	50	80	50,000	4,000	4,125	5,576	54,125	9,576
1	Erosion Control (silt fence, hay bales, etc.) and Restoration	50,000	60	50	60	50,000	3,000	4,125	4,182	54,125	7,182
50	Mobilize and Demobilize Equipment	0	60	50	3,000	0	150,000	0	209,100	0	359,100
120	Haul Materials Along ROW	0	18	50	2,160	0	108,000	0	150,552	0	258,552
0	Set Foundations	150,000	30	Contract	Contract	0	0	0	0	0	0
100	Dig Pole Hole (include auger & dewater)	100	6	50	600	10,000	30,000	825	41,820	10,825	71,820
20	Dig Rock Hole	3,000	30	Contract	Contract	60,000	0	4,950	0	64,950	0
120	Framing Wood / Steel Pole	0	24	50	2,880	0	144,000	0	200,736	0	344,736
120	Set Pole	0	16	50	1,920	0	96,000	0	133,824	0	229,824
96	Transfer Static and Conductors - 1 Structure (tangent, swing)	0	4	50	384	0	19,200	0	26,765	0	45,965
24	Transfer Static and Conductors - 1 Structure (deadend)	0	4	50	96	0	4,800	0	6,691	0	11,491
42	Install Conductor (per mile)	0	100	50	4,200	0	210,000	0	292,740	0	502,740
14	Install Static Wire/OPGW (per mile)	0	60	50	840	0	42,000	0	58,548	0	100,548
20	Install and Remove Grounds	0	4	50	80	0	4,000	0	5,576	0	9,576
25	Switching (Electricians Rate = 1.5)	0	4	75	100	0	7,500	0	10,455	0	17,955
14	OPGW installation (per mile, includes splicing)	35,000	1	Contract	Contract	490,000	0	171,500	0	661,500	0
1	Tree Trimming and Line Clearance	75,000	1	Contract	Contract	75,000	0	6,188	0	81,188	0
1	Special Equipment	100,000	1	Contract	Contract	100,000	0	35,000	0	135,000	0
1	Non Stock Materials (steel poles, wood poles, etc)	500,000	0	0	0	500,000	0	41,250	0	541,250	0
1	Non Stock Materials (insulators, wire, etc)	400,000	0	0	0	400,000	0	33,000	0	433,000	0
14	Non Stock OPGW (per mile)	27,000	0	0	0	378,000	0	31,185	0	409,185	0
120	Standard Stock Materials (average $ per structure)	2,000	0	0	0	240,000	0	84,000	0	324,000	0
	Management & Other Services										
1	Drafting	500	45	30	100	500	3,000	175	4,182	675	7,182
1	CH Engineering & Engineering Management	0				0	18,000	0	19,062	0	37,062
1	CH Environmental Management (DEC Reg. Wetlands)	0				0	5,000	0	5,295	0	10,295
1	CH Special Services Management	0				0	12,500	0	13,238	0	25,738
1	Permitting Consultant (including permitting fees)	175,000				175,000	0	14,438	0	189,438	0
1	Construction Supervision	0				0	50,000	0	69,700	0	119,700
1	Arrestor Study	7,000				7,000	0	578	0	7,578	
1	Right of Way Restoration	25,000				25,000	0	2,063	0	27,063	
	- SUBTOTALS -									2,993,900	2,169,042
	Total District M-hrs.(w/o contingency)				16,500						
	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.									2,993,900	2,169,042
	Accounting O.H. @14% of first $300k										42,000
	Estimated AFUDC										60,000
	Contingency @10%										516,294
	Grand Total										5,781,236
	Approximate				16,500						**5,781,000**
					16,500						

Case 4:09-cv-00031-JTC Document 1-1 Filed 01/16/09 Page 844 of 1288

Exhibit ___ (EIP-1)(Redacted)

Attachment #11

Removal Estimate for Rebuilding WH1&2 Lines (OPTION #4 SINGLE POLE, SINGLE CIRCUIT)

Location:

Project No:

Updated 8/2/201

By: R.K.Fournie

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	UNIT COST LABOR MH/unit	UNIT COST LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (Includes Overheads) Material	Total (Includes Overheads) Labor
240	Remove Wood/Steel Pole	0	20	50	4,800	0	240,000	0	334,560	0	574,56
42	Remove conductor wire (per mile)	0	25	50	1,050	0	52,500	0	73,185	0	125,68
14	Remove static wire (per mile)	0	25	50	350	0	17,500	0	24,395	0	41,89
14	Hauling/Dispoasal (Contract)	800	0	0	0	11,200	0	924	0	12,124	0
	Management & Other Services										
	Construction Supervision					0	10,000		13,940	0	23,94
	- SUBTOTALS -					11,200	320,000			12,124	766,08
	Total District M-hrs.(w/o contingency)				6,200						
	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.									12,124	766,080
	Grand Total				6,200						778,204
	Approximate				**6,200**						**778,000**

Case 14-E-0318 14-G-0319
Exhibit__(EIP-1)(Redacted)
Page 845 of 1288

PLANNING ESTIMATE

Attachment #12

Installation Estimate for Rebuilding ELLENVILLE TAP — 8/11/2011

Location: *WH Line Ellenville Tap (1.3 miles)* — By: R. K. Fournier

Project No:

TOTAL UNITS	Construction Activity	UNIT COST MATERIAL ($)	UNIT COST LABOR MH/unit	UNIT COST LABOR $ / MH	TOTAL Man Hrs.	TOTAL COST Material ($)	TOTAL COST Labor ($)	Overhead Material	Overhead Labor	Total (includes overheads) Material	Total (includes overheads) Labor
1	Building Access Road (stone, swamp mats, tree removal)	15,000	80	50	80	15,000	4,000	1,238	5,576	16,238	9,576
1	Erosion Control (silt fence, hay bales, etc.) and Restoration	15,000	60	50	60	15,000	3,000	1,238	4,182	16,238	7,182
10	Mobilize and Demobilize Equipment	0	60	50	600	0	30,000	0	41,820	0	71,820
24	Haul Materials Along ROW	0	18	50	432	0	21,600	0	30,110	0	51,710
48	Dig Pole Hole (include auger & dewater)	100	6	50	288	4,800	14,400	396	20,074	5,196	34,474
20	Dig Rock Hole	3,000	30	Contract	Contract	60,000	0	4,950	0	64,950	0
24	Framing Wood / Steel Pole	0	24	50	576	0	28,800	0	40,147	0	68,947
48	Set Pole	0	16	50	768	0	38,400	0	53,530	0	91,930
20	Transfer Static and Conductors - 1 Structure (tangent, swing)	0	4	50	80	0	4,000	0	5,576	0	9,576
4	Transfer Static and Conductors - 1 Structure (deadend)	0	4	50	16	0	800	0	1,115	0	1,915
6	Install Conductor (per mile)	0	100	50	600	0	30,000	0	41,820	0	71,820
2	Install Static Wire/OPGW (per mile)	0	60	50	120	0	6,000	0	8,364	0	14,364
4	Install and Remove Grounds	0	4	50	16	0	800	0	1,115	0	1,915
6	Switching (Electricians Rate = 1.5)	0	4	75	24	0	1,800	0	2,509	0	4,309
2	OPGW installation (per mile, includes splicing)	35,000	1	Contract	Contract	70,000	0	24,500	0	94,500	0
1	Tree Trimming and Line Clearance	12,000	1	Contract	Contract	12,000	0	990	0	12,990	0
1	Special Equipment	20,000	1	Contract	Contract	20,000	0	7,000	0	27,000	0
1	Non Stock Materials (steel poles, wood poles, etc)	130,000	0	0	0	130,000	0	10,725	0	140,725	0
1	Non Stock Materials (insulators, wire, etc)	35,000	0	0	0	35,000	0	2,888	0	37,888	0
2	Non Stock OPGW (per mile)	27,000	0	0	0	54,000	0	4,455	0	58,455	0
24	Standard Stock Materials (average $ per structure)	2,000	0	0	0	48,000	0	16,800	0	64,800	0
	Management & Other Services										
1	Drafting	500	10	30	10	500	300	175	418	675	718
1	CH Engineering & Engineering Management	0				0	2,000	0	2,118	0	4,118
1	CH Environmental Management (DEC Reg. Wetlands)	0				0	1,000	0	1,059	0	2,059
1	CH Special Services Management	0				0	2,000	0	2,118	0	4,118
1	Permitting Consultant (including permitting fees)	20,000				20,000	0	1,650	0	21,650	0
1	Construction Supervision	0				0	8,000	0	11,152	0	19,152
1	Arrestor Study	4,000				4,000	0	330	0	4,330	0
1	Right of Way Restoration	10,000				10,000	0	825	0	10,825	0
	- SUBTOTALS -									576,459	469,704
	Total District M-hrs.(w/o contingency)				3,670						
	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.									576,459	469,704
	Accounting O.H. @14% of first $300k										42,000
	Estimated AFUDC										5,000
	Contingency @10%										104,616
	Grand Total				3,670						1,197,778
	Approximate				**3,670**						**1,198,000**

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Attachment #12

Removal Estimate for Rebuilding ELLENVILLE TAP 8/11/2011

Location: *WH Line Ellenville Tap (1.3 miles)* By: R.K.Fournier

Project No:

TOTAL		UNIT COST			TOTAL	TOTAL COST		Overhead		Total (Includes Overheads)	
		MATERIAL	LABOR		TOTAL						
UNITS	**Construction Activity**	($)	MH/unit	$ / MH	Man Hrs.	Material ($)	Labor ($)	Material	Labor	Material	Labor
24	Remove Wood/Steel Pole	0	20	50	480	0	24,000	0	33,456	0	57,456
6	Remove conductor wire (per mile)	0	25	50	150	0	7,500	0	10,455	0	17,955
2	Remove static wire (per mile)	0	25	50	50	0	2,500	0	3,485	0	5,985
2	Hauling/Dispoasal (Contract)	800	0	0	0	1,600	0	132	0	1,732	0
	Management & Other Services										
	Construction Supervision					0	10,000		13,940	0	23,940
	- SUBTOTALS -					1,600	44,000			1,732	105,336
	Total District M-hrs.(w/o contingency)				680						
	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.									1,732	105,336
	Grand Total				680						107,068
	Approximate				**680**						**107,000**

Case 14-E-0318 & 14-G-0319

Exhibit___(EIP-1)(Redacted)
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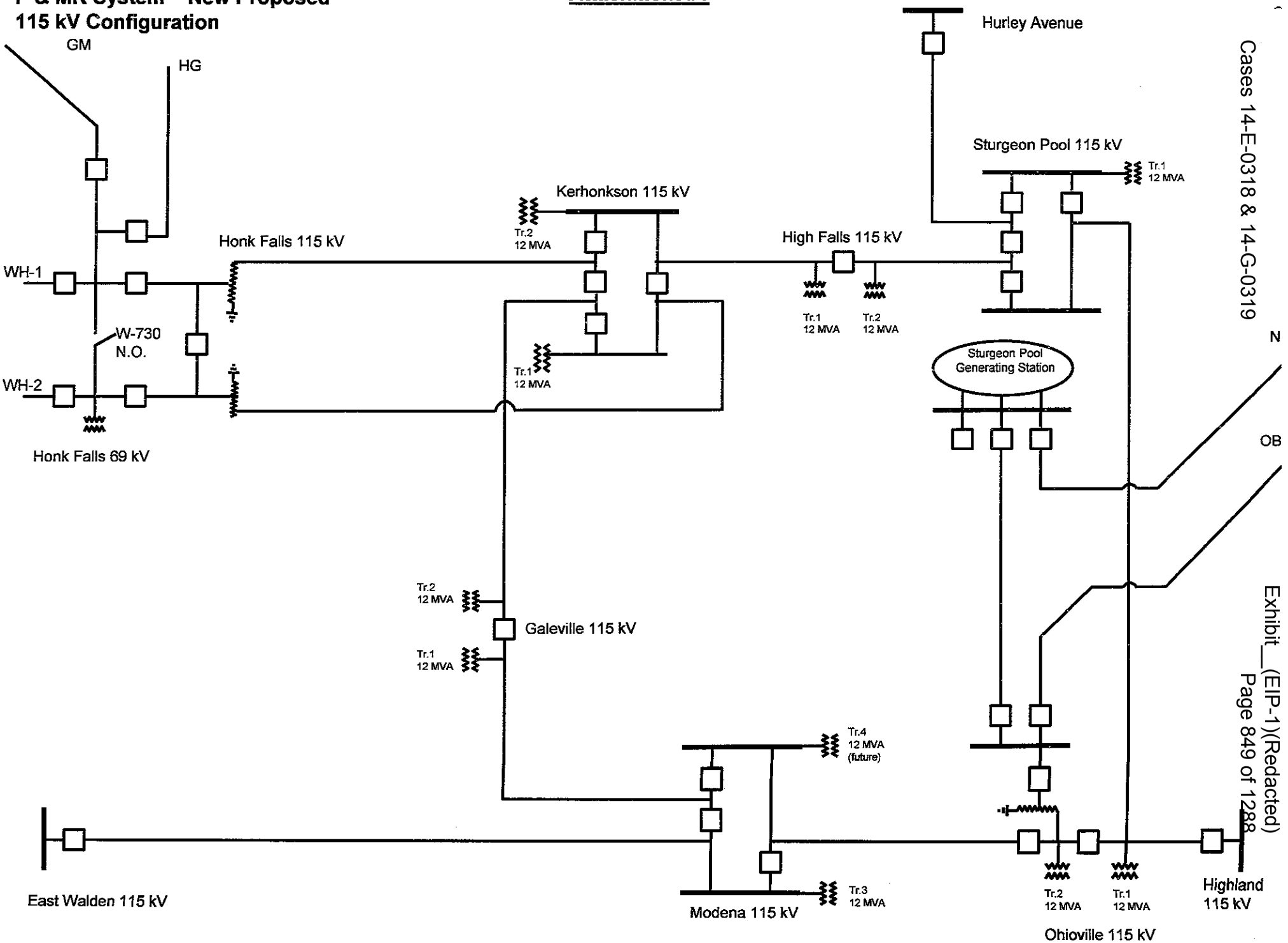
Breaker Replacement Program - 2014

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	(Condition)	Cost	model
SAND DOCK	115 kV	KC-1447-SC	GENERAL ELECTRIC	OilBreaker	1/1/1952	61.00%		$255,000	FK-439-115-3500F
REYNOLDS HILL	115 kV	DR-1418	GENERAL ELECTRIC	OilBreaker	1/1/1958	64.00%		$255,000	FK-439-115-5000
REYNOLDS HILL	115 kV	X-1143	GENERAL ELECTRIC	OilBreaker	1/1/1958	55.00%		$255,000	FK-439-115-5000
EAST WALDEN	69 kV	WM-634	WESTINGHOUSE	OilBreaker	1/1/1950	26.00%		$234,000	GO-4B
EAST WALDEN	115 kV	EM-642	GENERAL ELECTRIC	OilBreaker	1/1/1958	76.00%		$255,000	FK-439-115-5000
EAST WALDEN	115 kV	W-644	GENERAL ELECTRIC	OilBreaker	1/1/1958	63.00%		$255,000	FK-439-115-5000
MILAN	115 kV	RT-7	GENERAL ELECTRIC	OilBreaker	1/1/1952	70.00%		$255,000	FK-439-2500
MILAN	115 kV	R-10	GENERAL ELECTRIC	OilBreaker	1/1/1952	36.00%		$255,000	FK-439-115-3500
HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	OilBreaker	1/1/1953	49.00%		$234,000	FZO-151-69F
HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	OilBreaker	1/1/1952	46.00%		$234,000	FZO-151-69F
HONK FALLS	69 kV	WH-962	ALLIS CHALMERS	OilBreaker	1/1/1952	46.00%		$234,000	FZO-151-69F
BEACON	15 kV	NM-402	WESTINGHOUSE	AirBreaker	1/1/1958	19.00%		$39,000	150-DH-500E
BEACON	15 kV	W-408	WESTINGHOUSE	AirBreaker	1/1/1959	59.00%		$39,000	150-DH-500E
BEACON	15 kV	W-420	WESTINGHOUSE	AirBreaker	1/1/1959	59.00%		$39,000	150-DH-500E
BEACON	15 kV	BF-1089	ALLIS CHALMERS	OilBreaker	1/1/1957	17.00%	P	$112,000	FZO-15-1000-H
BEACON	15 kV	TD-8006	ALLIS CHALMERS	OilBreaker	1/1/1958	29.00%	P	$112,000	FZO-15-1000-H
BEACON	15 kV	W-426	ALLIS CHALMERS	OilBreaker	1/1/1958	17.00%	P	$112,000	FZO-15-1000-H
EAST PARK	15 kV	CKT 6073	ITE CIRCUIT BREAKER	OilBreaker	1/1/1964	28.00%	P	$112,000	KS-500-12-B
EAST PARK	15 kV	TD-6074	SIEMENS	OilBreaker	1/1/1971	29.00%	P	$112,000	SDO-15-500
EAST PARK	15 kV	TD-6075	SIEMENS ALLIS	OilBreaker	1/1/1984	29.00%	P	$112,000	SDO-15-500
EAST PARK	15 kV	TD-6074	SIEMENS	OilBreaker	1/1/1971	29.00%	P	$112,000	SDO-15-500
EAST PARK	15 kV	TD-6075	SIEMENS ALLIS	OilBreaker	1/1/1984	29.00%	P	$112,000	SDO-15-500

Cases 14-E-0318 & 14-G-0319
Exhibit___(EIP-1)(Redacted)

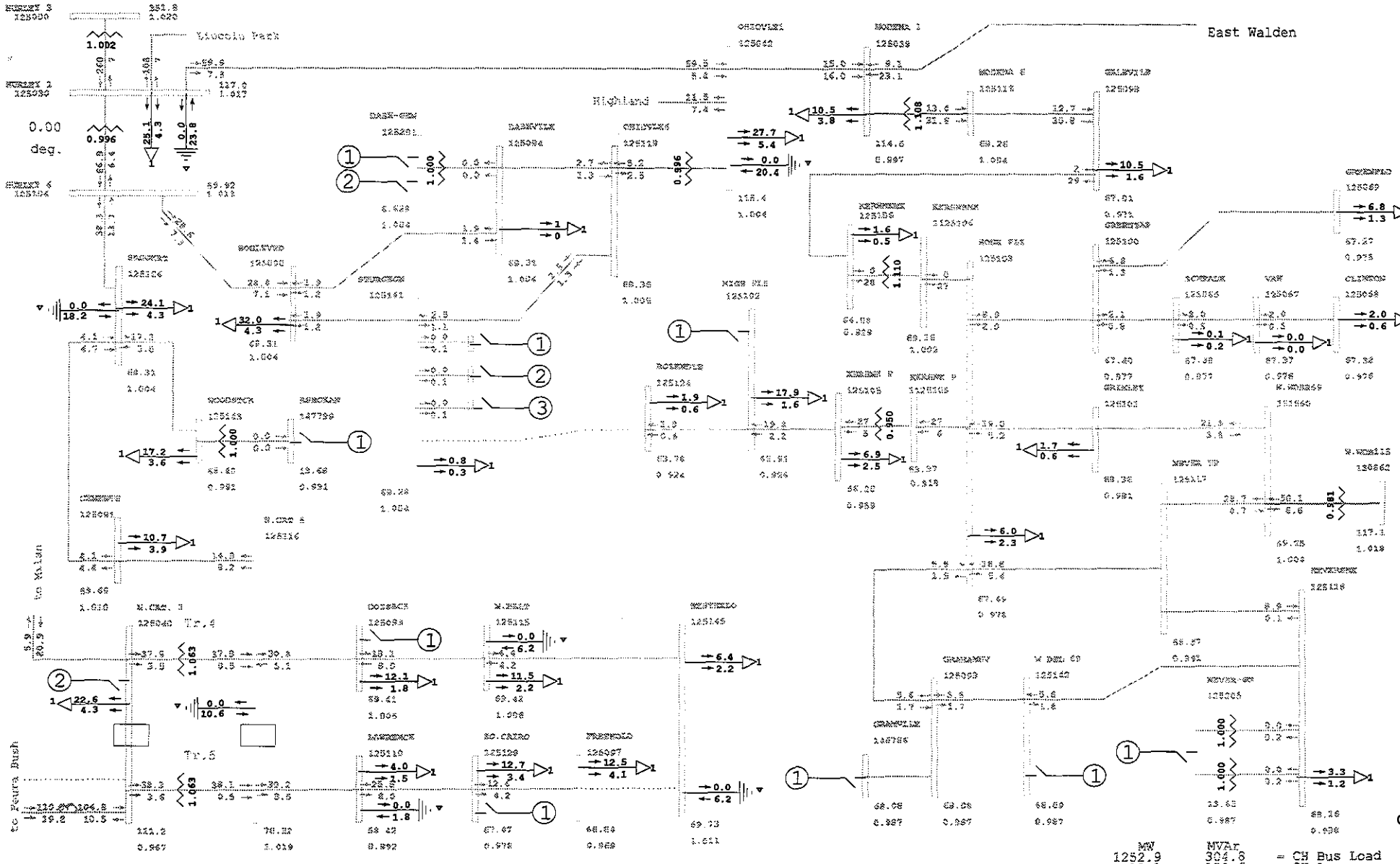
P & MK System – New Proposed 115 kV Configuration

Attachment #1



Cases 14-E-0318 & 14-G-0319

Exhibit__(EIP-1)(Redacted)
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	MW	MVAr	MW	MVAr
Central East =	2365.0	122.1		
Total East =			5264.0	469.1
UPNY - SENY =	5233.5	274.5	5343.3	691.4
UPNY-CE =	4546.1	494.4	6795.5	759.0
	Open Interface		Closed Interface	

MW	MVAr	
1252.9	394.6	= CH Bus Load
18.1	122.6	= CH Losses
0.0	208.4	= CH Shunts
1271.0	218.9	= CH Load
	0.985	= corr.pf

Attachment #2
P Line out of service
No Ellenville hydro generation

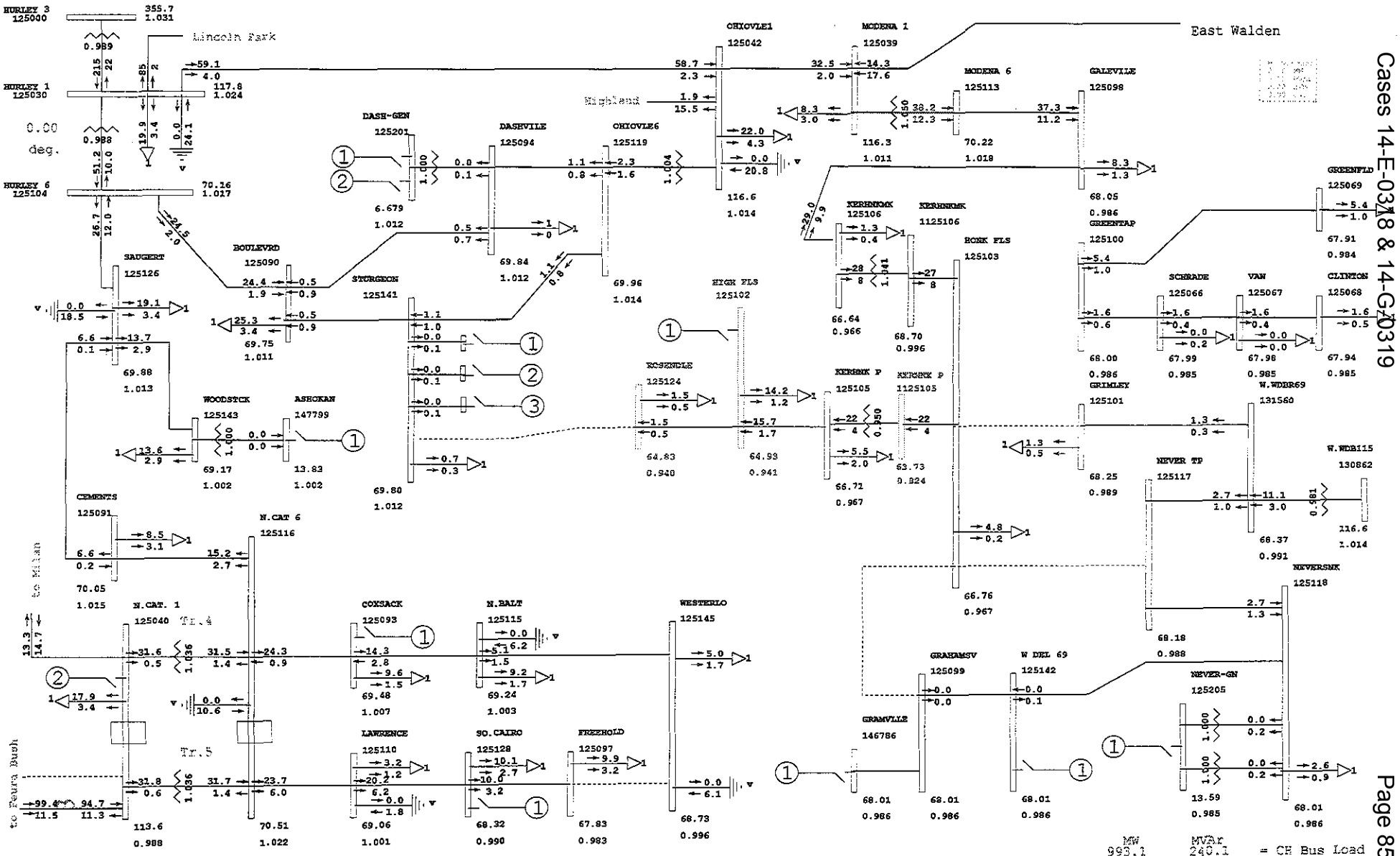
Area Load = 63.8 MW
System Load = 1253 MW

