Carlos Gavilondo
Senior Counsel II

VIA ELECTRONIC DELIVERY

January 31, 2014

Hon. Kathleen H. Burgess, Secretary
New York State Department of Public Service
3 Empire State Plaza
Albany, New York 12223-1350

Re: Case 10-E-0050, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service;
Five-Year Transmission and Distribution Capital Investment Plan

Dear Secretary Burgess:

Pursuant to the Public Service Commission's January 24, 2011 order in Case 10-E-0050, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or "Company") hereby submits its annual Transmission and Distribution Capital Investment Plan ("Plan"). The Plan sets forth the Company's projected capital spending on the electric transmission and distribution system for the 5-year period from April 1, 2014 through March 31, 2019 (fiscal years 2015 -2019).

A copy of this filing is also being provided directly to Christian Bonvin of Department of Public Service Staff. Please contact me if you have any questions regarding this filing.

Thank you for your attention to this matter.

Respectfully submitted,

/s/ Carlos Gavilondo

Carlos Gavilondo

Enc.

cc: C. Bonvin, DPS

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TRANSMISSION AND DISTRIBUTION CAPITAL INVESTMENT PLAN

CASE 10-E-0050

PREPARED FOR:

THE STATE OF NEW YORK PUBLIC SERVICE COMMISSION

THREE EMPIRE STATE PLAZA

ALBANY, NY 12223

JANUARY 31, 2014

nationalgrid

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Chapter 1. Executive Summary

Niagara Mohawk Power Corporation d/b/a National Grid ("Niagara Mohawk" or the "Company") submits its Five Year Capital Investment Plan (the "Plan") in compliance with the New York Public Service Commission ("PSC" or the "Commission") Order issued January 24, 2011 in Case 10-E-0050.[1] The Plan submitted here relates to fiscal years 2015 to 2019 (FY15 to FY19).[2] The investment levels in the Plan are summarized by system in Table 1-1, below. The Plan reflects total investment levels agreed in the Company's most recent electric rate case (12-E-0201) through FY16 and the Company's present estimate of investment levels needed in FY17 – FY19 to meet its obligation to provide safe and adequate service at reasonable cost to customers.[3]

Table 1-1
Capital Investment Plan by System ($millions)

System	FY15	FY16	FY17	FY18	FY19	Total
Transmission	176.3	166.8	198.5	189.0	205.8	936.4
Sub-transmission	32.8	32.8	36.6	40.4	42.0	184.5
Distribution	243.3	248.1	276.1	283.8	289.0	1340.3
Total	**452.4**	**447.7**	**511.2**	**513.2**	**536.8**	**2461.2**

National Grid's commitment to safety, reliability and efficiency is paramount, and is the foundation for all we do. The five-year investment plan presented here balances the need to constrain infrastructure cost while simultaneously mitigating some of the significant risks on the system. The Company continuously reviews the Plan relative to current risks and information and will revise the Plan as required to meet emergent needs and provide safe and adequate service at reasonable cost to customers.

[1] Case 10-E-0050, *Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation for Electric Service*, Order Establishing Rates for Electric Service, issued and effective January 24, 2011 ("Rate Case Order"). The Rate Case Order adopted the terms of a Stipulation and Agreement on Certain Matters Relating to Capital Investment and Operating & Maintenance Spending (dated September 15, 2010), in which the Company agreed to continue to submit periodic reports as provided in Case 06-M-0878, *Joint Petition of National Grid PLC and KeySpan Corporation for Approval of Stock Acquisition and Other Regulatory Authorizations,* including the annual five-year investment plan.

[2] The period FY15 to FY19 covers April 1, 2014 - March 31, 2019.

[3] Differences between FY15-FY16 system level sub-totals in this Plan and corresponding system level sub-totals in the Joint Proposal are primarily due to changes in investment timing during the period governed by the Joint Proposal and shifts in investment amounts between systems.

Chapter 1 A. Capital Investment Plan Summary

The Company's capital investment plan is presented by system and by spending rationale. A view of planned investments segmented by system is presented in Table 1-1 above, while a view of planned investments segmented by spending rationale is summarized below.

Investment by Spending Rationale

The Company classifies capital projects into five spending rationales based on their primary investment driver. The Company has updated its Spending Rationale classifications to better reflect the primary driver of the work performed. This change has resulted in the elimination of the Statutory/Regulatory category used in previous plans and addition of a new category, Customer Requests/Public Requirements. It has also resulted in the realignment of several projects among Spending Rationales. The five Spending Rationales reflected in this Plan are: (A) Customer Requests/Public Requirements; (B) Damage/Failure; (C) System Capacity and Performance; (D) Asset Condition; and (E) Non-infrastructure.

Customer Requests/Public Requirements
Customer Requests/Public Requirements projects are required to respond to, or comply with Customer Requests/Public Requirements mandates. This work includes capital expenditures required to ensure the contractual obligations of the Company adhere to customer and public requirements. These items include new business residential, new business commercial, outdoor lighting, third party attachments, land rights and public requirements including municipal, customer interconnections and wind farms.

Damage/Failure
Damage/Failure projects are required to replace failed or damaged equipment and to restore the electric system to its original configuration and capability following equipment damage or failure. Damage may be caused by storms, vehicle accidents, vandalism or other unplanned events. The Damage/Failure spending rationale is typically non-discretionary in terms of scope and timing. The Damage/Failure budget may also include the cost of purchasing strategic spares to respond to equipment failures.

System Capacity and Performance
System Capacity and Performance projects are required to ensure the electric network has sufficient capacity to meet the growing and/or shifting demands of our customers, as well as changes in the generation landscape. Projects in this category are intended to reduce degradation of equipment service lives due to thermal stress and to provide appropriate degrees of system configuration flexibility to limit adverse reliability impacts of large contingencies. In addition to accommodating load growth, the expenditures in this category are used to install new equipment such as capacitor banks to maintain the requisite power quality, and also include investments to adhere to NERC, NPCC and similar standards.

Asset Condition
Asset Condition projects are required to reduce the likelihood and consequences of failures of transmission and distribution assets. Replacing system elements such as overhead lines, underground cable or substation equipment are examples of such projects. Investments in the Asset Condition category reflect the targeted replacement

of assets based on condition rather than wholesale replacement based on “end of useful life” criteria, especially for transmission line refurbishment projects.

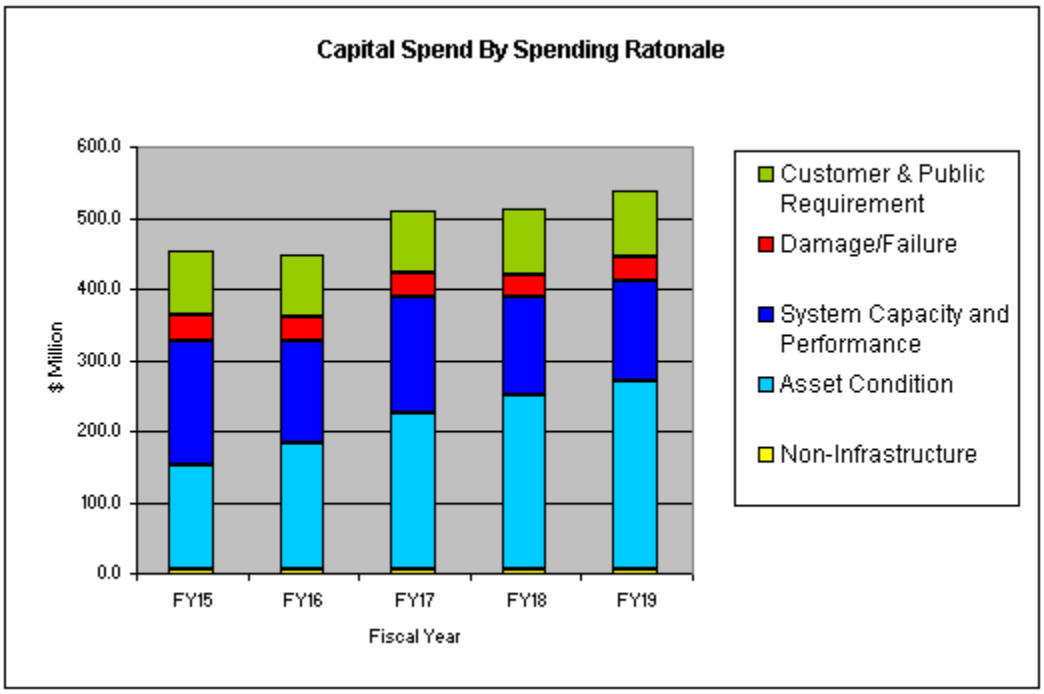
Non-Infrastructure
Non-Infrastructure projects are ones that do not fit into one of the foregoing categories, but which are necessary to run the electric system. Examples in this rationale include substation physical security, radio system upgrades and the purchase of test equipment.

Investment by spending rationale for fiscal years FY15 to FY19 is provided in Table 1-2, and Figure 1-1.

Table 1-2
Investment by Spending Rationale ($ millions)*

	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	88.3	87.9	89.4	92.6	93.0	451.1
Damage/Failure	37.1	32.5	32.8	32.6	32.4	167.4
System Capacity and Performance	174.7	142.8	162.8	136.1	140.5	756.9
Asset Condition	145.2	179.0	221.4	247.1	266.1	1058.8
Non-Infrastructure	7.0	5.5	4.8	4.8	4.9	27.0
Total	**452.4**	**447.7**	**511.2**	**513.2**	**536.8**	**2461.2**

Figure 1-1
Investment by Spending Rationale by Year FY15-FY19



Spending Rationale Totals

Twenty five percent ($618.5 million) of the planned infrastructure investment is in the Customer Requests/Public Requirements and Damage/Failure spending rationales. This work is required to address items that are mandatory and non-discretionary in terms of timing. Examples of such work include new business requests, municipal interconnections, capital work done to repair a portion of a distribution feeder damaged in a storm event, and facility relocations to accommodate municipal public works projects.

The System Capacity and Performance spending rationale accounts for approximately 31 percent ($756.9 million) of the total investment in the Plan, and includes investments to ensure substations and feeders can reliably supply customer load within system design criteria. Examples of investments in this rationale include investments to bring substations into NPCC design, protection and operation standards, to address reliability issues presented as a result of the mothballing of the Dunkirk generating station, and planned expansions and network upgrades to accommodate load growth associated with the Luther Forest industrial park expansion.

The Asset Condition portion of the Plan represents nearly 43 percent ($1058.8 million) of total planned investment. Programs in this rationale aim to mitigate future risks and consequences of potential failures caused by deteriorated assets. An example of a program in this spending rationale is the rebuild of the Gardenville Station, which is a 230/115kV complex south of the Buffalo area.

Chapter 1 B. Investment by System

Following is a summary of planned investment by system. Chapters 2, 3 and 4 detail the transmission, sub-transmission and distribution system spending, respectively.

Transmission System Summary

The transmission system consists of approximately 6,000 miles of transmission line, 313 transmission substations, more than 500 large power transformers and over 700 circuit breakers at operating voltages above 69kV. To serve the needs of customers over the five year period covered by this Plan, the Company expects to invest approximately $936.4 million on the transmission system, as shown in Table 1-3 below. The majority of planned transmission system investment is in the System Capacity and Performance and Asset Condition spending rationales. The System Capacity and Performance category includes spending to address generator retirements, NERC/NPCC standards and transmission owner led system studies. Substantial portions of the planned investment in the Asset Condition category relate to conductor clearance, substation rebuild and overhead line refurbishment programs.

Table 1-3
Transmission System Capital Expenditure by Spending Rationale ($millions)

Spend Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	0.06	0.01	0.0	0.0	0.0	0.07
Damage/ Failure	12.0	7.2	7.2	6.5	6.5	39.3
Non-Infrastructure	3.8	2.2	1.5	1.5	1.5	10.5
System Capacity /Performance	102.9	69.5	69.6	34.4	38.7	315.2
Asset Condition	57.5	87.9	120.2	146.7	159.1	571.4
Total	**176.3**	**166.8**	**198.5**	**189.0**	**205.8**	**936.4**

Sub-Transmission System Summary

The sub-transmission system comprises approximately 4,240 miles of lines including: 290 miles of 69kV, 365 miles of 46kV, 2,332 miles of 34.5kV, 1,050 miles of 23kV and 200 miles of lines below 23kV. To serve the needs of customers over the five year period covered by this Plan, the Company expects to invest approximately $184.5 million on the sub-transmission system, as shown in Table 1-4 below.

Table 1-4
Sub-Transmission System Capital Expenditure by Spending Rationale ($millions)

Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	2.8	2.1	2.0	3.3	1.8	12.0
Damage/Failure	2.6	2.1	2.2	2.2	2.3	11.4
System Capacity & Performance	3.8	5.4	9.9	8.6	6.0	33.7
Asset Condition	23.6	23.1	22.5	26.2	31.9	127.5
Total	**32.8**	**32.8**	**36.6**	**40.4**	**42.0**	**184.5**

This five year Plan envisions significant expenditures on the sub-transmission system in the areas of asset condition and system capacity and performance. Projects previously classified as sub-transmission station projects have now been redirected into transmission or distribution budgets.

Distribution System Summary

The Company's distribution system comprises lines and substations typically operating at 15kV and below. There are nearly 36,000 circuit miles of overhead primary wire and nearly 7,500 circuit miles of underground primary cable on the system supplying approximately 399,000 overhead, padmount and underground distribution transformers. Additionally, there are 420 substations providing service to the Company's 1.6 million electric customers.[4] The current five year plan for distribution is represented in Table 1-5.

Table 1-5
Distribution System Capital Expenditure by Spending Rationale ($millions)

Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	85.5	85.8	87.3	89.2	91.2	439.1
Damage/Failure	22.5	23.1	23.5	23.9	23.7	116.7
System Capacity & Performance	67.9	68.0	83.3	93.1	95.7	408.1
Asset Condition	64.1	67.9	78.7	74.2	75.0	359.9
Non-Infrastructure	3.2	3.3	3.3	3.3	3.4	16.5
Total	**243.3**	**248.1**	**276.1**	**283.8**	**289.0**	**1340.3**

[4] The distribution system data was taken January 7, 2014 from National Grid Asset Information Website located at http://usinfonet/sites/asset_info/Pages/AssetStatistics.aspx.

This Plan envisions the majority of investment in the distribution system will be in the Customer Requests/Public Requirements, System Capacity and Performance, and Asset Condition spending rationales.

Chapter 1 C. Opportunities and Challenges

Among the opportunities and significant challenges facing the Company and its customers over the period covered by this five year Plan are:

- Changing regulatory or compliance requirements requiring increased or different investments (e.g., changes in the definition of Bulk Electric System that will result in increased investment requirements, or accelerated remediation requirements resulting from NERC actions).
- Implementation of initiatives to accommodate increased deployment of distributed energy resources and electric vehicles, increase penetration of large-scale renewable resources and the transmission infrastructure needs to deliver those resources, investments in transmission upgrades to increase upstate to downstate transfer capacity, and processes to evaluate and accommodate generation repowering.
- Changes in the existing generation supply portfolio in the region that may require electric delivery infrastructure solutions, such as the potential closure of large generation units at Dunkirk, Cayuga and elsewhere.
- Challenges related to implementing targeted asset replacement of assets whose overall condition are becoming degraded and are well beyond their typical asset life, including increased operations and maintenance spending and service reliability issues.
- The expansion of advanced grid applications.
- Investments to improve storm resilience.

The Company will continue to monitor and evaluate developments in these and other areas and adjust its investment plans as appropriate to meet changing needs and maximize opportunities for greater efficiency consistent with providing safe and adequate service to customers.

Storm Resilience Investments

The June 22, 2013 Report of the Moreland Commission on Utility Storm Preparation and Response reviews the responses of the State's utilities to several recent major weather events, including Superstorm Sandy, Tropical Storm Lee and Hurricane Irene. The Moreland Commission report includes several recommendations regarding capital investment and utility operations intended to make utility systems more resilient to future storm events and mitigate the impacts of such events on customers. Recommendations to make the system more resilient include:

- Revised design standards
- Targeted response to flood potential
- Critical equipment location review
- Changes in material types and sizes
- Use of underground cables in specific areas or conditions

The Report recommends developing new standards for future replacement projects and the use of asset health assessments in determining the initial priority of capital investments. National Grid currently prepares and files with the PSC an annual Asset

Condition Report and information developed for that report guides the Company's capital investment plan. Increased resilience and infrastructure hardening have been consistent elements of past work plans. Such work includes:

- Additional line fusing
- Small wire replacement
- Tree wire installation
- Select feeder hardening
- Circuit automation
- EMS/communications
- Recloser installations
- Station flood mitigation

As resilience-related investments increase, future capital plans will likely reflect increased spending levels due to greater material and equipment costs. For example the Company may use underground cable in specific locations to avoid overhead damage risk where pole and overhead conductor may have ordinarily been used in the past. Undergrounding such facilities may provide greater storm resilience but also results in greater initial capital investment than an overhead installation.

Similarly, the Company is moving to standardize the use of class 3 poles. Class 3 poles are larger diameter, stronger poles than the class 5 poles previously used by the Company in many standard applications. The Company is also looking at extending the locations that should be hardened by the use of grade B construction. Grade B construction is typically used in situations where a failure could cause significant impact, such as highway or waterway crossings. The Moreland Commission report recommended targeting critical infrastructure in communities and hardening those locations to reduce outage risk. The Company will be revising its standards to provide guidance on the use of grade B construction for different situations such as to reduce risk of service loss to critical community infrastructure.

Although some investments in this Plan are directly in response to, or in preparation for, severe weather events (*e.g.*, New Florida substation to replace flooded facility; Whitesboro 64, 65, and 66 circuit rebuilds and transfers to address flooded substation; Small Conductor Replacement program), storm hardening-related costs are also reflected in other projects and programs in the form of enhanced standards or equipment costs. A hardened system will reduce reliability impacts caused by storm events, but will take many years to implement.

Non-Wires Alternatives

As part of its 2010 electric rate case (Case 10-E-0050), National Grid committed to developing a process to evaluate non-wires alternatives (NWAs) to traditional infrastructure investments. The Company has established a set of planning guidelines for the review and consideration of NWAs. These guidelines include two stages of review: one by transmission and distribution planners as they review potential capital investment needs; and another by the Product & Energy Services group project managers in the Company's customer organization.

The Company's most recent NWA review of anticipated capital projects included approximately 1,600 line items. The vast majority of projects did not pass initial screenings for detailed NWA review: More than half of the projects were related to asset condition; more than 30% had lead times that were too immediate to allow time for an NWA and a further 10% had cost estimates that did not meet the screening criteria.[5] Of the remaining projects, there were a few that were unrelated to electric load (e.g. removing equipment that had been previously out-of-use and non-infrastructure projects). Six projects (approximately 1% of all those considered) were considered for NWA. Of those six projects, one passed the initial NWA screens and is currently under secondary review. A more detailed discussion of the NWA process and the recently reviewed projects is provided in Exhibit 5.

Bill Impacts

The Company prepared a simplified analysis to estimate the revenue requirement effects in fiscal years 2015, 2016 and 2017 associated with the proposed capital investment levels included here, as well as an estimate of the associated per kWh impact of the resulting revenue requirement on a residential SC1 customer. For a typical residential SC1 customer, the allocated per kWh cost resulting from the investment levels included in the Plan would be $0.00263/kWh in FY2015; $0.00445/kWh in FY2016; and $0.00589/kWh in FY2017. Details of the simplified analysis are included in Exhibit 4 of this filing.

[5] The initial NWA screening criteria include: (1) the wires solution will likely cost more than $1million; (2) if load reduction is necessary, it must be less than twenty percent of the total load in the area of the defined need; (3) the start of construction must be at least thirty-six months in the future; and (4) the need cannot be based on asset condition.

Chapter 1 D. Developing the Capital Investment Plan

The Capital Investment Plan is based on the Company's current assessment of the needs of the electric delivery system over the Plan period. The investments described in this Plan are needed to provide customers with safe and adequate electric service, meet regulatory requirements, address load growth/migration, and replace equipment that is damaged or that fails. The investment levels in the Plan do not reflect costs of investments that may be needed to implement or accommodate new public policy initiatives, new regulatory requirements, technological developments, or the integration of renewable technologies that are not explicitly covered in the Plan.

To optimize the Plan budget and resources, a risk score is assigned to each project. The project risk score is generated by a decision support matrix that assigns the score based on the estimated probability and consequence of a particular system event occurring. The risk score takes into account key performance areas, such as safety, reliability and environmental considerations, while also accounting for criticality of the project.

Mandatory programs and projects (i.e., those under Customer Requests/Public Requirements and Damage/Failure spending rationales) known at this time are included in the Plan. Such programs and projects include new customer and generator connections, regulatory commitments, public requirements that necessitate relocation or removal of facilities, safety and environmental compliance, and system integrity projects such as response to damage/failure and storms.

Programs and projects in the other categories (i.e., System Capacity and Performance and Asset Condition spending categories) are developed based on system studies and evaluation of existing assets by subject matter experts for inclusion into the Plan. Inclusion/exclusion for any given project is based on several different factors including, but not limited to: project in-progress status, risk score, scalability, and resource availability. In addition, when it can be accomplished, the bundling of work and/or projects is analyzed to optimize the total cost and outage planning. The Company's objective is to arrive at a five year capital budget that is the optimal balance in terms of making the investments necessary to maintain the performance of the system for customers, while also ensuring cost-effective use of available resources.

The Plan budget is developed in a manner that is consistent with, and influenced by, the programs and initiatives being implemented as a result of the management audit in Case 08-E-0827. Those programs and initiatives will continue to mature and improve with time, resulting in further improvements in the capital planning and delivery processes for the benefit of customers. In addition, because of the time horizon over which the Company must budget its infrastructure investments, there are inevitable changes in budgets and project estimates over time. Such changes may be due to changes in project scope, changing material or resource costs, changing customer needs, or a more refined estimate based on where the project is in its development. External factors, such as generation retirement announcements or new regulatory or legislative requirements, also drive changes in the Plan budget.

Cost estimates for projects that are already in-process, or are soon to be in-process, generally have +/- 10% cost estimates. Other projects at earlier stages in the project evolution process, and the budgets for those projects, are accordingly less refined and are more susceptible to changes in scope and budget. The projects in the Company's

portfolio are continuously reviewed for changes in assumptions, constraints, as well as project delays, accelerations, weather impacts, outage coordination, permitting/licensing/agency approvals, and system operations, performance, safety, and customer driven needs that arise; and is updated accordingly throughout the year.

The Company includes certain Reserve line items in its Capital Investment Plan to allow flexibility to accommodate contingencies not known at the time the plan is developed and to allocate funds for projects in future years whose scope and timing have not yet been determined. Reserve funds for budget years 1 and 2 are typically negative values and are established to acknowledge the risk associated with projects that may arise in response to unforeseen concerns such as the replacement of damaged or failed equipment, customer or generator requirements, regulatory mandates, or delays in licensing and permitting of larger projects. For future year budgets, typically years 3 through 5, historical trends are used to develop the appropriate reserve levels and are typically a positive value. Specific projects which have encountered the unforeseen delays mentioned are reallocated and their funding is drawn from the positive reserves. Also, as specific project details become available, emergent projects are added to the Plan with funding drawn from the reserve funds. The Company tracks and manages budgetary reserves and emergent work as part of its investment planning and current-year spending management processes, and reports that information quarterly to Staff. The Company works to identify specific projects in the Plan to reduce reserve budgets to the extent feasible.