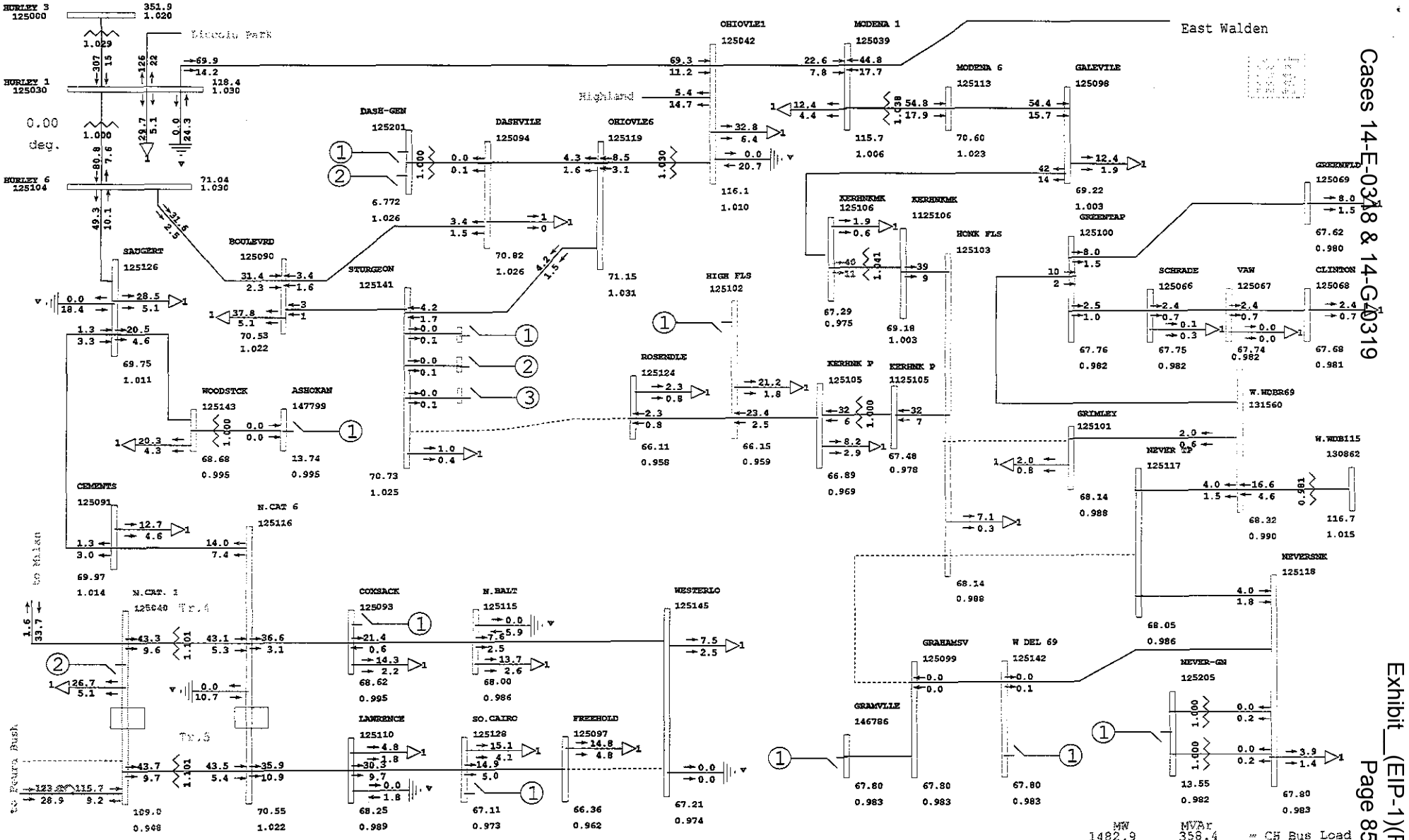
MW/MVAR
2008-west-side-69 wit

Attachment #

P & MK		Summer (MW) Coincident																					
P - Line Loads	**Source**	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**	**2003**	**2002**	**2001**	**2000**	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**	**1993**	**1992**	**1991**	**1990**	**1989**	**198**
Rosendale	Est	-	*0.5*	1.1	*1.30*	*1.3*	*1.9*	1.7	1.8	1.9	1.9	1.5	1.7	1.7	1.8	1.6	1.4	1.4	2.6	1.8	2.6	1.9	2	2.
Accord	Est	0.7	0.5	0.7	0.68	0.6	*0.8*	0.7	0.7	0.8	0.8	0.7	1	0.7	0.7	0.7	0.7	0.8	0.8	0.6	0.8	0.6	0.9	0.
Kerhonkson-HK 3081	Charts	*4.8*	4.5	4.8	4.86	4.8	2.9	2.5	3	5.9	5.7	5.4	6.2	5.8	4.6	4.6	4.5	4.4	4.5	3.9	4.3	3.5	4	4.
High Falls	EMS	18.6	14.4	15.9	16.07	17.6	14.8	11.4	9.2	11.3	8.7	8.5	10.5	6.8	8.5	7.3	9.7	7.2	8.6	7.5	8.2	7.8	7.7	7.
MK Line Loads																								
Kerhonkson-MK 3082	Charts	*5.3*	4.5	4.8	4.5	5.1	6.4	3.8	4.4	2.9	1.6	1.2	1.3	1.3	1.6	1.4	1.5	2	1.9	1.3	1.7	1.7	1	1.
Galeville	MV-90	8.8	7.3	9.0	9.81	10.0	9.1	7.1	6.1	6.2	5.9	4.5	5	4.1	3.6	3	3.6	3.5	4.2	2.5	4	3.5	3.4	
Modena 69 kV	EMS	-	-	-	-	-	-	8.8	9.1	8	8.3	8.5	9.8	9.5	9.1	7.8	8.1	9.2	9	7.6	7.8	7.6		6.
Ellenville Loads																								
Clinton Ave	MV-90	1.0	0.9	1.8	2.50	2.7	2.8	2.4	2.4	2.5														
Honk Falls	EMS	5.9	5.5	5.5	5.80	6.5	6.2	5.3	5	6.5	6.3	6	1.7	1.8	1.9	1.3	1.4	1.3	1.6	1.6	1.6	1	0	0.
Grimley Road	Est	4.3	*4.3*	3.6	*4.08*	*3.9*	*2.6*	2.4	1.8	2.4	1.7	1.5	1.9	1.5	1	2	2	2.4	3.7	3.7	3.7	2.5	3	
Greenfield Road[1]	Charts	6.5	7.4	7.4	7.34	7.9	7.4	6.1	6.5	7.6	17.4	17.3	22.5	20.8	21.1	20.7	21.6	19.8	20.8	19.3	21.2	13.8	16.4	18.
Schrade	MV-90	0.1	0.1	0.1	0.05	0.1	0.2	0.2	0.6	1														
VAW	MV-90	-	-	-	1.28	3.1	6.4	2.7	4.5	1														
Neversink	Charts	3.1	2.7	2.5	*1.20*	2.8	2.7	2.6	2.6	2.6	2.6	2.8	2.2	2.9	3	2.8	3.2	1.8	1.7	1.6	1.8	2.3	1	1.
Total Ellenvile,P&MK Loads		59.1	52.5	57.2	59.47	66.2	64.2	57.7	57.7	60.6	60.9	57.9	63.8	56.9	56.9	53.2	57.7	53.8	59.4	51.4	57.7	46.2	49.9	52.
Total Ellenvile,P&MK Loads w/o Modena		59.1	52.5	57.2	59.47	66.21	64.2	48.9	48.6	52.6	52.6	49.4	54	47.4	47.8	45.4	49.6	44.6	50.4	43.8	49.9	38.6	42.9	45.
1-Year Growth Rate[2]		12.48%	-8.09%	-3.87%	-10.18%	3.13%	31.29%	0.62%	-7.60%	0.00%	6.48%	-8.52%	13.92%	-0.84%	5.29%	-8.47%	11.21%	-11.51%	15.07%	-12.22%	29.27%	-10.02%	-5.92%	-
3-Year Growth Rate[2]		-0.21%	-7.42%	-3.79%	6.74%	10.86%	6.87%	-2.40%	-0.54%	-0.87%	3.53%	1.10%	5.95%	-1.50%	2.34%	-3.42%	4.23%	-3.67%	9.30%	0.69%	3.05%			
5-Year Growth Rate[2]		-1.64%	1.45%	3.30%	2.49%	4.71%	5.38%	-1.96%	0.50%	1.93%	2.99%	-0.08%	3.90%	-1.22%	1.76%	-1.87%	5.14%	0.78%	2.02%					
10-Year Growth Rate[2]		1.81%	-0.27%	1.89%	2.21%	3.85%	2.61%	0.92%	-0.36%	1.85%	0.53%	2.50%	2.33%	0.39%										
Since 1988[2]		1.19%	0.68%	1.14%	1.41%	2.09%	2.03%	0.44%	0.43%	1.03%	1.10%	0.67%	1.55%	0.39%	0.52%	-0.05%	1.21%	-0.37%	2.02%	-1.00%	3.05%	-8.00%	-5.92%	
Modena 115 kV	EMS	13.3	9.7	10.1	11.2	10.8	10.1																	
System Peaks		1227	1107	1187	1185	1295	1204	1051	1078	1125	1048	943	1014.6	900.2	916.7	838.1	902.2	891.6	859.9	854.4	950.4	871.4	888.1	890.
1-Year Growth Rate		10.84%	-6.74%	0.17%	-8.49%	7.56%	14.56%	-2.50%	-4.18%	7.35%	11.13%	-7.06%	12.71%	-1.80%	9.38%	-7.10%	1.19%	3.69%	0.64%	-10.10%	9.07%	-1.88%	-0.31%	-
3-Year Growth Rate		1.17%	-5.09%	-0.47%	4.08%	6.30%	2.29%	0.10%	4.56%	3.50%	5.20%	0.95%	6.58%	-0.07%	0.93%	-0.85%	1.83%	-2.11%	-0.44%	-1.28%	2.18%			
5-Year Growth Rate		0.38%	1.04%	1.95%	1.04%	4.32%	5.01%	0.71%	3.67%	4.18%	4.57%	0.89%	2.62%	0.92%	1.42%	-2.48%	0.70%	0.08%	-0.71%					
10-Year Growth Rate		2.67%	0.88%	2.80%	2.60%	4.45%	2.93%	1.66%	2.29%	2.79%	0.98%	0.79%	1.34%	0.10%										
Since 1988		1.47%	1.04%	1.45%	1.51%	2.10%	1.79%	1.04%	1.28%	1.68%	1.26%	0.47%	1.19%	0.10%	0.32%	-0.76%	0.18%	0.01%	-0.71%	-1.04%	2.18%	-1.10%	-0.31%	
Denotes in MVA																								
1. Prior to 2002 includes Greenfield Rd. 4kV and 13.2kV, Clinton Ave., Schrade and VAW																								
2. Percentages computed with Modena load excluded because it was transferred out of the Ellenville area in 2005																								
3. The 2009 load estimate for Rosendale and Grimley Road is in MVA, provided by the Kingston EOE																								
4. The 2010 load for Kerhonkson, Neversink, Grimley Road and Greenfield Road is obtained from GridSense and the 2010 load for Galeville is obtained from eDNA																								
5. The 2010 load for Accord Substation and Neversink Circuit 391 was estimated by the Kingston EOE																								

Case 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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HURLEY 3 125000
HURLEY 1 125030
HURLEY 6 125104
Lincoln Park
East Walden
Highland
to Milan
to Pleasant Valley
to Todd Hill
to Pleasant Valley
to Todd Hill
to Pleasant Valley
to Todd Hill



	MW	MVAr	MW	MVAr
Central East =	2444.0	128.4	5429.7	408.3
Total East =			6543.9	649.6
UPNY - SENY =	5371.1	261.7	6601.8	672.8
UPNY-CE =	4329.4	420.4		
	Open Interface		Closed Interface	

MW	MVAr	
1482.9	358.4	= CH Bus Load
19.2	180.2	= CH Losses
0.0	202.3	= CH Shunts
1502.1	336.4	= CH Load
	0.976	= corr.pf

Cases 14-E-0318 & 14-G-0319

Exhibit__(EIP-1)(Redacted)

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General Electric International, Inc. PSLF Program Tue Mar 29 13:00:28 2011 c:\p&mk\attachments\2009s-ellenville split new trans-pline-1483mw2.sav

Attachment #6

Split System - Replaced Modena Transformer

P line out of service

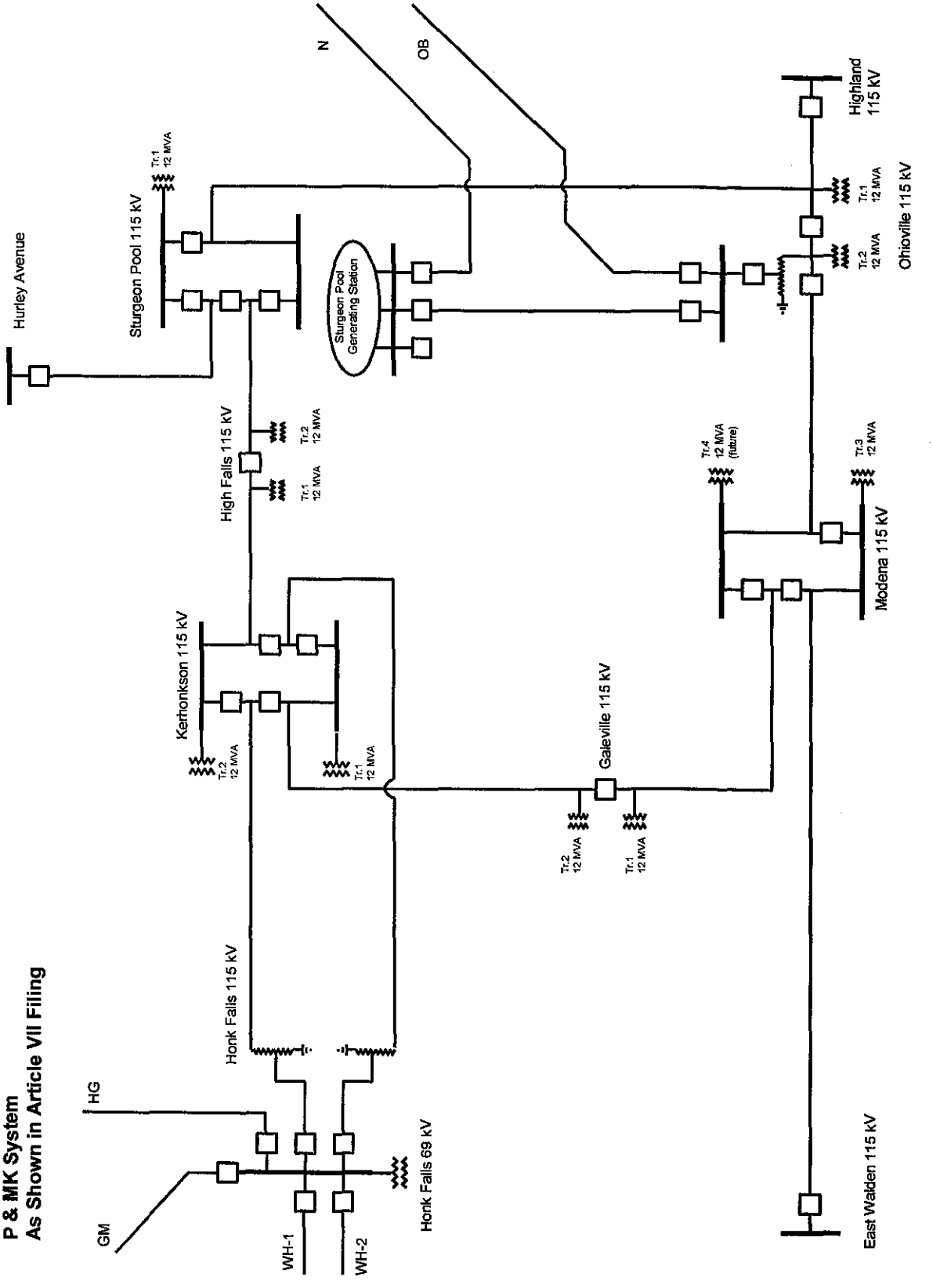
Area Load = 71.4 MW

System Load = 1483 MW

MW/MVAR

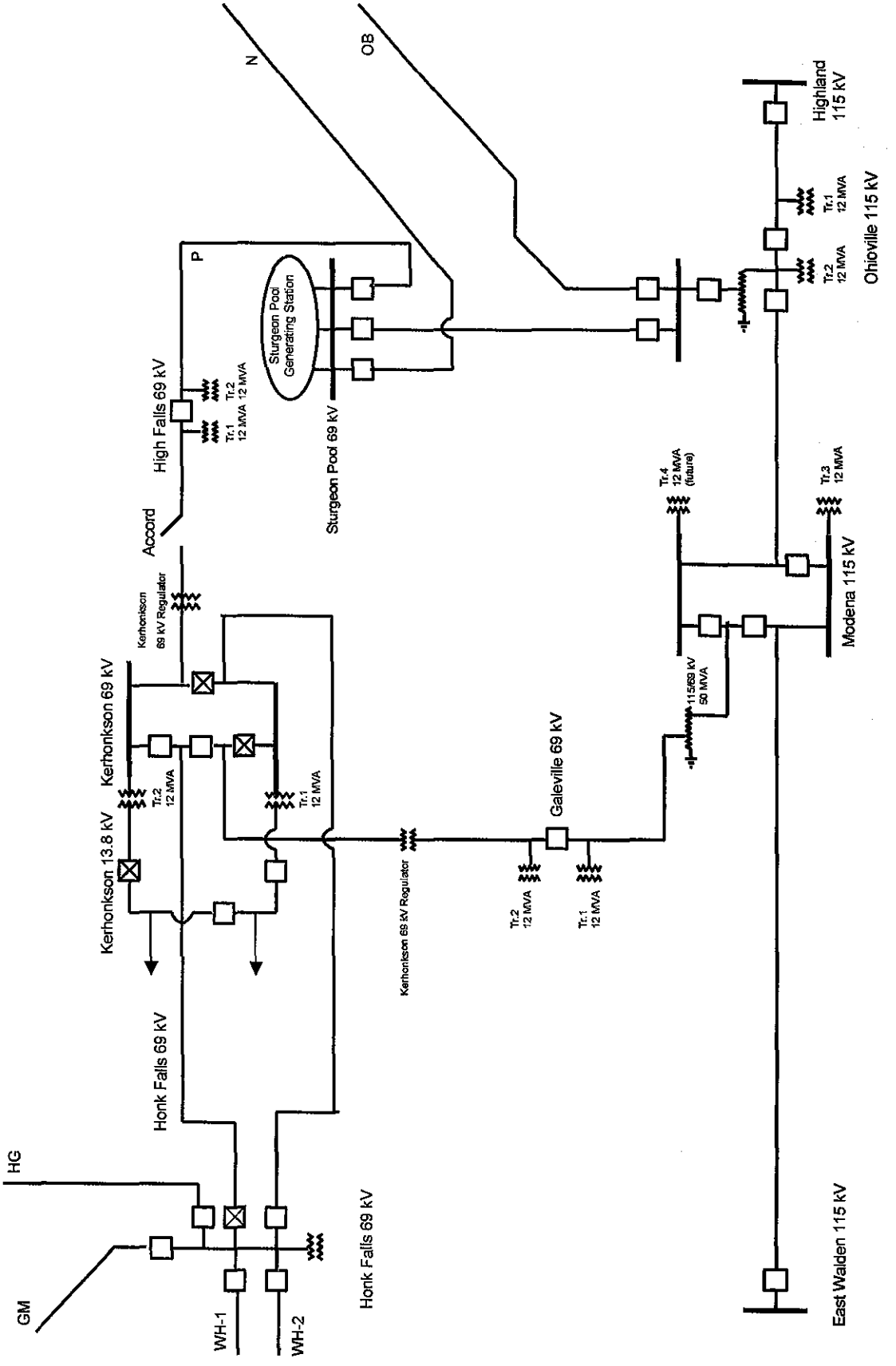
2008-west-side-69 w:

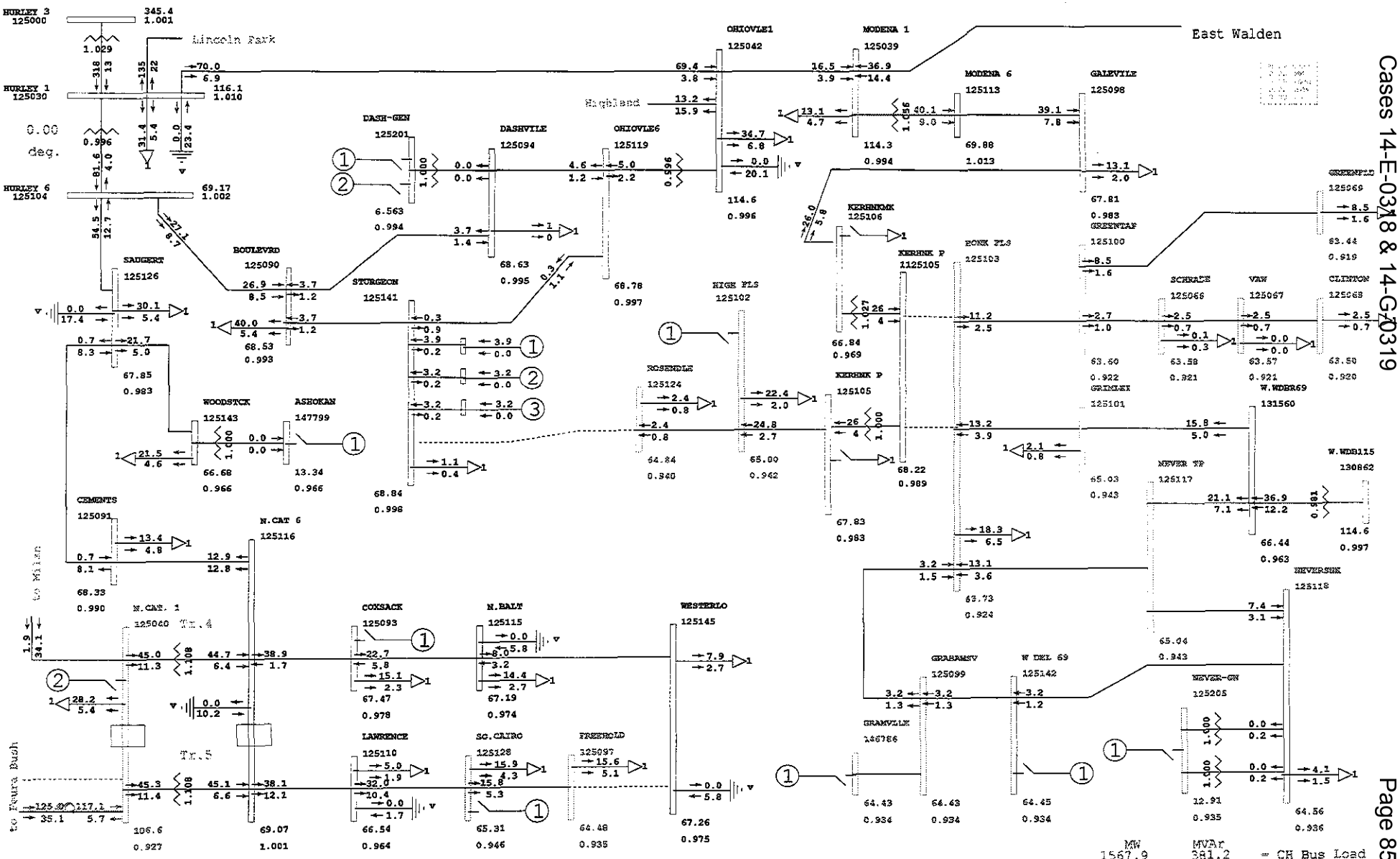
Attachment # 7



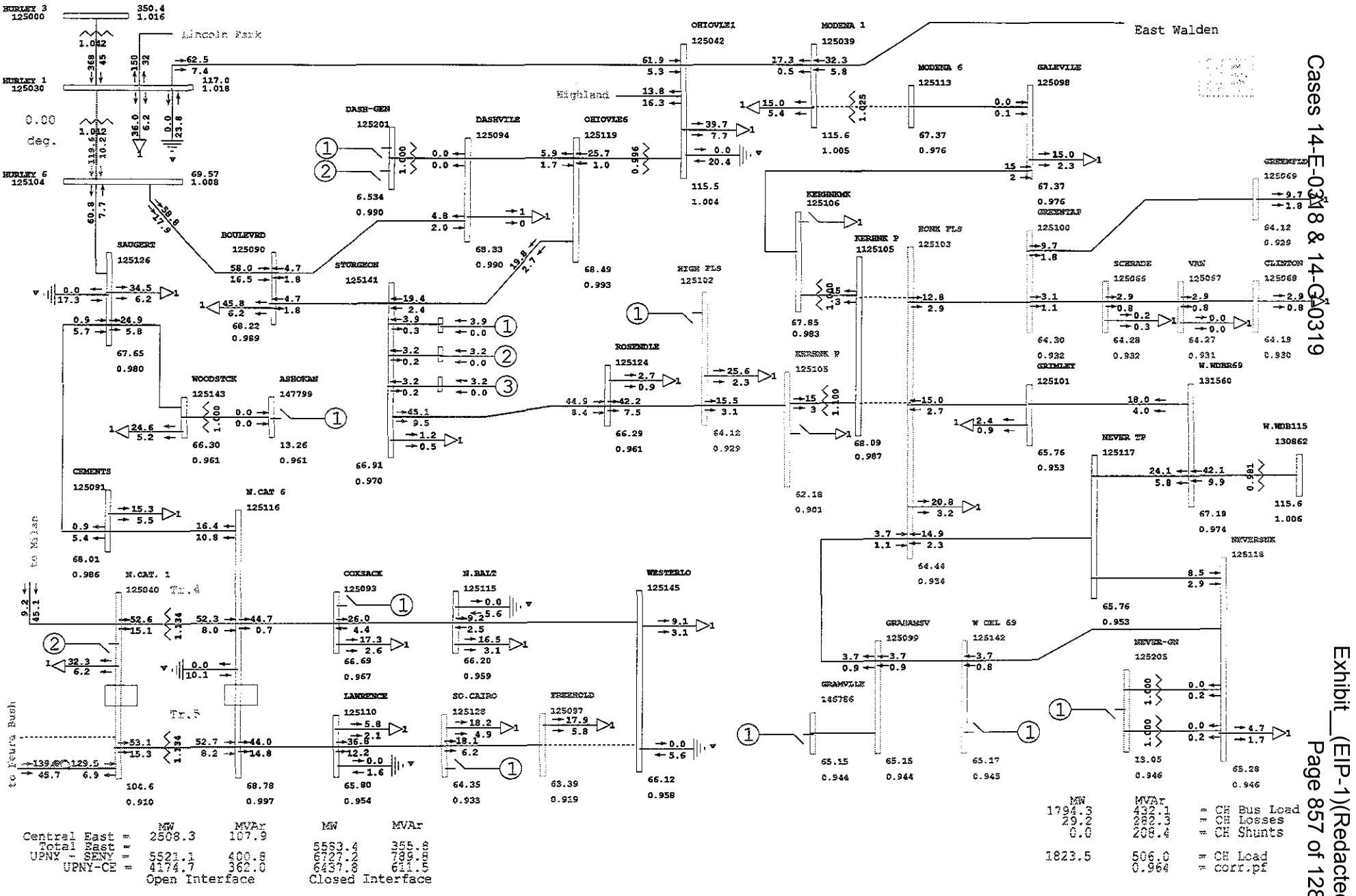
Attachment # 8

P & MK System – Operating flexibility of the Kerhonkson breaker rearrangement prior to conversion to 115 kV





	Attachment #9 Split System Configuration Kerhonkson Substation Rebuilt	P Line out of service Kerhonkson Load transferred to Honk Falls	MW/MVAR 2008-west-side-69 w



Cases 14-E-0318 & 14-G-0319

Exhibit___(EIP-1)(Redacted)

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General Electric International, Inc. PSLF Program Thu Apr 21 09:20:27 2011 o:\electpl\ruby\pslf\new kerhonkson\2009s-ostf with reg adj load kerhonkson

Attachment #10

Split System Configuratione

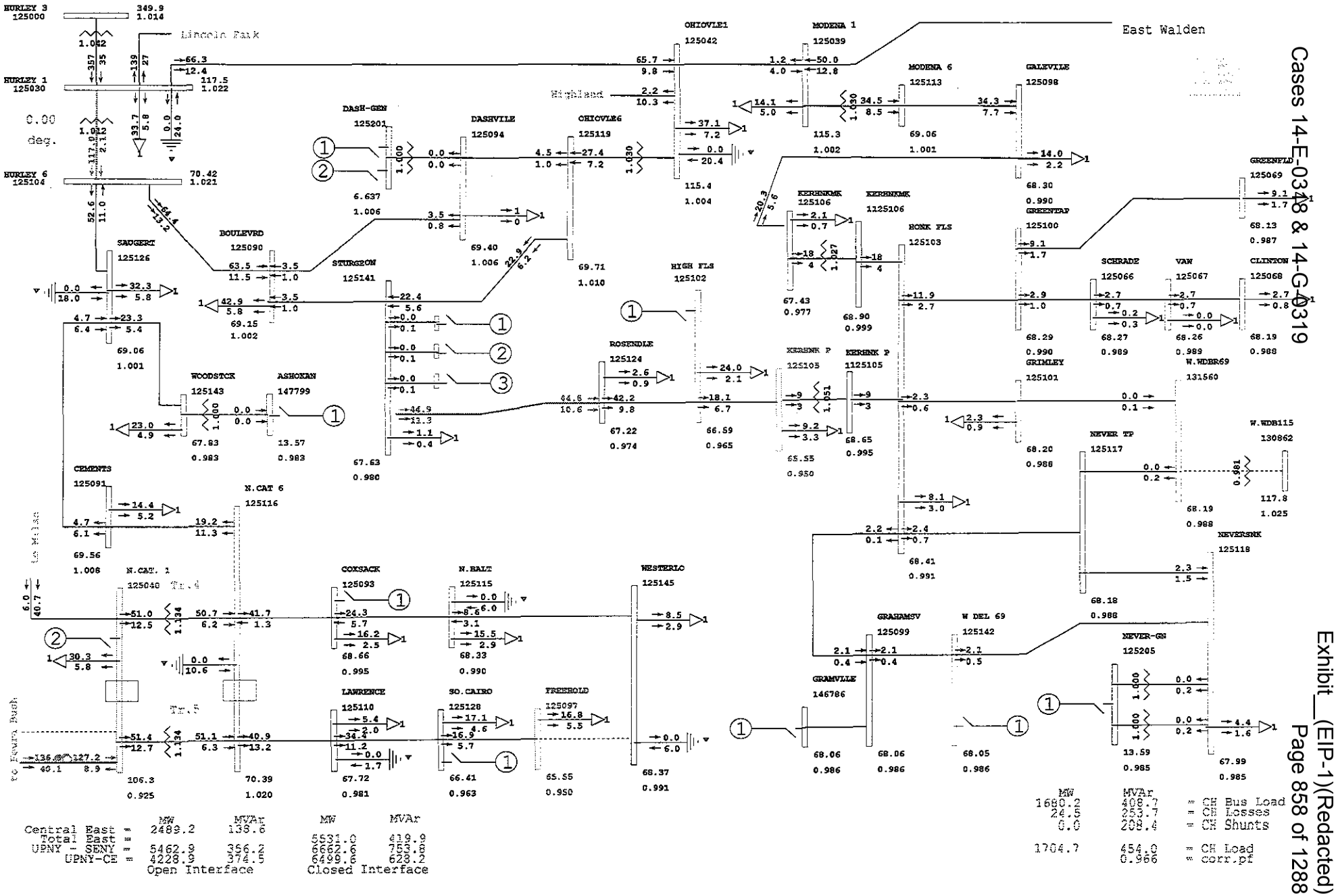
Kerhonkson Sub Rebuilt & Modena Trans replaced

Kerhonkson load transferred to Honk Falls

System load = 1794

MW/MVAR

2008-west-side-69 v



Cases 14-E-0348 & 14-G-0319

Exhibit__(EIP-1)(Redacted)

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General Electric International, Inc. PSLF Program Tue Mar 29 08:12:43 2011 c:\p&mk\for ww transformer\2009s-ostf with reg adj load-new-ww-1694.sav

Attachment #11

Replaced West Woodbourne Transformer

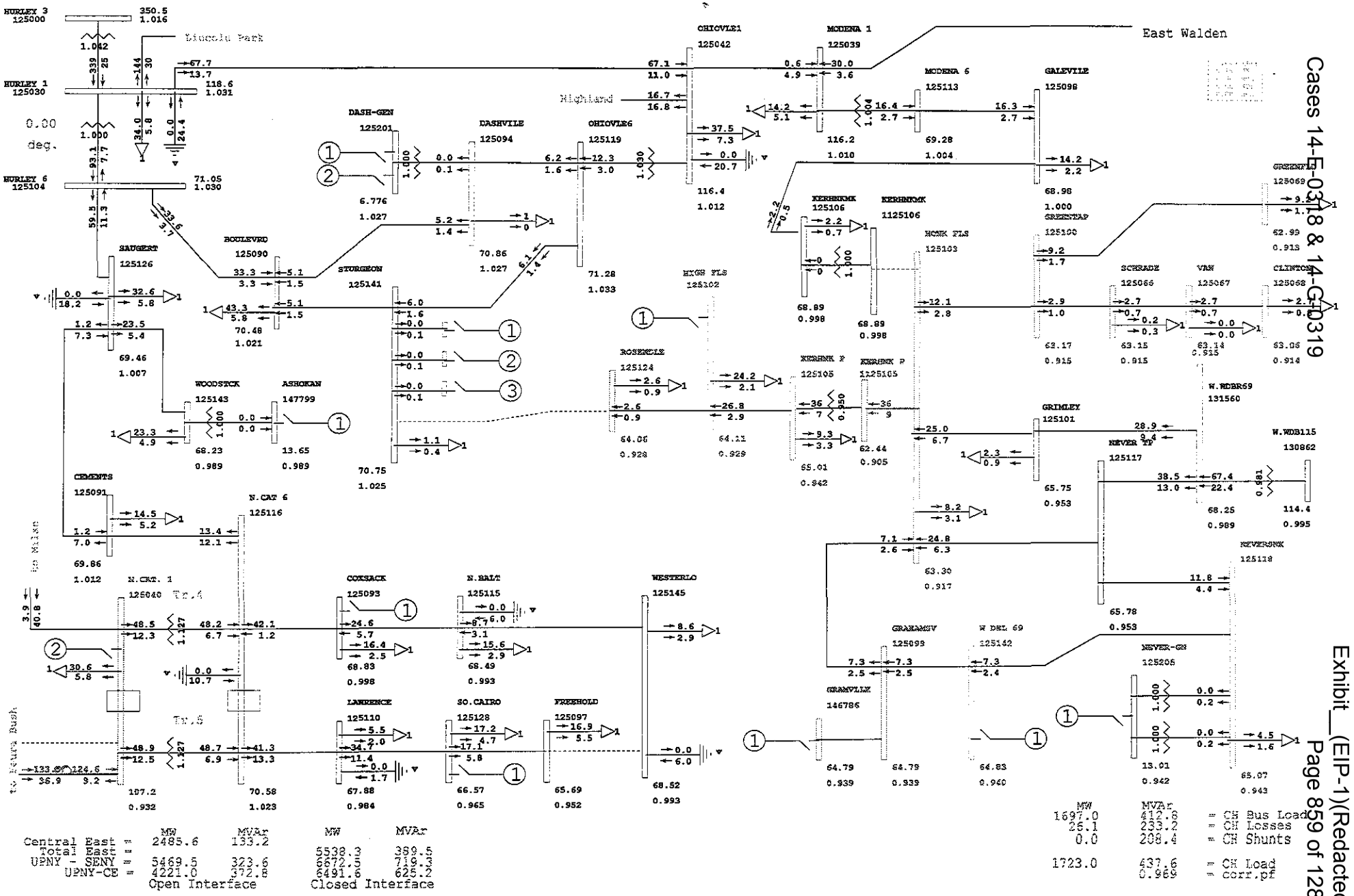
West Woodbourne transformer out of service

Area Load = 79.3 MW

System Load = 1680 MW

MW/MVAR

2008-west-side-69



	MW	MVAr	MW	MVAr
Central East =	2485.6	133.2	5538.3	389.5
Total East =			6672.5	719.5
UPNY - SENY =	5469.5	323.6	6491.6	625.2
UPNY-CE =	4221.0	372.8		
	Open Interface		Closed Interface	

MW	MVAr	
1697.0	412.6	= CH Bus Load
26.1	233.2	= CH Losses
0.0	208.4	= CH Shunts
1723.0	437.6	= CH Load
	0.969	= Corr.pf

General Electric International, Inc. PSLF Program Tue Mar 29 14:25:45 2011 c:\p&mk\for ww transformer\2009s-ostf with reg adj load-new-ww-1694-split.sa

Attachment #12
Replaced West Woodbourne Transformer
Split System Configuration

Note: The split system configuration is different than the operating strategy described in the previous sections

MW/MVAR
2008-west-side-69

Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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Attachment #13 - Economic Analysis of the Project Options

	Area load	Replace West Woodbourne Transformer	
		NPV (for 2011)	$28,552,037
2010	59.10		
2011	59.81		0
2012	60.53		0
2013	61.25	Replace West Woodbourne Transformer	$6,769,613
2014	61.99		0
2015	62.73		0
2016	63.48		0
2017	64.25		0
2018	65.02		0
2019	65.80		0
2020	66.59		0
2021	67.39		0
2022	68.20		0
2023	69.01		0
2024	69.84		0
2025	70.68		0
2026	71.53		0
2027	72.39		0
2028	73.25	Kerhonkson Rebuild	$27,893,759
2029	74.13		0
2030	75.02	Sturgeon Pool Substation	$15,735,830
2031	75.92	Third breaker at Modena	$1,671,460
2032	76.83		0
2033	77.76	Honk Falls Substation + Relay Protection	$56,575,682
2034	78.69	Voltage Conversion ($2,003,156) Retire old Modena Sub & old Kerhonkson Sub ($400,632)	$2,403,788

	Area load	P/HK & MG/MK to 115 kV	
		NPV (for 2011)	$27,078,884
2010	59.10		
2011	59.81		0
2012	60.53		0
2013	61.25		0
2014	61.99	Kerhonkson Rebuild	$11,984,472
2015	62.73		0
2016	63.48	Sturgeon Pool Substation	$6,760,853
2017	64.25	Third breaker at Modena	$718,138
2018	65.02		0
2019	65.80	Honk Falls Substation + Relay Protection	$24,307,575
2020	66.59	Voltage Conversion ($860,650) Retire old Modena Sub & old Kerhonkson Sub ($172,130)	$1,032,780

Notes

1. Assumed an area load growth of 1.2% (area load trend line)
2. From Case 09-E-0588 Average Cost of Capital - 7.435%
3. High Level Estimates in 2011 dollars (obtained from Substation Design)

Replace West Woodbourne 115/69 kV transformer	$6,000,000
Kerhonkson Rebuild	$10,000,000
Sturgeon Pool Substation	$5,000,000
Third breaker at Modena	$500,000
Honk Falls 115/69 kV Substation + Relay communication	$15,000,000
Voltage Conversion from 69 kV to 115 kV	$500,000
Retire old Modena 115/69 kV Substation & old Kerhonkson Substation	$100,000

4. The estimated cost to build Sturgeon Pool Substation, Kerhonkson Substation and Honk Falls Substation was 8.966 million in 1991.
5. The estimated cost to build Sturgeon Pool Substation, Kerhonkson Substation, Honk Falls Substation and install relay communication is 30 million in 2011.
6. The rate of increase from 1991's estimate to 2011's estimate is 6.22% per year. The rate of increase is used to project future year's project cost.

Attachment #(4)

P & MK Timeline	Start	+6 months	+12 months	+18 months	+24 months	+30 months	+36 months	+42 months	+48 months	+54 months	+60 months	+66 months	+72 months	+78 months	+84 months	+90 months	+96 months	+102 months
New Kerhonkson Substation																		
Environmental, ROW, Design & Permit																		
Construction																		
Sturgeon Pool Substation																		
Environmental, Design & Permit																		
Construction																		
Modena Substation																		
Construction																		
New Honk Falls 115/69 kV Substation																		
Environmental, ROW, Design & Permit																		
Construction																		
Upgrade to 115 kV																		
Retire Modena 115/69 kV																		
Retire old Kerhonkson Substation																		
Projects with flexible dates																		
Btwn Kerhonkson - Honk Falls, separate 6 structures guyed together and separate 3 double circuit structures																		
Transfer Accord Load, Retire Accord Substation																		

				W/ AFUDC, Inflated & OH Adjustments						
CAT.	Description	Discretion Level	Investment Type	2014	2015	2016	2017	2018	2019	5-Year Total
14	New Business	Non Discretionary	New Business	2722	1582	1687	1714	1846	1439	8267
14	New Business - Blanket OH	Non Discretionary	New Business	2532	1471	1570	1594	1717	1338	7691
14	New Business - Blanket URD Combo	Non Discretionary	New Business	538	313	334	339	365	284	1634
14	New Business - Blanket URD	Non Discretionary	New Business	538	313	334	339	365	284	1634
14	Subtotal - Electric New Business			6330	3678	3924	3986	4293	3345	19227
16	Transformers - New Business	Non Discretionary	New Business	4657	3747	4159	5227	5749	5987	24870
16	Capacitors	Non Discretionary	Infrastructure	274	325	370	205	463	482	1845
16	Regulators	Non Discretionary	Infrastructure	548	527	1013	803	474	494	3312
16	Network Protectors	Non Discretionary	Infrastructure	0	260	289	380	184	192	1305
16	Subtotal - Electric Transformers			5479	4858	5831	6616	6871	7155	31332
17	X041A - Special Meter Installations	Non Discretionary	Compliance	254	153	156	159	162	166	796
17	X042A - Instrument Transformers	Non Discretionary	Compliance	158	266	271	277	283	289	1387
17	X043A - Electric Meters	Non Discretionary	New Business	2757	1937	1975	2017	2059	2102	10090
17	Subtotal - Electric Meters			3169	2355	2403	2453	2505	2557	12273

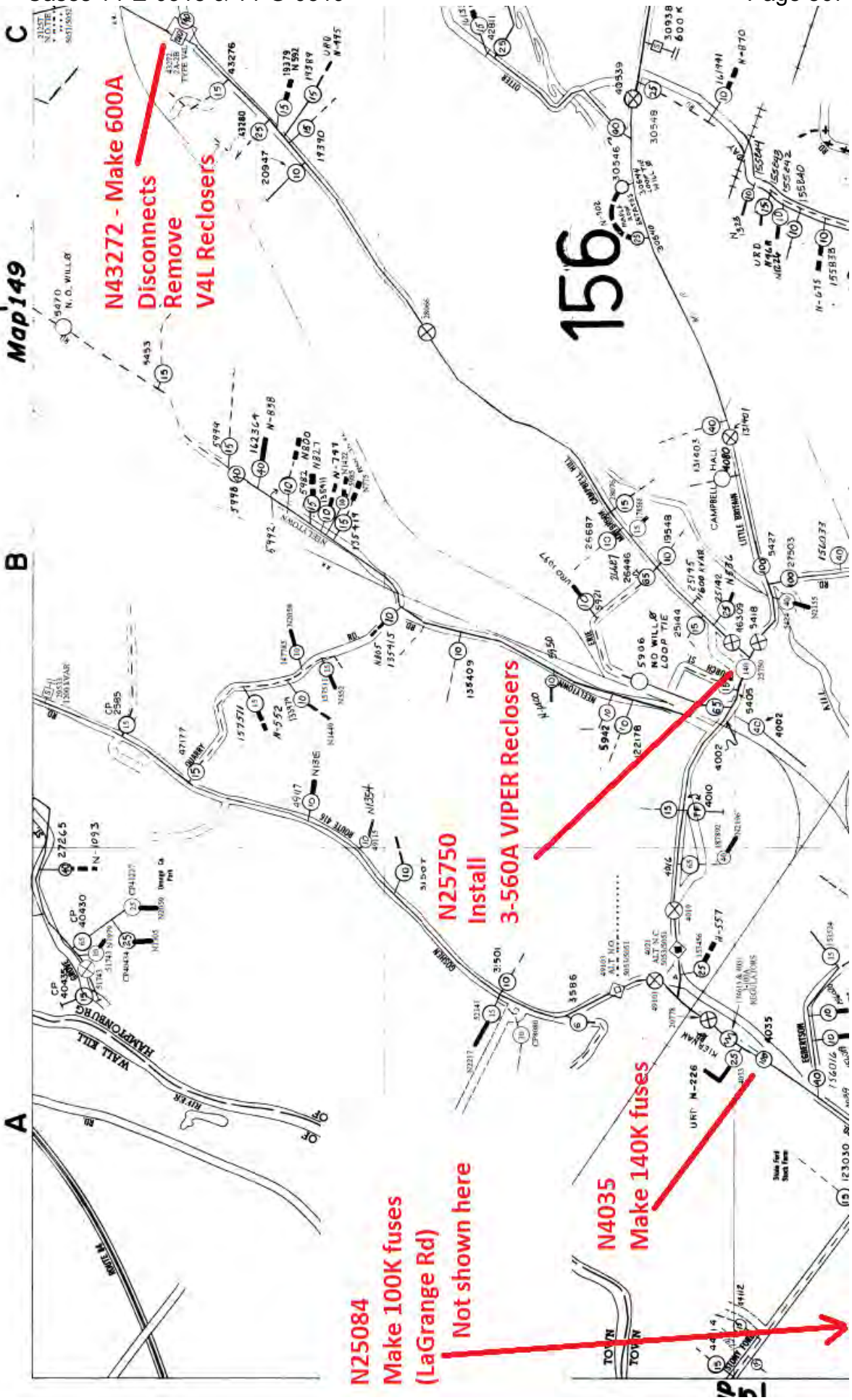
				W/ AFUDC, Inflated & OH Adjustments						
CAT.	Description	Discretion Level	Investment Type	2014	2015	2016	2017	2018	2019	5-Year Total
15	Distribution Improvement Blankets (15BL-01)	Non Discretionary	Daily Operations	7480	7740	7976	8096	8314	8179	40306
15	Relocation Blankets (15BL-02)	Non Discretionary	Compliance	170	200	206	209	215	212	1041
15	Distribution Improvement Minors (1511-0X)	Improve Reliability	Infrastructure	583	599	618	627	644	635	3123
15	Distribution Improvement Conversions (1521-0X	Improve Reliability	Infrastructure	291	300	309	313	322	317	1561
15	Road Rebuild Relocation Projects (1531-0X)	Non Discretionary	Compliance	544	499	309	313	322	317	1761
15	Distribution Improvement (1551-0X) - Thermal /	Maintain Standards	Infrastructure	2607	2222	2997	3029	3114	3068	14430
15	Distribution Improvement (1551-0X) - Reliability	Improve Reliability	Infrastructure	1326	1498	2523	2611	2685	2645	11962
15	Distribution Improvement (1551-0X) - Operating	Improve Reliability	Infrastructure	2511	3356	2323	3029	3222	3174	15102
15	5kV Aerial Cable Replacement Program	Maintain Standards	Infrastructure	180	250	257	261	322	476	1566
15	Poughkeepsie 14.4 kV Study	Improve Reliability	Infrastructure	243	429	299	0	0	0	726
15	Newburgh 14.4 kV Study	Improve Reliability	Infrastructure	0	0	1133	0	0	0	1133
15	Overhead Secondary Replacement Program	Improve Reliability	Infrastructure	97	150	154	209	215	212	940
15	14.4kV Cable Rejuvenation Program	Improve Reliability	Infrastructure	583	0	0	783	0	0	783
15	14.4kV UG Infrastructure	Improve Reliability	Infrastructure	0	0	0	0	0	423	423
15	Oil Switch Replacement	Maintain Standards	Infrastructure	53	75	77	104	107	159	523
15	CE Mesh / Protector Relays	Maintain Standards	Infrastructure	194	40	41	42	43	42	208
15	Cutout Replacement Program Zone 1 Devices	Maintain Standards	Infrastructure	787	200	0	0	0	0	200
15	Distribution Pole Replacement Program	Maintain Standards	Infrastructure	112	809	834	940	1074	1058	4715
15	Distribution Automation - ALT Program	Improve Reliability	Infrastructure	631	250	273	261	268	264	1317
15	Recloser Replacement Program	Improve Reliability	Infrastructure	801	649	309	0	0	0	958
15	10X Reliability Program	Improve Reliability	Infrastructure	656	434	664	522	537	529	2687
15	Secondary Network Upgrade Program (All Distr	Maintain Standards	Infrastructure	0	366	378	383	376	1016	2518
15	Rhinebeck Substation Rebuild Circuit ties	Maintain Standards	Infrastructure	146	250	0	0	0	0	250
15	Montgomery Street Substation Integration	Maintain Standards	Infrastructure	0	0	103	0	0	0	103
15	Dashville/Sturgeon Pool circuit exits	Maintain Standards	Infrastructure	0	0	412	0	0	0	412
15	Freehold Substation Rebuild Circuit ties	Maintain Standards	Infrastructure	0	0	0	104	0	0	104
15	Kerhonkson Circuit Exits	Maintain Standards	Growth	0	449	0	0	0	0	449
15	Maybrook Substation Circuit Exits	Maintain Standards	Growth	0	0	0	0	644	0	644
15	Montgomery Substation Circuit Exits	Maintain Standards	Growth	0	0	0	0	0	1919	1919
15	Boulevard Substation Integration	Improve Reliability	Infrastructure	0	0	0	157	0	0	157
15	Modena Integration	Improve Reliability	Growth	0	0	0	313	0	0	313
15	Stanfordville Integration	Risk Reduction	Infrastructure	0	0	0	0	644	0	644
15	Greenfield Road Substation Integration	System Enhancement	Infrastructure	1024	0	0	0	0	952	952
15	Clinton Avenue Retirement	System Enhancement	Infrastructure	0	0	0	0	0	0	0
15	Beacon Conversion	System Enhancement	Growth	0	1273	1177	0	0	0	2451
15	Knapps Corners circuit exits	System Enhancement	Infrastructure	0	0	0	418	0	0	418
15	Coxsackie Circuit exits	System Enhancement	Infrastructure	826	0	0	0	215	212	1253
15	Distribution Automation System & Integration (Ir	System Enhancement	Infrastructure	0	1997	5150	7310	9665	12696	36818
15	Copper Wire Replacement Program	System Enhancement	Infrastructure	0	0	309	470	483	635	1897
15	4800 V Conversion/Infrastructure Program	System Enhancement	Infrastructure	0	1019	1030	1044	1074	2116	6283
15	280A Electronic Recloser Program	System Enhancement	Infrastructure	1	0	360	366	376	688	1790
15	Resiliency / Incremental Aging Infrastructure	System Enhancement	Infrastructure	2	499	515	522	537	0	2076
15	Saugerties Substation Projects	System Enhancement	Infrastructure	316	0	0	0	0	0	316
15	Subtotal - Electric Distribution Improvements			22164	25554	30738	32436	35418	41943	166088

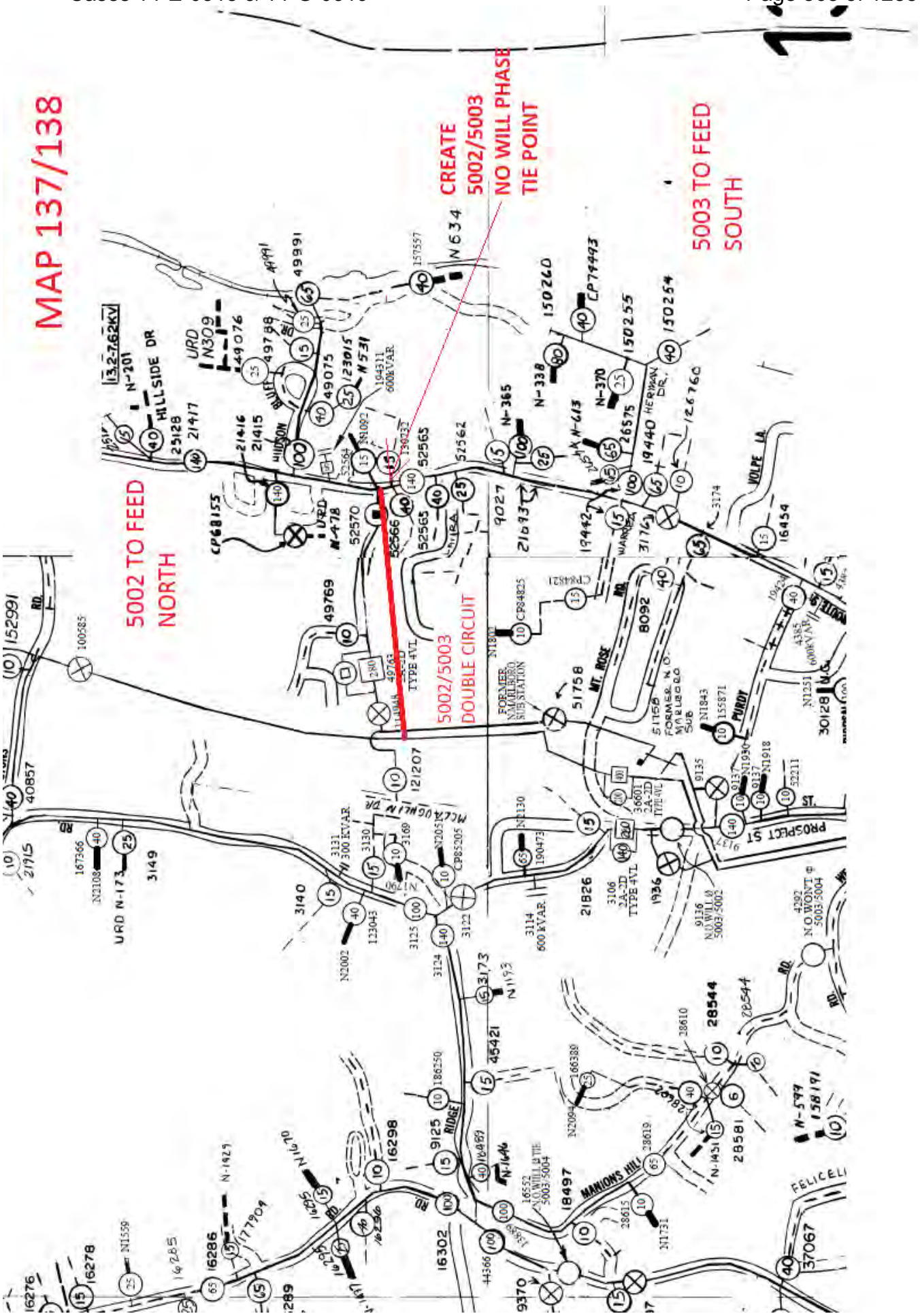
Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2015	2014		Poughkeepsie		Rhinebeck Circuit Exits	An integration study was developed as a part of the substation upgrade. Half of this project was budgeted in 2014.	Growth	Planning Study					$ 250,000
2015	2016		Kingston		Kerhonkson Circuit Exits		Infrastructure	Planning Study					$ 450,000
2015	2014	2013	Kingston	K-2013-09	5084K – Conversion of Old Post Rd and Swartekill Rd	Convert Old Post Rd to beyond Floyd Ackert Rd. Convert Floyd Ackert Rd between Old Post Rd and Swartekill Rd. Convert Swartekill Rd to beyond Floyd Ackert Rd. Install 3 - 250 kVA stepdowns for the remainder of the circuitry.	Growth	Thermal					$ 615,000
2015	2015	2013	Poughkeepsie	P-2013-03	6092 - Relocate 1.0 mile of off road circuitry onto Bedell Road	Relocating 1.0 mile of circuitry will eliminate the offroad tie point and eliminate an overloaded 2400V section along Bedell Road. ADD: replace ALT with VIPER ALT (+ $115k)	Infrastructure	Operating					$ 415,000
2015	2014	2013	Poughkeepsie	P-2013-02	7012- Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road	Convert 1.8 miles of circuitry along Clinton Corners Schultzville Road to reduce the load on the 250- stepdown	Growth	Thermal			111%		$ 560,000
2015	2015	2015	Fishkill	F-2014-02	8087L/8066L - Lane Gate Road Conversion	Convert 3.9 miles of circuitry to 13.2kV	Infrastructure	4800V					$ 663,000
2015	2013	2012	Poughkeepsie	P-2012-04	7056 - Relocate circuitry on-road & convert to 13.2kV, Lemon Ln. & Hook Rd.	Relocate on-road & convert approximately 1.1 miles of circuitry along Lemon Ln. and Hook Rd. due to voltage concerns.	Growth	Voltage	$ 687				$ 210,000
2015	2015	2015	Newburgh	N-2015-07	5051 - Install VIPER Reclosers	Replace existing 280A V4L with VIPER Reclosers	Growth	Thermal	$ 91				$ 55,000
2015	2015	2012	Poughkeepsie	P-2012-03	7091 - Relocate circuitry on-road & convert to 13.2kV, Hall Hill Rd.	Relocate on-road and convert approixmately 2.2 miles of circuitry along Hall Hill Rd. and Siegler Rd. due to voltage & loading concerns.	Infrastructure	4800V	$ 720		149%		$ 360,000
2015	2015	2015	Poughkeepsie	P-2015-02	7056 - Replace overloaded 200A V4L with a VIPER	Replace a set of overloaded 200A V4L hydraulic reclosers with a VIPER	Growth	Thermal			125%		$ 55,000
2015	2015	2015	Newburgh	N-2015-02	5003 - Extend 5003 to 9W	Extend 5003 circuit 0.45 miles to offload 5002 circuit	Growth	Thermal					$ 202,500
2015	2014	2011	Poughkeepsie	P-2011-07	7053 - Relocate circuitry on-road & convert to 13.2kV, Slate Quarry Rd.	Relocate approximately 2.75 miles of circuitry on-road & convert Slate Quarry Rd. due to voltage & loading concerns.	Growth	Voltage					$ 525,000
2015	2013	2011	Poughkeepsie	P-2011-06	7062 - Establish & integrate new circuit (Ph 3 of 3)	Reconductor 2.3 miles of circuitry along Spring Lake Rd. & Rt. 9 to complete offload of Rhinebeck 7051 ckt.	Growth	Thermal					$ 690,000
2015	2015	2015	Poughkeepsie	P-2015-06	6046 – Install a VIPER as First Fuse Point on New Hackensack Rd.	Install a VIPER as the first fuse point to provide transient protection for 561 customers served along the New Hackensack Rd portion of the Spackenkill 6046 circuit.	Reliability	Reliability	$ 107				$ 55,000
2015	2013	2012	Newburgh	N-2012-02	4012/WN - Rebuild along Gail Place from Rt. 32 to Vermont Dr.	Rebuild 0.4 miles of the 4012 and WN lines.	Infrastructure	Reliability	$ 163				$ 225,000
2015	2015	2015	Poughkeepsie	P-2015-04	6092 - Install VIPER as First Fuse Point	Install a VIPER as the first fuse point to provide transient protection for 1,051 customers served along the Rt. 44 portion of the Manchester 6092 circuit.	Reliability	Reliability	$ 472				$ 55,000
2015	2015	2015	Poughkeepsie	P-2015-05	6046 – Install a VIPER as First Fuse Point on Alda Dr.	Install a VIPER as the first fuse point to provide full fault current interrupting capability and fuse-saving capability to the circuitry along Alda Dr and Daria Dr on the Spackenkill 6046 circuit.	Infrastructure	Reliability	$ 559				$ 55,000
2015	2013	2011	Kingston	K-2011-16	2017/1022 - Foxhall Ave ALT	Install ALT between 2017 and 1022 to protect Albany Ave portion of 2017.	Reliability	ALT	$ 584				$ 115,000
2015	2015	2012	Newburgh	N-2012-04	5083 - Reconductor Perkinsville Road	Reconductor 0.5 miles to create a strong 5081/5083 circuit tie.	Infrastructure	Operating					$ 150,000
2015	2015	2012	Fishkill	F-2012-03	801/802/803/881/882 - Beacon Area (Ph 3 of 4)	Remove the BF cable and build 3 miles of distribution circuitry in its place	Growth	Planning Study					$ 1,275,000
2015	2011	2011	Poughkeepsie	P-2011-25	Replace failed aerial cable & convert Holmes St.	Rebuild and convert 0.25 miles of 3 phase along Holmes St and 0.15 miles of single phase along Crescent Rd. This would eliminate failed aerial cable and replace aging infrastructure.	Infrastructure	5kV Aerial					$ 115,000

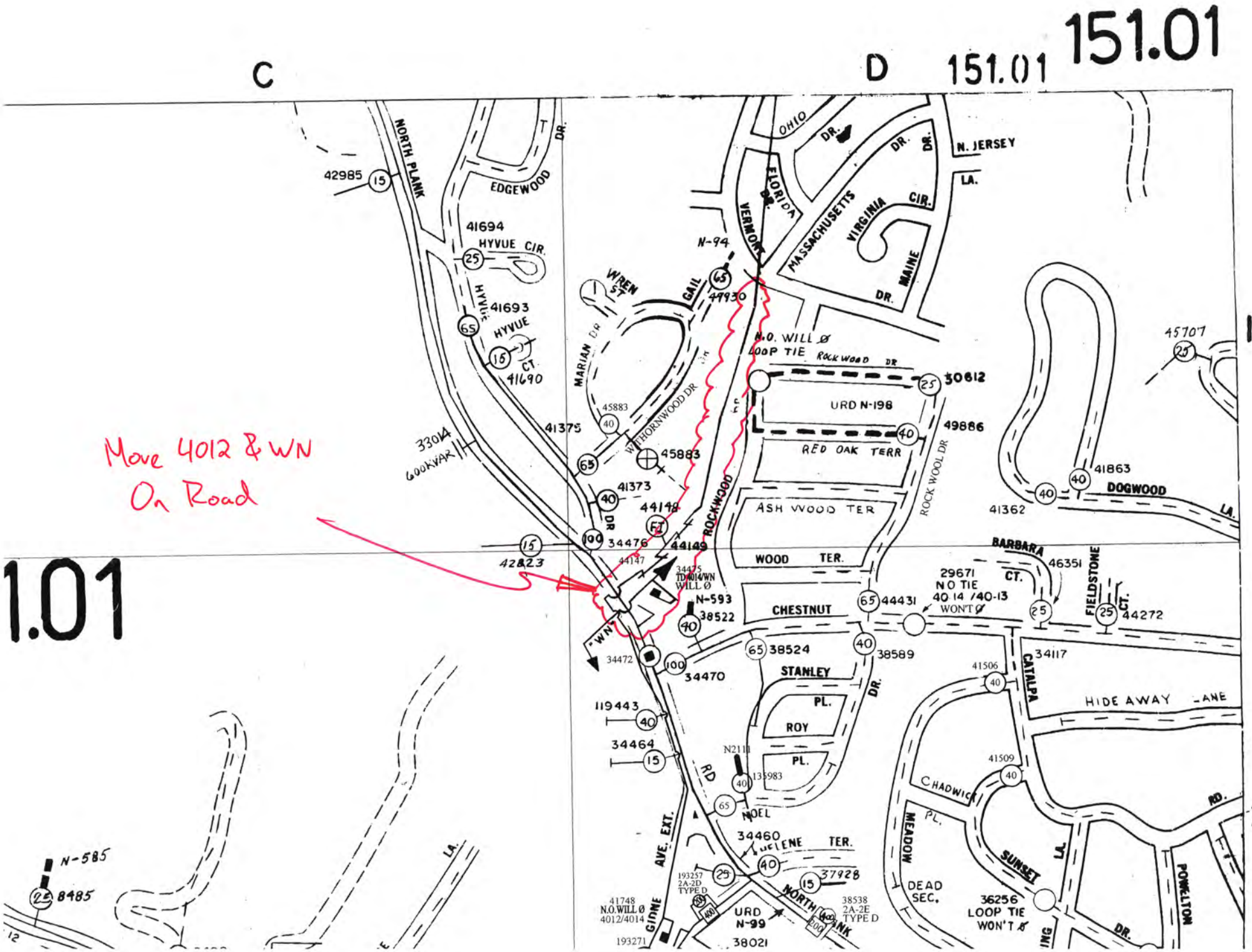
Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2015	2015	2011	Poughkeepsie	P-2011-10	621/PH - Retire Maryland Ave Substation (Ph 4 of 5)	Extend the PH by rebuilding approximately 0.5 miles of circuitry along S. Cherry St. to provide a new high voltage circuit path & convert all spurs. Hang step downs to retain low voltage ties.	Infrastructure	Planning Study					$ 430,000
2015	2014	2011	Newburgh	N-2011-09	4025 - Governor's Drive URD (Ph 4 of 5)	Replace live-front PM Gear.	Infrastructure	Operating					$ 200,000
2015	2015	2014	Poughkeepsie	P-2014-02a	7091 & 7061 Tie	7091/7061 - Polyphase, Reconductor & Convert 3 miles of Rt. 199 east of TSP. Replace TSP duct bank. Reconductor 1.5 miles west of TSP on Rt. 199 to create strong tie between 7091 and 7061.. (Ph 1 of 3)	Infrastructure	Operating		$ 11		46	$ 675,000
2015	2015	2015	Newburgh	N-2015-05	5033 - Bring Aumick Road circuitry on road	Improve reliability to 52 customers along Aumick Rd. by bringing 0.85 miles of single phase on-road	Infrastructure	Reliability	$ 348				$ 170,000
2015	2013	2011	Newburgh	N-2011-04a	4095 - Polyphase 2 miles along Lake Road in the Beaver Dam area	Establish strong ties. ($607/COA for both phases)	Infrastructure	Reliability	$ 619				$ 600,000
2015	2015	2014	Kingston	K-2014-03	3091 - Relocate Sundown Rd on-road	Rebuild one mile of circuitry on-road along Sundown Rd.	Reliability	Reliability	$ 688				$ 300,000
2015	2015	2014	Newburgh	N-2014-04	5084- New Ransom Rd. Feed	Build 0.4 miles of 3-phase to feed customers down Ransom Rd.	Reliability	Operating	$ 731				$ 120,000
2015	2014	2013	Catskill	C-2013-02	1083 - Rebuild single phase Route 51, Route 54, Roberts Hill Road and Highmount Road, 5.0 Miles	Rebuild the single phase circuitry along Route 51, Route 54, Roberts Hill Road and Highmount Road to replace failing 1930s pole plant.	Infrastructure	Reliability	$ 759				$ 750,000
2015	2015	2012	Catskill	C-2012-05	1092 - Rebuild & Reconductor Route 22, Route 145, 2 miles, Part II of II	Replace the #2 ACSR with 336 MCM Wr. Rebuilding and reconductoring the circuitry will eliminate problems associated with conductor failures.	Infrastructure	Reliability	$ 937				$ 600,000
2015	2015	2012	Newburgh	N-2012-03	5051 - Polphase Egbertston Road	Polyphase 1.2 miles on-road to create a strong tie and allow customers to benefit from the ALT. Also may help with Maybrook integration.	Reliability	10X	$ 1,148				$ 360,000
2015	2015	2014	Newburgh	N-2014-05	5021 - Single phase feed on Albany Post	Bring 0.5 miles of single phase circuitry on road near Albany Post Rd.	Reliability	10X	$ 1,421				$ 75,000
2015	2015		Poughkeepsie		Taconic Crossing #1		Infrastructure	Operating					$ 50,000
2015	2015		Fishkill		SMART GRID	Likely Tioranda/Merritt Park area - Regulators, Switched Caps, and ALTs	SMART						$ 1,600,000
2015	2015		ALL		Switched Capacitors	20 locations	SMART						$ 400,000
2015	2015		ALL		Electronic Reclosers	Replacement program	Infrastructure	Reliability					$ 650,000
2015	2015		ALL		Open Secondary Replacement	Replacement program	Infrastructure	Overhead Secondary					$ 150,000
2015	2015		ALL		Oil Switch Replacement	Replacement program	Infrastructure	Oil Switch					$ 75,000
2015	2015		Poughkeepsie		CE Mesh/Protector Relays	Replace rusted units	Infrastructure	Operating					$ 40,000
2015	2015		ALL		Cutout Replacement Program	Develop new $/COA and establish a new customer count threshold for replacement of porcelian with polymer cutouts	Reliability	Reliability					$ 200,000
2015	2015		ALL		Pole Replacement Program	Replace poles identified via the inspection and resistograph programs	Infrastructure	Reliability					$ 810,000
2015	2015		ALL		Microgrid Project	TBD	Reliability	Reliability					$ 500,000
2015	2015		Newburgh		Secondary Network Cable	Phase 1 of the Newburgh Secondary Network Cable	Infrastructure	Secondary Network					$ 367,000
2015	2015		ALL		5 kV Aerial Program	Replacement program	Infrastructure	Operating					$ 135,000
2016	2016	2014	Poughkeepsie	P-2014-03	7013 - Create New Hibernia 7013 Circuit	Polyphase 3.0 miles into mainline and add new breaker switchgear to take on load of surrounding circuits to defer need for a new Stanfordville Transformer	Growth	Thermal					$ 600,000
2016	2016	2015	Fishkill	F-2015-01a	8086/8066 - South Mountain Pass Conversion - Phase I	Polyphase/convert 4.4 miles of the 8066/8086 circuits to eliminate 4800V and create a 3-phase tie. POSSIBLE 2015 SMART GRID PROJECT	Infrastructure	4800V		$ 8			$ 462,000