The Company uses different approaches to deliver the investment Plan based on the differences in scope and character of Transmission and Distribution construction. With respect to the Transmission portion of the Company's investment plan, the Company will supplement its internal workforce with competitively procured contractor resources. On the Distribution side, the Company's internal workforce will continue to be primarily supplemented by the Company's Distribution Alliance contractor and competitively procured contractor resources.

The Company's risk-based approach to selecting projects and programs for inclusion in the Plan, coupled with its efforts to improve cost estimating and implement performance metrics that include substantial financial consequences, results in a capital investment budget that meets the needs of customers at reasonable cost.

Chapter 1 E. Organization of this Filing

The remainder of this Plan provides detail on the programs and projects that comprise the Five Year Capital Investment Plan. The document is segmented into the following chapters:

Chapter 2 - Transmission System

Chapter 3 - Sub-Transmission System

Chapter 4 - Distribution System

Chapter 5 - Investment by Transmission Study Area

Chapter 6 - Exhibits

Chapter 2. Transmission System

The transmission system consists of approximately 6,000 miles of transmission line, 313 transmission substations, more than 500 large power transformers, and over 700 circuit breakers at operating voltages above 69kV. The Company expects to invest approximately $936 million on the transmission system over the next five years as shown in Table 2-1 below.

Table 2-1
Transmission System Capital Investment by Spending Rationale ($millions)

Spend Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	0.06	0.01	0.0	0.0	0.0	0.07
Damage/ Failure	12.0	7.2	7.2	6.5	6.5	39.3
Non-Infrastructure	3.8	2.2	1.5	1.5	1.5	10.5
System Capacity /Performance	102.9	69.5	69.6	34.4	38.7	315.2
Asset Condition	57.5	87.9	120.2	146.7	159.1	571.4
Total	**176.3**	**166.8**	**198.5**	**189.0**	**205.8**	**936.4**

The $936.4 million 5-year transmission system investment level in this Plan is $87.1 million more than the 5-year investment level in the 2013 Plan. This increase is due primarily to the advancement of certain projects to stabilize the transmission system related to mothball announcements by the Dunkirk and Cayuga generating stations and spending in FY19 for some larger scope projects, including the Lighthouse Hill 115kV station rebuild, Lockport-Batavia 112 115kV line refurbishment, relay replacements, Ticonderoga 2-3 115kV line refurbishment, conductor clearance projects and upgrading Porter 230kV breakers, disconnects and power transformers. In addition, numerous transmission projects were re-phased/deferred to FY17 and beyond to accommodate acceleration of some projects related to the Dunkirk and Cayuga mothballing.

The remainder of the chapter briefly describes major capital investment programs that comprise a significant portion of the Company's overall five-year transmission capital investment Plan.

As described previously, the Company has revised how it classifies projects within Spending Rationale and Program classifications to better reflect the driver of the work performed. Specific transmission capital investment projects that have moved to a different spending rationale are listed in Table 2-2 below. A complete list of all projects in the capital plan can be found in Exhibit 1.

Table 2-2
Transmission Capital Projects with Changed Spending Rationale

Funding Number	Project Name	Previous Spending Rationale	New Spending Rationale
C026923	NY Inspection Repairs - Capital	Damage Failure	Asset Condition
C011640	Wood Pole Mgmt Program (Osmose)	Damage Failure	Asset Condition
Various	Conductor Clearance Program/Projects	Statutory Regulatory	Asset Condition
Various	Customer Interconnection	Statutory Regulatory	Customer Requests/Public Requirements
C027954	FAA Obstruction Lighting - West	Statutory Regulatory	Customer Requests/Public Requirements
C028686/ C028705	Station Rebuilds at Clay and Porter	Statutory Regulatory	System Capacity & Performance
Various	Northeast Region Reinforcement	Statutory Regulatory	System Capacity & Performance
C036866	Porter 230kV-Upgrade Brks/Disc/PT's	Statutory Regulatory	System Capacity & Performance
C044196	Purchase a 230-23kV NY System Spare	System Capacity & Performance	Asset Condition
C050745	Relocate Lafarge-Pleasant Valley#8	System Capacity & Performance	Customer Requests/Public Requirements

The sections below describe the investment drivers and customer benefits along with a description of significant changes between last year's Plan and this filing. Specific asset condition and performance issues are described in further detail in the annual Report on the Condition of Physical Elements of Transmission and Distribution Systems filing to the PSC, most recently filed October 1, 2013.

Chapter 2 A. Customer Requests/Public Requirements

Transmission investments in this spending rationale can include land rights and public requirements including municipal, customer interconnections and wind farms. Because customer interconnection projects are typically reimbursable (i.e., costs incurred by the Company are paid for by the customer), there is no net effect to the capital plan from such projects. The Company does not anticipate any significant non-reimbursable Customer Requests/Public Requirements transmission system projects over the 5-year period of this Plan.

Chapter 2 B. Damage/Failure Strategies and Programs

The Damage/Failure investment levels for the transmission system are based on historical actual costs. The Company does not anticipate any significant specific transmission system projects in the Damage/Failure spending rationale over the 5-year period of this Plan.

Chapter 2 C. System Capacity and Performance Strategies and Programs

There are three significant areas of transmission system investment in the System Capacity and Performance spending rationale in the next five years: generator retirements, NERC/NPCC standards and transmission owner led system studies.

2 C.1 Generator Retirements

Generator retirement related projects are intended to reinforce the transmission system to avoid or mitigate reliance on market generators to maintain system reliability and performance. In this Plan, the Company has included several transmission projects intended to mitigate the impacts of the closure or potential closure of the Dunkirk, Cayuga and Syracuse Energy Project generating facilities.

Dunkirk

On March 14, 2012, NRG announced plans to mothball its coal fired generation located at Dunkirk. An analysis by National Grid (Part 1) identified near-term projects that would mitigate the system impact of the mothballing for all but one 115kV generating unit. These near-term projects were completed by June 1, 2013. A second analysis (Part 2) of a full generation shutdown was later completed that identified more long term system reinforcements needed to allow all units to be retired.

In January 2013, the Public Service Commission directed a comparative evaluation of generation repowering and transmission alternatives to address the issues that would result from shutdown of the Dunkirk plant. In December 2013, Governor Cuomo announced an agreement in principle between NRG and National Grid to refuel the Dunkirk plant. If implemented, the refueling would increase the Company's flexibility with respect to the timing of certain transmission investments for western New York. For

example, if the generation solution can be ultimately agreed and timely implemented, the following investments could be deferred and/or rephased:

- Installation of two 33.3 MVAr capacitor banks on the two Dunkirk 115 kV bus sections, and a second 75 MVAr capacitor bank at the Huntley 115 kV switchyard. (C047318, C047316 respectively) - each $0.7m.
- Reconductoring of two 115 kV lines between Five Mile Road and Homer Hill, each 7.4 miles in length. (C047319) - $16.1m.

NRG and National Grid are working on a formal agreement to implement the generation refueling agreement in principle.

Drivers:

The projects identified in the Part 1 study of the impacts of Dunkirk generation shutdown did not fix all issues identified in the 2011 area study. A complete shutdown of the Dunkirk plant would result in criteria violations under certain key contingency conditions. A 2013 transmission study of Western New York tested both N-1 and N-1-1 design criteria, compliance with NERC TPL Standards, NPCC Directory #1, NYSRC Reliability Rules and the Company's Transmission Planning Guide (TGP 28). These standards require the entire transmission system to meet N-0 and N-1 voltage, thermal and stability criteria as well as the bulk power system and long lead time items to meet the same criteria for N-1-1 conditions. Issues found included voltage problems around Homer Hill and Dunkirk (N-0, N-1, N-1-1), and voltage problems around Batavia, Brockport and Golah (N-1). The transmission investments identified pursuant to the analysis of the Part 2 Dunkirk mothballing impact study, as well as the comprehensive area study, incorporates all recommendations of the Part 1 impact study, and address long term exposure to N-1 and N-1-1 low voltages and overloads using NPCC testing requirements if the Dunkirk generation is permanently retired. In the event a generation solution is successfully implemented, some of the transmission investments identified to mitigate the impact of the mothballing might be deferred or avoided altogether. In such case, the Company would adjust its capital plan accordingly.

Customer Benefits:

Exposure to service interruptions and performance degradation, including potential load shedding in the event of certain key contingencies, would be reduced significantly. Costly Dunkirk generation that currently must be run at times to support voltage and transmission thermal capacity would no longer be required for these purposes if the transmission reinforcement projects are built. However, if a generation agreement is ultimately implemented, such transmission reinforcements may be deferred.

2013 to 2014 Variance:

The difference in spend between the 2013 Plan and this year relates primarily to investment made in FY14 which is not included in this FY15-FY19 forecast.

Table 2-3
Transmission - Dunkirk Generation Mothballing
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.9	10.9	8.0	-	-	-	21.8
2014	-	11.1	6.4	-	-	-	17.5

In the event a generation solution is successfully implemented, future capital investment plans would reflect any adjustments in capital spending.

Cayuga

To meet existing needs within its Auburn region, NYSEG has proposed construction of a new 115kV line between the National Grid Elbridge substation and the NYSEG State Street substation. This new line would parallel the existing #5/#972 lines between the same two substations on the same existing rights-of-way owned by the two companies respectively. The State Street substation predominately supplies load in the Auburn area of NYSEG service territory. The #5 line shares a single double-circuit tower with the #15 line in a right-of-way owned by National Grid. The #15 line serves load in the Geneva area of the NYSEG service territory. The National Grid right-of-way also includes other lines that connect to RG&E and National Grid facilities further to the west in New York State.

In September 2012, the owners of the Cayuga generating plant (within the NYSEG service territory) announced plans to mothball both units. A subsequent joint analysis by the NYISO, NYSEG, and National Grid determined that system performance would not meet regulatory reliability criteria if the two Cayuga generators were no longer available.

The long term solution set that was identified by the joint analysis team to mitigate both the existing problems in the Auburn area as well as the reliability problems resulting from mothballing of Cayuga generation comprises the following major components with investment levels greater than $2 million (costs shown are for the period covered by this Plan):

- Construct a new 115kV line on the National Grid right-of-way (10.3 miles) between Elbridge and the NYSEG right-of-way to the State Street substation (C047298) - $9m (this project is proposed to be built and owned by NYSEG).
- Add a second set of new conductors onto the new double-circuit towers built to hold the new line between the Elbridge substation and the NYSEG right-of-way to State Street; connect this second set of new conductors so as to serve as the #15 line over this 10.3 mile section of right-of-way; bus together on existing towers the old conductor of the #15 line and the existing conductor of the #5 line over the 10.3 mile section of the National Grid right-of-way between the Elbridge substation and the NYSEG right-of-way to State Street (C047297) - $11.0m (this project is assumed to be reimbursable by NYSEG).
- Add two breaker positions in the Elbridge substation for the new 115kV line to State Street and the relocated #15 line (C047299) - $3.1m (this project is expected to be reimbursable by NYSEG).

Reconductoring of the Clay-GE #14 line (C045253) previously was identified as necessary as a result of the potential retirement of Cayuga generation. However, because of the retirement of the Syracuse Energy project in the summer of 2013, the Company must reconductor the Clay-GE #14 line irrespective of the status of the Cayuga generating station.

Drivers:

The new 115kV line between Elbridge and State Street is driven by NYSEG's needs to serve its customer load in the Auburn area. These needs relate to load growth and to voltage performance and existed prior to the announcement of Cayuga generator mothballing

The mothballing of Cayuga generation further stresses the existing system, even after the new line from Elbridge to State Street is built. The analysis of N-1 and N-1-1 contingency reveals that additional thermal or voltage problems would arise not only on the existing 115kV #5 line between Elbridge and State Street, but also in the NYSEG system at the Oakdale substation and in the National Grid system in and near the Clay substation.

The owner of the Cayuga plant and NYSEG have entered into a contract to ensure the availability of the generation until the necessary long term reinforcement projects are completed or until a potential repowering agreement is reached.

While a long term solution set of reinforcements to National Grid facilities that will mitigate the impact of a permanent shutdown of Cayuga generation is included in this 5-year investment Plan, specific issues involving final ownership of facilities have not been resolved at this time nor has a repowering agreement been finalized. Resolution of these issues may affect future investment plans.

Customer Benefits:

Exposure to service interruptions and performance degradation, including load shedding in the event certain key contingencies occur, would be reduced significantly. The Cayuga generation that currently must be run at times to support voltage and transmission thermal capacity will no longer be required for these purposes if all transmission reinforcements are built. If a repowering agreement is reached, however, it is possible that only the new line between Elbridge and State Street would be needed.

2013 to 2014 Variance:

The primary variance between the 2013 and 2014 Plans results from the reduction of cost associated with work on the #5 line between Elbridge and State Street, and because of a shift of non-reimbursable projects (i.e., the Clay – GE #14 line C045253) from this Cayuga Generation shutdown section to the Syracuse Energy Generation Shutdown section below in table 2-5. The reduction in cost results from avoidance of the need to replace all the existing towers that currently hold the #15 and #5 lines. The capital forecast in Table 2-4 includes only those projects assumed to be fully reimbursable by NYSEG. Because such projects are expected to be fully reimbursable, they are not expected to affect National Grid's net capital spending in the long run.

Table 2-4
Transmission - Cayuga Generation Shutdown
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	12.3	26.7	28.7	2.8	-	-	70.5
2014	-	19.6	3.1	0.3	-	-	23.0

Syracuse Energy

In June 2013 GDF SUEZ announced plans to retire its Syracuse Energy Generation facility. A subsequent joint analysis by the NYISO and National Grid determined that system performance would not meet regulatory reliability criteria if this plant were retired.

Performance of portions of the Syracuse area transmission system was shown to be dependent upon the output of local area generation. In particular, the Clay-G.E. #14 line was shown to be overloaded for certain criteria contingencies when the Syracuse Energy facility is no longer in-service. Thus, the major project triggered by the Syracuse Energy facility retirement is:

- Reconductor the Clay – GE #14 115kV line (C045253) - $13.4m

Drivers:

With Syracuse Energy retired, the Clay – GE #14 line was found to become loaded beyond LTE and STE ratings for certain applicable N-1-1 criteria contingency testing. To bring this line back into compliance with criteria, 4.67 miles of 4/0 copper conductor will need to be replaced with 795 ACSR.

Customer Benefits:

This project will eliminate the exposure to potential service interruptions including load shedding in the event of certain key contingencies.

2013 to 2014 Variance:

The retirement of the Syracuse Energy facility was unknown at the time of the 2013 Plan. Although the Clay – G.E. #14 line was included in the 2013 Plan, it was previously associated with the Cayuga generator mothballing. However, retirement of the Syracuse Energy facility makes it necessary to reconductor the Clay – GE#14 line irrespective of the status of Cayuga.

Table 2-5
Transmission – Syracuse Energy Generation Retirement
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	-	-	-	-	-	-	-
2014	-	10.1	3.3	-	-	-	13.4

The Company does not control, and has limited ability to project, future generator retirements. As a result, investment plans related to unannounced retirements are difficult to develop. The Company participates actively in NYISO working groups that monitor generator retirements, and is working with the NYISO and other transmission owners in an effort to assess impacts of potential generator retirements across the state. To the extent future generator retirement announcements affect the Company's investment needs, the Company's subsequent investment plans will reflect those investment needs.

2 C.2 NERC/NPCC Standards

Projects in this investment area are designed to bring the Company into compliance with applicable regulatory planning standards.

Substation Compliance Upgrades

This program relates to the need to upgrade the Clay 115kV (C028705 - $0.6m) and Porter 115kV (C028686 - $2.8m) substations to meet recently applicable NPCC criteria. The applicability of the NPCC criteria to these two stations has been confirmed by the New York ISO; therefore, investments are required to comply with the relevant NPCC requirements.[1] Also, 230kV circuit breakers, disconnect switches and potential transformers at Porter need to be upgraded to be compliant with applicable system standards (C036866 - $16.3m)

Drivers:

In accordance with NPCC criteria adopted in April 2007, testing of qualifying substations across New York State was performed by the NYISO. The results indicate that Clay and Porter 115 kV substations as facilities that are required to be brought into compliance with specific NPCC design, protection and operation requirements.

Customer Benefits:

In addition to compliance with NPCC and NYSRC requirements, the benefits of completing these projects are reductions in system vulnerability to certain severe contingencies identified in system studies. Customers throughout central New York will benefit from reduced vulnerability of the transmission system to such contingencies.

2013 to 2014 Variance:

The current construction sequence has the Clay and Porter 115kV projects completing by FY16 as planned. The Porter 230kV project work was not identified in this sub-category last year; instead it was categorized as "Other Statutory Regulatory" spend in the capital plan.

[1] This program was discussed in more detail in Appendix 1, Attachment 4 of the April 21, 2009 Petition to Defer Electric Transmission & Distribution Investment Costs (Case 07-E-1533).

Table 2-6
Transmission – Substation Compliance Upgrades
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	24.5	0.8	0.1	-	-	-	25.4
2014	-	3.4	0.1	0.3	1.0	15.0	19.8

2C.3 Transmission Owner Led System Studies

These projects are the result of studies performed by the Company's Transmission Planning department.

Northeast Region Reinforcement

This major program consists of reinforcements of the transmission system in the Saratoga and Glens Falls area of the Company's Northeast Region. It is necessitated by existing thermal and voltage needs and area load growth in the Northeast Region. It is also impacted by the proposed Luther Forest Technology Campus ("LFTC"). Currently, there are a number of major projects under this program each of which is still forecasted to incur a total spending level of over $1 million during the period covered by this Plan, including:

- Installation of a new Eastover Road 230/115kV substation near where the existing Rotterdam-Bear Swamp 230kV line crosses the existing Mohican-North Troy #3 line and the Battenkill-North Troy #10 115kV lines. This station would serve as a primary source to 115kV lines serving the east side of the Northeast Region. (Project #s C031326 - $9.8m & C031419 - $2.9m)
- Installation of a new 115kV line parallel to the existing Spier Falls to Rotterdam #1 & #2 circuits. This line is now energized and will reinforce the west side of the 115kV system that serves the Northeast Region. (Project # C031418 - $1.9m)
- Rebuild the Mohican-Battenkill #3 and #15 lines between Mohican and Battenkill substations and reconductor 14.2 miles of the #15. This project requires an Article VII application on which the Company is currently working. The current expectation is an Environmental Management and Construction Plan will be delivered to the Commission in February 2014, with a target approval by September 2014. Anticipated project completion is the end of CY2015. (Project # C034528 - $30.2m)
- Reconductoring of 22.9 miles of existing 115 kV lines in the Northeast Region. (Project # C035771 - $15.1m)

The timing of some facets of this program (including the reconductoring of existing lines, and reactive compensation) depends on the actual load growth for the Northeast Region (Saratoga and Global Foundries) during the next 1-10 years. Annual area planning studies will confirm whether and when such projects appear in future budgets going forward. Other projects in the program are needed absent additional load growth to relieve exposure to existing performance issues in the area. These include the new Spier-Rotterdam lines, Eastover Road Station, and rebuilding the Mohican-Battenkill 115 kV lines.

Drivers:

The transmission system serving the Northeast Region is currently exposed to post contingency thermal overloads during summer peak periods, including thermal capacity concerns with respect to certain transformers at Rotterdam and the Spier-Rotterdam 115kV double circuit. These conditions present a need to relieve 115kV thermal overloads which affect the transmission supply to the Northeast Region and to add transformation capacity.

As discussed in the 2009 Asset Condition Report[2] and the Eastern NY Reinforcement Project Report[3], the Global Foundries' (GF) chip-manufacturing plant at the Luther Forest Technology Campus (LFTC) site results in projected load growth within the Northeast Region that will exacerbate transmission system performance issues.

The Company's ten-year forecast for the area projects a growth rate of under 1% for loads within all of Eastern NY. The Company has phased the program over several years, so that it has the ability to defer, re-phase or eliminate certain load growth dependent elements of the program as discussed above.

Customer Benefits:

The transmission reinforcement plan will resolve existing thermal and voltage problems that are expected to be exacerbated from projected load growth in the Northeast Region. Load shedding on the order of hundreds of MWs would be necessary to relieve projected overloads without the new Spier-Rotterdam and Eastover Road projects.

In addition, the transmission reinforcement program will reduce dependence on local generation for reliability of service within the region. Without local generation available during the summer periods, the Spier-Rotterdam 115 kV circuits will be exposed to single contingency overloads until the local generation is returned to service. This in turn could require load shedding at or near LFTC for relief. This situation will be resolved with the addition of the new Spier-Rotterdam line, Eastover Road Substation and Mohican-Battenkill reconductoring.

2013 to 2014 Variance:

The primary variance between the 2013 and the 2014 Capital Investment Plans (CIP) results from spend that occurred in FY14 which is before the five year timeframe of this CIP. The current spending forecast still includes the new Eastover Road substation with a ring bus layout and a single 230/115kV bank which was the superior alternative to the other proposed solutions that did not involve the addition of Eastover Road substation. Reactive compensation at distribution and transmission stations (C035773) in the Northeast Region have been removed from the 2014 plan until future studies can validate their need.

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[2] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2009, pgs. II-17 to II-18.

[3] Report to DPS: Eastern NY Reinforcement Project – Associated Bulk Transformation Needs and Solution Assessment, November 3, 2011. The investments shown for Eastover Road in the latter DPS report included spending prior to FY13 whereas the investments shown in this five year Plan exclude spending prior to FY13.

Table 2-7
Transmission – Northeast Region Reinforcement
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	44.6	30.9	4.7	9.0	2.3	-	91.4
2014	-	27.4	17.5	1.6	4.7	8.8	59.9

Western NY Region Reinforcements

This program involves significant capital expenditure over the next five years and beyond to construct major reinforcements of the 115kV transmission systems in western New York, including the Southwest and Genesee regions that extend from the Buffalo area east to Mortimer Station and south to the Pennsylvania border. This program will strengthen the transmission network and ensure adherence to reliability standards. It will also correct existing asset condition, safety, and environmental concerns resulting in improved reliability of several circuits.

Reliability issues and preliminary solutions in western New York were identified by an area study conducted in 2011. Alternative solutions were further investigated by area studies in 2012 and 2013. The recommendations of the 2013 study confirmed the need for projects recommended in earlier studies and included new projects that reflect changes in overall load levels in western New York (NYISO Zone A) and the distribution of load within the region. The need and/or timing of some projects in this program that were recommended as long term reinforcements beyond those identified as near-term measures to mitigate the planned shutdown of generation at Dunkirk may be adjusted if the Dunkirk generating plant is refueled, as described previously.

The major components in this program with investment levels greater than $1 million (costs shown are for the period covered by this Plan) include:

- Constructing the new 345/115kV Five Mile Station near the Homer Hill Station tying into the Homer City-Stolle 345kV line #37 and the Gardenville-Homer Hill 115kV lines #151 and #152 to support area voltage (C024015 and C024016) - $26.1m.
- The 2013 Capital Investment Plan included a project to re-conductor 6 miles of the Falconer-Warren 115kV #171 circuit to prevent the circuit from being opened by FirstEnergy due to their loading concerns (C024017). These loading concerns will now be addressed by an alternative project involving installation of a Phase Angle Regulator (PAR) at the Falconer substation (C053145 for line work $1.1m and C053146 for the station work $7.1M).
- Reconductoring 14 miles of the Erie-Packard 115kV #181 circuit due to loading concerns for loss of the #182 line or the Homer City 345 kV source. (C050744) - $38.2m.
- Constructing a new 115kV substation and ring bus at West Golah that ties together the National Grid #119 and NYSEG # 906 lines (C050695) - $7.3m.