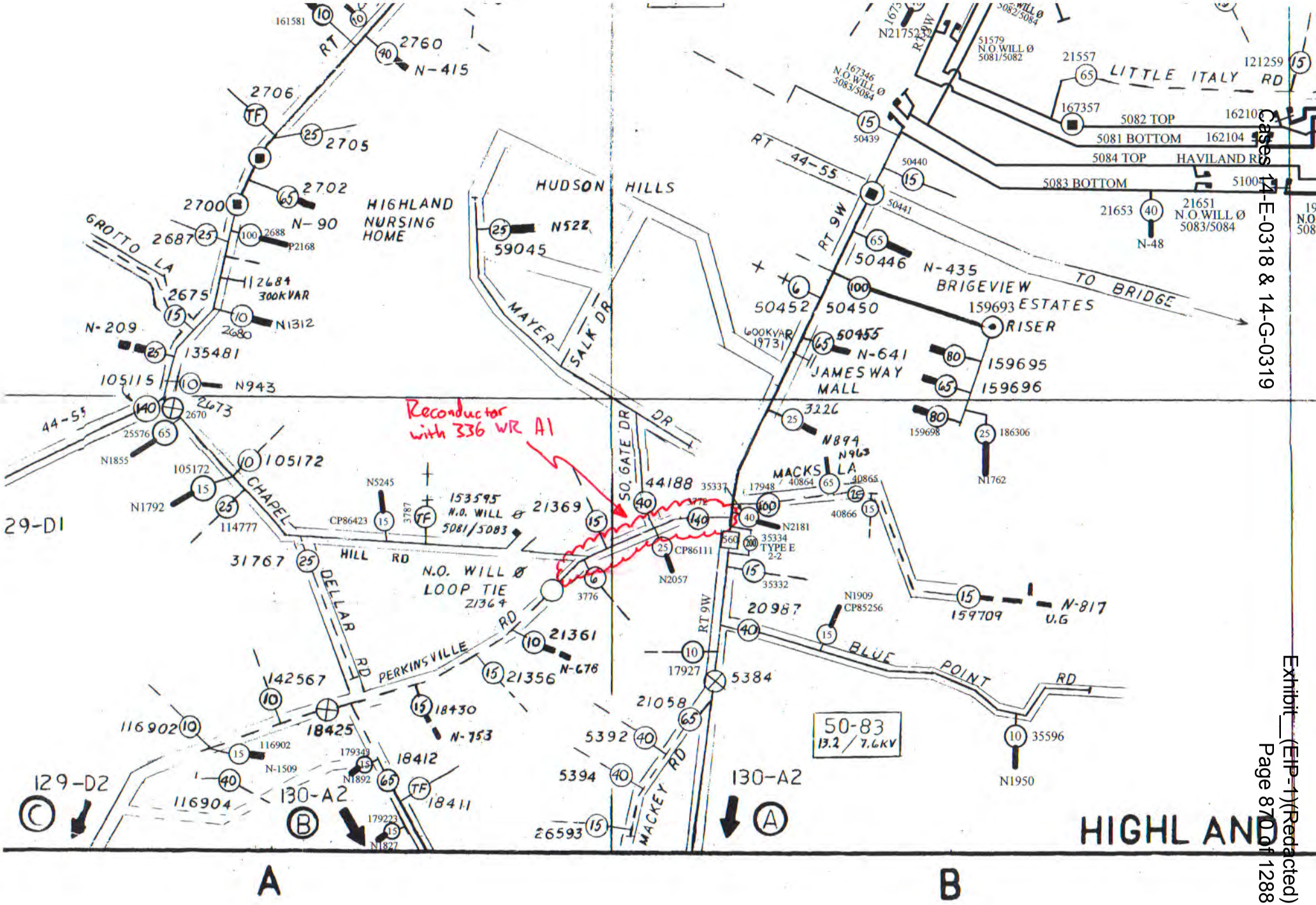
Year Currently Scheduled	Year Initially Scheduled	Budget Year Submitted	District	Local Project ID	Project Title	Project Description	General Category	Specific Category or Program	$/COA	$/CMA	% overloaded	Avg. Age (years)	Cost Estimate
2017	2017	2015	Fishkill	F-2015-01b	8086/8066 - South Mountain Pass Conversion - Phase II	Polyphase/convert 4.4 miles of the 8066/8086 circuits to eliminate 4800V and create a 3-phase tie POSSIBLE 2015 SMART GRID PROJECT	Infrastructure	4800V		$ 8			$ 707,000
2016	2016	2015	Newburgh	N-2015-01	5004/4011 - Polyphase Leslie Rd.	Polyphase /re-conductor 1.25 miles to create a 4011/5004 tie	Growth	Thermal					$ 375,000
2016	2016	2015	Poughkeepsie	P-2015-01a	7095 - Convert Shekomeko (Phase 1 of 3)	Convert 7.7 miles of 4800 to single phase 7620 along McGhee, Rt. 83, Hunns Lake, Pugsley Hill, Shaefer, Carpenter Hill, and Conklin Hill. This would eliminate cascading voltage issues, eliminate 4800 circuitry, and create 5 high voltage ties.	Infrastructure	4800V				49	$ 580,000
2016	2016	2014	Fishkill	F-2014-03	801/802/803/881/882 - Beacon Area (Ph 4 of 4)	Convert the 881, 882, 8015L, 8085L to 13.2kV; install an ALT team between new distribution feeders; retire Beacon and Conway Place Substations	Growth	Planning Study					$ 1,143,000
2016	2016	2013	Kingston	K-2013-13	341-345 – High Voltage Conversion	Build 0.5 mi of 336 ACSR, recondcutor & convert 0.3 mi of ACSR, and reconductor 0.3 mi of ACSR all along Rt 213. This alows the rebuild of Sturgeon Pool and converts the 341 & 345 circuits.	Growth	Planning Study					$ 610,000

= must completed by June 1
= programs which contain specific projects (most to be supplied by Engineering)
=draw up in case funding becomes available and/or anticipated permitting issues


Map 149
N43272 - Make 600A
Disconnects
Remove
V4L Reclosers
N25750
Install
3-560A VIPER Reclosers
N25084
Make 100K fuses
(LaGrange Rd)
Not shown here
N4035
Make 140K fuses
156
A
B
C


MAP 137/138
5002 TO FEED NORTH
5002/5003 DOUBLE CIRCUIT
CREATE 5002/5003 NO WILL PHASE TIE POINT
5003 TO FEED SOUTH
MT. ROSE
PURDY
MANIONS HILL
RIDGE
HILLSIDE DR
HERMAN DR.
WOLFE LA.
PROSPECT ST
MCLAUGHLIN DR
URD N-173
URD N309
URD N-478
13.2-7.62KV
FORMER N.O. MARLBORO SUB STATION
FORMER N.O. MARLBORO SUB
TYPE 4VL
2A-2D TYPE 4VL
600 KVAR
NO WILL BE 5003/5004
N.O. WONT BE 5003/5004


C
D
151.01
151.01
1.01
Move 4012 & WN
On Road
NORTH PLANK
EDGEWOOD DR.
42985
41694
HYVUE CIR.
41693
HYVUE
CT.
41690
HYVUE
41375
MARIAN DR
WITHORNWOOD DR
45883
45883
33014
GOOKWAR
41373
44148
44149
34476
44147
42823
34475
TD 4014WN
WILL Ø
N-593
38522
34472
34470
WN
119443
34464
N2111
135983
NOEL
34460
HELENE TER.
193257
2A-2D
TYPE D
41748
N.O.WILL Ø
4012/4014
193271
GIDNE
AVE. EXT.
RD
URD
N-99
38021
37928
NORTH
38538
2A-2E
TYPE D
N-585
8485
LA.
OHIO
DR.
FLORIDA
VERMONT
N-94
WREN ST
GAIL
44930
MASSACHUSETTS
VIRGINIA
CIR.
MAINE
DR.
N. JERSEY
LA.
N.O. WILL Ø
LOOP TIE
ROCKWOOD DR
30612
URD N-198
RED OAK TERR
49886
ROCKWOOL DR
ASH WOOD TER
WOOD TER.
ROCKWOOD
45707
41863
DOGWOOD
LA.
41362
BARBARA
CT.
46351
FIELDSTONE
CT.
44272
29671
NO TIE
40 14 /40-13
WON'T Ø
44431
CHESTNUT
38524
38589
STANLEY
DR.
PL.
ROY
PL.
34117
CATALPA
41506
HIDE AWAY
LANE
41509
CHADWICK
PL.
MEADOW
SUNSET
LA.
DEAD
SEC.
36256
LOOP TIE
WON'T Ø
POWELTON
RD.
DR.
1
2



Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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Future Distribution Circuit Paths

Attachment #6

151.1

Install ALT team for new BF and 8087 ckt

KEY

- Reclassified BF
- Reclassified CM/NM
- 8015 Circuit
- 8085 Circuit
- 8087 Circuit
- Low Voltage (4.16kV)

B

A

ROUTE 17K

CRS REALITY
626115
225KVA
CL321

D.O.T. WATER STORAGE
613014
75 kVA
CLS 321

FEDERAL EXPRESS
626301
300 kVA
CLS 351

612229
PAD & COVER ONLY

612235
3 3-WAY JUNCTION BLOCKS

~~TOWER~~ ASSEMBLY

ROAD

626114
3 3-WAY JUNCTION BLOCKS

~~613012~~

612284
25 kVA
CLS 175

612157
75 kVA
CLS 321

INSTALL #2 URD

RISER FOR "EAST" FEED
153224

613047

600 AMP IN LINE LOADBREAK DISCONNECTS

613136

612137

INSTALL VAULT

RISER FOR "WEST" FEED
51480

619078

619079

619080

MANHOLE ONLY WITH CABLES COILED FOR FUTURE USE

~~N.O.~~ REMOVE PM9 LEAVE VAULT

618180

~~N.O.~~

~~612227~~

65

621608
75 kVA
CLS 321

N.Y. TEL

~~EAST FEED SPLICED~~

612228
~~WEST FEED ON 3 3-WAY JUNCTION BLOCKS~~
REMOVE J-BLOCKS

EAST FEED

WEST FEED

DETAIL OF FOUR COMPARTMENT SWITCHGEAR

619081

630795

630796
CL 175

619082

N.O.

CARGO RD

2 RUNS OF CUST OWNED PRIMARY

2 RUNS OF CUST OWNED PRIMARY IN CONDUIT

PB

621023
2000 kVA
CUST OWNED

POST OFFICE

AIR CARGO

619083
150 kVA
CLS 341

622614
225 kVA
CLS 301
N.Y.S. DOT
BLDG 2290

DMV

619085
225 KVA
CLS 321

619084
3□JUNCTION PEDESTAL

612222
PULL BOX

612223
PAD & DUCT ONLY

ENTERPRISE ROAD

GOVERNOR

DRIVE

CHILD WORLD

612262
750 kVA
CLS 351

612950
3□FUSE MODULE

612525
PAD & COVER

619016 INSTALL PM11

612141

612228

612142

SKY CHEFS

618145
300 kVA
CLS 311

PUMPING STATION

612951
75 kVA
CLS 321

ABANDON IN PLACE

612216

NOT ENERGIZED

612217

INSTALL VAULT

612138

612139

612140

612141

612143

612213

WEST FEED

EAST FEED

612214

612215

3□JUNCTION PEDESTALS

614142

EAST FEED IS ON 3 3-WAY JUNCTION BLOCKS IN STACKED FG PADS

WEST FEED IS ON 3 3-WAY JUNCTION BLOCKS IN STACKED FG PADS

INSTALL PULLBOX

ORIGINAL LAYOUT WITH PROPOSED CHANGES

620090
MARRIOT COURTYARD
300 kVA

EAST FEED CABLE ACTUALLY LOOPS THROUGH 614142 BEFORE 619016

CUST OWNED SWITCHGEAR

614339
1000 kVA
CLS 351

GRAND UNION

619030
225 kVA

④

FEDERAL EXPRESS

619788
25 kVA
AT&T Tower

CUST OWNED SWITCH-GEAR

619026
1500 kVA

"NELCO"

NOTE

ALL N.O. POINTS ARE WILL □TIES BETWEEN EAST AND WEST FEEDS

LEGEND

- 3 – 2QC #2AL 15KV URD PRIMARY CABLES
- 3– 2/C 4/0 15KV URD PRIMARY CABLES
- SINGLE □PRIMARY
- (3 FI) 3□FAULT INDICATOR INSTALLED HERE

CAUTION

GAS IS IN SAME TRENCH THROUGHOUT MOST OF THE INDUSTRIAL PARK

REVISIONS
① 8-9-01 REVISED PAD 61221 3. PEL/BND
② 2-11-03 INS J BOX & PAD FIELD REV. RSP/BND
③ 7-24-03 W.O.6696 REPLACED PAD 618145 PEL/BND
④ 10-18-07 W.O.5822A M REPLACED PAD 619085. PEL/MPB
⑦ 11-20-98 INS.SWITCH 613012 & PAD 626301 TCJ/BND
⑧ 3-15-99 INS. PAD 621215 RSP/BND
⑨ 4-11-02 WO.A3744A INS. NEW PAD RSP/BND
⑩ 4-4-02 CHANGE FUSE SIZE AT FEDERAL EXP RSP/BND

CENTRAL HUDSON GAS & ELEC.CORP.

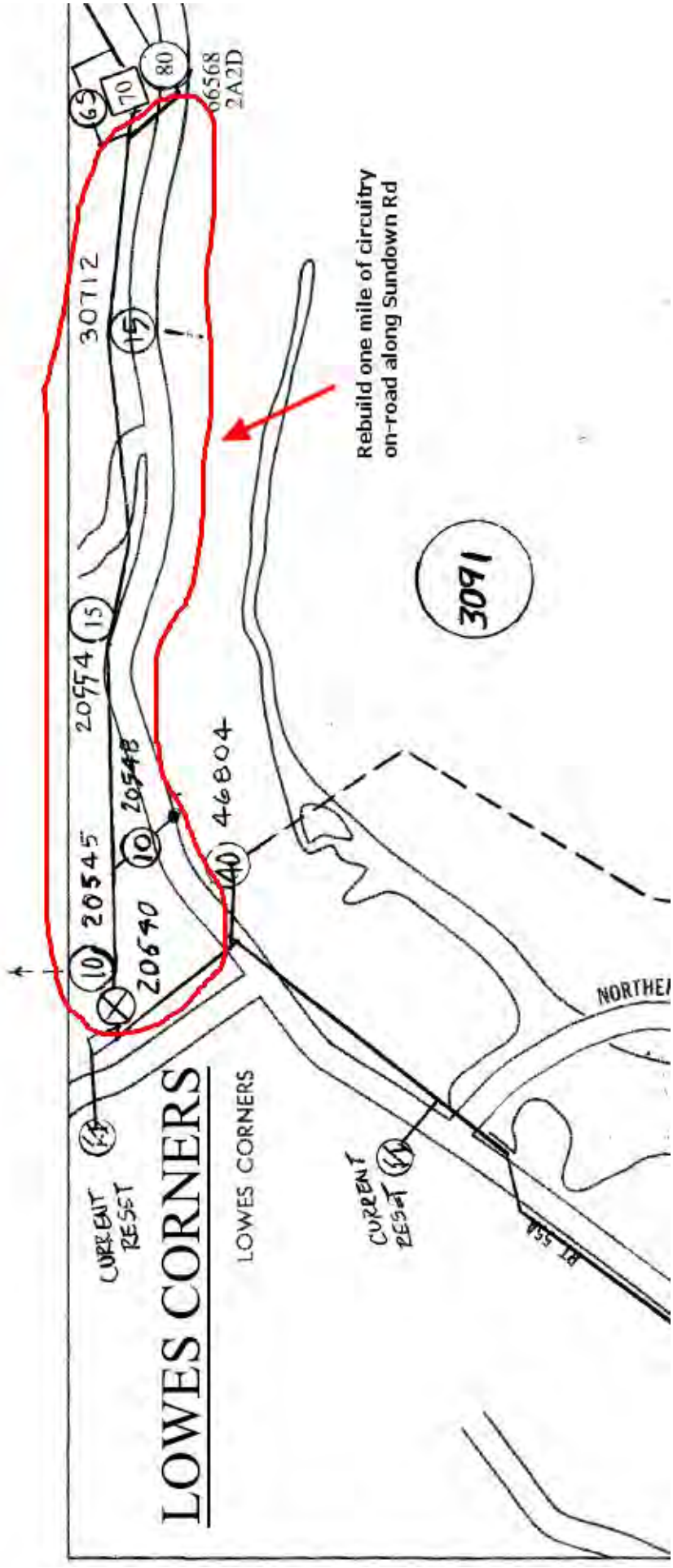
STEWART INDUSTRIAL PARK
GOVERNOR DRIVE
TN.NEWBURGH

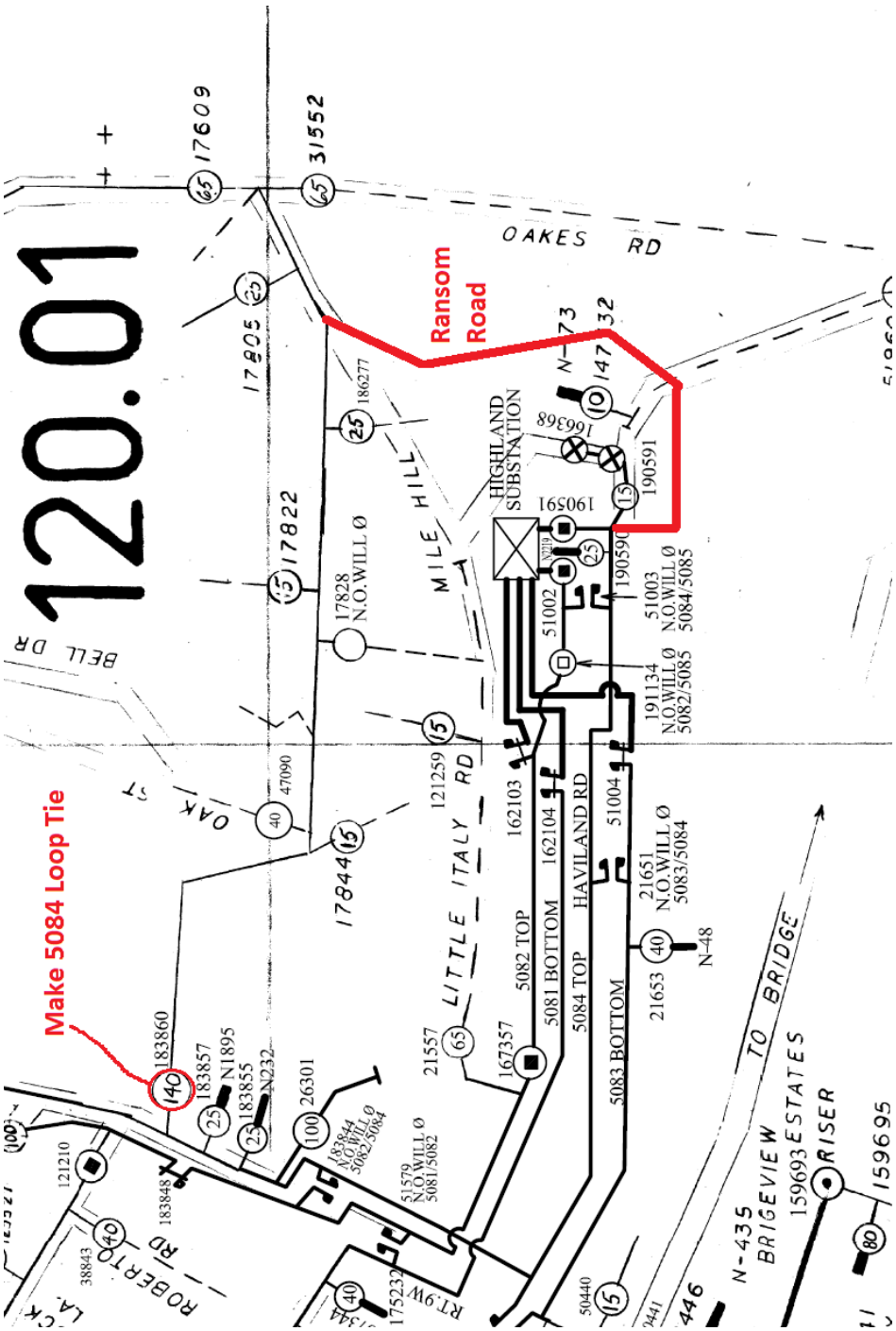
SCALE	N.T.S
DATE	9/22/92
REV.NO.	14
FILE NO.	
MAP 150	C3
W.O.NO. 5466A	CHECKED
PROJ.NO. 87-213	CLEARED
DRAWN R.R.	R/W
SUPV.	APPROVED
	N-379
	SH NO

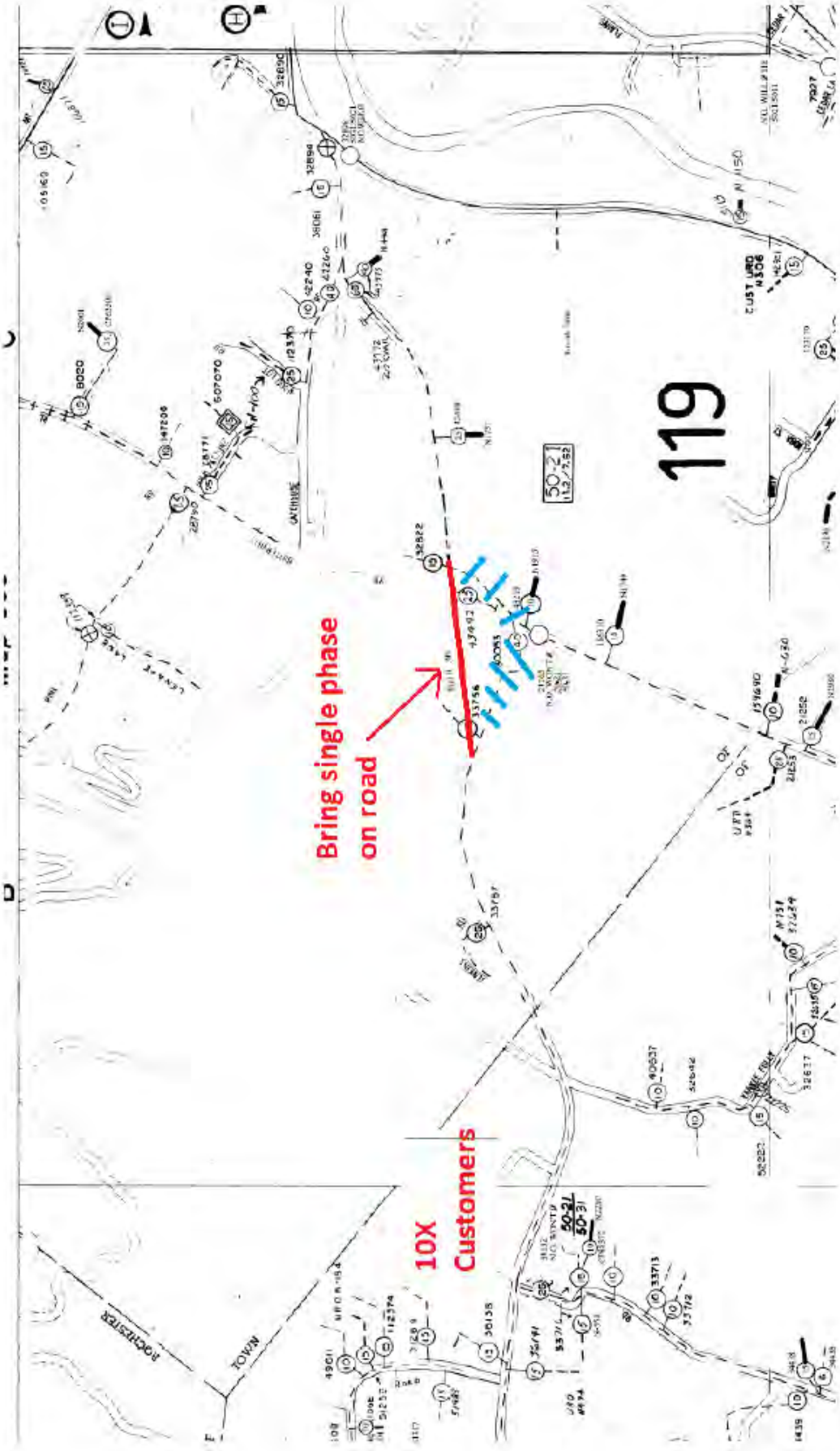
CAD DRAWING
DO NOT REVISE MANUALLY

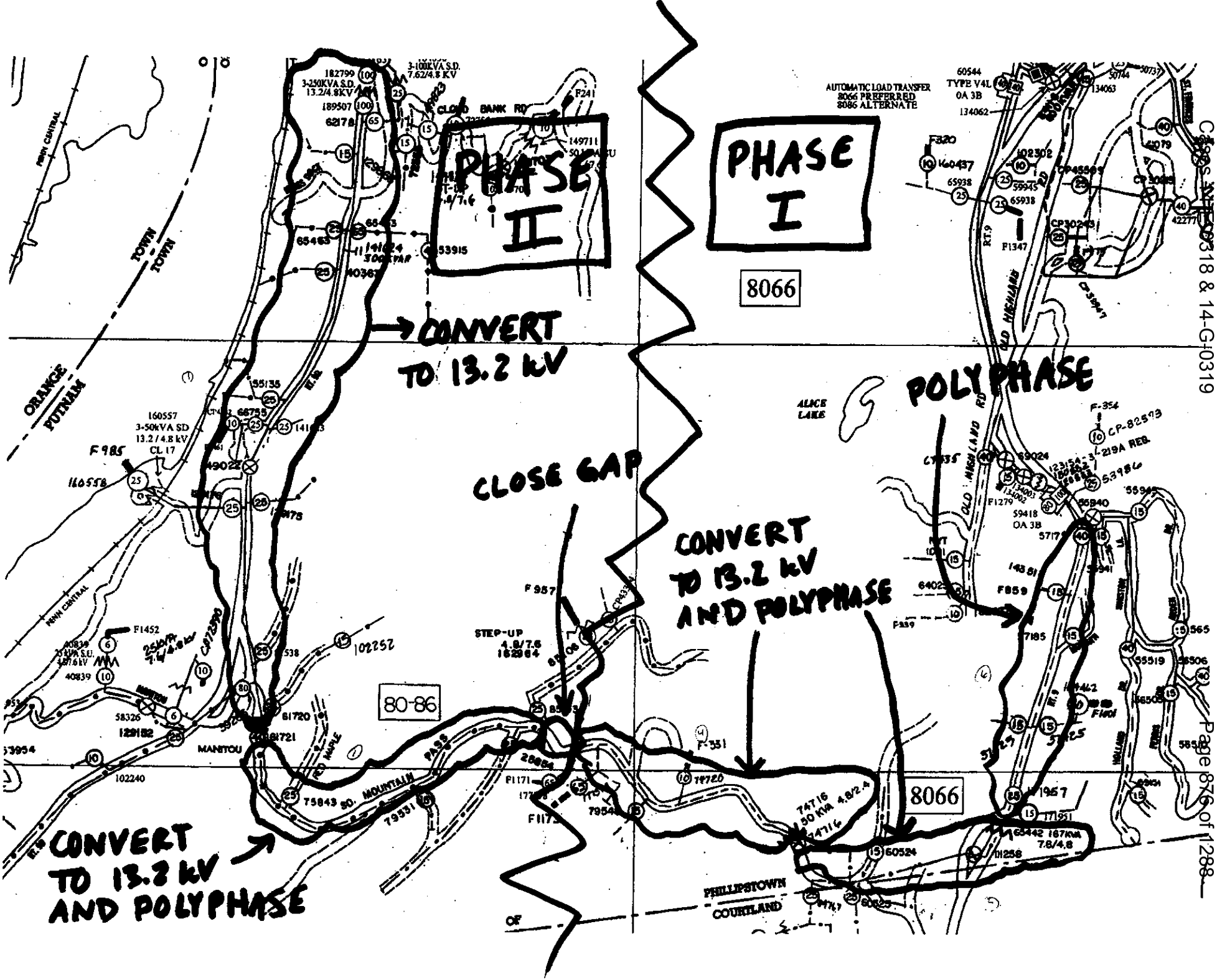
Cases 14-E-0318 & 14-G-0319

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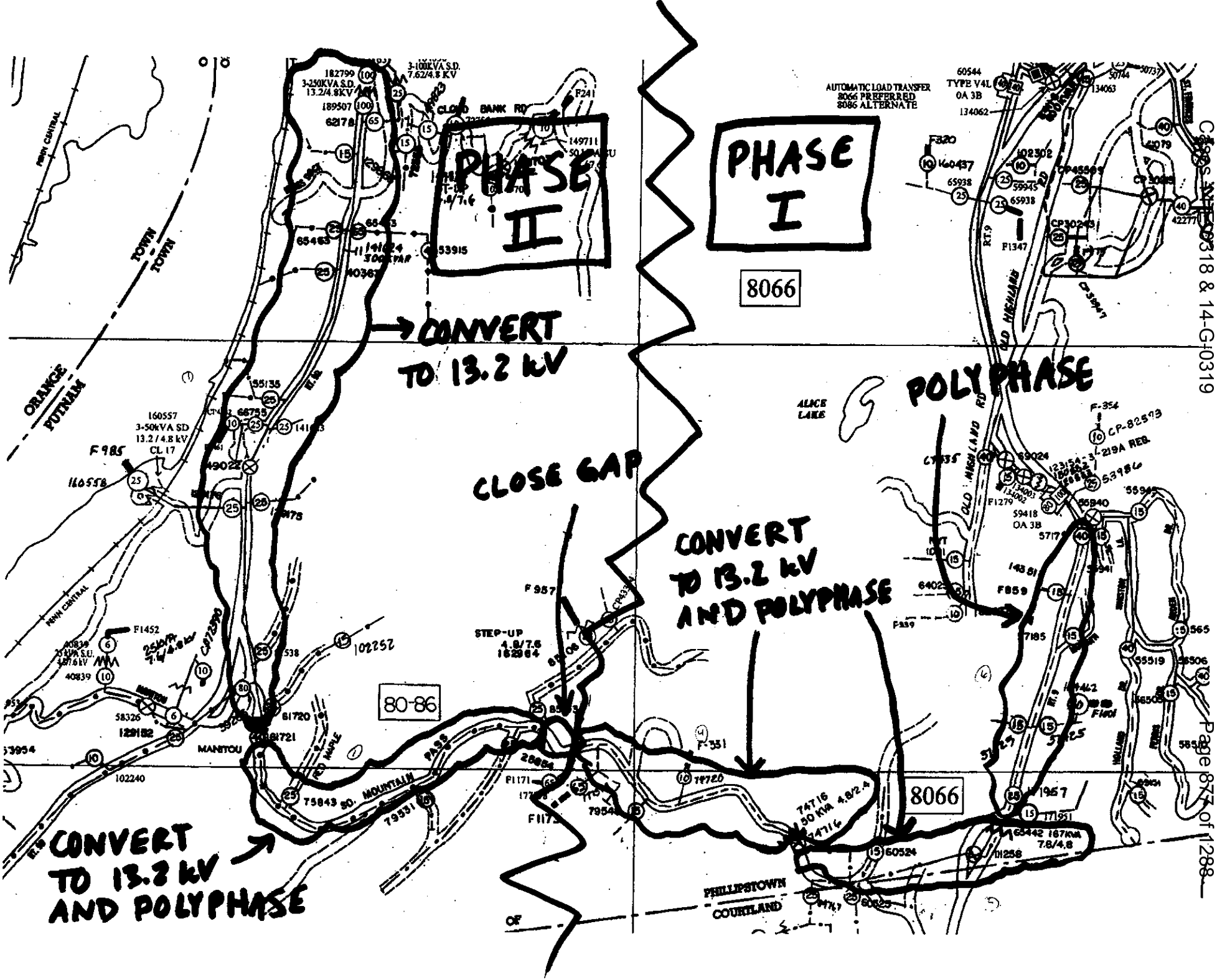