Drivers:

Studies of the 115kV and 230kV transmission systems were conducted for the Frontier, Southwest and Genesee regions of western New York, to determine compliance with applicable reliability standards. Studies initially performed in 2007 and repeated in 2012 and 2013 evaluated the system for existing load levels up to a 15 year forecasted load level. Included within each of these evaluations was testing of both N-1 and N-1-1 design criteria, ensuring compliance with NERC TPL Standards, NPCC Directory #1, NYSRC Reliability Rules and the Company's Transmission Planning Guide (TGP 28). These standards require the entire transmission system to meet N-0 and N-1 voltage, thermal and stability criteria as well as the bulk power system and long lead time items to meet the same criteria for N-1-1 conditions. Several reliability criteria issues for the area were discovered under various study conditions. In the Southwest Region, multiple reinforcement projects are required to correct all N-1 conditions.

Customer Benefits:

Customers will benefit from this program in several ways, including:

- Exposure to service interruptions, including load shedding, in the event of certain key contingencies would be reduced significantly. Generation that currently must be run at times to ensure voltage support and stability will no longer be required for these purposes, avoiding costs of dispatching the generation out of merit order.
- Circuits that are normally open, which provide a backup source to loads in the Homer Hill area will be operated normally closed, reducing the frequency and length of outages for certain contingencies.
- Some capability to accommodate new or expanding load will be added to the system.

2013 to 2014 Variance:

The primary variance between the 2013 and 2014 Plans results from the addition of project C050744 - reconductor 14 miles of the Erie-Packard 115kV #181 circuit, and projects C053145 and C053146 – Falconer PAR. These three projects were not in the previous plan, but are now recommended as a result of the 2013 area study and as a result of the new solution proposed to solve the previously identified problem with the #171 line.

Table 2-8
Transmission – Western NY Region Reinforcements
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	11.3	26.3	19.1	2.4	-	-	59.1
2014	-	24.3	9.7	24.6	14.1	7.0	79.7

Syracuse Area Reinforcements

This program reinforces the transmission system in and around the Syracuse area. These reinforcements are necessary to respond to system capacity and performance needs and to avoid thermal overloads during contingency conditions.

Needs and alternative solutions are investigated by annual area studies. The recommendations of the 2013 study confirmed the need for projects recommended in earlier studies and included new projects that reflect changes in overall load levels in western New York (NYISO Zone C) and the distribution of load within the region.

The program scope includes:

- Reconductoring two separate parts of the Clay–Teall 115kV Line #10, 6.75 miles and 6.08 miles sections, as well as 10.24 miles of the Clay-Dewitt 115kV #3 line. This project is required for compliance with mandatory NERC standards (C043995) - $38.2m. (Project C043995 is now a combination of two previous projects - C043995 and C043996.)
- Reconfiguring Transformer connection at Clay Substation (C047275) - $8.0m

Drivers:

Annual studies of the 115kV and 345kV transmission systems are conducted for the Central region of New York, which extends from Elbridge Substation in the West to Oneida Station in the East, to determine whether the systems comply with reliability standards. Included in this testing to comply with NERC TPL Standards, NPCC Regional Reliability Reference Directory #1, NYSRC Reliability Rules and the Company's Transmission Planning Guide (TGP 28). These standards require the entire transmission system to meet voltage, thermal, and stability criteria. These studies were last performed in 2013, and evaluated the system for load levels ranging from existing up to the 15 year forecasted load level.

Several reliability criteria issues for the area were discovered under study conditions. Issues include thermal overloads on 115kV circuits in the Central Region, and a reinforcement and reconfiguration of the Clay substation 345/115kV transformer capacity.

Customer Benefits:

Customers will benefit from this program in several ways, including:

- Their exposure to service interruptions, some resulting from load shedding, in the event that certain key contingencies were to occur will be reduced significantly.
- Some capability to accommodate new or expanding load will be added to the system.

2013 to 2014 Variance:

The primary variance between the 2013 and 2014 Plans results from a shift in the definition of specific projects and the redefinition of the scope of this spending subcategory. Initially the reconductoring of the Clay-Teall #10 and Clay-Dewitt #3 lines

were treated as two separate projects. They are now being combined into one overall project. This subcategory of System Capacity and Performance has also been broadened to include more than just the reconductoring projects in the Syracuse area. The project to reinforce and reconfigure the Clay 345/115kV transformer capacity has also been added to the costs shown for this plan in the variance table below. This project was not previously included in this subcategory in the previous plan. The portion of the total cost for the latter project that pertains to reconfiguration of the substation is related to the Cayuga generation mothballing. However, the need to reinforce the existing transformer capacity preceded the announcement of the Cayuga mothballing.

Table 2-9
Transmission – Syracuse Area Reinforcements
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.1	4.6	7.4	-	-	-	14.1
2014	-	9.5	5.7	22.5	8.5	-	46.2

BES 100kV Brightline

Although no investment amount is included in this Plan related specifically to the BES 100 kV Brightline, it is the Company's opinion that once the rules are finalized there may be a significant investment effect, and therefore it provides the following discussion.

Investments in FY15 and beyond will be impacted by NERC's implementation of a program to redefine circuits rated at 100 kV such that they will become part of the Bulk Electric System (BES). The implementation plan submitted by NERC included a two year period for all NERC registered entities to bring BES elements of the transmission system into compliance with the new standards. Compliance with the new definition is not expected to be required before July 1 2016. FERC made a ruling (Order 773) on the NERC submission in December of 2012. In April of 2013, FERC ordered that some changes be made to the initial ruling. However, these changes have not yet been finalized.

There are three main areas where the Company has identified potential impacts to its investment plans due to the bright line as originally defined in the NERC proposal.

- One aspect of meeting the proposed criteria would be to undergo a program similar to Conductor Clearance Strategy (SG163) on the circuits not formerly included in the A-10 bulk circuit list but that are on the new BES list (estimated to be over 200 additional circuits in 2012). The current 5 year Plan assumes implementation of such a program over a 5-10 year period. The conductor clearance program is in the capital investment plan at $75 million over 8 years. Application of the NERC rule could require implementation of the 8 year program in 2 years for 115kV spans with inadequate clearances (unless the Company can obtain relief from NPCC and NERC for a longer implementation timeline).

- The new NERC BES definition, in combination with the new NERC stricter planning criteria (TPL 001-4), will impose such criteria on a larger set of facilities in the future. Making specific cost estimates of the impact of the new BES

definition as it is ultimately implemented is difficult until a final ruling is made The Company is factoring the new BES definition and the new TPL standard into its planning studies, but it has not entered specific line items into this plan that can be attributed solely to this definition change.

- New Cyber Security standards version 5 in combination with the BES definition will impact facilities that are expected to be in conformance with the Critical Infrastructure Protection standards. The new Critical Infrastructure Protection standards require facilities that are critical in deriving Interconnection Reliability Operating Limits (IROLs), that have Special Protection Schemes that could impact an IROL, and that have a high number of lines connected to the substation to be included. These changes in conjunction with the new BES definition are expected to add 14 facilities in New York to the list of those that must meet the Critical Infrastructure Protection standards. The impact of this change is estimated in the range of $4 to $6 million over the next two years; however, more specific cost estimates are difficult at this point until the impact of version 5 of Critical Infrastructure Protection standards is fully evaluated. The Critical Infrastructure Protection standards are enforceable 4/1/16 for High and Medium facilities and 4/1/17 for Low facilities.

To the extent the Company identifies future investment plan needs specifically related to the BES rules, they will be reflected in future plans.

Chapter 2 D. Asset Condition

Asset Condition expenditures are those investments required to reduce the likelihood and consequence of the failures of transmission assets, such as replacing elements of overhead lines, underground cable or substation equipment. The Company presents an approach in this Plan that keeps near-term capital costs for asset condition projects in line with spending limits approved in its most recent electric rate case (12-E-0201) while still addressing system needs. The result is greater reliance on the purchase of spare equipment to replace damaged equipment that may fail in service for certain elements of the transmission and distribution system. This approach calls for more targeted replacement of assets based on their condition versus wholesale replacement based on "end of useful life" criteria, especially for transmission line refurbishment projects. Close monitoring of system performance as it relates to asset condition causes will remain necessary.

For overhead lines specifically, this Plan seeks to achieve compliance with NESC requirements, and will continue to implement the recommendation from Staff's 2010 rate case testimony to refurbish overhead transmission line facilities that are in unacceptably severe deteriorated condition (i.e. Niagara Mohawk's defined Level 1, Level 2 and Level 3 conditions), as opposed to entire lines, unless a compelling justification can be provided for the full refurbishment. Any overhead line proposed for a refurbishment will undergo a field inspection by qualified transmission line engineers and will usually be supported by comprehensive aerial inspection using stabilized video cameras. As part of the conceptual engineering process, refurbishment options will be thoroughly evaluated on a case-by-case basis and the engineering economics of various options such as a complete reconductoring versus a life extension are reviewed in the project sanctioning process. In addition, longer term impacts such as a greater number of visits to the same right-of-way, multiple site establishment costs, increased storm hardening, additional permitting and licensing costs, greater levels of environmental impact, and more disturbance to property abutters, among other things will be evaluated to determine if it is the most economical scope of work for the benefit of customers. Further detail on specific asset condition programs and projects is given below.

NY Inspection Repairs - Capital

The goal of this program (C026923 - $28.8m) is to replace those damaged or failed components on the transmission overhead line system identified during field inspections (five-year foot patrols). A 2012 (FY13) foot patrol inspection of the Homer Hill-Bennett 157 line revealed 103 reject poles and 11 structures requiring insulator replacements. Engineering has been completed and a design package being approved for completion of this work by FY16.

Drivers:

These programs assure that both steel tower and wood pole transmission lines meet the governing NESC standards by replacing hardware, wood poles, and structure components that no longer meet the governing code requirements. This follows standard industry practice and the Commission's 2005 Safety Order in Case 04-M-0159. Since this work is required to meet governing NESC standards the program could equally be categorized as Statutory or

Customer Benefits:

This program enhances public safety by assuring that damaged or failed transmission overhead line components are replaced and continue to meet the governing National Electrical Safety Code under which they were built. Replacement of damaged and failed components discovered during inspection also promotes reliable service performance.

2013 to 2014 Variance:

Spending levels during the last two years were lower than originally projected due to implementation and preliminary engineering lead times. Increases in FY15 and FY16 are primarily due to higher number of maintenance units identified as Level 3 during recent foot patrol inspections – most notably the Homer Hill – Bennett Road 157 pole replacements in FY16.

Table 2-10
Transmission – New York Inspection Projects
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	4.1	4.1	1.1	1.2	1.2	-	11.7
2014	-	6.2	12.3	4.3	3.0	3.0	28.8

Wood Pole Management

This program (C011640 - $8.5m) assures that transmission lines meet the governing NESC under which they were constructed by replacing wood poles and wooden structures that no longer meet the governing code requirements due to damage or failure of the pole or structure. In the 2013 CIP this program was categorized as Damage/Failure.

Drivers:

As discussed in the Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2013, wood poles that are either priority rejects or reject poles (as classified following a wood pole ground line inspection and treatment performed on behalf of the Company by Osmose Utilities Services Inc, of Buffalo, NY) as well as those damaged by woodpecker or insect activity will be replaced. The ground line inspection and treatment of wood poles is performed approximately every 10 years. These inspections are in addition to the 5 year foot patrol which is required under the Commission's 2005 Safety Order in Case 04-M-0159.

The wood poles targeted through this initiative are deemed to be beyond restoration by either re-treatment or placement of some form of additional pole support, usually at the ground line. Similarly, "reject equivalent" refers to deteriorated wood poles from such things as wood pecker damage, insect damage, or rotting and, therefore these poles are included in the Wood Pole Management Program.

Reject and priority reject poles generally do not meet NESC requirements. In a limited number of cases when an extra margin of safety was added into the design, some of this margin may still be available before failing to meet the Code. However, this usually provides only a limited amount of extra time to replace the damaged or deteriorated wood pole(s) or structures before potential failure.

Customer Benefits:

Customers will benefit from the maintenance of the appropriate public safety level by assuring that transmission wood structures continue to meet the governing Code. In addition to the public safety benefit, unplanned failures of wood poles or structures can reduce service reliability, and may reduce overall system integrity making the transmission system vulnerable to widespread disruption.

2013 to 2014 Variance:

The Company spent $5.2 million in FY13 as part of a catch-up effort to replace poles. Future spending levels are expected to remain consistent to the prior plan.

Table 2-11
Transmission – Wood Pole Management
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.5	2.6	1.5	1.5	1.5	-	9.6
2014	-	1.0	2.0	2.5	1.5	1.5	8.5

Conductor Clearance Strategy

The conductor clearance correction program will increase the clearance of certain overhead conductors to address locations that may not meet clearance standards prescribed by the National Electrical Safety Code (NESC) under certain loading conditions. The need for greater clearances has been identified as a result of an ongoing Aerial Laser Survey (ALS), also known as LiDAR for Light Detection and Ranging, being conducted on the transmission system. Clearances are in the process of being measured with aerial surveys providing an accuracy which was previously available by ground inspection only. The project will continue between FY14 and FY22 to address conductor clearance issues for 115kV lines newly classified as BES followed by non-BES 115kV circuits. This timeline assumes there will be no further directives from FERC similar to the October 7, 2010 a NERC Alert (Recommendation to Industry: Consideration of Actual Field Conditions in Determination of Facility Ratings) that would prescribe a specific correction period for circuits newly classified as BES.

Drivers:

The primary driver for this work is safety of the public and Company personnel as they work and travel under the overhead lines. The National Electrical Safety Code (NESC) sets required conductor clearances of overhead lines from the ground and other ground based objects. This program assures that transmission lines meet the governing NESCunder which they were constructed by improving ground to conductor clearances

in substandard spans. This follows standard industry practice and a Public Service Commission Order (Case 04-M-0159, effective January 5, 2005) that the Company shall adhere to the NESC.

Customer Benefits:

While safety events caused by substandard clearance conductors are rare, their consequences can be very serious and are difficult to quantify. Application of the NESC criteria provides a reasonable means to manage the issue and mitigate the risk from such events.

2013 and 2014 Variance:

The Company has kept its remaining project estimates the same based on experience with bulk power circuits under SG163. The increase in FY19 to $15.0M was driven by the need to reduce FY14 and FY15 budgets to accommodate Dunkirk related projects and maintain the overall 8 year timeline to complete this program.

Table 2-12
Transmission – Conductor Clearance Strategy
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	7.0	7.4	10.7	10.7	10.7	-	46.4
2014	-	7.4	10.7	10.7	10.7	15.0	54.6

Relay Replacement Strategy

Protective relays are maintained in accordance with Company substation maintenance standards and NERC or NPCC requirements, where applicable. Overall the population of approximately 4,000 relay packages remains adequate but approximately 6% of the population requires investment based on condition, performance or obsolescence. This program (C034690) will commence by replacing the worst 6% of the relays over the next eight years. Beyond that, studies and pilot programs will be initiated to explore the most efficient and cost effective approach to addressing the remaining population. The long-term objective is to have an asset management approach that allows a more commoditized approach to relay replacement. This approach will be necessary for modern microprocessor relays that are expected to have only 15 to 20 year asset lives.

Drivers:

This strategy ensures that reliable protective relay systems are in place to preserve the integrity and stability of the transmission system following a fault. This strategy is needed now because properly functioning protective relays are essential for rapid isolation of faults on the system thus protecting customers from potential outages and protecting equipment from damage.

Customer Benefits:

Properly functioning elements of relay protection schemes limit the extent and duration

of outages. Further, the protection system is designed to protect high value assets against failure in the event of system anomalies thereby reducing the potential investment needed to recover from an event. The primary benefit of this strategy will be to maintain the reliability performance of the system and customer satisfaction as known poor performing relay families are replaced with modern microprocessor based relays.

The new microprocessor based relays will also yield additional operational data that was not previously available, allowing better analysis of system failures to prevent reoccurrences which will improve overall system performance for the benefit of customers. With the availability of real time data, future applications can be developed such that more of the transmission system can be automated and designed to respond automatically to system events. The speed of data acquisition and analysis also present system operators with a better understanding of system anomalies and recommendations for remedial actions. For example, distance-to-fault data (DTF) can identify fault location with greater accuracy than currently possible. Accurate DTF data has the potential to reduce O&M costs since less effort will be required to patrol overhead lines after a fault. In addition, this data will be brought back to the control center for use by operations and engineering personnel to ensure the root causes of faults are identified to prevent recurrences.

2013 to 2014 Variance:

The difference between the 2013 and 2014 Plans is due to the project being re-phased in accordance with prior Staff recommendations.

Table 2-13
Transmission Relay Replacement Strategy
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.6	4.9	4.8	9.7	10.7	-	32.7
2014	-	4.8	6.8	2.8	4.8	8.0	27.2

Substation Rebuilds

The majority of the 313 transmission substations are in satisfactory condition, however, investment is recommended to rebuild substations whose overall condition has deteriorated to the point that wholesale refurbishment is required. In these circumstances, a standard substation design layout will typically be utilized to provide greater operational flexibility and increase reliability for customers served in the area. Where substation rebuilds are proposed, creative and innovative solutions and improvements, such as re-configurations of the layout, will be evaluated.

There are seven stations being studied for either upgrades or rebuilds to better meet the current and future needs of customers on the transmission system: Gardenville, Dunkirk, Rotterdam, Inghams, Lockport, Lighthouse Hill, Huntley and Boonville.

The investment profile for substation rebuilds has been re-phased to reduce costs in the Plan, and reflect DPS Staff concerns that each of these seven projects will require fairly complex retrofits and changeovers of existing facilities. The Company has re-phased

the projects to allocate additional time and resources to plan and design the projects and to provide a greater opportunity to consider and develop alternative approaches, consistent with Staff's recommendation in the Company's recent electric rate case. As a result, the Gardenville, Lighthouse Hill, Boonville, Lockport, Dunkirk and Huntley stations are now proposed to be rebuilt, or engineering started, during the FY15 – FY19 period with most of the spending occurring in the later years of the Plan as the Company continues to study alternatives. At remaining substation sites the Company will only replace those assets that cannot be repaired economically. Although a more coordinated, integrated approach is more consistent with long-term sustainability of the system, the ad hoc "fix on fail" approach results in lower capital costs in the short term.

Drivers:

The substations mentioned above have all been identified as having asset condition or configuration issues that warrant a major station rebuild or upgrade.[4] Included with the station name is the forecasted spend amount within this Plan.

Gardenville (C005156 & C030084) $50.8m

Gardenville is a 230/115kV station south of Buffalo that has two 115kV stations in close proximity that are referred to respectively as New Gardenville and Old Gardenville, and which both serve over 750MW of regional load. New Gardenville was built between 1959 and 1969 and has asset condition issues such as faulty control cables, deteriorated foundations and many disconnects which have deteriorated beyond repair. Old Gardenville, built in the 1930s, feeds regional load via eleven 115kV lines. The station has serious asset condition issues including, but not limited to, control cable, breaker, disconnect and foundation problems. The station has had no major updates since it was built. There have been a number of misoperations that can be directly attributed to control cable issues in the past several years alone.

A project has been initiated to address these issues. A new breaker-and-a-half 115kV station is to be built between the two existing stations to replace them. A new 115kV switchyard will be constructed in the western section of the site and there will be rerouting of approximately seventeen 115kV lines for the project to eliminate the current "criss-cross" arrangement outside of the station and eliminate line to ground clearance issues. Project sanction is expected in winter of 2013 after the completion of preliminary engineering.

The completion date was extended to FY18 to accommodate projects related to the Dunkirk and Cayuga plant closures.

Rotterdam (C034850) $7.1m

The Rotterdam substation is a supply source to the surrounding transmission and sub-transmission system. A number of alternative plans for rebuilding the Rotterdam substation are under consideration. One of these plans involved removal of the existing

[4] See "Report on the Condition of Physical Elements of Transmission and Distribution Systems," October 1, 2008, Exhibit 2, p. V-66 (Upstate NY Asset Health Report for Transmission. at p. 62, section 6.8.2) and "Report on the Condition of Physical Elements of Transmission and Distribution Systems," October 1, 2009, Page III-68 through III-77.

69kV and 34.5kV yards to make room for building a new 115kV yard while the existing 115kV yard remains in service. . Studies of the long term transmission and sub-transmission needs of the areas east and west of Rotterdam are beginning to examine the impact of removing the Rotterdam 69kV and 34.5kV supplies. For example, projects associated with the Ephratah substation (C046486 and C053144) are, in part, related to the expected rebuild of Rotterdam.

Given the uncertainty over the 230kV station as it relates to the Energy Highway projects and the possible need to supply large loads in the Luther Forest campus, the Company has postponed both the 230kV and 115kV rebuilds at Rotterdam. Any asset issues that arise will now be managed through the normal damage / failure process.

Engineering analysis with respect to the rebuild itself is expected to begin in FY17.

Boonville (C049903) $0.65m

The Boonville substation was constructed in the 1950s and originally designed as a switching station for several 115kV transmission lines and the radial 46kV supply line to Alder Creek, White Lake, Old Forge, Eagle Bay and Raquette Lake. The use has not changed with the exception of the addition of a 23kV terminal for hydro generation.

Electrically the station was designed with minimal redundancy and has antiquated relay protection. The design has the single source transformer for the 46kV line to the Old Forge area connected to the south 115kV bus with no alternate method to supply the transformer if the south bus is out of service. The 115kV to 46kV transformer was replaced in the 1990s, but is still the only source and can not be maintained properly due to outage restrictions. There is a spare transformer for the 115/46kV TB#3 located at the station.

All of the electrical components at the station such as oil breakers, oil filled potential transformers and switches require replacement due to their condition. The station control building is of brick design and needs reconditioning. The size of the building has also become an issue with the addition of EMS and relay upgrades over time. Also, the station perimeter fencing needs replacement on 3 sides.

Lockport (C035464) $2.1m

Lockport is a 115 kV transmission station with thirteen 115 kV transmission lines tying through the East and West bus sections and serving the 115 kV system in Western New York. The overall condition of the station yard and control room is poor. Work is required on control cable duct banks, breaker operators, structure painting and concrete equipment foundations that are significantly deteriorated.

The control room building is also in very poor condition and requires repairs. Existing peeling paint is likely lead contaminated. It is an oversized building with continued maintenance costs for the original roof and the intricate brickwork. It contains a 90 ton overhead crane in the old 25 cycle frequency changer portion of the building which is presently used only to store old cable. The control house roof was repaired in the 1990s and brick pointing was also done to limit deterioration within the last 5 years.

Conceptual engineering to rebuild the station in place was completed in June 2010. The project has been deferred for further consideration in FY2017.

Dunkirk (C005155) $12.9m

Dunkirk is a 230/115kV station located south of Buffalo, connected to 522MW of generation owned by NRG. The Company retains ownership of most of the 230kV and 115kV switch yard; however, the controls are located in the generation control room owned by NRG. This station has recently experienced several 230kV misoperations due to control cable issues as detailed in the 2010 Asset Condition report. Complete replacement of control cables is not possible due to space constraints in shared areas. In addition, portions of the station may require significant modification to conform to NPCC requirements.