Rebuild one mile of circuitry on-road along Sundown Rd
LOWES CORNERS
LOWES CORNERS
CURRENT RESET
CURRENT RESET
3091
30712
20554
20545
20540
20548
46804
06568
2A2D
NORTHE


120.01
Ransom Road
Make 5084 Loop Tie
OAKES RD
MILE HILL
LITTLE ITALY RD
HAVILAND RD
HIGHLAND SUBSTATION
BELL DR
OAK ST
ROBERTO RD
RT.9W
TO BRIDGE
BRIGEVIEW ESTATES
RISER
N-435
N-73
N-48
446
17609
31552
17905
17822
17844
17828 N.O.WILL Ø
186277
166368
190591
190590
190591
51002
51003 N.O.WILL Ø 5084/5085
191134 N.O.WILL Ø 5082/5085
121259
162103
162104
47090
5082 TOP
5081 BOTTOM
5084 TOP
5083 BOTTOM
51004
21651 N.O.WILL Ø 5083/5084
21653
21557
167357
183860
183857 N1895
183855 N232
26301
183844 N.O.WILL Ø 5082/5084
51579 N.O.WILL Ø 5081/5082
121210
183848
38843
175232
50440
159693
159695


Bring single phase
on road
10X
Customers
119
ROCHESTER
TOWN



Cases 13-E-0318 & 14-G-0319
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Land & Buildings

- 2015 Major Projects
  - Fishkill Office Expansion
  - Poughkeepsie Property Improvements
  - Build Pole Barns for Equipment Storage
  - Repave Parking Lots

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Daily Operations - Electric	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - Flooring	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - HVAC	Maintain Standards	26	13	13	27	28	27	27	28	136
41	Daily Operations - Unidentified	Maintain Standards	261	132	133	265	279	269	272	278	1363
41	Repave Parking Lot (Multi Year) (Kingston)	Maintain Standards	157	79	80	159	167	162	163	167	818
41	Repave Parking Lots (Multi Year)	Maintain Standards	157	79	80	159	167	162	163	167	818
41	Replace Magnetic Door Card Access System (Ellenville)	Maintain Standards	21	0	0	0	0	0	0	0	0
41	Update Restroom Linemen's Area (E.C.)	System Enhancement	26	0	0	0	0	0	0	0	0
41	Fix Floor Drains in Line Garage (E.C.)	Maintain Standards	31	0	0	0	0	0	0	0	0
41	Install Pole Pile (E.C.)	System Enhancement	42	0	0	0	0	0	0	0	0
41	Replace Roof - Front Building Flat	Maintain Standards	601	0	0	0	0	0	0	0	0
41	Replace Magnetic Door Card Access System (Newburgh)	Maintain Standards	37	0	0	0	0	0	0	0	0
41	Enlarge Front Parking Area (Newburgh)	System Enhancement	52	0	0	0	0	0	0	0	0
41	Building 805 - Tile Hallway outside Foremen's Offices	Maintain Standards	5	0	0	0	0	0	0	0	0
41	Building 805 - Install Door - Foremen's Hallway to Stores/Dock	System Enhancement	10	0	0	0	0	0	0	0	0
41	Building 805 - Replace Floor Tile Formen's Offices	Maintain Standards	26	0	0	0	0	0	0	0	0
41	Build Roof over Wire Storage	System Enhancement	63	0	0	0	0	0	0	0	0
41	Install Sand / Item IV / Cold Patch Storage Sheds	System Enhancement	125	0	0	0	0	0	0	0	0
41	Replace Door - Kitchen	Maintain Standards	2	0	0	0	0	0	0	0	0
41	Replace Front Doors - Lodge	Maintain Standards	4	0	0	0	0	0	0	0	0
41	Replace Roof - Snack Shack	Maintain Standards	10	0	0	0	0	0	0	0	0
41	Replace UV Water Treatment	Maintain Standards	10	0	0	0	0	0	0	0	0
41	Storm Drain Repair	Maintain Standards	21	0	0	0	0	0	0	0	0
41	Replace Roof - Small Pavilions (Bocce Ball Courts)	Maintain Standards	31	0	0	0	0	0	0	0	0
41	Install Handicap Ramp @ Front Entrance	System Enhancement	42	0	0	0	0	0	0	0	0
41	Replace Roof - Office	Maintain Standards	63	0	0	0	0	0	0	0	0
41	Building 807 Replace Auditorium Tiles	Maintain Standards	26	0	0	0	0	0	0	0	0
41	Building 807 Temperature Automation	System Enhancement	31	0	0	0	0	0	0	0	0
41	Building 801 - Renovate Women's Rest Room 1st Floor	System Enhancement	42	0	0	0	0	0	0	0	0
41	Building 803 Replace 8 Ton RTU (CHAZ)	System Enhancement	52	0	0	0	0	0	0	0	0
41	Building 803 - Install Conference Center	System Enhancement	78	0	0	0	0	0	0	0	0
41	Building 800 Window Replacement - 2nd Floor	System Enhancement	136	0	0	0	0	0	0	0	0
41	Building 803 Replace Elevator	Maintain Standards	188	0	0	0	0	0	0	0	0
41	Pole Barn along South side of property (40x150x15)(Catskill)	System Enhancement	0	63	64	127	0	0	0	0	127
41	Transportation Garage - Install Remote Door Openers - Bay 2-4	System Enhancement	0	16	16	32	0	0	0	0	32
41	Replace Back Staircases (Fishkill)	Maintain Standards	0	13	13	27	0	0	0	0	27
41	Swing Arm for Transformer Platform (Fishkill)	System Enhancement	0	13	13	27	0	0	0	0	27
41	Install new Salt / Sand Sheds (Fishkill)	System Enhancement	0	18	19	37	0	0	0	0	37
41	Replace Sidewalk	Maintain Standards	0	26	27	53	0	0	0	0	53
41	Replace Magnetic Door Card Access System (Fishkill)	Maintain Standards	0	37	37	74	0	0	0	0	74
41	Replace Roof - Front Building - Sloped	Maintain Standards	0	158	160	318	0	0	0	0	318
41	Replace Front Doors & Raise	Maintain Standards	0	8	8	16	0	0	0	0	16
41	Replace Front Sidewalk & Regrade	Maintain Standards	0	13	13	27	0	0	0	0	27
41	Resurface Gas Garage Floors	Maintain Standards	0	26	27	53	0	0	0	0	53
41	Pave Employee Parking Lot	Maintain Standards	0	37	37	74	0	0	0	0	74
41	Install 40x60 Pole Barn (Newburgh)	System Enhancement	0	40	40	80	0	0	0	0	80
41	Dispatch Center Renovation	System Enhancement	0	26	27	53	0	0	0	0	53
41	Extend Dock Area - Lineman's Garage	System Enhancement	0	26	27	53	0	0	0	0	53
41	Pole Barn for Equipment Storage	System Enhancement	0	79	80	159	0	0	0	0	159
41	Building 804 - Renovate OMS Office Area	System Enhancement	0	16	16	32	0	0	0	0	32
41	Building 803 - Renovate S-1 IT Training Room	System Enhancement	0	21	21	42	0	0	0	0	42
41	Building 800 - Create Women's Rest Room 1st Floor	System Enhancement	0	32	32	64	0	0	0	0	64
41	Building 802 - Roof Replacement	Maintain Standards	0	34	35	69	0	0	0	0	69
41	Building 805 Resurface and Restripe Garage Floors	Maintain Standards	0	32	32	64	0	0	0	0	64

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Building 807 Replace Pneumatic Controls with Electronic	System Enhancement	0	42	43	85	0	0	0	0	85
41	Building 807 Relocate Transformers and Replace Steps	System Enhancement	0	105	107	212	0	0	0	0	212
41	Enlarge Loading Dock / Install Leveler (Ellenville)	System Enhancement	0	0	0	0	56	0	0	0	56
41	Pole Barn along South side of property (40x80x15)(Ellenville)	System Enhancement	0	0	0	0	89	0	0	0	89
41	Replace Loading Dock and Install Roof (E.C.)	System Enhancement	0	0	0	0	89	0	0	0	89
41	Relocate/Install new pole pile (Fishkill)	System Enhancement	0	0	0	0	45	0	0	0	45
41	Pave Front Lot	Maintain Standards	0	0	0	0	111	0	0	0	111
41	Install Roof over wire storage area (Fishkill)	System Enhancement	0	0	0	0	134	0	0	0	134
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	446	0	0	0	446
41	Replace Pole Piles (Newburgh)	Maintain Standards	0	0	0	0	45	0	0	0	45
41	Replace Magnetic Door Card Access System (Stanfordville)	Maintain Standards	0	0	0	0	17	0	0	0	17
41	Install HVAC (Stanfordville)	System Enhancement	0	0	0	0	28	0	0	0	28
41	Replace Boiler & Heating System (Stanfordville)	System Enhancement	0	0	0	0	28	0	0	0	28
41	Install Ladies Rest Room (Stanfordville)	System Enhancement	0	0	0	0	39	0	0	0	39
41	Repave Front and Side Parking Lot (Stanfordville)	Maintain Standards	0	0	0	0	167	0	0	0	167
41	Building 801 - VVT Automation	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 810 Control Center Replace Heat Pumps w/ RTU's	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 802 - VVT Automation	System Enhancement	0	0	0	0	89	0	0	0	89
41	Building 807 - Replace Roof - Auditorium	Maintain Standards	0	0	0	0	111	0	0	0	111
41	Building 800 Window Replacement - 1st Floor	System Enhancement	0	0	0	0	145	0	0	0	145
41	Enlarge Transformer Dock & Replace Roof (Ellenville)	System Enhancement	0	0	0	0	0	32	0	0	32
41	Replace Carpeting - Main Bldg and Training Room (Fishkill)	Maintain Standards	0	0	0	0	0	88	0	0	88
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	0	431	0	0	431
41	Build Pole Barn for Transformers (Newburgh)	System Enhancement	0	0	0	0	0	129	0	0	129
41	Window Replacements - Front and North Side	System Enhancement	0	0	0	0	0	140	0	0	140
41	Improve Drainage around Newburgh Building	System Enhancement	0	0	0	0	0	162	0	0	162
41	Install Pole Barn - NE Side of Building	System Enhancement	0	0	0	0	0	129	0	0	129
41	Replace Street Light Poles	Maintain Standards	0	0	0	0	0	54	0	0	54
41	South Road Complex - Install New Curbing	System Enhancement	0	0	0	0	0	54	0	0	54
41	Building 806 Resurface and Restripe Garage Floors	Maintain Standards	0	0	0	0	0	97	0	0	97
41	Building 808 - Replace Windows	System Enhancement	0	0	0	0	0	108	0	0	108
41	Building 807 - Replace Windows	System Enhancement	0	0	0	0	0	162	0	0	162
41	Building 808 Roof Replacement	Maintain Standards	0	0	0	0	0	269	0	0	269
41	Replace Roof - 1/3 Back Building	Maintain Standards	0	0	0	0	0	0	435	0	435
41	Repave Back Parking Lot near Line Garage (Newburgh)	Maintain Standards	0	0	0	0	0	0	87	0	87
41	Replace Front Door - Cottage	Maintain Standards	0	0	0	0	0	0	2	0	2
41	Basement Drainage - Cottage	System Enhancement	0	0	0	0	0	0	54	0	54
41	Paving front of Lodge and roadway into site	Maintain Standards	0	0	0	0	0	0	163	0	163
41	Replace Ice Machine	Maintain Standards	0	0	0	0	0	0	5	0	5
41	Building 802 - Install Awning @ Drafting Entrance	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 807 - Customer Service Entrance Awning	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 810 - Install Awning @ Back Entrance	System Enhancement	0	0	0	0	0	0	5	0	5
41	Building 808 Fluid Containment Mechanics Garage	System Enhancement	0	0	0	0	0	0	27	0	27
41	Building 801 Replace 50 Ton RTU	System Enhancement	0	0	0	0	0	0	141	0	141
41	Building 801 - Roof Walkway	System Enhancement	0	0	0	0	0	0	381	0	381
41	Building 803 - Call Center Break Room Renovation	System Enhancement	0	0	0	0	0	0	54	0	54
41	Remove Steam / Water Pipes - Main Building (Asbestos)	System Enhancement	0	0	0	0	0	0	87	0	87
41	Renovate Restrooms - Main Building	System Enhancement	0	0	0	0	0	0	131	0	131
41	Transformer Shop Upgrade	System Enhancement	0	0	0	0	0	0	163	0	163
41	Replace Storm Drains	Maintain Standards	0	0	0	0	0	0	54	0	54
41	Pedestrian Entrance Doors - Main Building & Garage	Maintain Standards	0	0	0	0	0	0	33	0	33
41	Swing Arm for Transformer Platform (Greenville)	System Enhancement	0	0	0	0	0	0	33	0	33
41	Pave Parking Lot	Maintain Standards	0	0	0	0	0	0	0	167	167
41	Install Generator at Storeroom	System Enhancement	0	0	0	0	0	0	0	56	56

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
41	Lighting Upgrade - Storeroom	System Enhancement	0	0	0	0	0	0	0	44	44
41	Replace Exhaust Fan in lineman's garage	Maintain Standards	0	0	0	0	0	0	0	39	39
41	Replace Pavillion & Bath House Roof	Maintain Standards	0	0	0	0	0	0	0	78	78
41	Controls System HVAC	System Enhancement	0	0	0	0	0	0	0	111	111
41	Lighting Upgrade - Storeroom	System Enhancement	0	0	0	0	0	0	0	44	44
41	Replace/Upgrade 803 RTU's	Maintain Standards	0	0	0	0	0	0	0	222	222
41	Replace Training Room HVAC Unit hook up to new controls	Maintain Standards	0	0	0	0	0	0	0	67	67
41	Pave Pole & Equipment area	Maintain Standards	0	0	0	0	0	0	0	89	89
41	Replace Carpeting - Call Centers	Maintain Standards	0	0	0	0	0	0	0	83	83
41	Upgrade Lighting - Mechanics Garage	System Enhancement	0	0	0	0	0	0	0	11	11
41	Install New signs	Maintain Standards	0	0	0	0	0	0	0	11	11
41	Controls System HVAC	System Enhancement	0	0	0	0	0	0	0	333	333
41	Build Additional Office/Cubical Space	System Enhancement	0	0	0	0	0	0	0	667	667
41	Expand Fishkill Storeroom and Garage Area	System Enhancement	1569	790	801	1591	1671	0	0	0	3262
41	Building Expansion (Stanfordville)	System Enhancement	0	0	0	0	0	1616	0	0	1616
41	Subtotal Building & Grounds		4001	2002	2028	4031	4183	4145	2549	2716	17624

EDP Equipment

Major Projects

- Annual Planned PC Replacements
- Annual Planned Mobile Computer Replacements
- Annual Planned Monitor & Printer Replacements
- Annual Planned Server Replacements
- Annual Planned Network Hardware Replacements
- Annual Security System Replacements

Software

Major Projects

- Enterprise Content Management
- Cognos BI tool
- OSM Replacement
- Mobility Upgrades
- Cyber Security

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4220	Wires Down, Damage Assessment - Phase 1 (Jeff C)	System Enhancement	0	0	0	0	0	0	0	0	0
4222	Hardware Minors	Maintain Standards	105	56	56	112	119	127	135	144	638
4222	PC and Laptop Replacements	Maintain Standards	315	163	163	326	343	361	379	553	1962
4222	Mobile (Pen) Computing Replacements	Maintain Standards	263	81	81	163	166	170	173	221	893
4222	Monitors, Network Printers-Adds/Repl.	Maintain Standards	105	51	51	102	104	106	108	111	531
4222	Server Replacements and Storage Upgrades	Maintain Standards	1105	357	357	713	779	796	812	829	3930
4222	Network Infrastructure Upgrades/Replacements	Maintain Standards	289	153	153	306	260	265	271	332	1433
4222	Cyber Security	Reduces Risk	0	31	31	61	62	64	65	77	330
4222	Copiers (new budget line item requested by Tim B)	Maintain Standards	0	71	183	255	52	53	54	55	469
4222	Legacy Replacement - hardware	Reduces Risk	1024	0	0	0	0	0	0	554	554
4222	GIS - equipment for Estimating Design phase	Improve Reliability	1024	0	0	0	54	0	0	0	54
4220	Business Intelligence (Cognos)	System Enhancement	0	410	383	784	784	802	819	831	4021
4220	Enterprise Content Management - Phase II	Improve Reliability	0	656	0	628	0	0	0	0	628
4220	Enterprise Content Management - Phase III	System Enhancement	0	0	623	638	638	0	0	0	1276
4220	Enterprise Content Management - Phase IV	System Enhancement	0	0	0	0	638	653	0	0	1290
4220	Enterprise Content Management - future Phases	Improve Reliability	0	0	0	0	0	267	546	554	1368
4220	Legacy Replacment - software	Reduces Risk	614	0	0	0	0	0	0	10526	10526
4220	Cyber Security	Reduces Risk	154	164	153	314	314	321	328	332	1609
4220	VoIP	Maintain Standards	307	109	102	209	157	160	164	166	857
4220	Mobility Upgrade (Tim H)	System Enhancement	154	0	0	0	1568	1070	0	0	2638
4220	ARCOS - Mobility Interface (Tim H)	System Enhancement	1024	82	26	105	0	0	0	0	105
4220	Emergent Software Packages/Upgrades	Maintain Standards	102	328	306	628	627	642	656	665	3217
4220	EmpCenter Phase 2 (IT estimate)	System Enhancement	0	82	77	157	0	0	0	0	157
4220	Wires Down, Damage Assessment - Phase 1 (Jeff C)	System Enhancement	0	0	0	0	0	0	0	0	0
4220	Wires Down, Damage Assessment, Phase II (Tim H)	System Enhancement	0	109	179	288	0	0	0	0	288
4220	Transmission Outage app	Reduces Risk	0	0	0	0	0	0	0	0	0
4220	Electric GIS- Environment (Hal T)	Improve Reliability	0	24	680	720	73	0	0	0	793
4220	Electric GIS- Estimating Design (Hal T)	Improve Reliability	0	0	0	0	535	48	0	0	583
4220	Electric GIS- Underground manhole (Hal T)	Improve Reliability	102	0	0	0	0	0	328	332	660
4220	AP Automation System upgrade (Joe C)	System Enhancement	0	0	102	105	0	0	0	0	105
4220	PowerPlant upgrade (Joe C)	System Enhancement	0	0	0	0	0	0	492	0	492
4220	New Maintenance Request System (Eric K)	Maintain Standards	0	0	102	105	0	0	0	0	105
4220	PowerPlant - Construction Budgeting upgrades (Chris R)	System Enhancement	0	0	102	105	105	0	0	0	209
4220	Crew Constant Time measurment and dashboarding utilizing existing technology (mobility, rocket modems	System Enhancement	0	0	0	0	209	0	0	0	209
4220	Operator scheduling software that automates compliance verification with all DOT-PHMSA hours on- and o	Reduces Risk	0	0	143	146	0	0	0	0	146
4220	Taurigma Automated Fault Location and Event Retriever (Eric L)	System Enhancement	0	0	56	58	26	64	66	66	280
4220	GL Essentials Upgrades (IT estimate)	Maintain Standards	0	0	0	0	209	0	0	0	209
4220	Clarity Replacement/Upgrade (Stan K - coincide w FAS legacy repl)	System Enhancement	0	0	0	0	0	0	0	554	554
4220	ARCOS - Crew Manager Software (Tim H)	System Enhancement	0	0	0	0	105	0	0	0	105
4220	OMS Replacement (Tim H)	Maintain Standards	0	0	0	0	0	0	1093	1662	2755
4220	Cognos Enterprise Level License	System Enhancement	0	0	511	523	0	0	0	0	523
4220	EMS JUMP	System Enhancement	0	0	0	0	0	0	0	0	0
4222	Ops Services Integration	0	102	0	0	0	0	0	0	0	0
4222	Other Customer Services (IVR, Arcos integration, FCS upgrade)	0	255	0	0	0	0	0	0	0	0
HW/SW	Subtotal Hardware & Software		7044	2929	4619	7548	7926	5970	6489	18565	46498

IT Summary ** Project totals are not adjusted for overheads*

Initiative	Priority	Achieve Departmental Mission / Improve KPI Performance	Initiative Description Including: · **(Measurable) Desired Outcome** · **(Relevant) Alignment to Mission and Strategy** · **(Time bound) Initiative Resolution**	2014	2015	2016	2017	2018	2019
Enterprise Content Management	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phase initiative - Phase 2 OpenText implementation to roll out the core system to the entire Company will continue through Q2 2015. Additional functionality will be rolled out in subsequent phases in accordance with the ECM Strategy document. · Expected capital investment for 2015 approximated at $1.247M. · Project Manager – Vicki Wheeler; Project Sponsor – Stacy Renner; Project Team – Maureen Kverek, Laura Butler, Kim Short, Daemyian Watson, Andrea Balga, Barbara MacIsaac, Casey Gunther, System Integrator – Locus Systems, business area resources as needed. · Milestones, Deliverables, Timelines: o Phase II: § Wave 6 Go Live: January 2015 § Wave 7 Go Live: March 2015 § DIS and Stellent migrations into Content Central: April 2015 § Email Management implementation: April 2015 o Phase III § Workflows § Everywhere module for mobile devices	3,102,418	1,210,000	1,220,000	860,000	500,000	500,000
Business Intelligence	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-year initiative to enhance the organization's data exploitation and analytical capabilities · Expected investment for 2015 approximated at $773k PLUS Cognos Enterprise License @ $500K · Project Manager – Suzette Mazurowski; Project Sponsor – Vicki Wheeler; Project Team – Antonio Martinez, Casey Gunther, External Resources as needed · Milestones, Deliverables, Timelines: o Prioritization, Definition and assignment of projects monthly in accordance with ITSC meeting schedule o Various additional projects released to Production (December)	701,000	1,250,000	750,000	750,000	750,000	750,000
Cyber Security	High	Directly related to enabling our group mission to support the organization by providing safe and secure solutions.	· Projects to address the remaining items from the Cyber Security Action Plans. · Expected investment for 2015 approximated at $370k. · IT will provide continued representation on the Cyber Security Working Group.	676,514	360,000	360,000	360,000	360,000	370,000
Systems Integration Strategy with Services Oriented Architecture (SOA)	High	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phased initiative to define requirements and to implement a shared services SOA platform. This will be a foundational investment allowing us to provide a flexible, scalable, secure, and reliable environment poised for current and anticipated information and technology demands coupled with a continued focus on digital (Web, mobile, social, IVR), self-service oriented offerings to increase overall customer engagement. · Project Manager – TBD; Project Sponsor – Mark Holtermann · Milestones, Deliverables, Timelines: o Identify, select and secure a SOA solution o Software selection and purchase o Compile strategy roadmap for future rollouts o Pilot services	TBD	TBD	TBD	TBD	TBD	TBD

Application Testing Automation Strategy	High	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Multi-phased initiative to increase quality, reduce defects, and shorten development cycle times across all application environments. This is a foundational investment to ensure effective, timely, and consistent delivery of applications. · Project Manager – TBD; Project Sponsor – Mark Holtermann · Milestones, Deliverables, Timelines: o Identify, select, and secure an automated testing solution(s) o Tool selection and procurement o Compile strategy roadmap and implementation plan o Identify partner in the development of test scripts (pre-requisite before automation) o Compile automated scripts o Pilot tools	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Disaster Recovery Enhancements	Med	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Our existing Newburgh Disaster Recovery (DR) hardware environment requires enhancements in order to be able to support restoration of critical server applications in the event of a disaster. · Expected investment for 2015 approximated at $440k. · Milestones, Deliverables, Timelines: o Mainframe Storage o TSM Storage o IBM V7000 storage unit		440,000					
Network Strategy	Med	This initiative will improve our 'Availability of IT Infrastructure'	· This multi-million dollar initiative led by Ray Abrial aims to create a Central Hudson owned Information System Communications Infrastructure for our transmission and distribution assets. · IT will provide support as needed including continued participation on the Network Strategy Committee. · Lead responsibility: R. A'Brial and D. Dittmann							
VOIP Enhancements	Med	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Continue to add enhanced functionality for our VOIP systems. · Expected investment for 2015 approximated at $206k. · Milestones, Deliverables, Timelines: o IVR Green Belt Enhancements (3Q 2015) o IVR Speech recognition (4Q 2015) · Project Manager – John Chrysler; Project Sponsor – Rick McGowan		200,000	150,000	150,000	150,000		150,000
Electric GIS	Med	Directly related to enabling our group mission. Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· The Electric GIS Project provides a data warehouse of geographic electric data. · Investment for 2015 approximated at $860K as defined by Frank Bailey. · Milestones, Deliverables, Timelines as defined by Engineering: o Integration with Engineering modeling software (DEW): June 2015 o Electric GIS staging environment complete: September 2015 o Schneider ArcFM implementation complete: December 2015; Includes equipment for Design Phase in 2016 · Lead responsibility: H. Turner and F. Bailey ; IT Lead: J. Robinson	263,750	688,450	633,250	45,000	300,000		300,000
Logistics Software / Damage Assessment	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Damage assessment activities are critical during storm restoration. Software packages were considered in order to improve damage assessment activities and respond to PSC commission recommendations. The first phase of an emergency logistics tracking program, to be implemented in 2014, includes the automation of data collection of damage assessment operations, reporting and restoration package creation. The second phase of an emergency logistics tracking program to be implemented in 2015 includes: o Materials and Poles o Trees o Service Wire (Loop) Operations o Resources – Labor o Lodging o Meals · Investment for 2015 approximated at $283K · Lead responsibility: J. Cito; IT Project Manager: C. Robertson	420,000	275,000					

Integration of ARCOS and MWM	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Streamline the business process to improve the efficiency and performance of Customer Services supervision by using ARCOS data to populate MWM. This will reduce administrative time and increase assignment accuracy through a direct connection between a personnel database and the Mobile Workforce Management system. · Investment for 2015 approximated at $103K · Milestones, Deliverables, Timelines: o Integration mapping, SOW development, and IT Steering and CARE approvals 3/1/15. (Torcello/Collins) o Contract development and application development follow 6/30/15. o Testing and implementation 12/31/15. · Lead responsibility: J. Collins	100,000						
ARCOS - Crew Manager Software (Tim H)	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Lead responsibility: T. Hayes		100,000					
EmpCenter Phase 2	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Implementation of a work breakdown structure within EmpCenter as defined by Green Belt team led by Lora Gescheidle in 2014. · Investment for 2015 approximated at $155K · Lead responsibility: TBD		150,000					
AP Automation System Upgrade/Phase II (Automated Distribution)	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Lead responsibility: TBA		100,000					
New Maintenance Request System	Low	·	· Investment for 2015 approximated at $103K · Lead responsibility: E. Kiszkiel		100,000					
PowerPlant - Construction Budgeting upgrades	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $103K · Lead responsibility: N. Komar		100,000	100,000	450,000			
Crew Constant Time Measurment and Dashboarding	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Utilizing existing technology (mobility, rocket modems, GPS tracking devices) or other new technology · Lead responsibility: James K.			200,000				
Operator scheduling software for Compliance Verification	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $144K · Lead responsibility: D. Dittmann		140,000					
Taurigma Automated Fault Location and Event Retriever	Low	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Investment for 2015 approximated at $57K · Lead responsibility: E. Loeven		55,000	25,000	60,000	60,000	60,000	
Transmission Outage app	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.		206,000						0
Clarity Replacement/Upgrade	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment of $500K, contingent upon Legacy Replacement decision · Lead responsibility: Stan K.							500,000
GL Essentials Upgrades	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.				200,000				
OMS Replacement	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment will be refined after an RFP process · Lead responsibility: T. Hayes					1,000,000	1,500,000	
Mobility Upgrade / Redesign	High	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	· Estimated investment will be refined after an RFP process · Lead responsibility: T. Hayes			1,500,000	1,000,000			
Emergent Software Packages/Upgrades	Med	Impact to our 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Misc expected software imlementations and/or upgrades.	10,000	600,000	600,000	600,000	600,000	600,000	600,000

IT Transformation / Legacy Replacement	High	Strategic	· Further analysis needed before strategy is refined · Year one of a multi-year transformation effort · Lead responsibility: M. Holtermann						10,000,000
Infrastructure Optimization and Lifecycle Intiatives	High	Directly related to enabling our group mission. This project could impact our 'Availability of IT Infrastructure', 'ITSC Projects on budget' and 'ITSC Projects on schedule' KPIs.	Hardware Minors, PC and Laptop Replacements, Mobile (Pen) Computing Replacements, Monitors, Network Printers-Adds/Repl., Server Replacements and Storage Upgrades, Network Infrastructure, Upgrades/Replacements Copiers	2,064,506	1,940,000	1,755,000	1,770,000	1,785,000	2,030,000

EMS

Major Projects

- Network Strategy
- New Distribution Management System
- EMS Upgrades

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4230	DMS	System Enhancement	1224	0	0	0	0	0	0	0	0
4230	ACC Video Wall - Blackboard Enhancement	System Enhancement	433	0	0	0	0	0	0	0	0
4230	EMS Backup and Restore	System Enhancement	0	0	0	0	0	0	0	0	0
4230	EMS FEP DIGI Replacement	System Enhancement	0	0	0	0	0	0	0	0	0
4230	EMS Server Upgrade - Hardware associated with the JUMP Upgrade	System Enhancement	0	0	0	0	312	0	0	0	312
4230	Miscellaneous Hardware and Software Failures	System Enhancement	0	26	26	51	52	53	54	55	266
4230	EMS Active Directory Server Implementation (PCC and ACC)	System Enhancement	0	68	0	66	0	0	0	0	66
4230	EMS Corporate Cluster Server Replacement for External View Only EMS Access	System Enhancement	153	0	31	31	0	0	0	0	31
4230	EMS Network Upgrade (Includes Firewalls and Switches not Upgraded with R15)	System Enhancement	0	0	0	0	312	0	0	0	312
4230	EMS Sophos Antivirus Upgrade from SEPM	System Enhancement	0	0	0	0	52	0	0	0	52
4230	EMS DTS Video Wall/Blackboard Software - Operator Training Enhancements	System Enhancement	0	0	0	0	331	0	0	0	331
4230	EMS ACC Video Wall - Blackboard Enhancement	System Enhancement	0	0	434	434	0	0	0	0	434
4230	EMS eDNA Historian Upgrade	Improve Reliability	0	0	0	0	0	0	0	0	0
4230	EMS eDNA Historian Redundancy Package	Improve Reliability	0	0	0	0	94	0	0	0	94
4230	EMS PCC Mapboard Replacement (Video Wall)	System Enhancement	0	0	0	0	0	0	0	2771	2771
4230	EMS Software Upgrade (non-JUMP)	System Enhancement	0	0	0	0	0	0	869	0	869
4230	Network Strategy Pilot Project	Reduces Risk	0	83	0	82	0	0	0	0	82
4230	Network Strategy Implementation Pilot	Reduces Risk	0	0	2088	2091	4226	4292	4942	4179	19730
4230	DMS - New Distribution Management System and D-Scada	Improve Reliability	0	104	510	613	6345	0	0	0	6959
4230	DMS - Three Video Walls (one per DSO)	System Enhancement	0	0	0	0	0	1436	0	0	1436
4230	DMS - Software Upgrade	System Enhancement	0	0	0	0	0	0	0	0	0
4230	System Operations Room Reconfiguration & Construction	System Enhancement	0	0	0	0	0	160	0	0	160
4230	Subtotal EMS		1810	281	3088	3369	11724	5940	5865	7006	33904

Security

Includes the following planned purchases

Cameras and Intrusion Detection Equipment

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
4240	Eltings corners access add/camera upgrade	System Enhancement	357	0	0	0	0	0	0	0	0
4240	Poughkeepsie HR/DR River Crossing pump house cameras	System Enhancement	41	0	0	0	0	0	0	0	0
4240	Poughkeepsie Mail Room Card Reader additions	System Enhancement	10	0	0	0	0	0	0	0	0
4240	Rock Tavern Sub SMART Cameras Add	System Enhancement	0	0	0	0	0	637	0	0	637
4240	Security Guard Booths District Offices	System Enhancement	0	0	0	0	364	0	0	0	364
4240	License Plate Cameras District Offices	System Enhancement	0	0	0	0	249	0	0	0	249
4240	Mahopac Gas Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	88	88
4240	Pleasant Valley Gas Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	92	0	92
4240	Fishkill Plains Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	108	0	108
4240	Smithfield Sub Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	111	111
4240	Rifton Training Center Cameras	System Enhancement	0	51	51	102	0	0	0	0	102
4240	Poughkeepsie Gas Cameras/Intrusion Detection	System Enhancement	0	0	0	0	0	0	0	0	0
4240	Poughkeepsie River Crossing Pump House	System Enhancement	0	0	0	0	0	0	103	155	258
4240	Subtotal Security		408	51	51	102	613	637	303	354	2,009

Tools and Transportation

- Transportation
  - Planned Fleet Replacements

Transportation and Tools 2015-2019 Forecast

COMMON :	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	← Actuals									Budget	Forecast →				
Tools															
4-43BL (Blankets)				$ 153	$ 198	$ 209	$ 189	$ 185	$ 159	$ 130	$ 130	$ 130	$ 130	$ 130	$ 130
4-4311- (Minors)				$ 402	$ 238	$ 388	$ 417	$ 649	$ 505	$ 685	$ 685	$ 701	$ 719	$ 737	$ 755
subtotal	**$ 453**	**$ 568**	**$ 462**	**$ 555**	**$ 436**	**$ 597**	**$ 606**	**$ 834**	**$ 664**	**$ 815**	**$ 815**	**$ 831**	**$ 849**	**$ 867**	**$ 885**
Transportation															
4-4511- vehicles				$ 1,879	$ 1,139	$ 1,404	$ 1,539	$ 1,614	$ 2,087	$ 1,071	$ 2,142	$ 2,209	$ 2,189	$ 2,557	$ 2,961
4-4521- mobil tools				$ 135	$ 49	$ 501	$ 233	$ 382	$ 804	$ 1,370	$ 869	$ 906	$ 910	$ 1,066	$ 1,224
4-4522- POE				$ 2,456	$ 1,345	$ 2,843	$ 2,753	$ 3,269	$ 2,553	$ 2,920	$ 3,637	$ 4,416	$ 5,176	$ 4,904	$ 4,455
subtotal	**$ 3,669**	**$ 4,944**	**$ 4,387**	**$ 4,470**	**$ 2,533**	**$ 4,748**	**$ 4,525**	**$ 5,265**	**$ 5,444**	**$ 5,361**	**$ 6,648**	**$ 7,531**	**$ 8,275**	**$ 8,527**	**$ 8,640**
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Total Cat 43 and 45	**$ 4,122**	**$ 5,512**	**$ 4,849**	**$ 5,025**	**$ 2,969**	**$ 5,345**	**$ 5,189**	**$ 6,099**	**$ 6,108**	**$ 6,176**	**$ 7,463**	**$ 8,362**	**$ 9,124**	**$ 9,394**	**$ 9,525**

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
43	Small Tools	Maintain Standards	816	407	407	815	831	849	867	885	4246
44	Communication	Maintain Standards	204	102	102	204	208	212	217	221	1062
45	Transportaion	Maintain Standards	5363	3324	3324	6648	7531	8275	8527	8640	39621

Transportation 5 Year Capital Forecast

2015-2019

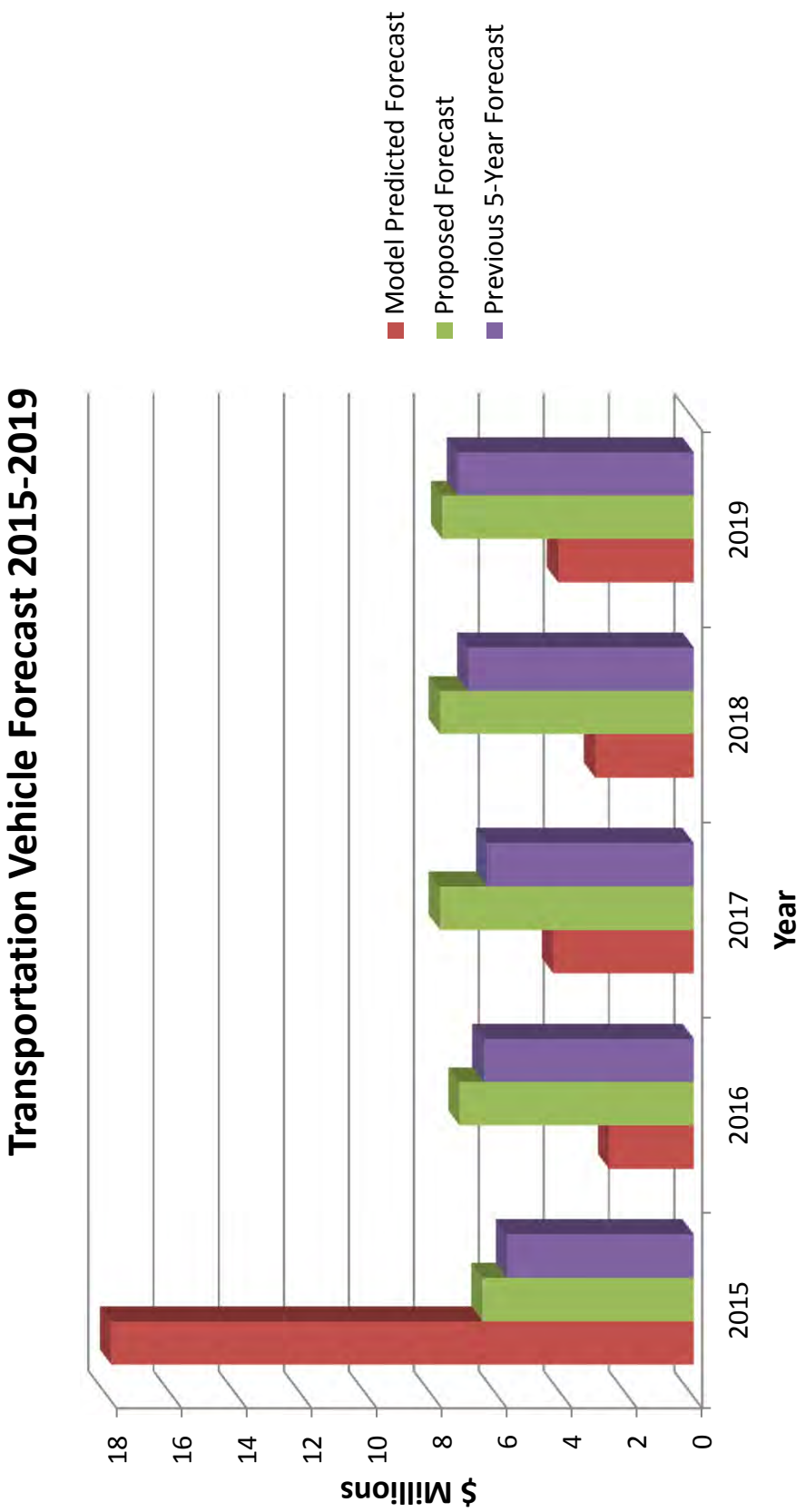
Fleet Status

- Past replacement practices
  - 10 years
  - 100,000 Miles
  - Operating hours not considered
- Current average fleet age is 8 years, but:
  - 176 units (~20%) of the fleet meet above requirements; cost to replace just 176 units is $22M. Cost over 5 years would be $42M to maintain criteria
  - Some units do not meet mileage or age, but meet operating hour retirement criteria
  - Industry average fleet age in Utility sector is 5-6 years; we are behind.

5 Year Forecast Development

- Applied new criteria to fleet in a financial model
  - 12 year replacement age
  - 120,000 mileage replacement
  - 9,500 engine hour replacement
- Yielded a $32M spend over 5 years to replace vehicles older than 12 years; heavily weighted to first year ($18M)
- Added $1M / year for replacing non-road equipment
- Spend is proposed to be levelized over the next 5 years
- Reduces average fleet age and *"caps"* fleet age at 12 years
- Age is currently main driver of fleet replacement; this budget would "flush" the fleet
- With new mileage and hour tracking systems being installed, fleet can be managed on utilization – most vehicles will be replaced before they reach 12 years old

5 Year Forecast



Radio Communication

Radio Major Projects

- Additional Radio and RF Link- Tannersville
- C-soft Console Additions
  - Kingston
  - Catskill
  - Newburgh
- Kingston Emergency Radio Replacement
- South Road Radio Network Recorder

Office Equipment

Includes the following planned purchases

Miscellaneous Furniture – System Wide

Office Chair Replacement Program

			W/ AFUDC, Inflated & OH Adjustments								
CAT.	Description	Discretion Level	2014	2015 Proposed Budget (1st Half)	2015 Proposed Budget (2nd Half)	2015	2016	2017	2018	2019	5-Year Total
421	South Road - Daily Operations - Larger Projects	Maintain Standards	66	33	33	66	68	69	70	72	345
421	South Road - Misc. Furniture	Maintain Standards	41	20	20	41	42	42	43	44	212
421	South Road - Office Chair Replacement Program	Maintain Standards	36	18	18	36	36	37	38	39	186
421	Greenville Furniture replacement	Maintain Standards	10	0	0	0	0	0	0	0	0
421	New Office Furniture - Conference Center	Maintain Standards	20	0	0	0	0	0	0	0	0
421	Additional Cubicles - Lake Katrine	Maintain Standards	25	0	0	0	0	0	0	0	0
421	New Office Furniture - OMS Office Area	Maintain Standards	0	5	5	10	0	0	0	0	10
421	New Office Furniture - S-1 IT Office Area	Maintain Standards	0	5	5	10	0	0	0	0	10
421	Upgrade Office Furniture - Fishkill	Maintain Standards	0	25	25	51	0	0	0	0	51
421	New Office Furniture (Stanfordville)	Maintain Standards	0	0	0	0	31	0	0	0	31
421	Subtotal Office Equipment		199	107	107	214	177	149	152	155	846

change to the proposed new control house elevation would be de minimis when compared to the overall project costs.

"CHGE Response to DPS-061 Supplemental-Attachment C-Danskammer Storm Hardening" provides the preliminary cost estimate as the project is in the scoping/early design phase presently.

"CHGE Response to DPS-061 Supplemental-Attachment D-Danskammer Storm Hardening" provides a preliminary electrical layout.

"CHGE Response to DPS-061 Supplemental-Attachment E-Danskammer Storm Hardening" provides the study detailing the System load serving capability for cable outage scenarios.

Circuit Breaker Replacement Program:
Please note that the updated material provided in this response should be placed in the Budget Book provided previously in the Substation Section - Tab #20.

"CHGE Response to DPS-061 Supplemental-Attachment F-Breaker Program" provides an update to the circuit breaker replacement program.

"CHGE Response to DPS-061 Supplemental-Attachment G-Breaker Program" provides a basis for prioritization of replacements and justification for linking to other projects as well as pro forma cost estimates for the different types of circuit breaker replacements (i.e. based on voltage class, breaker type).

"CHGE Response to DPS-061 Supplemental-Attachment H-Breaker Program" provides a three year history of circuit breaker replacement cost data.

Freehold Substation:
"CHGE Response to DPS-061 Supplemental-Attachment I-Freehold Substation" provides a preliminary electrical layout for the proposed substation rebuild.

Transformer test cycle / watch list:
Central Hudson's current transformer test cycle for substation power transformers includes doble power factor testing on a 5 year cycle and dissolved gas analysis (DGA) for moisture, combustible gases, interfacial tension etc on an annual basis. "CHGE Response to DPS-061 Supplemental-Attachment J-Transformer Watch List" (provided at the 9/17/2014 meeting) is a copy of our current Transformer Watch List.

Danskammer Storm Hardening Project

- Sandy storm surge 40” above existing grade, 20” above control house floor.
- Existing station is about 65 years old.

Project scope:

1. Installing a new, elevated control house
2. Replacing aged oil-filled breakers with SF6 gas breakers
3. Raising elevation of yard stone
4. Installing cable trench
5. Upgrading protection & controls





Danskammer Storm Hardening Project

Project Cost Estimate

(High Level Budgetary Cost, in $1k)

Scope Item	Design	Construction Material	Construction Labor	Construction Total	Total
Control House	170	1,800	360	2,160	2,330
Breakers	110	720	360	1,080	1,190
Raising grade	20	100	150	250	270
Cable Trench, Foundations	60	490	180	670	730
Protection & Controls	100	290	250	540	640
Miscellaneous	40	210	110	320	360
Total	500	3,610	1,410	5,020	5,520

Danskammer Storm Hardening Project

Projected Expenditure by Year

(High Level Budgetary Cost, in $1k)

2014	2015	2016	Total
100	3,870	1,550	5,520





DANSKAMMER STORM HARDENING PROJECT
PROPOSED CONTROL HOUSE LOCATION
CONCEPTUAL PLAN: NORTH END OF STATION SHOWN

EXISTING OIL FILLED BREAKER TO BE REPLACED WITH SF6 GAS BREAKERS ON ELEVATED SUPPORTS (TYP. 5 LOCATIONS TOTAL)

PULLBOX, USED FOR CABLE TRENCH TRANSITIONS

PRECAST CONCRETE CABLE TRENCH TO SPAN ENTIRE SUBSTATION.

EXISTING CONTROL HOUSE TO REMAIN.

NEW CONTROL HOUSE, ELEVATED 5' ABOVE GRADE. SIZE TBD.

PLAN SECTION F-F

Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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Breaker Replacement Program - 2015

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
MANCHESTER	115 kV	MC-1554-M	GENERAL ELECTRIC	OilBreaker	1952	50%	FK-439-115-3500-1
NORTH CHELSEA	115 kV	SC-1566	ALLIS CHALMERS	Oil Breaker	1972	62%	BZO-115-10000
HONK FALLS	69 kV	WH-769	ALLIS CHALMERS	OilBreaker	1952	46%	FZO-151-69F
HONK FALLS	69 kV	GM-737	GENERAL ELECTRIC	OilBreaker	1963	39%	FK-69-2500-5
HONK FALLS	69 kV	HG-709	ALLIS CHALMERS	OilBreaker	1953	49%	FZO-151-69F
EAST PARK	15 kV	CKT 6073	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	28%	KS-500-12-B
EAST PARK	15 kV	TD-6074	SIEMENS	OilBreaker	1971	29%	SDO-15-500
EAST PARK	15 kV	TD-6075	SIEMENS	OilBreaker	1984	29%	SDO-15-500
BOULEVARD	15 kV	CKT 1014	WESTINGHOUSE	RecloserOil		68%	ESM
OHIOVILLE	15 kV	CKT 5021	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	33%	KS-500-12-B
OHIOVILLE	15 kV	CKT 5022	GENERAL ELECTRIC	OilBreaker	1966	32%	FKD-15.5-18000-4
OHIOVILLE	15 kV	CKT 5023	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	33%	KS-500-12-B
OHIOVILLE	15 kV	CKT 5024	ALLIS CHALMERS	OilBreaker	1972	32%	SDO-15-500
OHIOVILLE	15 kV	W-1537	ITE CIRCUIT BREAKER COMPANY	OilBreaker	1964	31%	KS-500-12-B
OHIOVILLE	15 kV	W-1600	GENERAL ELECTRIC	OilBreaker	1966	31%	FKD-15.5-18000-4
OHIOVILLE	15 kV	W-1602	GENERAL ELECTRIC	OilBreaker	1966	32%	FKD-15.5-18000-4
HONK FALLS	15 kV	TD-3071	COOPER	OilRecloser	1998	0%	WE
HONK FALLS	15 kV	TD-3072	COOPER	OilRecloser	1998	0%	WE

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Breaker Replacement Program - 2016

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age Priority)	(Breaker Duty)	model
DANSKAMMER	115 kV	AC-1051	ALLIS CHALMERS	OilBreaker	1964	91%	BZO-115-7500
DANSKAMMER	115 kV	DC-1411	ALLIS CHALMERS	OilBreaker	1965	91%	BZO-115-7500
DANSKAMMER	115 kV	DR-1421	ALLIS CHALMERS	OilBreaker	1966	87%	BZO-115-7500
DANSKAMMER	115 kV	DC-1061	ALLIS CHALMERS	OilBreaker	1967	90%	BZO-115-7500
DANSKAMMER	115 kV	W-1424	GENERAL ELECTRIC	OilBreaker	1958	90%	FK-439-115-5000-5
FORGEBROOK	115 kV	FT-882-WF	GENERAL ELECTRIC	OilBreaker	1968	74%	FK-439-115-5000-1
HURLEY AVENUE	69 kV	SB-233	GENERAL ELECTRIC	Oil Breaker	1963	58%	FK-69-2500-5
HURLEY AVENUE	69 kV	I-442	GENERAL ELECTRIC	OilBreaker	1963	53%	FK-69-2500-5
HURLEY AVENUE	69 kV	W-142	GENERAL ELECTRIC	OilBreaker	1963	40%	FK-69-2500-6
FORGEBROOK	15 kV	TD-8011	WESTINGHOUSE	Air Breaker	1961	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8012	WESTINGHOUSE	Air Breaker	1965	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8013	WESTINGHOUSE	Air Breaker	1969	77%	150-DH-500E
FORGEBROOK	15 kV	TD-8014	WESTINGHOUSE	Air Breaker	1959	77%	150-DH-500A
FORGEBROOK	15 kV	TD-8015	WESTINGHOUSE	Air Breaker	1959	77%	150-DH-500A
FORGEBROOK	15 kV	TD-8016	WESTINGHOUSE	AirBreaker	1989	77%	150-DH-500
FORGEBROOK	15 kV	W-1486	WESTINGHOUSE	AirBreaker	1973	74%	150-DH-500A
FORGEBROOK	15 kV	CM-1488	WESTINGHOUSE	Air Breaker	1959	72%	150-DH-500A
FORGEBROOK	15 kV	BF-1489	WESTINGHOUSE	Air Breaker	1959	56%	150-DH-500A
FORGEBROOK	15 kV	W-1527	WESTINGHOUSE	Air Breaker	1959	56%	150-DH-500A
FORGEBROOK	15 kV	W-994	WESTINGHOUSE	AirBreaker	1989	57%	150-DH-500
MANCHESTER	15 kV	TD-6091	WESTINGHOUSE	Air Breaker	1960	56%	150-DH-500E
MANCHESTER	15 kV	TD-6092	WESTINGHOUSE	Air Breaker	1960	56%	150-DH-500E
MANCHESTER	15 kV	TD-6093	WESTINGHOUSE	Air Breaker	1964	56%	150-DH-500E
MANCHESTER	15 kV	TD-6094	WESTINGHOUSE	AirBreaker	1968	56%	150-DH-500E
MANCHESTER	15 kV	TD-6095	WESTINGHOUSE	AirBreaker	1979	56%	150-DH-500E
MANCHESTER	15 kV	TD-6096	WESTINGHOUSE	AirBreaker	1982	56%	150-DH-500E
MANCHESTER	15 kV	TD-6097	WESTINGHOUSE	AirBreaker	1982	56%	150-DH-500E
MANCHESTER	15 kV	MS-1457	WESTINGHOUSE	Air Breaker	1960	52%	150-DH-500E
MANCHESTER	15 kV	W-648	WESTINGHOUSE	AirBreaker	1968	52%	150-DH-500E
MANCHESTER	15 kV	W-650	WESTINGHOUSE	AirBreaker	1968	51%	150-DH-500E
MANCHESTER	15 kV	W-1458	WESTINGHOUSE	AirBreaker	1980	52%	150-DH-500E
UNION AVENUE	15 kV	TD-4041	WESTINGHOUSE	Air Breaker	1964	89%	150-DH-500E
UNION AVENUE	15 kV	TD-4042	WESTINGHOUSE	Air Breaker	1956	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4043	WESTINGHOUSE	Air Breaker	1957	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4044	WESTINGHOUSE	Air Breaker	1969	89%	150-DH-500E
UNION AVENUE	15 kV	TD-4045	WESTINGHOUSE	Air Breaker	1956	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4046	WESTINGHOUSE	Air Breaker	1958	89%	150-DH-500A
UNION AVENUE	15 kV	TD-4049	WESTINGHOUSE	AirBreaker	1967	89%	150-DH-500E
UNION AVENUE	15 kV	UN-594	WESTINGHOUSE	Air Breaker	1957	94%	150-DH-250A
UNION AVENUE	15 kV	UW-1494	WESTINGHOUSE	Air Breaker	1958	94%	150-DH-500A
UNION AVENUE	15 kV	W-1095	WESTINGHOUSE	Air Breaker	1961	41%	150-DH-500E
UNION AVENUE	15 kV	W-1105	WESTINGHOUSE	AirBreaker	1961	41%	150-DH-500E
UNION AVENUE	15 kV	W-837	WESTINGHOUSE	AirBreaker	1964	45%	150-DH-500E

Breaker Replacement Program - 2017

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
ROCK TAVERN	115 kV	W-681	GENERAL ELECTRIC	Oil Breaker	1971	19%	FK-121-43000-2
ROCK TAVERN	115 kV	W-814	GENERAL ELECTRIC	Oil Breaker	1971	37%	FK-121-43000-3
ROCK TAVERN	115 kV	RD-809	ALLIS CHALMERS	OilBreaker	1971	47%	BZO-115-10000
ROCK TAVERN	115 kV	RJ-818	ALLIS CHALMERS	OilBreaker	1971	47%	BZO-115-10000
ROCK TAVERN	115 kV	D-448	ALLIS CHALMERS	OilBreaker	1971	43%	BZO-115-10000
ROCK TAVERN	115 kV	SL-684	ALLIS CHALMERS	OilBreaker	1971	39%	BZO-115-10000
ROCK TAVERN	115 kV	J-788	ALLIS CHALMERS	OilBreaker	1971	38%	BZO-115-10000
ROCK TAVERN	69 kV	WM-1675	GENERAL ELECTRIC	Oil Breaker	1964	23%	FK-69-2500-6
FISHKILL PLAINS	15 kV	TD-8091	WESTINGHOUSE	AirBreaker	1963	73%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8092	WESTINGHOUSE	AirBreaker	1963	71%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8093	WESTINGHOUSE	AirBreaker	1963	73%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8094	WESTINGHOUSE	AirBreaker	1963	74%	150-DH-500E
FISHKILL PLAINS	15 kV	TD-8095	CUTLER-HAMMER	VacBreaker	1963	42%	150-DH-VR-500
FISHKILL PLAINS	15 kV	TD-8096	CUTLER-HAMMER	VacBreaker	1963	42%	150-DH-VR-500
FISHKILL PLAINS	15 kV	W-975	WESTINGHOUSE	AirBreaker	1963	34%	150-DH-500E
FISHKILL PLAINS	15 kV	W-976	WESTINGHOUSE	AirBreaker	1963	34%	150-DH-500E
FISHKILL PLAINS	15 kV	W-1000	WESTINGHOUSE	AirBreaker	1963	32%	150-DH-500E
HURLEY AVENUE	15 kV	CKT 2091	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2092	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2093	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	CKT 2094	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	79%	15HK-500
HURLEY AVENUE	15 kV	W-1575	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	29%	15HK-500
HURLEY AVENUE	15 kV	W-252	ITE CIRCUIT BREAKER COMPANY	AirBreaker	1972	44%	15HK-500
WOODSTOCK	15 kV	TD-3011	ALLIS CHALMERS	AirBreaker	1972	23%	FC-500A
WOODSTOCK	15 kV	TD-3012	GENERAL ELECTRIC	AirBreaker	1947	46%	AM-15-250-1
WOODSTOCK	15 kV	TD-3013	GENERAL ELECTRIC	AirBreaker	1947	46%	AM-15-250-1
WOODSTOCK	15 kV	TD-3014	ALLIS CHALMERS	AirBreaker	1972	26%	FC-500A
WOODSTOCK	15 kV	W-1091	GENERAL ELECTRIC	AirBreaker	1947	44%	AM-15-250
WOODSTOCK	15 kV	W-1059	ALLIS CHALMERS	AirBreaker	1972	22%	FC-500A
WOODSTOCK	15 kV	W-25	GENERAL ELECTRIC	AirBreaker	2001	49%	AM-15-250-1

New PCC to be installed to replace all 15kV breakers.