An announcement was made in 2012 by NRG of plans to shut down the generation at Dunkirk indefinitely. Studies were subsequently performed to determine short term and long term reinforcements that would be necessary to ensure system reliability when the generators were no longer available. These reinforcements include 115kV capacitor banks at Dunkirk which are described in the generator retirement section of this chapter.

Huntley (C049902) $8.1m

Among the Huntley substation asset condition needs are: permanent capacitor banks at the Huntley 115 kV bus to replace the mobile banks currently there; improved grounding in the switchyard; removal of all National Grid controls, batteries and communications equipment from inside the Huntley Generating Station to a control house in the yard (both 115kV & 230kV); adding a second station service supply; refurbishing the existing oil circuit breakers; replacing the potential transformers; installing new CCVTs for 115 kV and 230 kV relaying; and refurbishing the 230 kV cable pumping plant.

While conceptual engineering was completed in 2011, no further work is planned at Huntley until FY17 to reduce and manage short-term capital investment. However, delaying rebuild of the Huntley station continues the current risks associated with having National Grid assets located in separately owned control rooms, such as mis-operation, inconsistent maintenance and uncontrolled conditions and access.

Lighthouse Hill (C031662) $23m

The Lighthouse Hill facility consists of a switching station with two 115 kV buses and seven transmission lines connecting to the station, allowing power to flow from generation located on Lake Ontario to the Watertown area and Clay Station in Syracuse.

Seven OCBs are located 200 feet from the Salmon River located about 70 feet below the yard elevation. The station is located a mile up-stream of the New York State Wildlife Fish Hatchery. Although the risk is low, any significant oil spill in the station would have a detrimental environmental impact. Even at 70 feet above the river level

there is also the risk of a flooding event at the station given its proximity to the river. In addition, the disconnect switches are in a very poor condition.

Another significant issue at Lighthouse Hill is that the land is owned by Brookfield Power and operated as a shared facility under a contractual agreement. The lack of direct access to Brookfield's control room at Lighthouse Hill is not ideal as it limits the Company's control over the housing conditions for the battery and relay systems. The Company has controls on the first floor of the control house which is immediately adjacent and downstream of Brookfield's hydroelectric dam. An uncontrolled release from the dam could flood the control room area. Flooding in the area occurred as recently as October 1, 2010 due to a rain event.

The recommended option of a conceptual engineering analysis is a new substation located about 1.5 miles west adjacent to Tar Hill Road in the clearing on land already owned in fee by the Company. This will eliminate the risks of oil contamination to the Salmon River and greatly reduce the likelihood of station flooding.

While conceptual engineering is complete, no further work is planned at Lighthouse Hill in the Plan period until FY16 to reduce and manage short-term capital investment. However, delaying the rebuild of the station maintains the risks associated with having National Grid assets located in separately owned control rooms such as mis-operation, inconsistent maintenance and uncontrolled conditions and access.

Customer Benefits:

The planned replacement of these stations reduces the likelihood of an in-service failure which can lead to long-term interruptions of the transmission system as well as significant customer outages.

2013 to 2014 Variance:

Apart from Gardenville, all of the previously recommended station rebuilds have been deferred as the Company evaluates additional options for addressing the needs at the other stations. Where substation rebuilds are proposed, the Company will seek creative and innovative solutions and improvements (such as re-configurations of the layout) that are cost effective. The Company is still examining the impact of this decision to defer the rebuilds on the relay and circuit breaker replacement strategies (i.e., relays and circuit breakers that would have been replaced as part of a substation rebuild will need to be considered on a stand alone basis).

Table 2-14
Transmission – Substation Rebuilds
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	9.6	4.4	6.6	23.1	33.7	-	77.3
2014[5]	-	2.9	6.4	20.8	31.9	40.6	102.6

[5] Does not include $1.5m in FY15 to complete the Rome Station rebuild project which had been included in prior filings. This forecast is only for the future station rebuild projects described above.

Overhead Line Refurbishment Program

Over the next five years the Company will refurbish a number of overhead lines based on their condition. During this period we will continue to work towards developing an overhead line refurbishment approach that to the greatest extent possible addresses only the most deteriorated condition equipment. This modified approach to SG080 only considers refurbishing an entire line when the conductor requires replacement. In general, as part of conceptual engineering, conductor testing will determine whether or not the conductor tensile strength fails to meet appropriate NESC heavy loading requirements. There is a risk that a number of the identified lines in our overhead line refurbishment program will fall within this category as conductor testing is pursued over the upcoming year. When possible, shield wire testing will also be performed.

For overhead lines with acceptable conductor strength, this program will assure that transmission lines meet the minimum governing NESC under which they were built. This will be accomplished through the replacement of deteriorating structures and line components that no longer structurally or electrical adhere to the governing NESC.

The costs projected for lines prior to the completion of the conceptual engineering process are preliminary in nature. As part of conceptual engineering process, the line will be field evaluated and refurbishment options more thoroughly evaluated on case-by-case basis. The value of various options (e.g., complete reconductoring versus a life extension) will be reviewed; however, cost estimates may continue to differ due to unforeseen circumstances, such as additional swamp matting needs due to weather conditions or environmental requirements.

To reduce costs during the period of this five-year Plan, the Company is implementing an approach recommended by DPS Staff in the Company's 2010 rate case to refurbish only those overhead transmission line facilities that are in unacceptably deteriorated condition (i.e. Niagara Mohawk's defined Level 1, Level 2 and Level 3 condition). Although this approach allows for reduced investment amounts in the five years covered by this Plan, the approach must be evaluated against longer term issues such as a greater number of visits to the same right-of-way, multiple site establishment costs, increased susceptibility to storm damage, additional permitting and licensing costs, greater levels of environmental impact, and more disturbance to abutters, among other things to evaluate the most economical solution for the benefit of customers. Therefore, for certain overhead line condition projects, a larger work scope to replace assets that are deteriorated, yet serviceable, may be more appropriate and cost effective.

This Plan is based on the assumption that issues identified during routine foot patrols (Level 1, 2 or 3 issues) will be addressed through the Damage / Failure programs. Where we suspect a systemic problem, an engineering inspection and an aerial comprehensive survey will be initiated. Any issues arising from these condition assessments will be addressed through this overhead line refurbishment program.

The more significant OHL refurbishment projects in this capital plan are listed below. Details of each of the projects are included in Exhibit 6 – Overhead Line Refurbishment Projects.

Boonville-Rome 3 & 4 (C047795 - $8.6M)
Browns Falls-Taylorville 3 & 4 (C024359 - $9.4M)

Colton-Browns Falls 1 & 2 (C036164 - $8.9M)
Falconer-Homer Hill 153 & 154 (C027422 - $17.1M)
Gardenville-Dunkirk 141 & 142 (C003389 - $20.3M)
Gardenville 180 & 182 (C027436 - $8.3M)
Gardenville-Homer Hill 151 & 152 (C027425 - $18.1M)
Homer Hill-Bennett Road 157 (C027429 - $41.9M)
Lockport-Batavia 112 (C003422 - $43.7M)
Porter-Rotterdam 31 (C030890 - $25.5M)
Taylorville-Boonville 5 & 6 (C027437 - $9.4M)
Ticonderoga 2 & 3 (C039521 - $41.1M)

Drivers:

The Company has over 6,000 circuit miles of transmission overhead lines and many of these overhead line assets are approaching, and some are beyond, the end of their anticipated lives. The program will ensure the Company's transmission lines meet the minimum requirements of the governing code under which they were built as required by the Commission's 2005 Safety Order (Case 04-M-0159).

Customer Benefits:

This program promotes safety and reliability by assuring transmission lines meet the governing NESC under which they were built by replacing deteriorating structures and line components that no longer structurally or electrically conform to the Code.

2013 to 2014 Variance:

The Company has re-phased much of the overhead line refurbishment to accommodate projects related to the Dunkirk and Cayuga plant closures. Overhead line equipment failures will be managed through the Damage / Failure budget and any Level 1, 2 or 3 issues identified during foot patrols will also be addressed through the Damage / Failure budget.

Driving the increase from 2013 to 2014 is the spend forecasted in FY18 which includes major work performed on the Gardenville-Dunkirk 141-142 & 151-152 lines, Colton-Browns Falls and Ticonderoga 2-3 lines.

Table 2-15
Transmission – Overhead Line Refurbishment Program
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2013	-	12.0	21.7	47.5	103.0	83.8	268.0
2014	-	14.0	33.3	66.1	92.9	85.4	291.8

Transformer Replacement Strategy

Power transformers are managed through routine visual inspection, annual dissolved gas analysis ("DGA") and electrical testing where required. Transformers with tap-changers are also maintained in accordance with our substation maintenance standards.

With the previous exceptions, this Plan utilizes a replace on fail approach with failures managed through the use of strategic spares. In this context, failure means either DGA results that suggest an immediate need for replacement or actual physical / electrical failure. A process has been initiated to ensure sufficient strategic spares are available to cover the probability of failure for the majority of the fleet.

Drivers:

In the next five years the investment plan is to replace three transformers with anomalous DGA results that have been or are expected to be confirmed as in poor condition through electrical testing.

Teal Ave (C047865) - (2) 115/34.5kV 24/33/40MVA transformers are needed to replace the existing single phase 1930, 1941, & 1945 transformers due to their asset condition and DGA analysis. These transformers are also on the NY transformer watch list. This upgrade would also provide adequate capacity for future load as determined by distribution planning. This is currently in preliminary engineering, transformers should be ordered this calendar year.

Seneca Terminal (C049744) - The summer emergency rating of the four 115-23kV ; 30 MVA LTC transformers with one transformer out of service matches the SE rating of the 115kV supply for one line out of service. Two of the four transformers are on the NY transformer watch list and the other two are currently under DGA review. The plan is to replace the four 1938/1950 transformers with 115-23kV; 55 MVA LTC units. Furthermore, Distribution Planning is considering the addition of a Terminal Station 230-23kV transformer for Seneca Terminal station expansion. A 230-23kV transformer was ordered for a system spare to be placed at Sawyer Avenue for storage in project funding number C044196, but it had to be redirected instead for Elm Street #4 transformer which was damaged in the summer of 2013 and this size transformer was not available at the time as a system spare. Another 230-23kV transformer is on order from HICO and expected for late 2014 / early 2015 arrival.

Inghams (C047864) – There are problems with the existing phase shifting transformer at Inghams. The allowable phase shifting transformer angle range is limited during high Central-East transfer conditions with Fairfield wind generation at full output. For design contingencies associated with losing parallel 345kV or 230kV lines in the Central East interface, and if Fairfield generation is at full output, line #3 becomes overloaded and the phase shifting transformer is out of adjusting range. Under an N-1-1 condition, with a long term outage of the phase shifting transformer and when breaker R81 cannot be closed separating the Ingham's 77G and 99G buses, voltages at various 115kV buses east of Ingham's station will be at 0.91~0.92 pu. This is not acceptable if the outage lasts for an extended period.

Asset strategy will purchase a spare phase shifting transformer that will be designed to meet the needs of the Transmission Planning study for future growth of the 115kV system east of Ingham's. There is not a spare phase shifting transformer in the New York system and if it were to fail it would take between 18-24 months to replace due to its specialty internal design. This would not be acceptable for system reliability and system stability. This is currently in preliminary engineering, transformer should be ordered this calendar year.

Woodlawn (C051986) – TB1 has had hotspots and arcing under oil in the past. The oil quality is below the acceptable threshold with inter facial tension, moisture and dielectric strength being outside expected in-service values. The main tank appears to be taking in moisture at a slow rate. Electrical tests show deterioration of the winding insulation. The tight physical clearances between the low voltage and high voltage structure make an emergency replacement difficult. TB2 A, B and C phase units all have partial discharge problems as indicated by increased Hydrogen in DGA results. All three have high moisture-in-oil levels which can lead to low dielectric strength and contribute to chemical reactions that degrade the oil quality. A three single phase transformer design makes emergency replacement with a three-phase unit very difficult. TB1 and TB2 replacements are expected to be completed by FY16.

Customer Benefits:

The failure of an average sized distribution station transformer could lead to a loss of power for approximately 17,000 residential customers. The prolonged time needed for restoration (either through the installation of a spare or a mobile sub) can translate into millions of customer minutes interrupted.

2013 to 2014 Variance:

The Company is, in the short-term, adopting a 'replace on fail' approach for transformers where failure includes DGA results that suggest immediate replacement is necessary or where actual failure takes place. The three transformers identified for replacement within the term of this plan were noted in the 2013 plan (Teal Ave, Seneca Terminal and Inghams). Woodlawn is new to the 2014 plan.

Table 2-16
Transmission – Transformer Replacement Program
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.8	6.3	3.4	3.5	3.0	-	16.9
2014	-	6.7	8.2	3.5	3.0	-	21.3

Circuit Breaker Replacements

The circuit breaker population is managed through ongoing inspection and maintenance activity along with routine preventative maintenance activities and electrical testing. In general, the circuit breaker population continues to be adequate for our needs; however, there are a number of obsolete circuit breakers that require investment. During the Plan, obsolete oil circuit breakers will be replaced with modern equivalent circuit breakers. Typically, these breakers will be replaced with circuit breakers employing SF6 gas as an arc interrupting medium. SF6 will be employed until a replacement arc interrupting gas with a lower global warming potential is developed.

Drivers:

There are 742 circuit breakers installed on the transmission system. Of these, 354 are large oil volume types. Based on asset condition and performance, 180 of these large volume oil circuit breakers are classified as high replacement priorities. The majority of the circuit breakers addressed in this strategy was installed between 1948 and 1969, are in poor condition or are the last remaining members of problematic families. The remaining high replacement priority oil circuit breakers on the system were either planned for replacement as part of station rebuild requirements or planning needs such as increased short circuit duty or load growth. There is an increasing trend of problems associated with the large volume oil circuit breaker population. Common problems include:

- Oil leaks, air leaks, bushing hot spots, high power factors and poor insulation
- Failures of: pressure valves, hoses, gauges, motors, compressors, pulleys, o-rings, control cables, trip coils, close coils, lift rods and contacts

Customer Benefits:

The planned replacement of circuit breakers reduces the likelihood of an in-service failure which can lead to long-term interruptions of the transmission system as well as significant customer outages. This circuit breaker replacement strategy promotes reliability of the transmission network in terms of CAIDI and SAIFI performance.

2013 to 2014 Variance:

The Company is committed to planned replacement of oil circuit breakers to maintain the reliability of its transmission system.

Table 2-17
Transmission – Circuit Breaker Replacements
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	1.8	3.3	3.7	4.5	1.6	-	14.9
2014	-	2.3	4.4	4.2	-	1.6	12.6

Problem Identification Worksheets (PIWs) (C031545)

The Company employs a process called "Problem Identification Worksheets" to document faults and defects with in-service substation and overhead line equipment that are identified either through normal maintenance activities (often called 'follow-up' work) or through inspection routines (often called 'trouble' work). Typically, the issues identified through the PIW process cannot be corrected immediately and require investigation, engineering analysis and solution design. These activities and the solutions proposed often lead to low cost capital projects to replace or refurbish items of equipment.

Drivers:

Historically, issues identified during inspection or maintenance were added to the capital plan in outer years to avoid reprioritizing other planned projects. In FY10 a budgetary line for PIWs was introduced to recognize that a number of high priority, low cost, capital projects will inevitably arise during the year and these should be undertaken to address found-on-inspection issues. PIWs typically require some degree of investigation and engineering to identify a solution. PIWs are also used to identify and correct transmission overhead line components that no longer meet minimum NESC requirements. This work is over-and-above that required during normal I&M activities and is likely to increase over the Plan period as a result of overall capital investment reductions.

Issues arising from PIWs are prioritized and engineering solutions for the highest priority are developed within year. Utilizing this approach, the Company can make progress on low cost capital investments that might otherwise be lost in the capital plan.

Customer Benefit:

The PIW approach followed by the Company benefits customers and the overall health of the system. PIWs identify important issues and work that are high priority, but the work does not usually fall into the scope of ongoing strategies, and are not yet damage / failures. PIWs help identify trends throughout the system and give the Company feedback on how better to manage the system as a whole.

2013 to 2014 Variance:

The investment levels in FY15 to FY19 have been held the same as the 2013 Plan except for FY15; however, PIW driven projects are likely to increase over the Plan period as a result of other capital investment reductions.

Table 2-18
Transmission – Problem Identification Worksheets
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.5	1.0	1.0	1.0	1.0	-	4.5
2014	-	0.4	1.0	1.0	1.0	1.0	4.4

Chapter 2 E. Non-Infrastructure

Non-Infrastructure capital expenditures are for items that are not part of the electric power system, but are required to run the power system such as tools, communications, and other general plant.

Transmission Substation Physical Security

This program provides state-of-the-art security measures to deter and/or detect unauthorized access to substations.

Drivers:

This program is driven by the need for additional physical security measures at certain substations to mitigate break-ins and the increasing risk that unauthorized access will lead to injury or death of a trespasser who comes in contact with energized equipment.[6] Reducing and detecting unauthorized access also reduces risk of vandalism and damage to electric system equipment.

The substations included in this project are already in compliance with the relevant NERC critical infrastructure protection (CIP) requirements, including CIP-006-1a "Physical Security of Critical Cyber Assets." CIP-006-1a calls for "six walled" security around critical cyber assets. For these substations, the six walls usually refer to the control house where the cyber assets are contained, and security measures under CIP-006-1a include card readers and cameras to monitor ingress and egress points for the control house.

This project provides physical security measures which are not addressed in the cyber security project mentioned above.

Customer Benefits:

Deterring and detecting unauthorized access to certain substations would result in:

- Avoided or reduced physical and personal injury to unauthorized third parties as well as Company personnel at the substations
- Reduced potential for service interruptions or equipment damage/loss from vandalism or theft

2013 to 2014 Variance:

[6] The Company and the Director of Utility Security at the Department of Public Service have discussed the need to enhance physical security at certain substations in light of an increase in unauthorized substation access incidents nationwide.

An earlier version of this security project completed in FY14 and is being replaced with this program.

Table 2-19
Transmission Substation Security
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.05	-	-	-	-	-	0.05
2014	-	-	1.5	1.5	1.5	1.5	6.0

Chapter 3. Sub-Transmission System

The sub-transmission system comprises approximately 4,237 miles of lines including: 290 miles of 69kV, 365 miles of 46kV, 2332 miles of 34.5kV, 1050 miles of 23kV and 200 miles of lines below 23kV. Over the five-year period covered by this Plan, the Company expects to invest approximately $185 million on the sub-transmission system, as shown in Table 3-1 below.

Table 3-1
Sub-Transmission System Capital Expenditure by Spending Rationale ($millions)

Spend Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	2.8	2.1	2.0	3.3	1.8	12.0
Damage/Failure	2.6	2.1	2.2	2.2	2.3	11.4
System Capacity & Performance	3.8	5.4	9.9	8.6	6.0	33.7
Asset Condition	23.6	23.1	22.5	26.2	31.9	127.5
Total	32.8	32.8	36.6	40.4	42.0	184.5

As described previously, the Company has revised how it classifies projects within Spending Rationale and Program classifications to better reflect the driver of the work performed. Specific sub-transmission capital investment projects that have moved to a different spending rationale are listed in Table 3-2 below. A complete list of all projects in the capital plan can be found in Exhibit 2.

Table 3-2
Transmission Capital Projects with Changed Spending Rationale

Funding Number	Project Name	Previous Spending Rationale	New Spending Rationale
Various	Inspection and Maintenance	Statutory/Regulatory	Asset Condition

Projects previously classified as sub-transmission station work (metal clad switchgear, pilot wire replacement, etc.) have been redirected into transmission or distribution budgets.

Chapter 3 A. Customer Request/Public Requirements

Customer Request/Public Requirements investment levels are based primarily on forecasted spending on known specific work and a review of historical blanket spending. These estimates reflect consideration given to inflation, estimates of materials, labor, indirect cost, market sector analysis, overall economic conditions and historical activity.

Variances in planned program spending between the 2013 and 2014 Plans are also discussed below.

Table 3-3
Customer Request/Public Requirements Variance Summary ($millions)

	CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
	2013	2.2	1.4	1.5	1.5	1.6	-	8.2
Specific Projects	2014	-	2.4	1.7	1.6	2.9	1.4	9.9
	2013	0.3	0.3	0.4	0.4	0.4		1.8
Blankets	2014	-	0.4	0.4	0.4	0.4	0.4	2.1
	2013*	2.5	1.8	1.8	1.9	2.0	-	9.9
Total	2014	-	2.8	2.1	2.0	3.3	1.8	12.0

Note: * Total 2013 Dollars exclude Inspection and Maintenance per the new Program classifications to better reflect the driver of the work performed.

Aside from blanket and program spending described in this section, there is one specific project identified under this spending rationale that has forecasted spending in excess of $1 million in any single fiscal year:

- Project C034722, DOTR NYS Route 28 White Lake - McKeever Substation (Moose River) Transmission Line: This project provides for the mandatory relocation of 6 miles of 46kV overhead sub-transmission facilities along Route 28 in the towns of Forestport and Webb to facilitate a NYSDOT project.

Chapter 3 B. Damage/Failure

The Damage/Failure investment level for the sub-transmission system is primarily based on historical costs for such work. Where condition renders the asset unable to perform its intended electrical or mechanical function on the delivery system, the Company initiates the timely replacement of such asset under the Damage/Failure spending rationale.

2013 to 2014 Variance:
The variance between the 2013 and 2014 Plans is based on recent historical spending.

Table 3-4
Damage/Failure
Variance Summary ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	3.3	3.4	3.5	3.5	3.6	-	17.3
2014	-	2.6	2.1	2.2	2.2	2.3	11.4

Chapter 3 C. System Capacity and Performance

The projected investment for sub-transmission work in the system capacity and performance spending rationale over the Plan period is shown in the table below. The majority of investment in FY13 and FY14 was associated with specific projects while later year investment levels are based on historical spending levels and forecasted growth in peak demand.

2013 to 2014 Variance:
The projected program investment is based on the specific projects discussed following the table below. Additional variance from the 2013 Plan is due to the reclassification of most sub-transmission station projects to transmission or distribution station projects.

Table 3-5
System Capacity and Performance
Variance Summary ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	6.8	7.6	7.6	8.1	8.7	-	38.6
2014	-	3.8	5.4	9.9	8.6	6.0	33.7

The following specific projects are estimated to have spending in excess of $1 million in any fiscal year:

- Project C046510, LN 863 Findley Lake – French Creek Expansion. This project will extend the Findley Lake 863 Tap and the Old Rd/French Creek Tap 863 to create a loop.
- Project C046546, Elm St Relief_23kV Line Work – This project provides for 23kV recabling or new cables/circuits associated with relieving Elm St Station in Buffalo.

Capacity Planning

Drivers:
An annual review of the sub-transmission system, including substation and circuit loading, is performed to review equipment utilization. The reviews take into account both normal equipment loading and Load at Risk following an N-1 contingency. Forecasted load additions are applied to historical data and the system is analyzed to determine where and when constraints are expected to develop. Recommendations for system reconfiguration or system infrastructure development are created as part of this annual review to ensure load can be served during peak demand periods and is documented in the Annual Capacity Plan.

The normal loading assessment identifies load relief plans for facilities that are projected to exceed 100 percent of normal capability (i.e., maximum peak loading allowed assuming no system contingencies). The projects from these reviews are intended to be in-service during the year the load limit is forecasted to occur. In general, load growth within the service area has averaged 0.7 percent over the past 10 years, and that modest growth rate is expected to continue at a similar level for the next 10 years. However, individual areas within the service area are forecasted to grow at varying rates.

In addition to the normal loading review, the Company has instituted planning criteria for Load at Risk following an N-1 contingency that sets MW and MWh interruption exposure thresholds ("MWh Violations") for various supply and feeder contingencies for the purpose of setting a standard for minimum electrical system performance. These thresholds are applied in conjunction with other criteria—such as maintaining acceptable delivery voltage and observing equipment capacity ratings—to ensure the system operates in a reliable manner while managing risk of customer interruptions to an acceptable level. MWh thresholds have been identified for three specific contingencies. For loss of a single substation supply line, a maximum interruption load limit of 20MW and/or 240MWh is specified, assuming that the line can be returned to service within 12 hours. For loss of a single substation power transformer, a maximum interruption load limit of 10MW and/or 240MWh is specified, assuming that the transformer can either be replaced or a mobile unit installed within 24 hours. Analysis of the interruptions under this criteria assume that any and all practical means are used to return load to service including use of mobile transformers and field switching via other area supply lines and/or area feeder ties. MWh analysis recognizes the approximate times required to install mobile/back-up equipment as well as stepped field switching, i.e. moving load from the adjoining in-service station with feeder ties, that will be used to pick up customers experiencing an interruption, to a second adjoining station to increase the capability of the feeder ties.

Customer Benefits:
The benefit to customers of completing the work identified in capacity planning studies includes less exposure to service interruptions due to overloaded cables and transformers. In addition, the implementation of projects to mitigate MWh Violations will reduce the likelihood that an unacceptable number of customers will be without service for extended periods due to supply, substation equipment or feeder contingencies.

2013 to 2014 Variance:
The projected investment in the table below shows an increase over the five year period due new projects being identified for later years. The FY15 decrease is due to the reclassification of most sub-transmission station projects transmission or distribution station projects.
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Table 3-6
Capacity Planning
Program Variance ($millions)

	CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
Specific Projects	2013	2.7	3.3	3.2	3.5	3.8	-	16.5
	2014	-	1.9	3.4	6.4	5.2	0.3	17.1
Load Relief Blankets	2013	0.0	0.0	0.0	0.0	0.0	-	0.1
	2014	-	0.0	0.0	0.0	0.0	0.0	0.1
Total	2013	2.8	3.3	3.3	3.6	3.8	-	16.7
	2014	-	1.9	3.4	6.4	5.2	0.3	17.2

The following specific projects are estimated to have spending in excess of $1 million in any fiscal year:

- Project C028893, Buffalo 23kV Reconductor - Huntley 2. This project will replace cable 11H from Sawyer Station to Buffalo Station 52. This cable has exceeded summer normal ratings in the past and may exceed emergency ratings for the loss of one of the other three supply cables.
- Project C028903, Buffalo 23kV Reconductor - Kensington 2. This project will replace the 10K cable from Kensington Terminal Station to Buffalo Station #28, the 11K and 12K cables from Kensington Terminal Station to Buffalo Station #32 and the 15K cable from Kensington Terminal Station to Buffalo Station #27. These circuits currently exceed emergency ratings for the loss of one cable.
- Project C028894, Buffalo 23kV Reconductor - Kensington. This project will replace the 21K, 22K, 23K and 33K cables from the Kensington Terminal Station to Buffalo Station #53. These circuits currently exceed emergency ratings for the loss of one cable.
- Project C036054, Golah Avon 217 Line Reconductoring. This project will reconductor approximately 5 miles of Line 217 from Golah Substation to Avon Substation.
- Project C046516, Buffalo 23kV Reconductor – Seneca 1S, 2S, 3S, 19S, 31S. This project will replace the 1S, 2S, 3S, 19S and 31S cables from the Seneca Terminal Station to Buffalo Station #44. These circuits currently exceed emergency ratings for the loss of one cable.

Sub-Transmission Automation

In a continuing effort to modernize the grid the Sub-Transmission Automation Strategy includes advanced distribution automation methodologies as well as SCADA for reclosers, fault locators, and switches; and the interface of distribution automation enabled line devices with substation feeder breakers. It also encompasses the communication of these devices with each other and to central operations centers and database warehouses. The Company often refers to such devices and communications technology as Advanced Grid Applications.

Drivers:
Following the success of pilot automation installations in 2008 and 2009, which verified the capability of advanced distribution automation enabled equipment, the Company recognized the additional benefit of identifying projects where the installation of modernized switching schemes would provide increased reliability to the sub-transmission system. The number of Advanced Grid Application switches per circuit or installation will vary depending on the number of substations the circuit supplies, the desired segmentation of the line, and the configuration of the supply system. Many of the automation schemes are unique and are developed considering an analysis of expected costs and benefits.

Customer Benefits:
Distribution lines or substations not equipped with automated sectionalizing or throw over schemes may be subject to extended service interruptions as Operations personnel must travel to the field locations to perform switching. This program provides an opportunity to continue to modernize the grid for the benefit of customers by reducing the number of customer interruptions that result from a given contingency and the time required to reconfigure the system to restore service to as many customers as possible while a faulted section of the system is being repaired.

2013 to 2014 Variance:
The projected investment is shown in the table below. The prioritization of projects and the timing of their implementation will be based on the performance of the various individual circuits.

Table 3-7
Sub-Transmission Automation
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.6	2.4	2.5	2.5	2.5	-	12.6
2014	-	1.1	0.6	1.2	2.1	2.0	7.0

Chapter 3 D. Asset Condition

Planned asset condition investment levels for the sub-transmission system are described below.

2013 to 2014 Variance:
The lower level of forecasted spending for asset condition replacement in 2013 was due to the transfer of funding from the sub-transmission budget to the transmission budget to accommodate generation retirement related investments. It should also be noted that the replacement of several deteriorated cable circuits are accounted for in the System Capacity and Performance spending rationale since the replacements also provide needed capacity increases.

Table 3-8
Asset Condition
Variance Summary ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	17.1	18.3	18.2	21.5	24.8	-	99.8
2014	-	23.6	23.1	22.5	26.2	31.9	127.5

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- Project C048968, Randall Road New Substation Install and Remove Sub-transmission Lines. Remove 34.5kV line from Ballston to Randall Road Substation.
- Project C046641, Callanan Tap – Install new Sub-T Line, Install a new sub-transmission line extension from Selkirk to Callanan to allow the removal of the Callanan Tap from Unionville to Callanan.
- Project C046707, Oakfield-Caledonia LN201 Reconductor. Reconductor approximately 11 miles between Churchville and Caledonia including pole replacements.
- Project C046766, N. Lakeville-Ridge LN 218 Refurbishment. Reconductor approximately 6 miles of 34.5kV circuit between Lakeville and Groveland substations including pole replacements.

Inspection and Maintenance

Under this program, the Company performs visual inspections on all overhead and underground distribution assets once every five years. Each inspection identifies and categorizes all necessary repairs, or asset replacements, against a standard and in terms of criticality to improve customer reliability in compliance with the Commission's Safety Order in Case 04-M-0159.[1]

In addition, the following types of inspections are conducted by the Company:

- Aerial assessments of sub-transmission lines on an annual basis, and
- Infra-red inspection of sub-transmission lines on a three year schedule.

The Company also performs annual elevated voltage testing per the Commission's Safety Order on all facilities that are capable of conducting electricity and are publicly accessible.

This program has been moved from the Customer Requests/Public Requirements spending rationale to Asset Condition to better reflect its impact on the condition of the Company's electric facilities.

Drivers:
The Company implements the Inspection and Maintenance program in accordance with the Commission's directives in Case 04-M-0159. The Company's annual Asset Condition Report details the application of the Inspection and Maintenance program to sub-transmission assets.[2]

Customer Benefits:
This program is designed to ensure the Company fulfills its obligation to provide safe and adequate service by inspecting it facilities and repairing safety and reliability issues identified in a timely fashion.

2013 to 2014 Variance:
Current investment forecasts are based on actual expenditures incurred under the Inspection and Maintenance program and an expectation that the number of defects found in future year inspections will decrease as the inspection cycle repeats.

Table 3-9
Inspection and Maintenance
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	11.4	11.0	11.0	11.0	11.0	-	55.4
2014	-	11.4	9.0	5.7	5.0	5.0	33.0

[1] Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Adopting Changes in the Electric Safety Standards (issued and effective Dec. 15, 2008) ("Safety Order").
[2] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 10-E-0050, most recently filed on October 1, 2013.

Overhead Line

Various projects are in place to refurbish or replace sub-transmission overhead assets to ensure the system continues to perform in a safe and reliable manner. This includes pole, tower, overhead groundwire and conductor replacement in addition to the work generated via the Inspection and Maintenance program discussed above.

Drivers:
Although spending is categorized by spending rationale, all drivers are considered in determining the optimum project solution. Reliability and condition are the main drivers for these projects. Historically, the number of reliability events that are initiated on the sub-transmission system is low; however these events can result in a significant number of customers being interrupted where the lines are radial.

Physical condition of the sub-transmission system is being assessed through the Inspection and Maintenance program, helicopter surveys and by local engineering reviews and 'walk downs'.

Customer Benefits:
Refurbishment and replacement of sub-transmission system components can have a significant impact on regional CAIDI/SAIFI and Customer Minutes Interrupted (CMI) since they typically supply distribution stations.

2013 to 2014 Variance:
The projected investment is shown in the table below. Existing identified work under this program will be continued. New projects are being identified on lines where work is needed due to significant deterioration.

Table 3-10
Overhead Line
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	1.5	6.3	2.9	6.9	2.9	-	20.5
2014	-	6.5	8.5	11.4	14.0	19.5	63.3

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- Project C016236, Gloversville-Canajoharie #6 Refurbishment. Refurbish 69kV line including pole replacement as needed and replacement of deteriorated shield wire.
- Project C033180, Hartfield-South Dow 859 Refurbishment. Refurbish 34.5kV line including pole replacement as needed and replacement of deteriorated conductors.
- Project C033182, Amsterdam-Rotterdam 3/4 Relocation. Relocate ¾ mile of Double Circuit 69kV to avoid wetland.

- Project C046468 W. Portland-Sherman 867-34.5kV Refurbishment. Refurbish 34.5kV line including pole replacement as needed and replacement of deteriorated small copper conductors.
- Project C046469, Dake Hill-W Salamanca 816-34.5kV Refurbishment. Refurbish 34.5kV line including pole replacement as needed and replacement of deteriorated small copper conductors.
- Project C046470, Frontier Region H lines 23kV Refurbishment. Refurbish 23kV lines including pole replacement as needed.
- Project C046465, Phillips-Medina 301-34.5kV Refurbishment. Refurbish 34.5kV line including pole replacement and reconductoring
- Project C046466, Phillips-Telegraph 304-34.5kV Refurbishment. Refurbish 34.5kV line including pole replacements and reconductoring.
- Project C046456, Ephratah-Caroga 2-23kV Refurbishment. Refurbish 23kV line including pole replacements.
- Project C046457, Ballston-Shore Road-Rosa Road 5 and 8-34.5kV Refurbishment. Refurbish 34.5kV lines including pole replacements.
- Project C046449, Yahnundasis-Clinton 47 and 27 Refurbishment. Refurbish 34.5kV lines including pole replacements.
- Project C046438, Old Jewitt-Solvay 26 (now lines 26, 30 and 31) 34.5kV Refurbishment. Refurbish 34.5kV lines including pole and aeromotor tower replacements.
- Project C046441, Lighthouse Hill-Mallory 22-34.5kV Refurbishment. Refurbish 34.5kV including pole replacements
- Project C046436, Carthage-Taylorville 21, 22 and 26 23kV Refurbishment. Refurbish 23kV single and double circuit lines including pole, tower and overhead ground wire replacements

Underground Cable

Various projects are completed each year to refurbish or replace sub-transmission underground assets to ensure the system continues to perform in a safe and reliable manner.

Buffalo

A major program has been initiated to replace 23kV cables in the city of Buffalo. The existing distribution system in the City of Buffalo was built starting in 1929 and is supplied by four terminal stations: Sawyer, Seneca, Kensington and Elm Street. The 23kV cable system represents about 433 miles of underground cables and supplies approximately (42) 4.17kV distribution substations. Approximately 385 miles of the original 1-3/C-350kcmil CU PILC (paper in lead covered cable) installed in the late 1930's are still in service. As time progresses, the aging cables experience continued mechanical stress due to annual loading cycles and eventually fail, causing interruptions.

Through analysis of failure records, 83 miles of cables have been identified that are considered high risk. These are cables that have a high rate of failure and have a major impact to our distribution substations and customers in an event of cable failure.

Drivers:

Failures of individual sub-transmission cables do not typically impact customer reliability since the portions of the system where they are utilized are generally networked. However, because these systems are located below ground and are out of sight, failures of underground sub-transmission cables can be difficult to locate and time-consuming to repair leaving the system at risk.

There are approximately 1,100 miles of sub-transmission underground cable. Approximately one-half are more than 47 years old and one-third are more than 60 years old. The sub-transmission underground cable asset replacement program replaces cables that are in poor condition, have had a history of failure or of a type known to have performance issues.

Customer Benefits:

Cable replacement projects reduce the likelihood of in service cable failures, and resulting exposure to the risk of extended outages.

2013 to 2014 Variance:

The projected program investment is shown in the table below. The increased levels of sub-transmission underground cable funding over five years reflects the addition of the 23kV cable replacement program in Buffalo.

Table 3-11
Underground Cable
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	1.8	3.1	2.7	1.3	0.0	-	8.8
2014	-	1.4	5.2	4.4	3.7	6.2	20.8

Not represented in the investment forecasts in the table above are five cable replacement projects: C028892, Buffalo 23kV Reconductor - Huntley; C028893, Buffalo 23kV Reconductor - Huntley2; C028903, Buffalo 23kV Reconductor - Kens2; and C028894, Buffalo 23kV Reconductor – Kensington, and Project C046516 Buffalo 23kV Reconductor – Seneca 1S, 2S, 3S, 19S, 31S. These planned projects are included in the forecasts for spending in the System Capacity and Performance Spending Rationale, in the Capacity Planning program, because they are also driven by loading issues.

Chapter 4. Distribution System

The Company's distribution system comprises lines and substations typically operating at 15kV and below. There are nearly 36,000 circuit miles of overhead primary wire and nearly 7,500 circuit miles of underground primary cable on the system supplying approximately 399,000 overhead, padmount and underground distribution transformers. Additionally, there are 420 substations providing service to the Company's 1.6 million electric customers.[1] The current five-year plan for distribution is represented in Table 4-1.

Table 4-1
Distribution System Capital Expenditure by Spending Rationale ($millions)

Spend Rationale	FY15	FY16	FY17	FY18	FY19	Total
Customer Requests/Public Requirements	85.5	85.8	87.3	89.2	91.2	439.1
Damage/Failure	22.5	23.1	23.5	23.9	23.7	116.7
System Capacity & Performance	67.9	68.0	83.3	93.1	95.7	408.1
Asset Condition	64.1	67.9	78.7	74.2	75.0	359.9
Non-Infrastructure	3.2	3.3	3.3	3.3	3.4	16.5
Total	**243.3**	**248.1**	**276.1**	**283.8**	**289.0**	**1340.3**

As described previously, the Company has revised how it classifies projects within Spending Rationale and Program classifications to better reflect the driver of the work performed. Specific distribution capital investment projects that have moved to a different spending rationale are listed in Table 4-2 below. A complete list of all projects in the capital plan can be found in Exhibit 3.

Table 4-2
Transmission Capital Projects with Changed Spending Rationale

Funding Number	Project Name	Previous Spending Rationale	New Spending Rationale
Various	Inspection and Maintenance	Statutory/Regulatory	Asset Condition

[1] The distribution system data was taken January 7, 2014 from National Grid Asset Information Website located at http://usinfonet/sites/asset_info/Pages/AssetStatistics.aspx.

Chapter 4 A. Customer Requests/Public Requirements

Distribution Customer Requests/Public Requirements projects include capital expenditures for new business residential, new business commercial, outdoor lighting, and third party attachments, among other things. Customer Requests/Public Requirements investment levels are based primarily on review of historical blanket spending and forecasted spending on known specific work. These estimates reflect consideration given to inflation, estimates of materials, labor, indirect cost, market sector analysis, overall economic conditions and historical activity.

The variance between the 2013 and 2014 Plans for blanket spending is based largely on spending trends during the recent economic downturn and an expectation of a slow recovery. This is most notable in the new business residential and new business commercial blankets. The planned spending in this rationale for 2014 is set forth below.

Table 4-3
Customer Requests/Public Requirements Spending Rationale
Variance Summary ($millions)

	CIP	FY14	FY15	FY16	FY17	FY18	FY18	Total
	2013	75.3	78.8	82.7	86.6	90.8	-	414.2
Blankets	2014	-	67.7	69.4	70.9	72.7	74.5	355.3
	2013	19.2	18.4	17.7	16.6	15.7	-	87.5
Specific Projects	2014	-	17.8	16.4	16.4	16.6	16.7	83.9
	2013*	94.5	97.2	100.4	103.1	106.4	-	501.7
Total	2014	-	85.5	85.8	87.3	89.2	91.2	439.1

Note: * Total 2013 Dollars exclude Inspection and Maintenance per the new Program classifications to better reflect the driver of the work performed.

Blankets

The distribution Customer Requests/Public Requirements blankets include items such as New Business Residential, New Business Commercial, Outdoor Lighting, Public Requirements, Transformer Purchase and Installation, Meter Purchase and Installation, Third Party Attachments, and Land Rights. Exhibit 3 shows the detailed investment for all blankets in this rationale. Blankets are described in more detail below:

New Business Residential
Installation of new overhead or underground services to residential customers, reconnections as well as miscellaneous equipment related to providing or upgrading services based on customer requests. Project spending can also include costs for the extension of distribution feeders directly related to providing service to a new residential customer or development; and actual spending is net of any contribution in aid of construction (CIAC).

New Business Commercial
Installation of new services to commercial customers, reconnections as well as miscellaneous equipment related to providing or upgrading services based on customer requests. Project spending can also include costs for the extension of distribution feeders directly related to providing service to a new commercial or industrial customer or development; and actual spending is net of any CIAC.

Transformer Purchase
Transformers are purchased and are shipped to locations within the Company where these items are put into stores.

Meter Purchase
Meters are purchased and shipped to locations within the Company where these items are put into stores.

Meter Installation
Meters are installed or replaced at customer metering points to maintain equipment compatibility and readout accuracy.

Public Outdoor Lighting
Street lighting or private area lighting and related equipment is installed or replaced.

Public Requirements
Overhead and underground facility relocations resulting from bridge or roadway rebuilds, expansions, or relocations;

Municipal requests to relocate overhead facilities underground;

Other public authorities requesting or performing work that requires equipment or facilities to be relocated.

Chapter 4 B. Damage/Failure

Damage/Failure projects are required to replace equipment and restore the electric system to its original configuration and capability following equipment damage or failure. Damage may be caused by storms, vehicle accidents, vandalism or other unplanned events, among other causes. The Damage/Failure spending rationale is typically a mandatory spending rationale of work that is non-discretionary in terms of scope and timing.

The Damage/Failure investment level for the distribution system is primarily based on historical actual costs for such work. Where condition renders the asset unable to perform its intended electrical or mechanical function on the delivery system, the Company initiates the timely replacement of such asset under the Damage/Failure spending rationale.

2013 to 2014 Variance:
Spending in the damage failure category is forecasted to be in line with last year's plan based on the current rate of spending. Comparison of the distribution Damage/Failure investment levels from the 2013 and 2014 Plans is set forth below.

Table 4-4
Damage/Failure Spending Rationale
Variance Summary ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	22.4	22.6	22.8	23.0	23.4	-	114.1
2014	-	22.5	23.1	23.5	23.9	23.7	116.7

Aside from blanket and program related projects, there is one specific project identified under this spending rationale that exceeds $1 million in any fiscal year:

- Project CD01168, New Florida Station (and Related Line Work). This project provides for the installation a new 69kV-13.2kV Florida substation as a replacement of the existing substation and Amsterdam distribution substation. Amsterdam Station which was heavily damaged during flooding in August and September 2011.

Chapter 4 C. System Capacity and Performance

System Capacity and Performance projects are required to ensure the electric network has sufficient capacity, resiliency, or operability to meet the growing and/or shifting demands of the system and our customers. Projects in this spending rationale are intended to reduce degradation of equipment service lives due to thermal stress, to improve performance of facilities where design standards have changed over time, and to provide appropriate degrees of system configuration flexibility to limit adverse reliability impacts of contingencies. In addition to accommodating load growth, the expenditures in this rationale are used to install new equipment such as capacitor banks to maintain the requisite power quality required by customers and reclosers that limit the customer impact associated with an interruption. It also includes investment to improve performance of the network through the reconfiguration of feeders and the installation of feeder ties. The projected distribution investment in the system capacity and performance spending rationale over the Plan period is shown below.

2013 to 2014 Variance:
The forecasted investment levels represent the cash flow of specific projects. The variance between the 2013 and 2014 Plans is based on the scope and timing of the specific projects in this category as discussed following the table below.

Table 4-5
System Capacity and Performance Spending Rationale
Variance Summary ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	53.3	65.8	65.8	79.3	82.9	-	347.2
2014	-	67.9	68.0	83.3	93.1	95.7	408.1

Capacity Planning

Drivers:
An annual review of the distribution system, including substation and feeder loading, is performed to review equipment utilization. The reviews take into account both normal equipment loading and Load at Risk following an N-1 contingency. Forecasted load additions are applied to historical data and the system is analyzed to determine where and when constraints are expected to develop. Recommendations for system reconfiguration or system infrastructure development are created as part of this annual review to ensure load can be served during peak demand periods and is documented in the Annual Capacity Plan.

The normal loading assessment identifies load relief plans for facilities that are projected to exceed 100 percent of normal capability (i.e., maximum peak loading allowed assuming no system contingencies). The projects from these reviews are intended to be in-service during the year the load limit is forecasted to occur. In general, load growth within the service area has averaged 0.6 percent over the past 10 years, and this growth rate is expected to continue for the next 10 years. However, individual areas within the service area are forecasted to grow at varying rates.

In addition to the normal loading review, the Company has instituted planning criteria for Load at Risk following an N-1 contingency that sets MW and MWh interruption exposure thresholds ("MWh Violations") for various supply and feeder contingencies for the purpose of setting a standard for minimum electrical system performance. These thresholds are applied in conjunction with other criteria - such as maintaining acceptable delivery voltage and observing equipment capacity ratings - to ensure the system operates in a reliable manner while managing risk of customer interruptions to an acceptable level. MWh thresholds have been identified for three specific contingencies. For loss of a single substation supply line, a maximum interruption load limit of 20MW and/or 240MWh is specified, assuming that the line can be returned to service within 12 hours. For loss of a single substation power transformer, a maximum interruption load limit of 10MW and/or 240MWh is specified, assuming that the transformer can either be replaced or a mobile unit installed within 24 hours. Finally, for loss of any single distribution feeder element, a maximum interruption of 16MWh is specified. Analysis of the interruptions under this criteria assume that any and all practical means are used to return load to service including use of mobile transformers and field switching via other area supply lines and/or area feeder ties. MWh analysis recognizes the approximate times required to install mobile/back-up equipment as well as stepped field switching, i.e. moving load from the adjoining in-service station with feeder ties, that will be used to pick up customers experiencing an interruption, to a second adjoining station to increase the capability of the feeder ties.