Breaker Replacement Program - 2018

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
HURLEY AVENUE	345kV	30151	WESTINGHOUSE	SF6Breaker	1976	37%	362-SFA-40
HURLEY AVENUE	345kV	30353	WESTINGHOUSE	SF6Breaker	1976	24%	362-SFA-40
NORTH CHELSEA	115 kV	AC-1086	PENNSYLVANIA TRAN	Oil Breaker	1968	57%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	B-2651	GENERAL ELECTRIC	Oil Breaker	1964	63%	FK-115-10000
NORTH CHELSEA	115 kV	B-2652	PENNSYLVANIA TRAN	Oil Breaker	1968	63%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	B-2653	PENNSYLVANIA TRAN	Oil Breaker	1968	63%	AHJ-54-115-10000
NORTH CHELSEA	115 kV	DC-1414	PENNSYLVANIA TRAN	Oil Breaker	1968	57%	AHJ-54-115-10000
WEST BALMVILLE	115 kV	DW- 662	ALLIS CHALMERS	OilBreaker	1965	30%	BZO-115-7500
UNION AVENUE	115 kV	RJ 52	GENERAL ELECTRIC	OilBreaker	1952	40%	FK-439-115-3500-3
MONTGOMERY ST	15 kV	NM-384	WESTINGHOUSE	Air Breaker	1958	45%	150-DH-500A
MONTGOMERY ST	15 kV	NB-385	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4001	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4002	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	TD-4003	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-507	WESTINGHOUSE	Air Breaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-508	WESTINGHOUSE	AirBreaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	W-509	WESTINGHOUSE	AirBreaker	1958	63%	150-DH-500A
MONTGOMERY ST	15 kV	R-350	WESTINGHOUSE	Air Breaker	1958	58%	150-DH-500A
MONTGOMERY ST	15 kV	F-351	WESTINGHOUSE	Air Breaker	1958	58%	150-DH-500A
MONTGOMERY ST	15 kV	B-352	WESTINGHOUSE	Air Breaker	1958	60%	150-DH-500A
MONTGOMERY ST	15 kV	W-359	WESTINGHOUSE	Air Breaker	1958	60%	150-DH-500A
MONTGOMERY ST	15 kV	WN-486	WESTINGHOUSE	Air Breaker	1958	61%	150-DH-500A
MONTGOMERY ST	15 kV	W-489	WESTINGHOUSE	Air Breaker	1958	49%	150-DH-500A

09.24.14
9/24/14 11:42 AM

Breaker Replacement Program - 2019

location (Substation)	equip_class (Voltage)	equip_position (Device ID)	manufacturer	equip_type (Type)	mfg_date (Age - Priority)	(Breaker Duty)	model
HURLEY AVENUE	345kV	30354	WESTINGHOUSE	SF6Breaker	1976	37%	362-SFA-40
PLEASANT VALLEY	115 kV	RX-4	ALLIS CHALMERS	OilBreaker	1968	53%	BZO-115-10000-2
PLEASANT VALLEY	115 kV	R-81	ALLIS CHALMERS	OilBreaker	1968	43%	BZO-115-10000-2
PLEASANT VALLEY	115 kV	PVL-R-10	ALLIS CHALMERS	OilBreaker	1980	63%	BZO
PLEASANT VALLEY	115 kV	PVL-R-61	MCGRAW EDISON	OilBreaker	1973	35%	OHT-54
PLEASANT VALLEY	115 kV	PVL-R-62	ALLIS CHALMERS	OilBreaker	1980	45%	BZO
HURLEY AVENUE	115 kV	HP-1643	ALLIS CHALMERS	OilBreaker	1969	29%	RXE
HURLEY AVENUE	115 kV	W-389	ALLIS CHALMERS	OilBreaker	1973	28%	FK-143
HURLEY AVENUE	115 kV	OR-1640	ALLIS CHALMERS	OilBreaker	1969	25%	BZO-121-50-6
HURLEY AVENUE	115 kV	A-2451	ALLIS CHALMERS	OilBreaker	1973	21%	BZO-121-40-3PST
SAND DOCK	15 kV	BP-1296	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-902	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-909	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	TW-910	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	W-116	WESTINGHOUSE	VacBreaker	1973	75%	150-VCP-W-750
SAND DOCK	15 kV	BP-1570	WESTINGHOUSE	AirBreaker	1973	75%	150-DHP-500
SAND DOCK	15 kV	GB-1468	WESTINGHOUSE	VacBreaker	1986	28%	150-VCP-500
SAND DOCK	15 kV	SH-886	WESTINGHOUSE	VacBreaker	1983	50%	150-DVP-750
SAND DOCK	15 kV	SH-911	WESTINGHOUSE	VacBreaker	1983	50%	150-DVP-750
SAND DOCK	15 kV	TD-6011	WESTINGHOUSE	VacBreaker	1986	41%	150-VCP-500
SAND DOCK	15 kV	W-1449	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-1453	WESTINGHOUSE	AirBreaker	1973	42%	150-DHP-500
SAND DOCK	15 kV	W-1467	WESTINGHOUSE	VacBreaker	1986	29%	150-VCP-500
SAND DOCK	15 kV	W-1568	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-1573	WESTINGHOUSE	AirBreaker	1973	41%	150-DHP-500
SAND DOCK	15 kV	W-857	MCGRAW EDISON	OilBreaker	1984	41%	Rmag
COXSACKIE	15 kV	TD-1071	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1072	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1076	GENERAL ELECTRIC	AirBreaker	1969	70%	AM-13.8-500-6H
COXSACKIE	15 kV	TD-1074A	GENERAL ELECTRIC	AirBreaker	1969	67%	AM-13.8-500-6H
COXSACKIE	15 kV	W-1398	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-296	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-484	GENERAL ELECTRIC	AirBreaker	1969	42%	AM-13.8-500-6H
COXSACKIE	15 kV	W-51	ITE CIRCUIT BREAKER	AirBreaker	1972	42%	15HK-500

Location (Substaion)	Class (kV)	# of Breakers Replaced	Position (Device ID)	In Service Date	Work Order	Pro-Forma Cost	Book Total Work Order: A	Book Total Work Order: R	Cost per Breaker	Notes
Milan	115 kV	2	RT-7 & R-10	06/01/2014	0677-E	$220,000.00	$327,731	$38,690	$183,211	
FISHKILL PLAINS	115 kV	1	A-1498	06/01/2014	7519-D	$220,000.00	$67,283	$0	$67,283	
EAST WALDEN	15 kV	1	EWD-CKT 5042	04/12/2014	8621-D		$81,440	$4,077	$85,517	
REYNOLDS HILL	115 kV	3	DR-1418, IR-1143, & W	04/02/2014	8630-D	$220,000.00	$578,597	$70,442	$216,346	
PULVERS CORNERS	15 kV	2	7091 & 7092	08/02/2013	6982AR		$248,390	$8,709	$128,550	Replaced with Vipers EACH HAS 3 PHASES
DANSKAMMER	115 kV	1	DB-1171	06/27/2013	0428AR	$220,000.00	$121,414	$13,133	$134,547	
STANFORDVILLE	15 kV	2	CKT 7072 & CKT 7071	06/20/2013	6985AR		$166,638	-$7,543	$79,548	Replaced with Vipers EACH HAS 3 PHASES
ROCK TAVERN 345 kV	345 kV	2	4255 & 31154	05/02/2013	7706AR	$750,000.00	$1,347,299	$169,657	$758,478	
OHIOVILLE	69 kV	2	OB-1244 & O-1078	02/26/2013	7018A	$200,000.00	$223,766	$15,690	$119,728	
NORTH CHELSEA	115 kV	1	W-1572	02/07/2013	6747AR	$220,000.00	$133,470	$32,677	$166,147	
WEST BALMVILLE	115 kV	1	WBA-MW-421	01/01/2013	6005-D	$200,000.00	$172,664	$7,518	$180,182	
MYERS CORNERS	15 kV	11	multiple Roll-ins	12/18/2012	7078AR	$36,000.00	$212,150	$68,025	$25,470	
EAST WALDEN	15 kV	1	CKT 5041	07/28/2012	8429A/R	$36,000.00	$22,483	$0	$22,483	
DANSKAMMER	115 kV	1	W-1224	05/24/2012	7849AR	$220,000.00	$123,753	$24,757	$148,510	
ROCK TAVERN 345 kV	345 kV	2	37751 & 31153	05/02/2012	5645AR	$750,000.00	$1,194,120	$135,400	$664,760	

Total Cost 2014 to Date	$1,168,260
Total Cost 2013	$2,653,482
Total Cost 2012	$1,780,688

Exhibit__(EIP-1)(Redacted)
Page 914 of 1288

BRUNING 12259

REVISIONS
① 11-15-72 R/W-BLDG'A PER HIGHWAY DEPT.

CENTRAL HUDSON GAS & ELEC. CORP.	
SCALE 1" = 20.00'	FREEHOLD SUB.
DATE 7-12-72	NEW
REVISION NO.	PLOT PLAN
FILE NO.	132A A
SH. NO. OF	72258

W.O. NO. 81006 A	CHECKED		
PROJ. NO. 72-G70	CLEARED		
DRAWN	R/W		
SUPV.	APPROVED		

REFERENCE DWGS.
FOUNDATION PLAN ——— 132 A - F - 72219
ELECTRICAL LAYOUT ——— 132 A - E - 72217

NOTE
TOP 3" TO 4" OF TOP SOIL TO BE REMOVED AND STATION AREA TO BE LEVELED. ENTIRE STATION TO BE SURFACED WITH CRUSHED STONE TO A MINIMUM DEPTH OF 4".

372' BETWEEN POLES

75' POLE #86

CHG'E POLE

GUARD RAIL

18"ø x 40' C.S. CULVERT PIPE

TO FREEHOLD

DRIVEWAY

ROUTE #32

CHG'E POLE #6670

TO GREENVILLE

NORTH

TO' POLE #87

50' POLE #89

168 ±'

171'-0"

457'-0"

STATION GRADE
(SEE FUTURE BANK XFMR OR MOBILE XFMR)

℄ OF STATION

℄ OF 2 POLE SWITCH STRUCT.

82'-0"

75'-0"

111'-0"

101'-0"

120'

132'-6"

156'-0"

31'-0"

15'-0"

22'-0"

20'-0"

13'-10"

30'-0"

3'-0"

12'-0"

11'-0"

9'-0"

22'-0"

PCC

Cases 14-E-0318 & 14-G-0319

SUBSTATION	TRANSFORMER DESIGNATION	SERIAL #	YEAR MANUFACTURED	MANUFACTURER	T-DRAWING	VOLTAGE CLASS (kV)	CAPACITY (MVA)	PREVIOUS PF TEST DATE	PF TEST RESULTS	DGA ANALYSIS	OIL QUALITY	OVERALL TRANSFORMER HEALTH	FORECAST
Freehold	TR #1	5001975	1935	GE	T-8500-1	66/14.8	8.5/11.3	04/15/2010	CL consistently high (0.8%), all other insulation acceptable.	Historic overheating (oil)	IFT - 24, Neut - 0.12	Bad	Transformer Replacment - 2015
Montgomery St	TR #2	5879248	1938	GE	T-4500-2	13.2/4.16	4.5/6	11/30/2011	All insulation PF values are elevated (> 1.0%)	Overheating (oil & paper)	Rel Sat - 63%	Bad	Transformer Replacement - 2016
Montgomery St	TR #1	5879247	1938	GE	T-4500-2	13.2/4.16	4.5/6	11/09/2011	CL consistently high at (1.56%), CH elevated to (1.34%)	Overheating (oil & paper)	IFT - 25	Bad	Transformer Replacement - 2016
North Chelsea	TR #1 PH 2	4081320	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are high (1.7% - 4.5%)	Overheating (oil)	IFT - 25	Bad	N/A
North Chelsea	TR #1 PH 1	4081321	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are consistently high (1.6% - 2.6%)	All gasses are very high	IFT - 22	Bad	N/A
North Chelsea	TR #1 PH 3	4081319	1947	Westinghouse	T-6667-1	110/68	6.667/8.88	05/07/2008	All insulation PF values are consistently elevated, CT (2.78%) especially high	TCG high but stable, Overheating (oil)	Acceptable	Bad	N/A
Ohioville	TR #3 PH 1	5062193	1951	Westinghouse	T-6667-1	115/69/13.8	6.667/8.88	09/02/2010	CT (1.17%) elevated but stable	Good	Rel Sat - 30%	Bad	Transformer Removal - 2015
Ohioville	TR #3 PH 2	5062194	1951	Westinghouse	T-6667-1	115/69/15	6.667/8.88	09/02/2010	CT (0.92%) elevated but stable	Overheating (oil)	Rel Sat - 17%	Bad	Transformer Removal - 2015
Beacon	TR #2	5469527	1937	GE	T-1500-7	13.2/4.33	1.5/2	03/15/2011	Data not sufficient, internal ground connections.	Good	Acceptable	Acceptable	Station Retirement - 2016
Boulevard	TR #2	6190899	1940	GE	T-8500-2	66/14.85	8.5/11.33	05/07/2008	Readings increased slightly, still acceptable.	Good	Acceptable	Acceptable	Transformer Replacment - 2017
Clinton Avenue	TR #1 TAP CHN	C505063	1957	GE	T-5000-9	67/4.36	5/6.25	07/22/2013	CI (1.27%) historically high, but stable	Good	Acceptable	Acceptable	N/A
Coxsackie	TR #1	C656684	1957	GE	T-10000-3	69/13.8	10/13.3	12/27/2011	CH is high, all other insulation is acceptable	Good	Acceptable	Acceptable	N/A
Dashville	TR #2	C184483	1956	GE	T-3750-4	67/4.356	3.75/4.687	06/25/2013	Acceptable	Overheating (paper)	Acceptable	Acceptable	N/A
Greenfield Road	TR #1 PH 3	5959797	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	CL slightly elevated, all other insulation acceptable	Good	IFT - 26	Acceptable	N/A
Greenfield Road	TR #1 PH 2	5959798	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	Acceptable	Good	IFT - 25	Acceptable	N/A
Greenfield Road	TR #3	8110261	1950	GE	T-2000-8	66/4.156	2/2.5	12/19/2011	Acceptable	Good	Acceptable	Acceptable	N/A
Greenfield Road	TR #1 PH 1	5959799	1939	GE	T-667-4	66/4.17	0.667/0.833	10/15/2013	CL continues to be elevated, all other insulation acceptable	Good	Acceptable	Acceptable	N/A
Grimley Road	TR #1	C184399	1955	GE	T-3750-6	69/13.2	3.75/4.687	05/22/2012	Acceptable	Good	Acceptable	Acceptable	N/A
Hurley Avenue	SST-1	5960031	1939	GE	T-2000-5	66/14.4	2/2.5	10/21/2008	Acceptable	Good	IFT - 27	Acceptable	N/A
Kerhonkson	HK LINE	4087889	1949	Westinghouse	T-VR-1	69	20	03/25/2008	Acceptable	Good	IFT - 27	Acceptable	N/A
Kerhonkson	MK LINE	4087888	1949	Westinghouse	T-VR-1	69	20	08/11/2009	Acceptable	Good	Acceptable	Acceptable	N/A
Montgomery	TR #1	8800860	1954	GE	T-2000-10	66/4.38	2/2.5	06/10/2009	Acceptable	Good	Acceptable	Acceptable	N/A
North Catskill	TR #4	5063135	1951	Westinghouse	T-26400-1	110/68	26.4/33	10/24/2011	Acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
North Catskill	TR #5	6530626	1956	Westinghouse	T-26400-2	115/68	26.4/33	10/19/2011	CT (0.56%) is slightly elevated but still acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
Reynolds Hill	TR #4	B498168	1952	GE	T-20000-1	110/14.85/4.38	20/26.7/33.3	04/02/2012	Acceptable	Good	Acceptable	Acceptable	Transformer Replacement - 2016
Rhinebeck	GRD TRANS #1	C503095	1957	GE	T-2000-19	13.8/7.98	2	12/13/2012	Acceptable	Good	Acceptable	Acceptable	Station Upgrade - 2015
Rhinebeck	TR #1 PH 2	5244080	1936	GE	T-2880-2	69/14.4/2.4	2.88/3.6	02/07/2011	CL (0.87%) elevated but stable, all other insulation is acceptable	Good	Acceptable	Acceptable	Station Upgrade - 2015
Smithfield	TR #1	5069073	1953	Westinghouse	T-3750-1	66.83/13.09	3.75/4.687	04/01/2008	CH (0.66%) slightly elevated, but stable	Overheating (paper)	Acceptable	Acceptable	N/A
Stanfordville	TR #1	6531840	1955	Westinghouse	T-3750-7	67/13.8	3.75/4.687	01/06/2010	Acceptable	Overheating (paper)	Acceptable	Acceptable	N/A
Tinkertown	TR #1	D203741	1958	GE	T-10000-6	67/14.4/8.5	10/12.5	01/09/2009	Acceptable	Good	Acceptable	Acceptable	N/A
Tinkertown	TR #2	39667-1	1957	PennTransformer	T-10000-4	67/14.4/4.8	10/12.5	03/08/2011	Acceptable	Good	Acceptable	Acceptable	N/A
Union Avenue	TR #1	6533064	1957	Westinghouse	T-20000-3	115/14.8/4	20/26.7/30.6	03/06/2012	Acceptable	Overheating (oil)	Acceptable	Acceptable	N/A
Van Wagners	TR #1	8800859	1951	GE	T-2000-10	66/4.8	2/2.5	12/02/1995	Acceptable	Good	Acceptable	Acceptable	Station Retirement - 2015
Balmville	TR #1	B364278	1951	GE	T-2000-13	13.2/4.16	2/2.3	11/15/2012	All PF increased from previous test, but still acceptable (< 0.6%)	Good	Rel Sat - 22%, IFT - 26	Monitor	Station Retirement - 2015
Beacon	TR #1	5589416	1937	GE	T-1500-7	13.2/4.33	1.5/2	03/15/2011	Data not sufficient, internal ground connections.	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2016
Boulevard	TR #1 PH 3	2790840	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Boulevard	TR #1 PH 2	2790841	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Boulevard	TR #1 PH 1	2790842	1954	Westinghouse	T-5000-2	66/13.2	5/6.667	07/01/2010	Consistently high readings in all insulation, stable.	Good	Acceptable	Monitor	Transformer Replacment - 2017
Converse Street	TR #2	C160454	1956	GE	T-3750-8	13.8/4.36	3.75/4.687	05/13/2010	Consistently high readings in all insulation, CL >7 in 2010	Overheating (oil)	Acceptable	Monitor	N/A
Forgebrook	TR #1	6534949	1958	ABB	T-20000-4	115/14.85	20/26.7/31	11/29/2012	Acceptable	TCG high but stable, Overheating (oil & paper)	IFT - 22	Monitor	N/A
Grimley Road	TR #2	2669278	1955	Allis Chalmers	T-5000-3	65.2/13.09	5	05/22/2012	Consistently high readings in all insulation except CH, stable	Good	Rel Sat - 16%	Monitor	N/A
Kerhonkson	TR #2	5589893	1937	GE	T-6000-3	66/14.8	6/7.5	03/22/2011	Acceptable	TCG high but stable, Overheating (oil)	IFT - 20	Monitor	Station Upgrade -2016
Maryland Avenue	TR #1	C160448	1955	GE	T-3750-3	13.8/4.36	3.75/4.687	03/02/2005	CL Increasing (0.37 to 0.44 to 0.54)	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2016
Maryland Avenue	TR #2	C160459	1955	GE	T-3750-14	13.8/4.36	3.75/4.687	06/05/2006	CH, CL and CHL are high (0.8% range) but stable	Good	Acceptable	Monitor	Station Retirement - 2016
Mckinley Street	TR #1	B686695	1954	GE	T-2000-18	14.4/4.16	2/2.3	12/07/2006	CH (0.51%) and CL (0.63%) slightly eleveated, but stable	Overheating (paper)	Acceptable	Monitor	Station Retirement - 2015
Mobile Sub	MOBILE (5MVA) XFMR	6532438	1955	Westinghouse	T-5000-4	67/13.8	5	09/30/2011	Acceptable	Overheating (paper)	Rel Sat - 30%	Monitor	N/A
Ohioville	TR #3 PH 3	8275175	1951	GE	T-6667-2	110/63.5/68	6.667/8.88	09/02/2010	CT (0.63%) slightly elevated but stable	Good	Rel Sat - 35%	Monitor	Transformer Removal - 2015
Pulvers Corner	TR #1	6531841	1955	Westinghouse	T-3750-7	67/13.8	3.75/4.687	04/22/2013	CT (0.69%) slightly elevated but stable	Overheating (paper)	Acceptable	Monitor	N/A

Reynolds Hill	TR #3	B686277	1954	GE	T-20000-2	110/14.8/4.4	20/26.7/33.3	04/04/2012	All insulation PF values slightly elevated (0.59% - 0.784%)	High CO2 but stable	Acceptable	Monitor	Transformer Replacement - 2016
Rhinebeck	TR #2	4680322	1931	GE	T-10000-1	66/14.85/4.8	10/12.5	12/13/2012	Acceptable	Overheating (oil & paper)	Rel Sat - 25% IFT - 25	Monitor	Station Upgrade - 2015
Rhinebeck	TR #1 PH 1	4497738	1956	GE	T-2880-1	69/14.4/2.4	2.88/3.6	02/07/2011	Consistently high historical results in all insulation, improved in 2010/11 testing	Overheating (paper)	Rel Sat - 21%	Monitor	Station Upgrade - 2015
Rhinebeck	TR #1 PH 3	4497737	1956	GE	T-2880-1	69/14.4/2.4	2.88/3.6	02/07/2011	Consistently high historical results in all insulation, improved in 2010/11 testing	Overheating (paper)	Rel Sat - 20%	Monitor	Station Upgrade - 2015
Smith Street	TR #2	C156560	1954	GE	T-3750-2	13.2/4.36	3.75/4.687	12/03/1998	Data not sufficient, internal ground connection on LV.	TCG high, overheating (paper)	IFT - 26	Monitor	Station Retirement - 2014
Smith Street	TR #1	C156559	1954	GE	T-3750-2	13.2/4.36	3.75/4.687	12/02/1998	Data not sufficient, internal ground connection on LV.	TCG high but stable, Overheating (paper)	Acceptable	Monitor	Station Retirement - 2014

"MR" LINE TO MILAN

MR-647
1200 AMP;
61kA MOM

795 MCM AA

PCA-S
115 kV 550 kV BIL
1000/600:1

PT-A

1200 AMP TYPE MD 2 FREQ

85 kHz
155 kHz

S FREQ LINE TUNER JZ 78.64

DTT XMTR

FUTURE

Hybrid

XMTR 155kHZ
RCVR 157kHZ

115kV

MR-660
600 AMP;
40kA MOM
(89-1)

98kV

795 MCM AA

28" AL. IPS

TRANSF. #3
115/69kV;
50/66.7/83.3//93.3 MVA @ 55//65°C;
550/350kV BIL;
±10% LTC, ±5% NLTC

1200/5 MR 400/5 TAP
2000/5 MR 400/5 TAP
800/5 SR Ø1
1200/5 SR
1200/5 MR
600/5 MR

60kV

LDC

63 SPR
63X SEAL IN

W-258
600 AMP;
1500 MVA INTER;
8 CYCLE

W-273
1200 AMP;
40kA MOM

69kV

W-1669
600 AMP;
40kA MOM

50CB SC

W-1668
1200 AMP;
61kA MOM

T.C.
S.T.
"I.P.S.

W-38
1200 AMP;
40kA MOM

Q-1472
1200 AMP;
40kA MOM

Q-1471
600 AMP;
1500MVA INTER;
8 CYCLE

Q-1470
1200 AMP;
40kA MOM

2-167 kVAR

100/5

103 T000W

86CB-1 LOR
86CB-2 LOR

59NPCB UP
59NBUCB BE1-59N

ALARM

69 kV 12.25 MVAR RATED
14.4 MVAR(NOMINAL)
3-SERIES GROUPS OF 8 PARALLEL CAPACITOR UNITS PER PHASE

94CB RO94G
52CB RO52C
59CB RO52G

94CB AR
52-C TD-5

50CB SC
50/51 CO CO-8

PT TYPE TEV69 350/120:1

94-Q AR

MTS
SXN /SXN CO-9
52/SX CO-9

79 ACR
81 UPSLOW

TRANSF. #2
68kV-14.85kV-4.8kV;
(-)10%-(-)10% NLTC-(±)5%NLTC;
10/12.5 MVA @ 55°C

PT-6
8400-120V;
70:1

10A
27-2 AGR

TO W-367
14.4kV BUS#2
CT'S-SEE SHT. 2

"Q" LINE TO STAATSBURG

336.4 MCM ACSR

Q-1487
1200 AMP;
61kA MOM
(89-5)

27/SY-1 CV-7

CLF TYPE 150SV69 350/600:1

Q-1340
600 AMP;
40kA MOM

SMD-1 12SE

AG-1
600 AMP;
40kA MOM

TRANSF. #1(3-1Ø)
66-13.8-4.83kV;
8.64/10 MVA @ 55°C;
3-2.88/3.6 MVA @ 55°C;
(-)10%NLTC- ±5% NLTC- ±5%NLTC

3kV

GROUNDING TRANSF.
15.8-15.8kV;
110-110 kV BIL;
(±)10%NLTC- ±5% NLTC;
2000 kVA @ 55°C

12kV

1.I.P.S.

4/0 CU

3-1/C 750 MCM XLPE

TO W-1017
A.C.B.
(SH. 2)

MR-557
1200 AMP;
61kA MOM
(89-2)

2000/5 MR 1200/5 TAP

S.MDB

21.21N.25.27 50.50N.67N.79

95P-ER SEL-311C

kV.kW kVAR

21.21N.50 50N.67N

95BU-ER D60

ER-835
1200 AMP;
61kA MOM
(89-3)

ER-830-MR
1600 AMP;
10,000 MVA;
INTER;
3 CYCLE

95P-ER-830MR SEL-351A

50.50N.62

95P-MR SEL-311C

95BU-MR D60

5/5A

ER-831
1200 AMP;
61kA MOM
(89-6)

ER-806
1200 AMP;
61kA MOM
(89-4)

PCA-S (Ø3)
115kV 550kV BIL
1000/600:1

TEVF-115 (Ø1&Ø2)
115kV 550kV BIL
1000/600:1

PT-B

70 kHz
110 kHz

HYBRID MODE

CARRIER UNBLOCK
XMTR 110 kHz
RCVR 108 kHz

DTT CARRIER
XMTR 72 kHz
RCVR 71 kHz

TRANSF. #4
115-13.8kV;
550-110kV BIL;
±5% NLTC-±10% LTC;
20/26.67/33.33 MVA @ 55°C

1200/5MR 400/5 TAP
1200/5MR 1200/5 TAP
2000/5 MR 2000/5 TAP

TO METERING SEE SHT. 2

TO METERING POT. SEE SHT. 2

TO W-1238
A.C.B.
(SH. 2)

TO W-1238
14.4 kV BUS #2
CT'S SEE SHT. 2

"ER" LINE TO EAST KINGSTON

* SEE TRIPPING SCHEDULE(SHEET 4)

Record Print

REDRAWN ON CADAM 11/24/92 FROM SIGNED ORIGINAL -DOM

REVISIONS
9 11-8-10 FIELD REV. TRANSFORMER #4 TIE BREAKER INSTALLATION RAB/MFB/JID/EMS
8 3-20-06 1088A/R 05-678 ER LINE RELAY UPGRADE JFT/MFB/RC/HAN/DJW
7 REM. 2-95 1088A/R 95-600 JFT/JEC/STV/JD
6 11/02 6386A/R 02-677 MR LINE RELAYING UPGRADE CDT/BND/EBA/CJM/HNN
5 12-14-99 3692A 98-668 JFT/BND/MEH
4 5-7-98 W.O. 3051A/R 97-689 INS. XFMR. #3 REM. MOBILE XFMR. TCJ/BND/JAK/MFR/MDR/TCD/RJW
3 1-28-98 W.O. 3051A/R 97-689 INS. MOBILE XFMR. RECORDED TCJ/BND/JAK/MDR/TCD/RFR/RJW
2 11-29-95 WO 2190A/R 94-760 ADD VOLTAGE XDUCER CMC BND JAK RFR DJD TCD RJW
1 1/15/93 W.O. 9257A INSTALL 115kV BANK DGW/JFT BND/LJS CDG DJD TCD KAM

CENTRAL HUDSON GAS & ELEC. CORP.		SCALE	N.T.S.
RHINEBECK SUBSTATION ONE LINE DIAGRAM		DATE	11-23-77
		REV. NO.	9
		FILE NO.	30C C
W.O. NO.	9326A	CHECKED	DVB KAM
PROJ. NO.	74-729	CLEARED	EJM RFR HL
DRAWN	MER	R/W	7928
SUPV.	PK	APPROVED	PJV
		SH. NO.	1 OF 3

CAD DRAWING
DO NOT REVISE MANUALLY

Cases 14-E-0318 & 14-G-0319

Exhibit__(EIP-1)(Redacted)
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TO TRANSF #2
(SEE SHEET #1)

TO 87T2/HU-1 RELAY
(SEE SHEET #1)

TO TRANSF. #1
(SEE SHEET #1)

12 kV
1200/5 S.R.
5A
3A
87B2 CA4
86B2 LOR *
1200/5 S.R.
1A
MTS
2A
AMP
Ø3
10A
6A
W-367
1200 AMP
500 MVA INTER
5 CYCLE
(UNIT #9)
52b
W-1238
2-T12 MGA
79 HGA
1200/5
67 IRV-6 (3)
TO TRANSF. #4 METERING CIRCUIT SEE SH. 1
TD
kW (G) CCW
kVAR (G) CCVAR
kWH DSGG
VS
VM Ø1 Ø3
SS-1 MG-G (NOTE 1)
PT
OUT OF SERVICE
14.4 kV-120V
UNIT #5
W-1067
1200 AMP
DUMMY BREAKER
UNIT #6
1200/5 S.R.
1200/5 S.R.
SST-2
1-50 kVA
14.4 kV-13.8 kV
UNIT 8
EJO-1 5E
250 A
14.4 kV BUS #2
1200 AMP
95 kV BIL
95 kV BIL BUS DUCT
1200 AMP
95 kV BIL
W-1280
1200 AMP
500 MVA
5 CYCLE
UNIT #11
SI
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000 A
95 kV BIL
W-1066
1200 AMP
500 MVA
5 CYCLE
UNIT #4
1200/5 S.R.
1200/5 S.R.
14.4 kV BUS #1
1200 AMP
95 kV BIL
95 kV BIL BUS DUCT
3-1/c 750 MCM PCLC
1200/5 S.R.
87B1 CA4
86B1 LOR *
10A
AMP
3A
600/5 S.R.
STATION SVC. 120/240V
ATS NOTE 2
SS-2
200 A SAFETY SW.
W-1017
1200 AMP
500 MVA
5 CYCLE
UNIT #1
SS-1
200 A SAFETY SW.
67 HCR (3)
1A
1.5A
1200/5 S.R.
250A
SST-1
1-50 kVA
14.4 kV-13.8 kV
UNIT 1B
EJO-1 5E
EJ-1 5E
PT-1
8400-120/70V
UNIT #1B
10A
10A
VM Ø1
AMP ADM-2
TD
AMP CA
2A
1A
600/5 S.R.
50M/51M CO-11
50/51 CO-11 (3)
5/10A
MTS
5 MDB
kW kVAR
5/5A
50/51 50N/51N 79
95P-7051 SEL-251
95EU-7051/56 SEL-501
X 50/51 50N/51N
Y 50/51 50N/51N
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
50/51 50N/51N 79
95P-7056 SEL-251
1200/5 S.R.
1200/5 S.R.
TD-7053
1200 AMP
500 MVA INTER
5 CYCLE
UNIT #8
TD-7051
1200 AMP
500 MVA
5 CYCLE
UNIT #7
TD-7052
1200 AMP
500 MVA
5 CYCLE
UNIT #3
TD-7056
1200 AMP
500 MVA
5 CYCLE
UNIT #2
TD-7054
1200 AMP
500 MVA
5 CYCLE
UNIT #1A
SI
T.C.
CC
79 RC
79 NLR
3A
15A
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
1200/5 S.R.
EJ-1 1E
PT-2
8400-120V
UNIT #14
10A
120V-70V
10A
TD-7055
1200 AMP
500 MVA
5 CYCLE
UNIT #13
2000/5 S.R.
2000/5 S.R.
2500A CELL
UNIT #12
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000 A
95 kV BIL
W-1238
2500 A
500 MVA
5 CYCLE
UNIT #10
2-T4 AGA
79 HGA
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
2000/5 S.R.
1-3/c 500 MCM PCLC
1-1/c 4/0 NEUT.
1-3/c 500 MCM PCLC
3-1/c 500 MCM KERITE
1-1/c 350 MCM WR NEUT
3-1/c 500 MCM KERITE
1-1/c 350 MCM W.R. NEUT.
1-3/c 500 MCM PCLC
1000 MCM KERITE ALUM.
1500 MCM KERITE 2/Ø
TO CIRCUIT 7053
TO CIRCUIT 7051
TO CIRCUIT 7055
TO FUTURE TRANSFORMER
TO TRANSF. #1 (SEE SHEET #1)
TO 87T4 HU (SEE SH. 1)
TO CIRCUIT 7052
TO CIRCUIT 7056
TO CIRCUIT 7054

*- SEE TRIPPING SCHEDULE (SHEET 4)

Record Print

NOTE:
1- AUTO-THROWOVER PT-1 PREFFERED SOURCE.
2- STA. SERV. AUTO-THROWOVER BUS #2 PREFFERED SOURCE.