The Annual Capacity plan reviews loading on over 2,000 feeders and more than 400 substations and results in numerous upgrade projects that range in scope from switching load between feeders and/or substations to new lines or substations.

Customer Benefits:
The benefit to customers of completing the work identified in capacity planning studies includes less exposure to service interruptions due to overloaded cables and transformers. In addition, the implementation of projects to mitigate MWh Violations will

reduce the likelihood that an unacceptable number of customers will be without service for extended periods due to supply, substation equipment or feeder contingencies.

2013 to 2014 Variance:
The projected investment is shown in the table below and variation year on year is due to the scope and timing of specific projects.

Table 4-6
Capacity Planning
Program Variance ($millions)

	CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
Specific Projects	2013	11.7	25.9	38.2	52.2	50.9	-	178.8
	2014	-	28.5	30.3	49.7	59.8	55.4	223.7
Load Relief Blankets	2013	2.0	2.1	2.3	2.4	2.6	-	11.3
	2014	-	1.82	1.882	1.947	2.015	2.084	9.748
Total	2013	13.7	28.0	40.4	54.6	53.4	-	190.1
	2014	-	30.3	32.2	51.6	61.8	57.4	233.4

The following specific projects are forecasted with planned spending in excess of $1 million in any fiscal year:

- Project C028831, North Syracuse Area Capacity Increase. This project provides for the installation of a new 115/13.8kV substation to relieve area transformers and distribution feeders that have exceeded their thermal ratings.
- Project C030506, North Syracuse Area Substation Getaways. This project provides for the installation of distribution feeder getaways in support of Project C28831, described above.
- Project C032495, Paloma Substation Second Transformer Addition. This project provides for a second substation transformer and switchgear. The existing transformer is projected to exceed its summer normal rating in 2015 and also has existing MWh Violations.
- Project C032503, Starr Road Substation Second Transformer Addition. This project provides for the resolution of an MWh Violations of the existing Starr Road Station transformer.
- Project C036185, Bridge Street Substation Second Transformer Addition. This project provides for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C036188, East Malloy Substation Second Transformer Addition. This project provides for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C036189, Fly Road Transformer Addition and C046722 Fly Road Low Side Substation Equipment. These projects provide for the resolution of MWh

violations for the contingency loss of the existing transformer and load relief for adjacent feeders.

- Project C046722, Fly Road Low Side Feeder Getaways. This project provides for the distribution line work associated with the expansion of Fly Road described above.
- Project C046592 and C046636, Whitaker Substation. These projects provide for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Projects C046609 and C046631, Milton Ave Substation and feeders, respectively. These projects provide for the resolution of normal loading concerns and MWh Violations for contingency loss of the existing substation transformer.
- Projects C046475 and C046476, New Cicero Substation and feeders, respectively. These projects provide for the resolution of normal loading concerns and MWh Violations for contingency loss of the existing substation transformer at Pine Grove Substation.
- Projects C046634 and C046635, New Haven Transformer Upgrade and Feeder, respectively. These projects upgrade the existing transformer at New Haven and extend a new feeder to relieve/retire Mexico Substation and provide a feeder tie to East Pulaski to address loading and contingency concerns.
- Projects C046640 and C046633, Fairdale Sub and Feeder, respectively. These projects upgrade the existing station to a 34.5-13.2kV station and provide a tie to Granby which is also 13.2kV to address reliability concerns.
- Project C046627 and C046610, Watertown New 115/13.2kV Substation and feeders, respectively. These projects provide for a new 115-13.2kV substation and distribution feeders to address normal and contingency loading issues in the Watertown area.
- Projects C046511 and C046505, Teal Substation Rebuild and Feeder, respectively. These projects provide for replacing the existing metalclad switchgear with higher rated switchgear to address loading and asset condition issues as well as extend and new feeder to address loading issues.
- Project C046526, Cortland Area Study. This project provides for a potential 115-13.2kV station in the Cortland area to address any normal loading or contingency loading issues.
- Project C046527, Syracuse UG Study. This project provides for resolution of 13.2kV and 4kV underground cable capacity and contingency issues in Syracuse.
- Project CD00896, Randall Road New Substation. This portion of the project is for a new 15kV switchgear and capacitor bank at a new 115-13.2 kV station. This and associated projects will resolve loading above summer normal rating of the existing substation transformer, MWh criteria violations and distribution feeder loading issues.
- Project CD00897, Randall Road Distribution Getaways. This project provides for the distribution line work associated with Project CD00896 described above.

- Projects C046798 and C046796, Sodemann Road New Substation and Distribution Getaways, respectively. These projects provide for a new 15kV switchgear and capacitor bank at a new 115-13.2 kV station as well as distribution feeder getaways, feeder reconductoring and other feeder work. These projects will resolve loading above summer normal rating of the existing substation transformer, MWh criteria violations and distribution feeder loading issues.
- Project C046490, Van Dyke Station. This project installs a new 115-13.2kV station to address loading, asset condition and reliability concerns in and adjacent to the Town of Bethlehem.
- Projects C046487, C046488, C046489, C046492, C046493, C046495 Van Dyke Feeders. These projects provide for distribution line work associated with Project C046490 described above.
- Projects CD00091 and CD00893, DeLaet's Landing Station and Feeders, respectively. These projects are for a new 115-13.2kV station and feeders to address loading concerns in the City of Rennsalear due to a new development.
- Project C046790 and C046791, McCrea Substation and feeders, respectively. These projects provide for the resolution of normal loading concerns at Burgoyne and Butler as well as asset condition concerns at the existing McCrea substation.
- Project C029186, Station 214 - Second Transformer Addition. This project will resolve the existing loading above summer normal rating of the existing transformer.
- Project C029187, Station 214 New F21466/67. Line work associated with Project C029186 to provide relief to stations and feeders in the vicinity of Station 214.
- Project C036056, Military Road 210 - Second Transformer Addition. This project provides for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C036059, Shawnee Road 76 - Second Transformer Addition. This project provides for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C036502, Buffalo Station 56 Upgrade Four Transformers. This project replaces four 23-4.16kV transformers with larger transformers to address loading above summer normal ratings.
- Project C036639, Buffalo Station 139 - Replace Transformers. This project provides for the replacement of the two existing Buffalo Station 139 Substation transformers, which are overloaded on contingency loss of one transformer.
- Projects C046552 and C046759, South Livingston Load Relief Distribution Line. Line work associated with Project C046146 to address loading above summer normal rating at two stations in the southern part of Livingston County.
- Project CD01089, West Hamlin 82 - Install Transformer #2. This and associated projects provide for the resolution of MWh Violations for contingency loss of the existing substation transformer.

- Project C046590, Mumford. This and associated projects provide for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C046553, Baker St - Install Transformer #2. This project provides for the resolution of MWh Violations for contingency loss of the existing substation transformer.
- Project C046536, Delameter - Install Two 20/26/33 MVA Transformers. This project and associated projects provide for the resolution of MWh Violations for contingency loss of the existing substation transformer, asset condition issues with the existing transformer and loading issues with neighboring stations.
- Project C047865, C047866 and C047877, Delameter. These projects provide the distribution line work associated with project C046536, above.
- Project C046496 and C046497, New Abby Street Substation and Line, respectively. These projects provide for the installation of a new 115-13.2kV substation and distribution feeder work to supply the Riverbend Development in Buffalo.
- Project C051266 and C051265, New Tonawanda Station and Line Work, respectively. These projects provide for the installation of a new 115-13.2kV substation and feeders to supply the Riverview Development in Tonawanda.
- Project C046611, Attica Station Transformer Upgrade. This project provides for the replacement of the existing Attica Transformer with a larger transformer to address station loading concerns.
- Project CD00977, Long Road #209 new TB#2. This and associated projects install a second transformer at Long Road and extend a new feeder to address contingency loading issues on Grand Island.
- Project C035743, Wilson 93 Load Relief. This project provides for the replacement of the existing Wilson Transformer with a larger transformer to address station loading concerns.
- Project C046538 and C046532, Eden Switch Structure. These projects provide of the installation of a new 34.5-13.2kV station at or adjacent to the existing Eden Switch Structure as well as the construction of new feeders to address loading and reliability concerns in the area.
- Project C046593 and C046591, West Sweden New Station and Feeders, respectively. These projects provide for the installation of a new 115-13.2kV substation and feeders to address contingency loading concerns.
- Project CD01128, Buffalo Station 49 – UG Upgrades. This project provides for three (3) new feeders in a new conduit and manhole system to supply customers in the Buffalo Niagara Medical Corridor.
- Project C046531, Buffalo Station 77 – Add TB3. This project provides for the installation of the third transformer at Station 77 to address normal and contingency loading issues.
- Project CD00881 – Dline- To expand Rock Cut Sub. This project provides for distribution line construction and conversions associated with the Rock Cut

Substation Expansion to allow the retirement of the indoor station at Brighton Ave.

- Projects C036520, C028931, C028929 – Frankhauser. These projects provide for the new 115-13.2kV substation in the Town of Amherst and related subtransmission line relocations and distribution feeder construction to address distribution and subtransmission capacity issues.
- Projects C046552 and C046759 – South Livingston Relief – D Line Fdr. These projects provide for the construction of four feeders from a new 115-13.2kV substation in the South Livingston area.

Heavily Loaded Line Transformer

The distribution line transformer strategy endeavors to mitigate outage/failure risks due to overloading of distribution service transformers. Transformer loading is reviewed annually via reports generated from the customer use information within the Geographical Information System (GIS). Transformers with calculated demands exceeding load limits specified in the applicable Construction Standard are identified and investigated in the field.

Heavily loaded units are to be systematically removed from the system over the next fifteen years. Replacement levels may be adjusted based on changes to loading levels, the condition of the population and budget constraints.

Drivers:
There are approximately 250 transformer failures per year due to overloading which affect approximately 3,700 customers annually. Proactive management of equipment loading through annual review has prevented overloaded transformers from becoming a significant system performance problem.

Customer Benefits:
The main benefit of this strategy is that asset utilization will be maximized by maintaining units in service until such point that replacement is required as identified through recurring loading reviews or visual and operational inspection, recognizing that transformer life expectancy is predominantly affected by loading and environmental factors rather than age. Implementation of this strategy will ensure the sustainability of this asset class over time and maintain its relatively minor impact on overall system reliability and customer satisfaction.

2013 to 2014 Variance:
Under the Heavily Loaded Line Transformer program, the Company expects to replace a similar number of transformers year on year, with slightly increasing costs due to inflation.

Table 4-7
Heavily Loaded Line Transformer
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	3.1	3.2	3.2	3.3	3.4	-	16.2
2014	-	3.2	3.2	3.3	3.4	3.4	16.5

Remote Terminal Unit (RTU)

This strategy covers the addition of Remote Terminal Units (RTUs) and related infrastructure at substations presently lacking remote monitoring and control capabilities. RTUs in substations communicate with the EMS (Energy Management Systems) and provide the means to leverage substation data that provides operational intelligence and significantly reduces response time to abnormal conditions through real time monitoring and control.

There is an additional investment to replace outdated RTUs based on their asset condition. That investment is documented in the Asset Condition spending rationale section.

Drivers:
RTUs will allow for remote operation and management of the system at stations providing benefits in contingency response and recovery and thus improving performance and reliability. In addition, RTUs are key components of automation and modernization of the Company's infrastructure.

Customer Benefits:
This strategy provides the means to leverage operational intelligence and significantly reduce response time to abnormal conditions through real time monitoring and control. The strategy also enables the distribution automation, sub-transmission automation, and future modernization strategies which will improve service to customers. When used to monitor and control the distribution feeder breakers and associated feeder equipment, RTUs and EMS facilitate the isolation of faulted equipment and the time required to reconfigure the distribution system to re-energize customers in non faulted segments of the distribution system.

2013 to 2014 Variance:
The projected investment is shown in the table below and the 2014 reduction in spend is primarily due to resource allocation and scheduling in fiscal years FY16 through FY18.

Table 4-8
Remote Terminal Unit
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.6	2.6	2.7	2.8	2.8	-	13.5
2014	-	2.5	1.4	1.0	1.5	2.2	8.6

Engineering Reliability Review

An Engineering Reliability Review (ERR) can be completed for any feeder experiencing reliability problems or any localized pocket of poor performance. ERRs are often performed on those feeders defined as Worst Performing Feeders ("WPF") as described in the Electric Service Reliability Report, filed annually in accordance with Case 90-E-1119. The scope of an ERR is typically a:

- Review of one year and multi-year historical reliability data for current issues and trends.
- Review of recently completed and/or future planned work which is expected to impact reliability.
- Review the need for the installation of radial and/or loop scheme reclosers.
- Review for additional line fuses to improve the sectionalization of the feeder.
- Comprehensive review of the coordination of protective devices to ensure proper operation.
- Review for equipment in poor condition.
- Review of heavily loaded equipment.
- Review for other feeder improvements such as fault indicators, feeder ties, capacitor banks, load balancing, additional switches and reconductoring (overhead and/or underground).

Drivers:
The ERR recommendations are utilized as a basis to improve the reliability on the circuits experiencing recent poor reliability performance.

Customer Benefits:
The ERR program will improve customer reliability in areas in which performance has been substandard. The ERR work also helps to harden the feeder and make the feeder more resilient.

2013 to 2014 Variance:
Projects associated with the ERR program are reactionary and are identified as reliability concerns arise. As such, specific projects are only identified in the early years of the plan and future spending is maintained in a targeted budget reserve. The increase seen in FY16 represents the reserve, less a small number of specific projects already identified.

Table 4-9
Engineering Reliability Review
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	3.4	3.7	3.8	3.9	4.0	-	18.7
2014	-	3.7	6.2	8.0	7.9	7.0	32.8

Minor Storm Hardening

The Minor Storm Hardening program proposes to increase the resilience of the distribution system in select areas of the service territory that have experienced repeated outages during adverse weather days in an effort to improve reliability performance and customer satisfaction for those customers experiencing multiple interruptions. Work included in these projects includes; reconductoring with tree resistant conductors. review of pole size and class as well as the use of Grade B construction at critical poles (junction poles, switch poles and road/rail/water crossings), additional sectionalizing points as appropriate (reclosers, fuses and switches), enhanced lightning protection and enhanced vegetation management.

Drivers:
The Storm hardening recommendations are utilized as a basis to improve the reliability in targeted areas that have experienced recent poor performance during adverse weather events.

Customer Benefits:
The Minor Storm Hardening program will enhance distribution resiliency in targeted areas.

2013 to 2014 Variance:
The projected investment is shown in the table below and variation in the early years is due to rephasing of specific projects. Future spending is maintained in a targeted budget reserve.

Table 4-10
Storm Hardening
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.7	3.2	3.2	3.3	3.4	-	15.8
2014	-	3.8	3.1	3.2	3.3	3.4	16.8

The following specific project is forecasted with planned spending in excess of $1 million in any fiscal year or in Total:

- Project C046394, Hague Road 41853 Feeder. This project provides for the reinforcing of line construction to provide improved resiliency during adverse weather events.

Overhead Distribution Fusing

Various projects are in place which will maintain customer reliability through the installation of fuses on overhead distribution lines. Fuses are installed to isolate permanent faults on the distribution system. Ideally, these fuses are installed at locations which limit the interruption to the fewest number of customers possible. Proper fuse application will limit the duration of the interruption by isolating the fault to a smaller area and reducing the time required to find the fault.

Drivers:
Fuses isolate the faulted area of a feeder and thereby interrupt the smallest practical number of customers.

Customer Benefits:
These projects will result in a reduction in the number of customer interruptions and will help the Company continue to meet its service quality metrics.

2013 to 2014 Variance:
The program consists of two distinct components: fuse identification and fuse installation. The identification of fuse locations will conclude in FY17 as expected. Due to higher than expected volumes of fuse locations identified, the installations are expected to continue into FY18.

Table 4-11
Overhead Distribution Fusing
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	1.9	1.9	2.0	2.0	0.0	-	7.7
2014	-	2.4	2.4	2.4	1.2	0.0	8.4

Arc Flash Mediation - 480 Volt Spot Networks

The installation of 480 volt spot network primary and secondary isolation equipment mitigates the arc flash hazard levels within 480 volt spot network systems.

Drivers:
The primary driver of this strategy is safety. National Grid adheres to the National Electrical Safety Code's Part 4: Work Rules for the Operation of Electric Supply and Communication Lines and Equipment. This strategy addresses the National Electrical Safety Code 2012 revision which requires an arc flash hazard analysis for work assignments within distribution secondary network systems. This strategy will mitigate the calculated incident energy levels by installing engineering controls.

Customer Benefits:
Installation of primary and secondary isolation equipment will facilitate emergency and routine maintenance without interruption of service to the customer.

2013 to 2014 Variance:
Forecasted spending levels are shown below. Early material issues slowed the start but spending levels are increasing with a forecasted FY18 project completion.

Table 4-12
Arc Flash Mediation - 480 Volt Spot Networks Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.0	4.0	4.0	4.0	2.1	-	16.1
2014	-	4.0	4.0	4.0	2.1	0.0	14.1

System Capacity and Performance – Other

The following specific projects are proposed under the System Capacity and Performance rationale and are not associated with any of the programs described above and exceed $1 million in any fiscal year:

- Project C033636, Buffalo Albany Flying Grounds Switch Replacement. This project provides for the removal of Flying Ground Switches as a power transformer protection method and replaces them with Circuit Switchers.
- Project CD00606, Bolton 51/Warrensburg 51 Feeder Tie. This project provides for the creation of a feeder tie to provide operation flexibility and resolve restoration concerns..
- Project CD01088 and C032446, Harris Substation. These projects for substation expansion and distribution line work respectively, will resolve loading above summer normal ratings and MWh criteria violations of the Harris Ave. Substation transformer as well as asset condition concerns at adjacent substations.
- Projects C046411 – Long Road #209 new TB#2. This project provides for the expansion of Long Road Station #209 to address outage exposure and area capacity.
- Project C046569 – Lyndonville Station 34.5kV Cap Bank Installation. This project will install a 34.5kV capacitor bank at Lyndonville to improve system voltage performance.
- Project C049723 – NR_Hammond 37061-Oak Point Rd. This project rebuilds the existing distribution circuit along Sand Street and Oak Point Road.
- Project C049197 – NR 76462-CoRte28-Rebuild. This project constructs new three-phase and single-phase portion of the circuit to upgrade and/or replace existing.
- Project C049789 – NR Bremen 81556-Beech Hill Rd. Rebuild and convert existing circuit to 13.2kV along Beech Hill and Erie Canal Roads.
- Project C049757 – NR Chasm Falls 85251 –Duane Road Tie. This project provides for the rebuilding and conversion of approximately three miles of 4.8kV circuit to three-phase 13.2kV to provide a second source to an area..
- Project C049760 – NR 85251 NYS Hwy 30 Feeder Tie. This project rebuilds and converts approximately 8 miles of single phase 4.8kV circuit to three phase 13.2kV.
- Project C050878 – Whitesboro 64, 65 and 66 Retirement. This project provides for the rebuild, conversion and transfer of distribution circuits to neighboring substation to facilitate the retirement of Whitesboro Substation. This is to address flooding issues at Whitesboro.
- Project C046409 – New 115 kV, 40 MVA Mobile Substation. This project is a new system requirement that will assist with mitigation of risks associated with extended loss of transformation for 200 units with capacity ranges of 15 MVA to 40 MVA.

Chapter 4 D. Asset Condition

Planned asset condition investment levels for the distribution system, and comparison to investment levels from last year's Plan, are shown below.

2013 to 2014 Variance:
The variance between the 2013 and 2014 Plans is based on the scope and timing of the specific projects in this category as discussed following the table below. Some of the variance is due to the reclassification of subtransmission station projects to distribution station projects.

Table 4-13
Asset Condition Spending Rationale
Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	30.0	31.5	33.0	41.5	42.0	-	178.0
2014	-	64.1	67.9	78.7	74.2	75.0	359.9

Funding levels for the programs and projects included in the Asset Condition rationale are presented below.

Inspection and Maintenance

The Company performs visual inspections on all overhead and underground distribution line assets once every five years. Each inspection identifies and categorizes all necessary repairs, or asset replacements, against a standard and in terms of criticality to maintain customer safety and reliability in compliance with the Commission's Safety Order in Case 04-M-0159.[2] The Company also performs annual contact voltage testing per the Commission's Safety Order on all facilities that are capable of conducting electricity and are publicly accessible, such as street lights.

2013 to 2014 Variance:
Current investment forecasts are based on actual expenditures being incurred with the on-going Inspection and Maintenance program and an expectation that the number of defects found in future year inspections will decrease as the inspection cycle repeats.

Table 4-14
Inspection and Maintenance
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	28.6	20.6	20.6	20.6	20.6	-	111.1
2014	-	25.4	21.8	21.8	21.8	18.7	109.7

[2] Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Adopting Changes in the Electric Safety Standards (issued and effective Dec. 15, 2008) ("Safety Order").

Underground Cable

A strategy has been implemented to proactively replace underground cable on the subtransmission, distribution primary and distribution secondary systems. Available information such as failure history, cable age, inspection program results and cable type were used to identify candidate cable replacements for further engineering evaluation. Subtransmission and distribution cable replacement projects will be on a circuit basis, with each project justified, engineered, scoped and approved individually. A single program funding number in each Division will be used for secondary cable replacement. Distribution cable replacement opportunities are aligned with other projects such as Buffalo Substation rebuild projects and load relief projects.

Drivers:
Recently, there have been a number of cable failures that resulted in manhole cover dislodgements and smoking manholes. These events heightened concerns regarding the safety and reliability of the aged underground systems. Although the consequence of a manhole event can be severe, the likelihood of an event remains low. This strategy is expected to further reduce the likelihood of manhole events by proactively replacing cable based on its condition and past performance.

Customer Benefits:
Cable systems are often designed with greater redundancy than overhead systems, and cable failure often has a limited impact on customer reliability statistics. However, if cable performance deteriorates significantly, the likelihood of concurrent failures increases. Cable failures can result in increased operation and loading on parallel equipment, further increasing the risk of failure on the rest of the system. The consequences of multiple secondary network failures or multiple subtransmission failures would be significant. Proactive replacement of aged cable in these systems is expected to reduce the risk of concurrent failures and the potential for large scale customer outages in urban areas, including critical loads such as police, fire and hospitals.

2013 to 2014 Variance:
The projected investment is shown in the table below. On-going cable replacement projects will be completed in FY15 and FY16. New expenditures for the secondary cable replacement program are projected as $5M annually. Distribution primary cable replacement expenditures as identified in the strategy are not shown. These will be added as each project is justified, engineered, scoped and approved individually.

Table 4-15
Primary Underground Cable
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	5.4	5.9	3.4	0.0	0.0	-	14.7
2014	-	10.3	6.3	5.0	5.0	5.0	31.5

Conductor Replacement

Various projects are planned which will replace "small" (< #2 AWG) copper, copperweld, amerductor and aluminum conductor.

The Company stopped installing #4 and smaller copper primary wire sometime prior to 1953. This makes the small wire population at least 60 years old (some of the oldest overhead energized equipment in service on the distribution system).

Drivers:
In the course of this 50+ year service life, the average conductor will have lost some of its tensile strength due to loading conditions and elongation during splicing following emergency service restoration. This loss of tensile strength increases the likelihood of conductor breakage during an interruption which involves physical contact with the conductor. Interruptions involving broken conductors typically result in longer service restoration times. With each successive interruption the ability to restore service quickly is deteriorated. This loss of tensile strength is especially significant during a storm situation where the wind and/or ice/snow loading on the conductor will be higher than during clear conditions. These projects will systematically identify and replace the small wire.

Customer Benefits:
Replacing the "small wire" population will improve the resiliency and harden the distribution system during adverse weather conditions.

Replacement will also improve voltage performance.

2013 to 2014 Variance:
The projected investment is shown in the table below.

Table 4-16

Conductor Replacement
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.9	1.6	1.6	0.7	0.0	-	4.8
2014	-	1.1	4.5	4.3	4.4	4.6	18.9

Buffalo Streetlight Cable Replacement

This program will re-establish safe and reliable underground street light service by replacing faulty street light cables and conduit, and removing temporary overhead conductors.

Drivers:
Fiscal year 2015 is the third year of a planned 10 year program to replace deteriorated street light cable in the Buffalo area to address repetitive incidents of elevated voltage (EV) as determined through periodic testing as defined under electric operating procedure NG-EOP G016. The underground street light cable system located in the Buffalo metropolitan area is comprised of a variety of electrical cable types and electrical wiring configurations that have been in service for more than 50 years. Recently, Elevated Voltage Testing has identified stray voltage incident rates that are from 2 to 20 times the rates measured in other areas in the Company's service territory.

Analyses have determined the primary driver for the elevated voltages in this area is the deteriorated physical condition of the street light cable. Spot repairs have only marginally remedied the incidence rates. Current incident rates in many of the 11 Company-defined test zones in Buffalo have experienced inconsistent EV results following each spot repair cycle since 2009. Testing of the new circuitry has resulted in a dramatic reduction of EV incidents associated with street light infrastructure.

Customer Benefits:
This work will provide more reliable street light service and reduce the incidence of elevated voltages in the Buffalo area.

2013 to 2014 Variance:
The Company expects to spend approximately $2.5M annually under this program to replace an estimated 14% of the city's existing street light cable system over the 10 year program period. The projected investment is shown in the table below; slight down in spending is magnified by rounding.

Table 4-17
Buffalo Streetlight Cable Replacement
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.5	2.5	2.5	2.5	2.5	-	12.5
2014	-	2.4	2.4	2.4	2.4	2.5	12.3

Substation Asset Condition Programs

Substation assets frequently have long lead times and require significant projects in terms of cost, complexity and project duration for replacement or refurbishment. Consequently, it is often more efficient as well as cost effective to review an entire substation. Further, where there are asset condition issues that indicate replacement as an option, the Company reviews planning and capacity requirements to ensure alternative solutions are evaluated such as system reconfiguration to retire a substation. Hence, the asset strategies coordinate with system planning to develop an integrated system plan.

Substation Power Transformers

Power transformers are large capital items with long lead times. Their performance can have a significant impact on reliability and system capacity. Condition data and condition assessment are the key drivers for identifying replacement candidates. Replacements are prioritized through a risk analysis which includes feedback from operations personnel. The distribution element covers transformers which are identified as replacement candidates through the test and assessment procedure. A 'Watch List' of candidate transformers has been identified and recorded in the Asset Condition Report.[3]

Drivers:
There are approximately 779 power transformers plus 21 spares with primary voltages 69kV and below. Each unit is given a condition code based on individual transformer test and assessment data, manufacture/design and available operating history. Higher codes relate to transformers which may have anomalous condition; units with a higher code are subject to more frequent monitoring and assessment, and are candidates for replacement on the Watch List.

Customer Benefits:
The impact of power transformer failure events on customers is historically substantial. By proactively replacing units in poor condition there will be direct benefits to customers in reduced impact of power transformers on performance.

2013 to 2014 Variance:
The projected program investment is shown below. Through on-going review of the distribution substation transformer fleet, new problems are identified. The resulting replacement costs and related annual investment will vary based on the size of the transformer to be replaced.

Table 4-18
Substation Power Transformers
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.9	3.4	2.1	6.4	3.9	-	18.8
2014	-	3.7	4.8	6.3	2.9	2.8	20.4

The capital investment plan in Exhibit 3 shows the current list of transformers expected to be replaced within the next five years. The following specific projects are expected to exceed $1 million in any fiscal year:

- Project C051706, Grooms Road Substation Transformer Replacement. This project provides for the replacement of two transformers.
- Project C046670, Station 124 Transformer Replacement. This project provides for the replacement of two transformers.

[3] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 10-E-0050, filed most recently October 1, 2013.

- Project C046676, Liberty Street Substation Transformer Replacement. This project provides for the replacement of one transformer.

Indoor Substations

The purpose of this strategy is to replace, retrofit, or retire the twenty-four remaining indoor distribution substations. The indoor substations were built in the 1920s through the 1940s. These substations have inherent safety risks due to design and equipment condition. Sixteen of these indoor substations remain to be rebuilt in the City of Buffalo and five are in Niagara Falls. The remaining three substations are located in Syracuse, Gloversville and Troy. Details of the asset condition issues and key drivers are outlined in the asset condition report.

Drivers:
These indoor substations are obsolete. Their outmoded design does not meet currently accepted safety practices, equipment and protection schemes are becoming unreliable in their function of interrupting faults, and in general the condition of equipment shows signs of deterioration.

Customer Benefits:
Under normal conditions, failure of obsolete indoor substation equipment could result in sustained customer interruptions until some type of replacement is installed. Equipment outages can result in increased operation and loading on parallel equipment. Indoor substations typically supply urban environments, including critical loads such as police, fire and hospitals. This program mitigates the risk for a long-term, sustained, customer interruptions occurring in these urban areas.

2013 to 2014 Variance:
The projected program investment is shown below. The spending has been modified based on lessons learned regarding scheduling, the availability of resources and further development of the plan for each substation.

Table 4-19
Indoor Substations
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	7.5	7.7	12.2	11.1	12.3	-	50.7
2014	-	8.4	5.7	14.5	10.9	11.1	50.6

- In Buffalo, seven indoor substation projects are expected to exceed $1 million: Buffalo Stations #25, #27, #29, #31, #34, #37, #41 and #59.
- In Niagara Falls, three substations are expected to exceed $1 million: Eighth Street #80, Welch #83, and Stephenson #85.
- In Syracuse, expansion of the Rock Cut #286 substation is expected to exceed $1 million. The Rock Cut #286 substation expansion will allow the retirement of the Brighton Avenue #8 substation.

Metal-Clad Switchgear

Deteriorated metal-clad switchgear can be prone to water and animal ingress which leads to failures. Visual surveys will detect such degradation, but cannot identify surface tracking where hidden behind metal enclosures. Identification of these concerns is more likely with electro-acoustic detection techniques. By using sensors to detect anomalous sound (acoustic) waves or electric signals in the metal-clad switchgear, it is possible to identify equipment condition concerns before failure. An initial review using this technique identified a number of locations for further action as part of this strategy.

For each substation, an analysis will be conducted to determine if direct replacement is the best course of action or if an alternate means of supplying the load will be constructed.

Drivers:
Metal-clad switchgear installed prior to 1970 has several factors that can lead to component failure. Electrical insulation voids were more prevalent in earlier vintage switchgear. Higher temperatures due to poor ventilation systems can degrade lubrication in moving parts such as breaker mechanisms; and, gaskets and caulking deteriorate over time leading to ingress of moisture.

Customer Benefits:
The impact of each metal-clad switchgear event on local customers is usually substantial, with nearly 3,000 customers interrupted for over three hours per event. This program would reduce the risk of such events and provide significant benefit to the affected customers.

2013 to 2014 Variance:
The projected program investment is shown below. The capital forecast reflects new condition assessment data and analyses which helped identify and prioritize replacement candidates. Multiple stations are in progress with a program underway to prioritize additional stations.

Table 4-20
Metal-Clad Switchgear
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.2	0.0	4.2	7.9	6.9	-	19.2
2014	-	0.1	1.2	7.7	9.5	8.1	26.6

There is separate funding shown in Chapter 3 for the sub-transmission system.

The following specific projects are expected to exceed $1 million in any fiscal year:

- Project C017952, Emmet Street Substation Replace Transformer Bank 1 and Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C046745, Union Street 376 Substation Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C046747, Johnson Road Substation Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C046744, Pinebush Substation Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C046741, Hopkins 253 Substation Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C046742, Whitesboro 632 Substation Metal-Clad Switchgear. This project provides for the retirement of the station as the best economical solution to address the asset condition and the need to rebuild/convert the distribution circuits in surrounding area to 15 kV operation.
- Project C046743, Conkling 652 Substation Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C052706, Station 61 Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C051707, Station 162 Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.

Substation Circuit Breakers and Reclosers

Certain types, or families, of breakers have been specifically identified for replacement in the next ten years. Breaker families are typically older, obsolete units that are less safe or less reliable. Certain breaker families that are targeted for replacement contain parts that must be custom machined or units that contain asbestos in the interrupting systems and require extra precautions during maintenance, refurbishment and overhaul.

Drivers:
The approach for breaker condition coding was based on engineering judgment and experience which was supported by discussion with local Operations personnel. The units are prioritized for replacement based on the condition coding; units in poorer condition are given a higher score. Many of these breakers are obsolete.

Aged units have been specifically identified for replacement because they are difficult to repair due to the lack of available spare parts. Likewise, unreliable units have been identified for replacement since their replacement would reduce the number of customer interruptions.

Customer Benefits:
Several of the targeted breaker families present opportunities to reduce hazards associated with safety and the environment (i.e. oil and asbestos).

2013 to 2014 Variance:
The projected program investment is shown below. The overall spend has been modified based on lessons learned regarding scheduling and the availability of resources. The reduction in FY18 and FY19 reflects the completed replacement of a group of 115 kV breakers.

Table 4-21
Circuit Breakers and Reclosers
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	2.6	2.6	2.6	2.1	1.8	-	11.5
2014	-	1.6	2.2	2.2	1.4	1.4	8.8

Substation Batteries and Related

This program mirrors the Transmission Substation Batteries and Chargers program. Battery and charger systems are critical components that are needed to ensure substation operational capability during both normal and abnormal system conditions. The intent of this program is to replace battery and charger systems that are 20 years old. The 20 year limit is based on industry best practice and experience in managing battery systems. This program work is coordinated with other asset replacement programs where appropriate.

Currently, there are over 200 substation batteries in service. To bring all battery systems to less than twenty years old within ten years would require a replacement rate of approximately nine per year.

Individual battery problems may arise at any time during Visual and Operational inspections or periodic testing. Problems identified through these methods are addressed under the Damage/Failure spending rationale.

Drivers:
Failure of batteries and charger systems may result in substation protective relays and/or circuit breakers not operating as designed.

Customer Benefits:
Battery and charger system failures can result in additional customers being interrupted as back-up relay schemes at remote substations will have to isolate a fault. It may also result in equipment damage if a fault is not cleared in a timely fashion. Interruptions related to battery incidents are uncommon at this time as the replacement program is working as desired.

2013 to 2014 Variance:
The projected program investment is shown below. The budget has been increased due to the need to replace substation batteries approaching 20 years of age.

Table 4-22
Substation Battery and Related
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.5	0.5	0.5	0.6	0.5	-	2.5
2014	-	0.9	0.9	0.9	0.9	0.9	4.5

Mobile Substation

Mobile substations are key elements for ensuring continued reliability and supporting the system during serious incidents.

Drivers:
To improve the management of the mobile substation fleet, the Company conducted a review which considered system requirements, the amount of mobile usage, and the uniqueness of the individual unit to better understand the condition of all members of the fleet and their associated risks. Highly utilized units may present a risk if they are not properly maintained or refurbished. Further, uniquely configured units or very highly utilized units in which there is only one available unit on the system, present some risk since they may not be available for an emergency due to utilization elsewhere. Based on the review, mobile substation protection upgrades, rewinds and replacement units were recommended.

Customer Benefits:
A mobile substation or transformer is the quickest method for restoring service to customers when an outage occurs in a substation, typically occurring within sixteen to twenty-four hours. By refurbishing, upgrading, replacing and purchasing new mobile substations, as necessary, via system reviews and condition assessments, the risk of extended customer outages will be significantly reduced. In addition, properly addressing the needs of the mobile fleet will allow us to schedule maintenance for substation transformers in a timely manner since they are one of the most valuable assets on the system. Lastly, having an adequate number of mobile substations on hand will promote the completion of new construction projects on-time and on-budget.

2013 to 2014 Variance:
The projected investment is shown below. The revised plan is based on identified work related to the strategy and a recent asset condition assessment of the entire fleet.

Table 4-23
Mobile Substation
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.6	0.0	1.7	0.4	0.0	-	2.7
2014	-	0.6	1.8	2.5	2.1	1.0	8.0

Circuit Switcher

Strategy paper SG 062v2 “S&C Type G and Mark II Circuit Switcher Replacement”, approved Nov 2010, addresses the problematic S&C Type G and Mark II circuit switchers on the Company’s transmission network.

Drivers:

In 2000, S&C announced that parts specific to the Type G and Mark II circuit switcher models would no longer be manufactured and support for these models would be limited. While these switches were relatively reliable at that time, since 2003 they have begun to exhibit problems. At present, there are limited options for repairing any problems that occur on these switches as spare parts and support formerly offered from S&C are no longer available. No other manufacturer fabricates or supplies these parts.

Customer Benefits:
Replacement of obsolete, deteriorated and problematic circuit switchers will lead to improved reliability performance providing customers with improved service. Planned replacement offers the lowest lifetime cost approach for customers.

2013 to 2014 Variance:
The spending in the table below represents a rephasing of the remaining work.

Table 4-24
Circuit Switcher
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	1.0	1.0	1.0	2.5	2.5	-	8.0
2014	-	0.3	0.6	2.0	2.0	0.0	4.9

Remote Terminal Unit Replacement

Work in this program relates to distribution assets identified as part of the Transmission - Remote Terminal Unit (RTU) Replacement strategy There is also significant investment in installing upgraded distribution RTU equipment as documented in the System Capacity and Performance spending rationale section.

2013 to 2014 Variance:
The projected program investment is shown below. Additional stations requiring RTU replacements have recently been identified and the reduction in the budget is due to scheduling and the availability of resources.

Table 4-25
Remote Terminal Unit Replacement
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.5	0.5	0.6	1.0	0.0	-	2.6
2014	-	0.3	0.0	0.0	0.0	0.0	0.3

Pilot Wire

Various projects call for the replacement of metallic pilot wire schemes used to protect sub-transmission underground cables. Due to the complexity of these networks, communication aided protection schemes are required.

Drivers:
There have been several pilot wire failures over the last several years which have caused protection mis-operation and increased the risk of customer interruptions due to loss of supply to distribution substations. Typically, when a pilot wire scheme is not able to operate as designed, the line protection reverts to a non-directional over-current scheme. On a networked system, this may be lead to "over-tripping", i.e. more elements of the system are de-energized than necessary to isolate a fault, possibly resulting in electrically isolating a distribution system resulting in customer interruptions.

Customer Benefits:
Engineering and construction costs should be reduced for planned work instead of a damage/failure replacement. In addition, replacement of the pilot wire schemes with modern protective relays will minimize the risk of relay mis-operations causing customer interruptions.

2013 to 2014 Variance:
In general, variance from the 2013 Plan is due to the reclassification of most sub-transmission station projects to transmission or distribution station projects. In the case of the Pilot Wire projects, all have been reclassified and the projected program investment is shown below.

Table 4-26
Pilot Wire
Program Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	0.0	0.0	0.0	0.0	0.0	-	0.0
2014	-	0.4	0.0	0.0	0.0	0.0	0.4

Department of Energy (DOE) Smart Grid Investment Grant Program

The Company is participating in the New York State Capacitor and Phasor Measurement Unit Project which originated through a NYISO funding application to the US DoE's Smart Grid Investment Grant ("SGIG") program. The capacitors are being placed on the sub-transmission system and distribution system and the Phasor Measurement Units are being placed on the Transmission system. The SGIG program is supported by the American Recovery and Reinvestment Act of 2009 ("ARRA") which has a stated goal of improving the economy by investing funds as soon as possible in worthwhile Smart Grid research projects or pilots.

On August 6, 2009, the NYISO submitted a proposal to the DOE in response to its Smart Grid Investment Grant Program. The Smart Grid Proposal provides that the NYISO, as the awardee and the recipient of funds, and the Transmission Owners, as sub-awardees and sub-recipients, will (i) install a system of phasor measurement units ("PMUs") and related devices and (ii) implement a statewide capacitor program, as specified in detail in the Smart Grid Proposal.

Effective July 1, 2010, the Company entered into an agreement with NYISO to deploy 286MVAr of capacitor banks and PMUs at twelve (12) substations. The agreement provides for up to 50% reimbursement of the Company's investment by DOE with the remainder to be recovered through traditional means.

Drivers:
The primary drivers of this project are regulatory in nature and can be separated into two groups: 1) current federal investment and smart grid policies and 2) current state renewable energies policy.

Investment and Smart Grid Policy - Federal policy centers on an investment policy (ARRA) with a directed smart grid program. Formally termed the Electricity Delivery and Energy Reliability ("EDER") Program, it is funded at $4.5 billion and primarily intended to create jobs while accelerating smart grid investment to advance the energy independence goals of EISA.

Renewable Energy Policy - NYISO's application specifically points to needs based on the current New York State Renewable Portfolio Standard as approved by the Public Service Commission. The NYISO notes that because " ... renewable resources are by their nature intermittent and have varying locations, increasing their integration into the electric system will require close monitoring and control of system dynamics." The Project will enhance the NYISO's ability to continue to monitor the operation of the New York power grid in a reliable manner as increasing numbers of renewable resources are brought online.

Capacitor Installations
The current scope of the capacitor project is to install 286MVAr of reactive support in eastern New York as close as possible to study-based locations identified by the NYISO to minimize transmission line losses associated with cross state transfers. Conceptual engineering has been completed, identifying 322 distribution and sub-transmission system capacitor locations, including 278 on distribution lines and five on distribution substation equipment. Design engineering and procurement and construction are complete resulting in the installation of a total of 288 MVAr with 322 capacitor banks

allocated as Distribution (279 sites), Sub Transmission (38 sites), and Substation (5 sites).

Phasor Measurement Unit (PMU) Installations
Per agreement with NYISO, National Grid installed a total of sixteen PMU's across twelve substations in up-state New York. Working in collaboration with the NYISO and neighboring New York Transmission owners, twelve substations were selected for PMU placement by National Grid. To ensure adequate visualization of the data from the desired buses, some substations required more than a single PMU. The data from the various PMU's are transmitted to a centralized Phasor Data Concentrator (PDC) that time-aligns the data and is then forward to the NYISO. The PMU installations were completed in accordance with the agreement by June 30, 2013

Customer Benefits:
While this project is regulatory driven, capacitor installation is in-line with the drivers of the transmission system Northeast Region Reinforcement Project.[4] The project calls for capacitor installations to address inadequate thermal performance, reduce losses and improve reliability in the transmission system. While this project is not directed at specific inadequate thermal issues, capacitors will improve the overall thermal performance of the system. This project will result in reliability improvement through improved transmission system voltage profile, increased generator MVAr reserve, and increased interface transfer limits.

Phasor measurement units provide wide area situational awareness to system operators providing early warning of incipient challenges to the grid including system instabilities, frequency excursions and power swings to name a few. Further, the data can be used to validate the results of state estimation to ensure modeling accuracy. By way of analogy, phasor data is to SCADA data as the MRI is to the X-Ray. While SCADA samples the system on the order one sample every 2 seconds, the PMU samples the system 30 to 60 times every second. This rate of sampling coupled with GPS time-stamping of each sample, provide a synchronous wide view of system stability not only across National Grid's service territory and across the NYISO region and further. Once the PMU's from all the related transmission owners are operational, the NYISO will have new tools to manage system stability and will likely be able to identify and rectify any system anomalies that before could have resulted in blackout events.

[4] "Northeast Region Reinforcement Project" SG097 - Projects C18250, C18253, CNYX39, and CNYPL6.

Asset Condition – Other

The following specific projects are proposed under the Asset Condition rationale are not associated with any of the programs described above and exceed $1 million in any fiscal year:

- Project C045334, Syracuse Connective Corridor Ductline. This project provides for the replacement of the existing deteriorating tile ductline along Fayette St as part of the City of Syracuse Connectiive Corridor.
- Project C050697, State Street Feeder Conversion. This projects converts feeders supplied by the State Street Station in Canton to allow for the retirement of the substation..
- Project C046417, New Harper Substation D Line. This project provides for the construction of new 13.2kV feeders from the New Harper substation.
- Project C049982, Karner – Station Ties Getaway Work. This project provides for the replacement of underground feeder getaway cable at three substations to facilitate the retirement of Karner Station.
- Projects C046605 and C046606, MV-Poland 62258 Route 8 Reconductor. This project reconductors and refurbishes the existing distribution circuit including pole replacements.
- Project C046854, Buffalo Station 42 Rebuild – D Station. This project replaces the existing outdoor Buffalo Station 42 to address the existing condition issues at the substation.
- Project CD00782, Buffalo Station 122 Rebuild – Substation. This project replaces the existing outdoor Buffalo Station 122 to address the existing asset condition issues at the substation.
- Project C046478, New Maple Ave Substation. This project builds a new 115-13.2kV substation on a new site to replace the existing Market Hill 69-4.16kV substation.

Chapter 4 E. Non-Infrastructure

This spending rationale includes items that do not fit into the previous four categories but are necessary for the operation of the distribution system. They include capitalized tools such as micro-processor based relay test equipment and SF6 gas handling carts. In addition, radio system expansion and upgrade projects across the system are included in this spending rationale.

Drivers:
Specialized tools are required by Operations personnel to perform equipment maintenance and complete capital projects. Radio communication systems upgrades and replacements are necessary for real time communications while performing switching and for other operational needs.

Customer Benefits:
The proper tools allow Operations personnel to work safely and efficiently thus reducing overall costs. Radio communications promote personnel safety by allowing the control centers to direct Operations personnel during field switching. In addition, timely communications allow a coordinated response to interruptions thereby limiting customer interruption durations.

2013 to 2014 Variance:
The projected investment is shown below. The reduction results from a change in historical trend.