REVISIONS
- DIST. CKT. TO 7052 CORR. 5-30-85 WO 8222AR
- 10-25-85 W.O. 8383 R.E. ADD 50N/51N CO-11 REL. SEL 351A/B Rev 5 AM
- 3 9-30-86 WO 8522AR RECORDED
- 4 11-25-95 WO 21601R 94-320 ADD 0151-0478 TO-7051, 7056 and 7054 AM/KAW/MER/DBD 1700
- 5 8-10-96 WO 21904R 94-320 RECORDED
- 6 4-23-98 WO 22601R UPGRADE STATION SERVICE TO 15kVA AM/KAW/MER/DBD 1700
- 7 4-23-98 WO 23051R 97-669 TO 7051 AM/KAW/MER/DBD 1700
- 8 6-15-99 PRINT CORRECTION
- 9 12-20-02 FIELD REVISION KTS/BAB/
- 10 7-20-10 FIELD REVISION LIGHTNING ARRESTOR REMOVALS UNI/RSB/MFB/JTD/EMS

FOLD

CENTRAL HUDSON GAS & ELEC. CORP.	SCALE
RHINEBECK SUBSTATION	DATE 1-4-79
14.4 KV ONE LINE DIAGRAM	REVISION NO. 10
	FILE NO. 30C C
W.O. NO. 9326A	CHECKED DVB
PROJ. NO. 74-729	CLEARED
DRAWN MER	R/W
SUPV. PK	APPROVED
	7928
	SH. NO. 2 OF 3

DF 1/9/87 DF 7/16/99 DF 11/21/75 DF 7/9/79 9/24/86 DF 10/2/85 5/24/85

BRUNING 44-141 24816-2

Cases 14-E-0318 & 14-G-0319

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N

"MR" LINE TO MILAN

MR-647 1200 AMP; 61kA MOM (89-8)

795 MCM AA

PCA-5 115 kV 550 kV BIL 1000/600:1

PT-A

TRANSF. #5 115-13.8kV; 550-110kV BIL; ±5% NLTC-±10% LTC; 22.4/29.87/37.3 MVA @ 65°C

1200 AMP TYPE MD 2 FREQ

85 kHZ / 155 kHZ

2 FREQ LINE TUNER JZ 78.64

DTT for XMTR

MR-660 600 AMP; 40kA MOM (89-1)

98kV

1200/5 MR 400/5 TAP

2000/5 MR 1200/5 TAP

795 MCM AA

24" AL. IPS

TRANSF. #3 115/69kV; 50/66.7/83.3//93.3 MVA @ 55//65°C; 550/350kV BIL; ±10% LTC, ±5% NLTC

60kV

800/5 SR

1200/5 SR

1200/5 MR

600/5 MR

LDC

Ø3 SPR

63X SEAL IN

MR-701 1200 AMP; 61kA MOM (89-9)

115kV

95P-T5 SEL-587 50/51 50N/51N 87

95BU-T5 T60 50/51 50N/51N 87

Hybrid

XMTR 155kHZ

RCVR 157kHZ

TO W-1017 & PT-D 13.8kV BUS #2 SEE SHEET 2

MR-557 1200 AMP; 61kA MOM (89-2)

21, 21N, 25, 27 50, 50N, 67N, 79 kV, kW kVAR

95P-ER SEL-311C S.MDB

21, 21N, 50 50N, 67N

95BU-ER D60

ER-835

ER-830-MR 1600 AMP; 10,000 MVA; INTER; 3 CYCLE (52-1)

95P-MR SEL-311C S.MDB

95BU-MR D60

95BE-ER830MR SEL-351A

50, 50N, 62

ER-831 1200 AMP; 61kA MOM (89-6)

FUTURE

ER-835 1200 AMP; 61kA MOM (89-3)

TRANSF. #4 115-13.8kV; 550-110kV BIL; ±5% NLTC-±10% LTC; 20/26.67/33.33 MVA @ 55°C

1200/5MR 400/5 TAP

1200/5MR 1200/5 TAP

2000/5 MR

PCA-5 (Ø3) 115kV 550kV BIL 1000/600:1

TEVF-115 (Ø1&Ø2) 115kV 550kV BIL 1000/600:1

PT-B

95BU-T4 T60 50/51 50N/51N 87

95P-T4 SEL-587 50/51 50N/51N 87

TO PT-C (SH. 2)

150sq MCM MARTIE 2/0

TO W-1238 V.C.B. (SH. 2)

ER-806 1200 AMP; 61kA MOM (89-4)

HYBRID MODE

CARRIER UNBLOCK XMTR 110 kHZ RCVR 108 kHZ

DTT CARRIER XMTR 72 kHZ RCVR 71 kHZ

TO W-1238 13.8kV BUS #1 CT'S SEE SHT. 2

"ER" LINE TO EAST KINGSTON

89 kV 12.25 MVAR RATED 14.4 MVAR(NOMINAL) 3-SERIES GROUPS OF 8 PARALLEL CAPACITOR UNITS PER PHASE

W-1669 600 AMP; 40kA MOM

60 kV

(89-CB)

TO CAP. BANK GATE

W-1668 1200 AMP; 61kA MOM

87V, 59NP, 62 50, 51, 50N, 51N

95BU-CB GE-C70

95SP-CB SEL-487V

W-38 1200 AMP; 40kA; MOM

PT TYPE TEVF69 350/600:1

W-273 1200 AMP; 40kA; MOM (89-7)

69kV

Q-1472 1200 AMP; 40kA; MOM

(52-2) Q-1471 1200 AMP; 69kV-1200 AMP; 40kA

Q-1470 1200 AMP; 40kA; MOM

"Q" LINE TO STAATSBURG

336.4 MCM ACSR

Q-1487 1200 AMP; 61kA; MOM (89-5)

95P-Q SEL-311C S.MDB

21, 21N, 25, 27, 79 51, 51N, 50, 50N, 81 kV, A, kW kVAR

95BU-Q D-60

21, 21N, 50, 50N 51, 51N

95P-T3 SEL-387E S.MDB

87, 50, 51 50/51N kV, A, kW kVAR

95BU-T3 T60 87, 50, 51 50/51N

REDRAWN ON CADAM 11/24/92 FROM SIGNED ORIGINAL -DOM

REVISIONS
(10) 4-17-13 MOH 67459/R UPGRADE & RECONFIGURE STATION. VOID SH. 3 PLE/
(9) 11-8-10 FIELD REV. TO REFLECT INSTALLATION LTC POT. RAB/MFB/JD/EMS
(8) 3-20-06 10888A/R 05-698 ER LINE RELAY UPGRADE REN/MFB/JD/EMS
(7) 11-2-05 09086A/R 05-699 REN. KF, INS. BE1-IPS100 JFT/JEC/STV/JD
(6) 11/02 6386A/R 02-677 MR LINE RELAYING UPGRADE CDT/BND/SPA/CJM/HNN
(5) 12-14-99 3692A 98-688 REVISED JFT/BND/MEH
(4) 5-7-98 W.O. 30510A/R 97-669 INS.XFMR,HS REN.MOBIL XFMR TCJ/BND/JAK/RPB/MBR/TCD/RJN
(3) 1-28-98 W.O. 30510A/R 97-669 INS. MOBILE XFMR, REQUIRED MODIFICATIONS TCJ/BND/JAK/RPB
(2) 11-29-95 WO 21908A/R 94-760 ADD VOLTAGE XDUCER DTC BND SPK RFR
(1) 6/93 M.O. 9657A REPLACE CAPACITOR BANK DOM/JFT BND/LJS CDB ELV DJD TCD KAH

CENTRAL HUDSON GAS & ELEC. CORP.

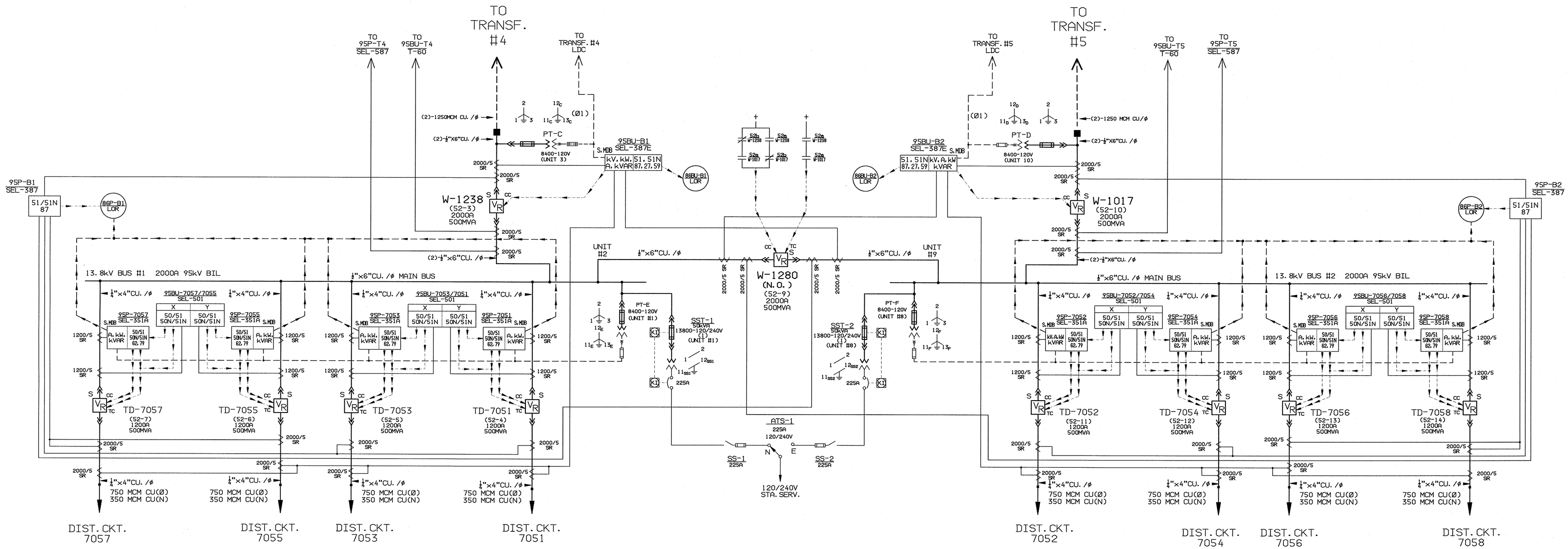
RHINEBECK SUBSTATION ONE LINE DIAGRAM

SCALE	N.T.S.
DATE	11-23-77
REV. NO.	10
FILE NO.	30C C
W.O. NO.	9328A
PROJ. NO.	74-729
DRAWN	MER
SUPV.	PK
CHECKED	DVB KAM
CLEARED	EJM RFR HL
R/W	
APPROVED	PJV
	7928
SH. NO.	1 OF 2

CAD DRAWING DO NOT REVISE MANUALLY

Cases 14-E-0318 & 14-G-0319

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LEGEND:

- P.T. CIRCUIT
- C.T. CIRCUIT
- D.C. CIRCUIT
- CONDUCTOR TRANSITION
- MDB METER DATA BASE
- KI KEY INTERLOCK(STATION SERVICE)

REVISIONS

1. 10-25-85 W.O. 5583 R. ADD 34.5kV STA. SVC. SEL 387E/BU REL 387/BU
2. 9-30-86 W.O. 5222 A/R RECORD SST-1 & SST-2 AS 50kVA
3. 11-24-93 W.O. 94-340 ADD DIST. CKTS TD-7057, 7055 CHG [illegible]
4. 8-10-94 W.O. 94-340 RECORDED
5. 6-28-96 W.O. 96-305 A/R UPGRADE 13.8kV BUS #1 & #2 TO 2000A
6. 8-9-96 W.O. 97-664 A/R
7. 7-15-98 PRINT CORRECTION
8. 12-20-02 FIELD REVISION KTS/BU/BU
9. 7-20-10 FIELD REVISION LIGHTNING ARRESTOR REMOVAL & UPDATE TO REFLECT UNIT #4 LDC
10. 4-17-13 W.O. 67456 A/R UPDATE & RECONFIGURE STATION, VOID SH. 3 PLB/

CENTRAL HUDSON GAS & ELEC. CORP.

RHINEBECK SUBSTATION

14.4 KV ONE LINE DIAGRAM

W.O. NO.	5326A
PROJ. NO.	74-729
DRAWN	MER
SUPV. PK	
CHECKED	DVB
CLEARED	
R/W	
APPROVED	

SCALE
DATE 1-4-79
REVISION NO. 11
FILE NO. 300 C
7928
SH. NO. 2 OF 2

BRUNING 44-141 24816-2

Exhibit_(EIP-1)(Redacted)
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P & MK — **Summer (MW) Coincident**

P - Line Loads	Source	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988
Rosendale	Est	Retired in 2010				*0.5*	1.1	*1.30*	*1.3*	*1.9*	1.7	1.8	1.9	1.9	1.5	1.7	1.7	1.8	1.6	1.4	1.4	2.6	1.8	2.6	1.9	2.3	2.6
Accord	Est	Retired in 2012			0.7	0.5	0.7	0.68	0.6	*0.8*	0.7	0.7	0.8	0.8	0.7	1	0.7	0.7	0.7	0.7	0.8	0.8	0.6	0.8	0.6	0.7	0.6
Kerhonkson-HK 3081	Charts	4.8	4.8	5.546	*4.8*	4.5	4.8	4.86	4.8	2.9	2.5	3	5.9	5.7	5.4	6.2	5.8	4.6	4.6	4.5	4.4	4.5	3.9	4.3	3.5	4.5	4.1
High Falls	EMS	18.9	17.5	18.56	18.6	14.4	15.9	16.07	17.6	14.8	11.4	9.2	11.3	8.7	8.5	10.5	6.8	8.5	7.3	9.7	7.2	8.6	7.5	8.2	7.8	7.7	7.6
MK Line Loads																											
Kerhonkson-MK 3082	Charts	4.5	4.5	4.981	*5.3*	4.5	4.8	4.5	5.1	6.4	3.8	4.4	2.9	1.6	1.2	1.3	1.3	1.6	1.4	1.5	2	1.9	1.3	1.7	1.7	1.9	1.5
Galeville	EMS	7.05	8.4	7.09	8.8	7.3	9.0	9.81	10.0	9.1	7.1	6.1	6.2	5.9	4.5	5	4.1	3.6	3	3.6	3.5	4.2	2.5	4	3.5	3.5	4
Modena 69 kV	EMS	-	-	-	-	-	-	-	-	-	8.8	9.1	8	8.3	8.5	9.8	9.5	9.1	7.8	8.1	9.2	9	7.6	7.8	7.6	7	6.6
Ellenville Loads																											
Clinton Ave	MV-90	*1.3*	0.9	0.93	1.0	0.9	1.8	2.50	2.7	2.8	2.4	2.4	2.5														
Honk Falls	EMS	6.1	5.8	4.75	5.9	5.5	5.5	5.80	6.5	6.2	5.3	5	6.5	6.3	6	1.7	1.8	1.9	1.3	1.4	1.3	1.6	1.6	1.6	1	0.9	0.8
Grimley Road	Est	4.5	4.5	5	4.3	*4.3*	3.6	*4.08*	*3.9*	*2.6*	2.4	1.8	2.4	1.7	1.5	1.9	1.5	1	2	2	2.4	3.7	3.7	3.7	2.5	3	3
Greenfield Road[1]	Charts	7.7	7.9	9	6.5	7.4	7.4	7.34	7.9	7.4	6.1	6.5	7.6	17.4	17.3	22.5	20.8	21.1	20.7	21.6	19.8	20.8	19.3	21.2	13.8	16.6	18.7
Schrade	MV-90	0.05	0.07	0.07	0.1	0.1	0.1	0.05	0.1	0.2	0.2	0.6	1														
VAW	MV-90	-	-	-	-	-	-	1.28	3.1	6.4	2.7	4.5	1														
Neversink	Charts	3	3	3	3.1	2.7	2.5	*1.20*	2.8	2.7	2.6	2.6	2.6	2.6	2.8	2.2	2.9	3	2.8	3.2	1.8	1.7	1.6	1.8	2.3	1.8	1.5
Total Ellenvile,P&MK Loads		57.9	57.4	58.9	59.1	52.5	57.2	59.47	66.2	64.2	57.7	57.7	60.6	60.9	57.9	63.8	56.9	56.9	53.2	57.7	53.8	59.4	51.4	57.7	46.2	49.9	52.6
Total Ellenvile,P&MK Loads w/o Modena		57.9	57.4	58.9	59.1	52.5	57.2	59.47	66.21	64.2	48.9	48.6	52.6	52.6	49.4	54	47.4	47.8	45.4	49.6	44.6	50.4	43.8	49.9	38.6	42.9	45.8
1-Year Growth Rate[2]		0.92%	-2.64%	-0.29%	12.48%	-8.09%	-3.87%	-10.18%	3.13%	31.29%	0.62%	-7.60%	0.00%	6.48%	-8.52%	13.92%	-0.84%	5.29%	-8.47%	11.21%	-11.51%	15.07%	-12.22%	29.27%	-10.02%	-5.92%	-
3-Year Growth Rate[2]		-0.68%	2.97%	1.02%	-0.21%	-7.42%	-3.79%	6.74%	10.86%	6.87%	-2.40%	-0.54%	-0.87%	3.53%	1.10%	5.95%	-1.50%	2.34%	-3.42%	4.23%	-3.67%	9.30%	0.69%	3.05%			
5-Year Growth Rate[2]		0.26%	-0.72%	-2.30%	-1.64%	1.45%	3.30%	2.49%	4.71%	5.38%	-1.96%	0.50%	1.93%	2.99%	-0.08%	3.90%	-1.22%	1.76%	-1.87%	5.14%	0.78%	2.02%					
10-Year Growth Rate[2]		1.77%	0.87%	1.14%	1.81%	-0.27%	1.89%	2.21%	3.85%	2.61%	0.92%	-0.36%	1.85%	0.53%	2.50%	2.33%	0.39%										
Since 1988[2]		0.96%	0.96%	1.12%	1.19%	0.68%	1.14%	1.41%	2.09%	2.03%	0.44%	0.43%	1.03%	1.10%	0.67%	1.55%	0.39%	0.52%	-0.05%	1.21%	-0.37%	2.02%	-1.00%	3.05%	-8.00%	-5.92%	
Modena 115 kV	EMS	14.1	13.3	14.7	13.3	9.7	10.1	11.2	10.8	10.1																	
System Peaks		1203	1168	1225	1227	1107	1187	1185	1295	1204	1051	1078	1125	1048	943	1014.6	900.2	916.7	838.1	902.2	891.6	859.9	854.4	950.4	871.4	888.1	890.9
1-Year Growth Rate		3.00%	-4.65%	-0.16%	10.84%	-6.74%	0.17%	-8.49%	7.56%	14.56%	-2.50%	-4.18%	7.35%	11.13%	-7.06%	12.71%	-1.80%	9.38%	-7.10%	1.19%	3.69%	0.64%	-10.10%	9.07%	-1.88%	-0.31%	-
3-Year Growth Rate		-0.66%	1.80%	1.06%	1.17%	-5.09%	-0.47%	4.08%	6.30%	2.29%	0.10%	4.56%	3.50%	5.20%	0.95%	6.58%	-0.07%	0.93%	-0.85%	1.83%	-2.11%	-0.44%	-1.28%	2.18%			
5-Year Growth Rate		0.27%	-0.29%	-1.11%	0.38%	1.04%	1.95%	1.04%	4.32%	5.01%	0.71%	3.67%	4.18%	4.57%	0.89%	2.62%	0.92%	1.42%	-2.48%	0.70%	0.08%	-0.71%					
10-Year Growth Rate		1.10%	0.38%	1.57%	2.67%	0.88%	2.80%	2.60%	4.45%	2.93%	1.66%	2.29%	2.79%	0.98%	0.79%	1.34%	0.10%										
Since 1988		1.21%	1.13%	1.39%	1.47%	1.04%	1.45%	1.51%	2.10%	1.79%	1.04%	1.28%	1.68%	1.26%	0.47%	1.19%	0.10%	0.32%	-0.76%	0.18%	0.01%	-0.71%	-1.04%	2.18%	-1.10%	-0.31%	

Denotes in MVA

1. Prior to 2002 includes Greenfield Rd. 4kV and 13.2kV, Clinton Ave., Schrade and VAW

2. Percentages computed with Modena load excluded because it was transferred out of the Ellenville area in 2005

3. The 2009 load estimate for Rosendale and Grimley Road is in MVA, provided by the Kingston EOE

4. The 2010 load for Kerhonkson, Neversink, Grimley Road and Greenfield Road is obtained from GridSense and the 2010 load for Galeville is obtained from eDNA

5. The 2010 load for Accord Substation and Neversink Circuit 391 was estimated by the Kingston EOE

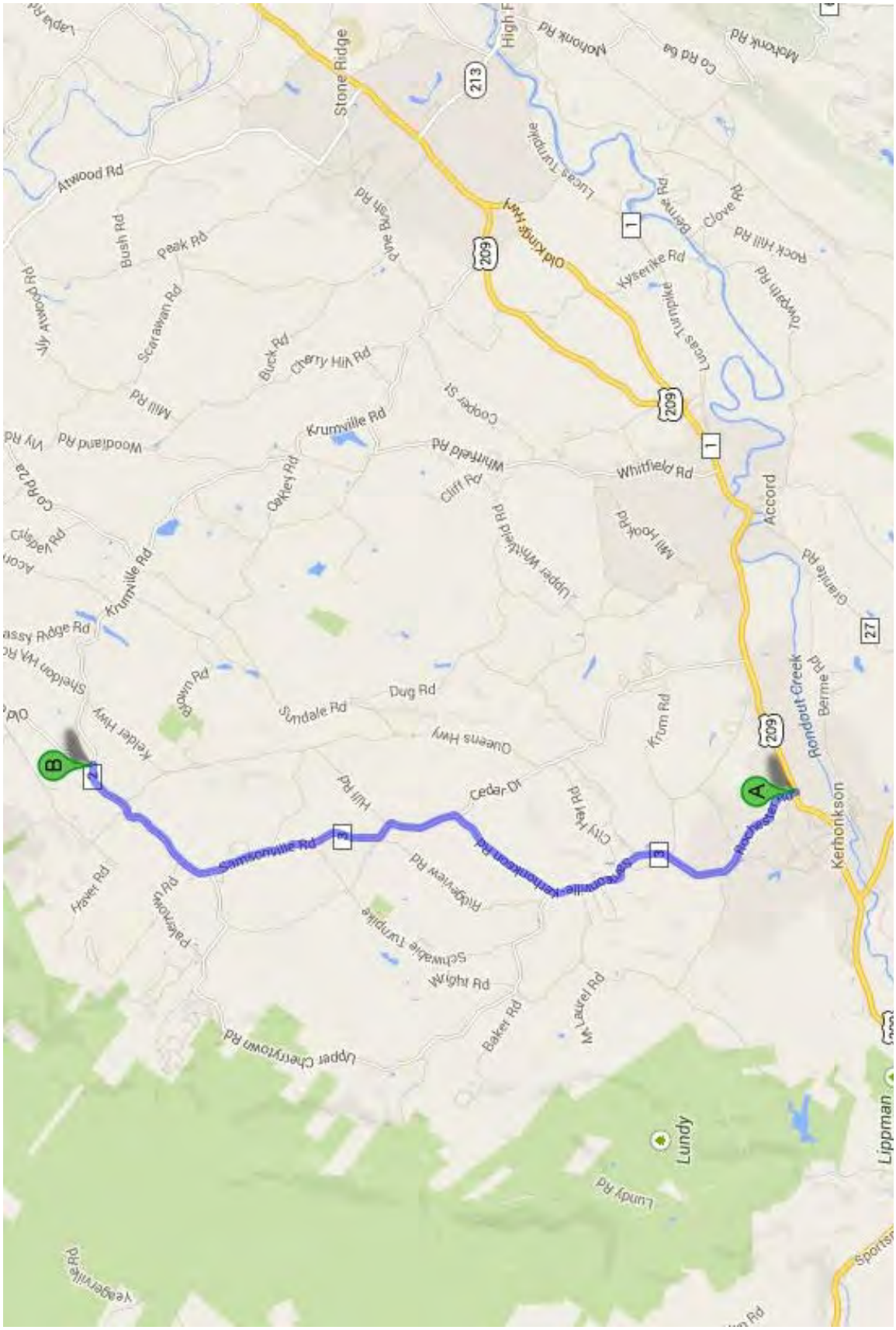
6. The 2012 load for Grimley Rd was estimated by the Kingston EOE

7. The 2013 load for Clinton Avenue, Kerhonkson and Neversink was estimated by the Kingston EOE

Cases 14-E-0318 & 14-G-0319
Exhibit__(EIP-1)(Redacted)
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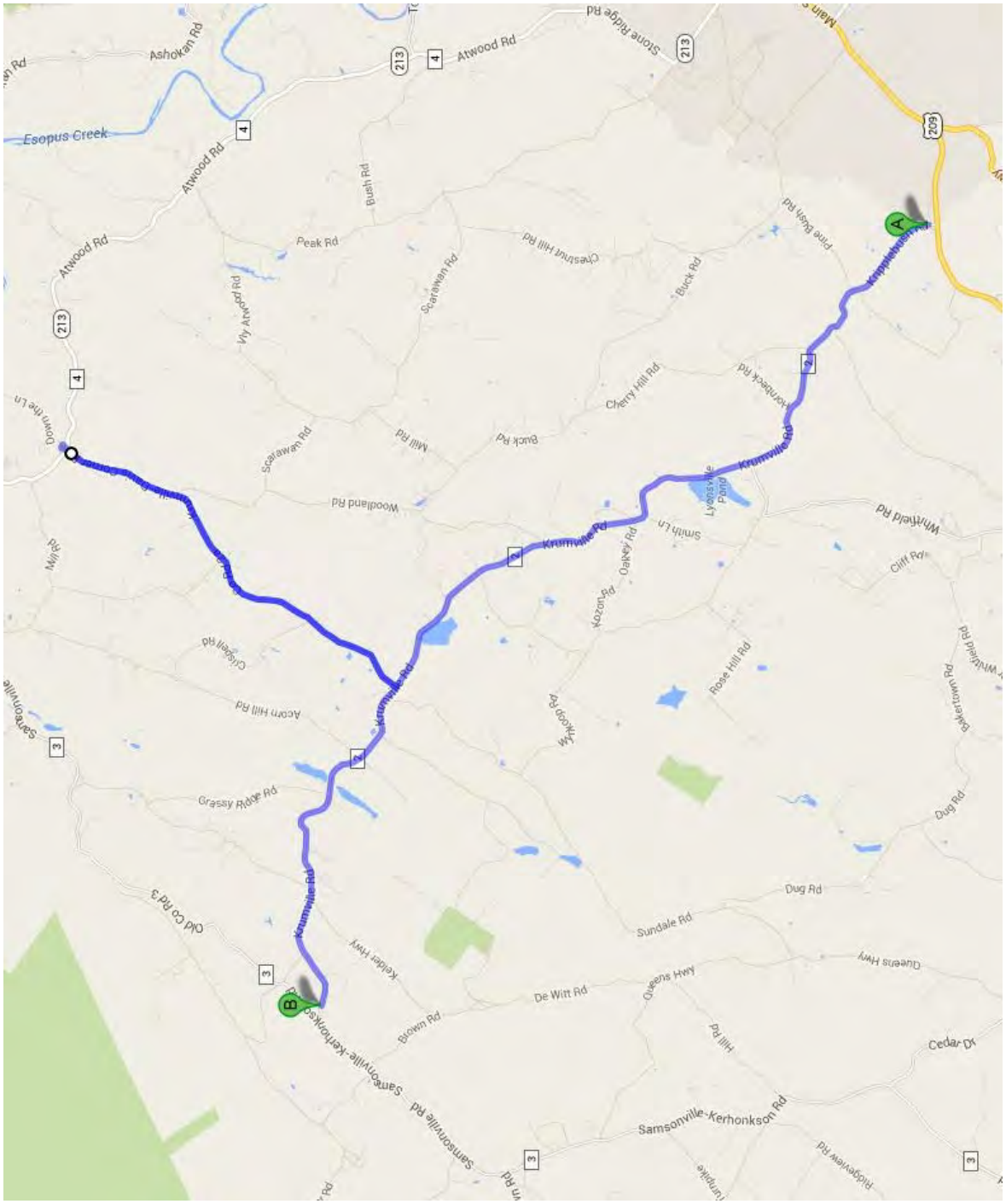
ATTACHMENT 2

Kerhonkson 3082 Circuit Mainline



ATTACHMENT 2

High Falls 3024 Circuit Mainline



Key Assumptions Summary Sheet

(In Thousands)	2011 Actual	2012 Actual	2013 Actual	2014 Forecast	2015 Budget	2016 Budget	2017 Budget	2018 Budget	2019 Budget
Energy Sales (gWh)	5,184	5,073	5,109	4,892	4,920	4,915	4,893	4,858	4,818
Energy Sales Increase (Decrease) %	-0.6%	-2.1%	0.7%	-4.24%	0.57%	-0.10%	-0.45%	-0.72%	-0.82%
Customer Growth Rates %	0.19%	-0.31%	0.21%	0.11%	0.16%	0.13%	0.13%	0.11%	0.10%
# Customers	300,538	299,591	300,226	300,556	301,035	301,434	301,813	302,137	302,432
Capital Expenditures Actuals/Budget	4,564	5,360	3,899	3,500	3,678	3,924	3,986	4,293	3,345

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		$K	2013		2012		2011		2010		2009	
Catergory 14:	Budget		5,410		5,719		5,411		6,797		6,200	
	Actual		3,899		5,360		4,564		5,401		5,068	
	delta		28%	1	6%		16%		21%	6	18%	
Catergory 16:	Budget		5,375		6,073		5,944		6,182		6,071	
	Actual		3,381		4,718		4,740		5,673		5,667	
	delta		37%	2	22%	3	20%		8%		7%	
Catergory 17:	Budget		2,021		1,426		1,443		1,618		1,450	
	Actual		1,934		2,618		1,998		1,606		1,904	
	delta		4%		(84%)	4	(38%)	5	1%		(31%)	7

1 2013 New Business expenditures were less then what was originally forecasted, budgeted dollars were transferred to category 15.

2 2013 Transformers budget was created based off of prior spending, but actuals came in under historical levels in part due to underruns in New Business.

3 2012 Transformer budget was based off of prior year budget plus 2% inflation, expenditures were consistent with New Business.

4 2012 Meter expenditures were higher due to ERT's program for the city of Newburgh which was not included in the meter budget.

5 2011 Meter expenditures were higher due to ERT's program for the city of Newburgh which was not included in the original meter budget.

6 2010 New Business expenditures were less than what was originally forecasted.

7 2009 Meter budget was based off of 2008 actuals. 2009 actuals reflect increase in level of meters required for lowered threshold of the Mandatory Hourly Pricing Porgram and the purchase of meters for the time test requirements.

Repair	Function Number	Quantity/Costs as of 4/20/2014 Qty	DRG PPU	DRG Total Cost	Find Rate	2014 Forecast Projected Qty	DRG 2014 Cost
Ground Wire Reconnected	92022-1-862	68	$ 45.00	$ 3,060	0.96%	439	$ 19,738
Ground Wire repaired	92022-1-862	64	$ 45.00	$ 2,880	0.91%	413	$ 18,577
Ground Molding Replaced	92022-1-862	428	$ 45.00	$ 19,260	6.07%	2,761	$ 124,232
Ground Molding Stapled	92022-1-862	192	$ 3.11	$ 597	2.72%	1,238	$ 3,852
Materials for Minor Repairs	92022-1-862	1	$ 2,883.07	$ 2,883		1	$ 18,355
				Current Total	$ 28,680	Projected Total	$ 184,753

Expected Number Locations with 2 Conditions/1 $45 Charge	6% Population	217	$ 9,753	***Grand Total*** ***$ 175,000***

Work Schedule (Pads/Poles)		
Asset Class	through 4/20/14	Targeted
Poles	7,054	45,500

Projected Costs

	Calendar Year 2014*	2015*	2016	2017
1/1 to 6/30 Costs	$ 60,000	$ 90,000	$ 91,890	$ 93,820
7/1 to 12/31 Costs	$ 115,000	$ 90,000	$ 91,890	$ 93,820
Year Total	*$ 175,000*	*$ 180,000*	*$ 183,780*	*$ 187,640*

	Rate Year 2015*	2016	2017
Ending 6/30	$ 205,000	$ 181,890	$ 185,710

*2014 costs are higher in second half of year due to delayed start of stray testing program. 2015 numbers are adjusted to return program to 50% of distribution mitigations in each half of calendar year. This alters 2014 and 2015 projected costs.

AP Exp

	2009				2010				2011		
Description	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed	Cost/Unit	Actual	Budget (Year)	Inspections Targeted/ Completed
UG Inspections	$ 86,471	$ 64,500	4,556	$ 18.98	$ 113,887	$ 64,500	7,122	$ 15.99	$ 56,553	$ 80,000	3,226
OH Inspections	$ 75,047	$ 141,000	60,796	$ 1.23	$ 115,211	$ 129,000	74,023	$ 1.56	$ 65,307	$ 88,000	41,810