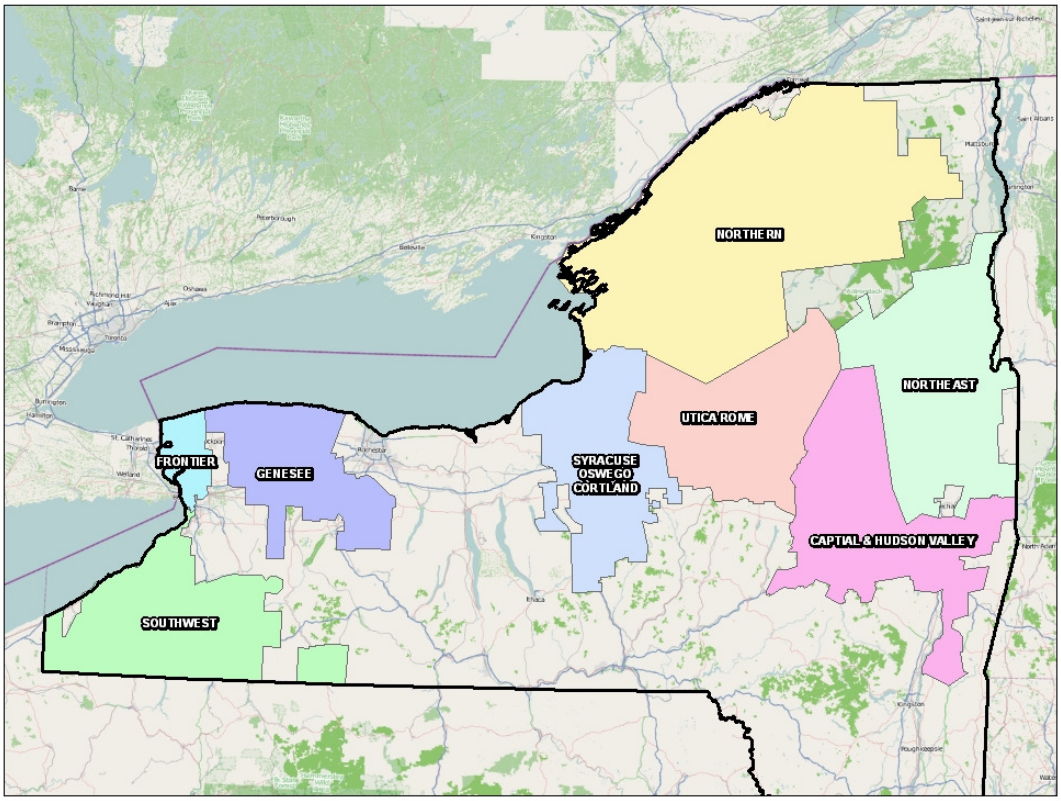
Table 4-27
Non-Infrastructure Spending Rationale
Variance ($millions)

CIP	FY14	FY15	FY16	FY17	FY18	FY19	Total
2013	4.2	4.2	4.4	4.5	4.7	-	22.0
2014	-	3.2	3.3	3.3	3.3	3.4	16.5

Chapter 5. Investment by Transmission Study Area

For regional analysis, the Company's service territory is divided into eight transmission study areas. The transmission study areas are shown in Figure 5-1. Within the eight transmission study areas, the sub-transmission and distribution networks are further subdivided into 43 distribution study areas.

Figure 5-1
Transmission Study Areas



Each of the transmission study areas is described separately below in the following format:

- Area Summary
- Area Description
- Major Project Table

Chapter 5 A. Northeast Transmission Study Area

Area Summary

The principal driver for the transmission and distribution capacity projects in the Northeast transmission study area is load growth associated with Luther Forest industrial load, specifically Global Foundries, and the general area distribution load growth that is stimulated by the economic impact of the Luther Forest development during the period from 2012-2019. A new 230-115 kV Eastover substation is recommended to avoid 115kV line overloads, Rotterdam 230-115 kV transformer overloads, and to support adequate system post-contingency voltage levels. New 115-13.2kV substations at Sodeman Road, Randall Road and McCrea are recommended to supply load growth in the area and correct some asset concerns.

Area Description

The Northeast transmission study area serves approximately 133.900 customers. The study area extends approximately 90 miles north along the western border of Vermont, from Cambridge in the south to Westport in the north, and extends approximately 45 miles to the west at its widest point to Indian Lake. The area incorporates the southeastern section of the Adirondack State Park. Much of the area load is concentrated in the southern portion of the study area, along Interstate I-87 and US Route 9, particularly in the Towns of Ballston Spa, Saratoga Springs and Glen Falls. Some of the areas offer summer recreation and see a spike in load during the summer months.

The 115kV system runs primarily in a north-south direction on both sides of Lake George. There is a single radial line, east of Lake George, which runs north from Whitehall substation, which extends to the NYSEG system and also continues north to the Port Henry substation. The western 115kV radial line extends from the Spier Falls substation to the North Creek substation in the Adirondack State Park. There is an extensive 34.5kV system in the study area supplying smaller towns along interstate I-87 and Route 28.

In the Northeast transmission study area there is one distribution study area, also called Northeast. The Northeast distribution study area has a total of 112 distribution feeders that supply customers in this area. There are eighty-eight 13.2kV feeders, with twenty-five being supplied from 34.5-13.2kV transformers, and the rest supplied by 115-13.2kV transformers; thirty-five 34.5kV sub-transmission lines that supply the distribution step down transformers in the area; ten 4.8kV feeders with six supplied by 34.5-4.8kV transformers; and fourteen 4.16kV feeders all supplied by 34.5-4.16kV transformers.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-1
Northeast Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	Substation Metal-Clad Switchgear	Dist	Northeast	Union St 376 - Replace Metalclad Ge	C046745
	Sub-T Overhead Line	SubT	Northeast	Mech-Schuylerville 4-34.5kV refurb	C050323
				Ballston-Mechanicville 6-34.5kv	C046472
	Component Fatigue/Deterioration	Tran	None	Spier-West 9 T5770 ACR	C021694
				Ticonderoga 2-3 T5810-T5830 ACR	C039521
				Ticonderoga 2-3 T5810-T5830 SXR2	C039487
				Queensbury - replace OCBs	C049554
				Whitehall - replace OCBs	C049564
System Capacity & Performance	Capacity Planning	Dist	Northeast	Butler 53 - Build 36253 feeder - UG	C028878
				Queensbury Station - Reroute getawa	CD00895
				Sodeman Rd Station - new station -	C046798
				McCrea Station - New station - Inst	C046790
	SC&P Other	Dist	Northeast	*Brook Rd 52 - Lewis Rd Conversion	C049761
	TO Led System Studies	Tran	None	Sodeman Rd 115kV station equipment	C043754
				Sodeman Rd Install New taps	C043755
				Queensbury TB3 & TB4 upgrades (sub)	C036822

Chapter 5 B. Capital and Hudson Valley Transmission Study Area

Area Summary

Key drivers behind the transmission capacity related projects in this transmission study area include the following:

- Thermal issues observed on the Rotterdam 230-115 kV transformer banks drive the recommended new 230-115 kV Eastover substation in the Northeast Region, which also addresses issues in the Capital & Hudson Valley Region. This substation is expected to be in service in 2016.
- Projected load growth in the area over the next 5 to10 years, and in the adjacent Northeast study area – particularly that associated with Luther Forest, will trigger future projects.
- Thermal issues observed on the Reynolds Rd 345-115 kV in 2026 will drive the addition of a second transformer bank in the Eastover substation.
- Thermal issues observed on 115kV lines in the Rotterdam-New Scotland corridor in 2026 will drive the recommendation to install a reactor in the Altamont-New Scotland #20 line and the Rotterdam-New Scotland #19 line.

Key sub-transmission and distribution drivers include the following:

- DeLaet's Landing is a proposed Underground Commercial Development (UCD) in the City of Rensselaer with a full build out of 19MW. The developer has requested service for an initial phase which represents 2MW. In response, construction of a new substation at Forbes Avenue will be used to supply the area.
- Van Dyke Road Station is a new 115-13.2kV station that will be used to address load growth at Vista Tech Park and loading and asset concerns at adjacent stations.

Area Description

The Capital and Hudson Valley study area is connected to the Utica Rome study area in the west, the New England system in the east, the Central Hudson Gas and Electric (CHG&E) and Consolidated Edison (ConEd) systems in the south, and the Northeast study are in the north. The transmission system consists primarily of 115kV and 345kV transmission lines. There are also several 230kV lines emanating from Rotterdam Substation. The Capital and Hudson Valley study area is the east end of the Central-East interface, which is a power interface between central NY and eastern NY. Several transmission lines in the area are also important facilities to the UPNY-SENY interface between the eastern NY system and the downstate system.

National Grid has three 345-115kV transformers in the region; two at New Scotland and one at Reynolds Road. There are three existing 230-115kV transformers at Rotterdam. In addition, Con Ed has one 345-115kV transformer at Pleasant Valley and CHG&E has one 345-115kV transformer at Hurley Ave. Station, all of which have impacts on the National Grid system.

Within the Capital and Hudson Valley study area, there are six distribution study areas: Capital-Central, Capital-East, Capital-North, Mohawk, Schenectady and Schoharie.

The Capital-Central study area serves approximately 89,000 customers. The study area encompasses the greater Albany area, including a mixture of commercial customers heavily concentrated in downtown Albany, and industrial and residential customers spread across downtown to the suburban areas. The primary distribution system in Capital-Central is predominantly 13.2kV with pockets of 4.16kV primarily in the City of Albany and 4.8kV south of the City of Albany. Most 4kV distribution substations are supplied from the local 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the local 115kV transmission system.

The Capital-East study area serves approximately 84,100 customers. The study area is located east of the Hudson River, with the center approximately adjacent to Albany. This area extends approximately from Valley Falls in the north to Tivoli in the south. The larger load concentrations are in the cities of Rensselaer and Troy and in the towns along US Route 9. There is a 345kV source into the area at Reynolds Road substation and a 115kV corridor running in a north-south direction supplying approximately 90% of the distribution load in the area. There is also a 34.5kV sub-transmission system in the central area with the 115kV sources from Greenbush, North Troy, Hudson and Hoosick substations. In addition, there is scattered generation on the 34.5kV system in the area.

The Capital-North study area serves approximately 86,600 customers. The study area encompasses the suburban area north of the City of Albany, including a mixture of industrial, commercial and residential customers throughout Colonie, Cohoes, Watervliet, Clifton Park, Halfmoon, Waterford, Niskayuna, and Ballston. The primary distribution system in Capital-North is predominantly 13.2kV with a few pockets of 4.16kV in the Newtonville area and 4.8kV in the Town of Ballston. All 4kV distribution substations are supplied from the 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the 115kV transmission system. Maplewood and Patroon substations are the main sources for the 34.5kV sub-transmission system in this area, which is operated in loop configuration. Along with these facilities, a group of hydro and cogeneration power plants located along the Mohawk River (School St, Crescent, Vischer Ferry, Colonie Landfill, etc) form the backbone of the local 34.5kV sub-transmission system. In addition to supplying power to all 4kV and a few 13.2kV distribution substations, the 34.5kV sub-transmission system serves several industrial customers such as Mohawk Paper, Honeywell, Norlite, and Cascade Tissue. Major distribution customers in this area include the Albany International Airport, which is supplied by feeders from Forts Ferry, Sand Creek, Wolf Road and Inman Road substations.

The Mohawk study area serves approximately 61,200 customers. The study area includes the city of Amsterdam and the rural areas west of the city. This area is comprised of mostly residential customers and farms with some commercial and industrial customers located in areas such as the City of Amsterdam, Gloversville, Johnstown, Northville, and Canajoharie. The primary distribution system in Mohawk is predominantly 13.2kV with areas of 4.16kV (Gloversville and Johnstown areas) and 4.8kV (Canajoharie). Most 4kV distribution substations are supplied from the 23kV and 69kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the 115kV transmission system.

The Schenectady study area serves approximately 57,900 customers. The study area is defined by the region that includes the City of Schenectady and the surrounding suburban

areas. This area includes a mixture of industrial, commercial and residential customers spread across downtown to suburban areas such as Niskayuna, Glenville, and Rotterdam. The primary distribution system in Schenectady area is predominantly 13.2kV with a few pockets of 4.16kV (Schenectady, Scotia and Rotterdam areas). All 4kV distribution substations are supplied from the local 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the local 115kV transmission system. In addition, the downtown areas of Schenectady are served by a general network that is supplied by the Front Street Substation. Rotterdam, Woodlawn and Rosa Rd. are the main sources for the local 34.5kV sub-transmission system, which is operated in loop configuration.

The Schoharie study area serves approximately 20,600 customers. The study area is defined by the region west and south of Schenectady that include towns and villages along the I-88 and Route 20 corridors such as Delanson, Schoharie, Cobleskill, Schenevus, and Sharon Springs. This area is mostly rural comprised mainly of residential customers and farms with few commercial and industrial customers. The primary distribution system in Schoharie is predominantly 13.2kV with areas of 4.8kV (Cobleskill, Worcester, and Schenevus areas). Most distribution substations in this region are supplied from the local 23kV and 69kV sub-transmission system. Marshville and Rotterdam are the main sources for the local 69kV sub-transmission system which is operated in loop configuration. The 69kV sub-transmission system supplies power to both 4kV and 13.2kV distribution substations, besides a few industrial and commercial customers, such as Guilford Mills and SUNY Cobleskill. The existing 23kV sub-transmission system in Schoharie, which supplies power to East Worcester, Worcester, and Schenevus substations, is operated in radial configuration from Summit substation.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-2
Capital and Hudson Valley Major Project

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	Dist	Mohawk	New Maple Ave Substation	C046478
			Schenectady	Karner - Station Ties Getaway Work	C049982
		SubT	Capital Central	Callanan Tap - Install new Sub-T li	C046641
	Cable Replacement	Dist	Capital Central	Riverside 28855 UG Cable Replacemen	C036468
		SubT	Capital Central	Partridge-Ave A # 5 Cable Replaceme	C036273
	Substation Metal-Clad Switchgear	Dist	Capital Central	Pinebush - Replace Metalclad Gear	C046744
			Schenectady	Emmet St - Repl TB1 and mclad	C017952
	Substation Power Transformer	Dist	Capital North	Grooms Rd Transformer Replacememt	C051706
			Capital East	Liberty Street Station 94-Replace T	C046676
	Sub-T Overhead Line	SubT	Capital North	W. Milton Tap-34.5kV new line	CD00898
			Mohawk	Amsterdam-Rotterdam 3/4 Relocation	C033182
	Component Fatigue/Deterioration	Tran	None	Leeds - Replace U Series Relays	C024663

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				Rotterdam 115kV SubRebuild(AIS)	C034850
				New Scotland Relay Replacement	C047861
				Leeds Station Service	C049900
				New Scotland - replace 345kV OCBs	C049553
				Inghams Phase Shifting Transformer	C047864
				Hoosick - Replace Bank 1 & relays	C053132
				Woodlawn Transformer Replacement	C051986
				Menands Station Relay Replacement	C049601
Damage/Failure	D/F Other	Dist	Mohawk	New Florida Substation	CD01168
System Capacity & Performance	Capacity Planning	Dist	Capital Central	Van Dyke - UG - Civil & Elec work	C052098
				Van Dyke Station - New 56 Dist Feed	C046487
				DeLaet's Landing DxD	CD00893
				DaLaet's Landing - Land and Civil	C053137
				Van Dyke Station - New 115/13.2kV s	C046490

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
			Capital North	Randall Rd - New station - Dist get	CD00897
				*Randall Rd 46357 Rebuild & Conv	C049883
				Randall Rd - New station - M/C S/G	CD00896
	TO Led System Studies	Tran	None	Eastover Rd - New 230-115kV Station	C031326
				Eastover Rd-New Line Taps	C031419
				Ephratah substation rebuild	C046486
				Forbes Ave TSub	C043593
				Mohican Battenkill#15 Rebuild Recon	C034528
				Randall Rd Transmission Line	C043672
				Randall Road Substation Trans work	C043673
				Reconductoring 115kv NE reg NRRP	C035771
				Spier Rotterdam NEW Line	C031418
				Ephratah Sub Rebuild - Line Portion	C053144
				Riverside-Reynolds Rd#4 Forbes Tap	C043592

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				Hudson Valley Reinforcement	C053148
Customer & Public Requirement	S or R Other	Dist	Schenectady	Rotterdam 13852 & 13853 Relocation	C046422

Chapter 5 C. Northern Transmission Study Area

Area Summary

Key drivers behind the transmission capacity related projects in this study area include the following:

- The interconnection of several wind generation projects.
- All overloads resulting from contingencies can be mitigated by reducing hydro generation, wind generation, or imports from Hydro Quebec.

Key sub-transmission and distribution drivers include the following:

- The Little River - State St. 23kV sub-transmission system has seen increased customer expansion in recent years and has been the driver of capacity work.
- New 115-13.2kV substation in the Watertown area to supply load growth in the area.

A potential major driver for the area is the possible North Country Power Authority (NCPA) takeover of the electrical system in portions of St. Lawrence and Franklin Counties. The Company is not aware of any activity regarding NCPA in the past year.

Area Description

The Northern transmission study area includes the 115kV transmission facilities in the Northern Region and the northeast portion of the Mohawk Valley Region.

The backbone of the 115kV Northern area system runs from National Grid ALCOA substation to Boonville substation. The major substations along the 115kV transmission corridor are Browns Falls, Colton, Dennison and Taylorville.

The Jefferson/Lewis county area is bounded by the #5 – #6 Lighthouse Hill-Black River lines to the west and the #5 – #6 Boonville-Taylorville lines to the east. The Ogdensburg-Gouverneur area is served by the #7 Colton-Battle Hill, #8 Colton-McIntyre and the #13 ALCOA-North Ogdensburg 115kV lines. The #1 – #2 Taylorville-Black River lines and the #3 Black River-Coffeen support the load in the Watertown area. The Thousand Island region is served by the #4 Coffeen-Thousand Island 115kV radial line. The Colton-Malone #3, Malone-Lake Colby #5, and Willis-Malone #1 (NYPA) 115kV lines serves the Tri Lakes region. The Akwesasne #21 115kV Tap served from the Reynolds/GM #1 (NYPA) 115kV line supplies part of the Nicholville-Malone area.

Within the Northern study area, there are four distribution study areas: Nicholville-Malone, St. Lawrence, Tri-Lakes and WLOF (Watertown and Lowville). The Nicholville-Malone study area serves approximately 16,100 customers. There are total of twenty seven feeders (twenty 4.8kV and seven 13.2kV feeders) in the study area. The distribution substations are primarily supplied from the 34.5kV system with exception of Malone 13.2kV and Akwesasne 4.8kV substations that are served by the 115kV system. The main supplies for the 34.5kV sub-transmission system are Akwesasne, Malone, and Nicholville substations. It is operated as a radial system due to loading issues although the system is constructed as a loop design. There are also two hydroelectric facilities connected to the system (Macomb and Chasm substations).

The St. Lawrence area serves approximately 39,600 customers. There are twenty-six 4.8kV feeders and thirty 13.2kV feeders in the study area. The distribution substations are supplied from 23kV and 34.5kV sub-transmission lines with exception of four substations, Corning, Higley, North Gouverneur and Ogdensburg substations that are served from the 115kV system. The main supplies for the 23kV sub-transmission system are Balmat, Little River, McIntyre, Mine Rd. and Norfolk substations. Browns Falls substation is the main supply for the 34.5kV sub-transmission system.

The Tri-Lakes area serves approximately 8,800 customers. There are twenty nine 4.8kV, two 2.4kV feeders and six 13.2kV feeders in the study area. Most of the distribution substations are supplied from the 46kV sub-transmission system with the exception of Lake Colby and Ray Brook substations that are served from the 115kV system. The supply for 46kV sub-transmission system in the area is Lake Colby substation. There are two municipal electric companies supplied via the 46kV sub-transmission in the Tri-Lakes area, Lake Placid and Tupper Lake.

The WLOF area serves approximately 70,100 customers with a peak load of 235MW. There are nine 23-4.8kV substations supplying twenty-seven 4.8kV feeders; and ten 115-13.2kV substations supplying thirty-eight 13.2kV feeders. The 23kV sub-transmission system is supplied from the Boonville, Black River, Coffeen, Indian River, North Carthage and Taylorville substations.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-3
Northern Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	Dist	St. Lawrence	State St Feeder Convension	C050697
	Sub-T Overhead Line	SubT	WLOF	Carthage-Taylorville 21/22/26-23kv	C046436
				Carthage-N. Carthage-Deferiet 23kv	C046435
			Tri-Lakes	Union-Ausable Forks 36-46kV ref	C050320
	Component Fatigue/Deterioration	Tran	None	Br F-Taylorville 3-4 ACR	C024359
				Colton-BF 1-2 T3140-T3150 ACR	C036164
				Colton-Replace CBs and Disconnects	C029844
				Taylorville-B 5-6 T3320-T3330 ACR	C027437
				Taylorville-Moshier 7 T3340 LER	C024361
				Mohican - Replace Bank 1 and Relays	C053133
	NERC/NPCC Standards	Tran	None	Br. Falls-Taylorville 4 T3090 CCR	C048221
				Browns Falls-Taylorville 3 T3080CCR	C048218
System Capacity & Performance	Capacity Planning	Dist	WLOF	Watertown New 115/13.2 kV Substatio	C046610 C046627
			Nicholville-Malone	North Bangor new 34.5/13.2kV Statio	C046423
	SC&P Other	Dist	WLOF	*NR_76462-CoRte28-Rebuild	C049197
				*NR-Bremen 81556-Beech Hill Rd	C049789
			St. Lawrence	*NR_Hammond 37061-Oak Point Rd	C049723
			Nicholville-Malone	*NR-Chasm Falls 85251-Duane Rd-Tie	C049757
				NR-85251-NYS Hwy 30-FdrTie	C049760
	ERR	Dist	WLOF	NR-T.I.81458-County Route 1-FdrTie	CD01187
			St. Lawrence	*NR_Hammond 37061_Pleasant Val Rd	C049725

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Customer & Public Requirement	Public Requirements	SubT	WLOF	DOTR NYSRt28 White Lk-McKeever SubT	C034722

Chapter 5 D. Syracuse Oswego Cortland Transmission Study Area

Area Summary

The drivers behind the transmission capacity related projects in the Syracuse Oswego Cortland (SOC) study area are:

- Area load has, over time, reached levels that result in potential post-contingency overloading of one of the Clay 345-115kV autotransformers, as well as three 115kV circuits in the Syracuse area.
- Recommended projects to address post-contingency overloading include the replacement of the Clay 345-115kV TB1 autotransformer with an existing spare and the replacement of that spare, and the reconductoring of the Clay-DeWitt #3 and Clay-Teall #10 lines.
- The Clay-G.E. #14 line was shown to be overloaded for certain criteria contingencies when the Syracuse Energy facility was no longer in-service and will be reconductored.
- Fault current levels have been identified in excess of the interrupting capability of breakers at four different substations in the area.

Key sub-transmission and distribution drivers include the following:

- Load growth in the Syracuse University and the North Syracuse areas are major drivers of distribution capacity work.
- The addition of second transformers and new feeders at several substations are major drivers of reliability work.
- The condition of the Ash St. substation is an asset condition driver.

Area Description

The SOC study area includes the 345kV and 115kV transmission facilities in the Central Region and all of the 115kV and above transmission facilities around the Oswego Complex area, including the 345kV Scriba and Volney stations.

The SOC area is bordered by Elbridge substation in the West, Cortland substation in the South, Oneida substation in the East, and Clay substation in the North. The major substations in the area include Clay, South Oswego, Dewitt, and Geres Lock. This area also includes some of the assets stretching between Mortimer and Elbridge.

Within the SOC study area, there are eight distribution study areas: Cazenovia, Cortland, East Syracuse, Manilus-Fayetteville, North Syracuse, Syracuse, Volney and West Syracuse.

The Cazenovia study area serves approximately 5,100 customers. The study area is a very rural region, with the Village of Cazenovia and the Cazenovia Industrial Park being the only large loads. The distribution system consists of one 34.5-13.2kV, three 34.5kV-4.8kV substations and one 34.5-4.16V substation. The only physical constraint is Cazenovia Lake and the residential load which is spread around Cazenovia Lake.

The Cortland study area serves approximately 26,200 customers. The study area is defined by the region that includes the City of Cortland and the surrounding towns and villages. It is located in central New York between Syracuse and Binghamton. The primary distribution system voltages in Cortland are 13.2kV and 4.8kV. Most of the area is fed from a 34.5kV sub-transmission system supplied out of the Cortland and Labrador substations.

The East Syracuse study area serves approximately 13,000 customers. The study area is an industrial suburb of the City of Syracuse. The distribution system consists of one 115-34.5kV, three 115-13.2kV and three 34.5-4.8kV substations. The transmission supply is adequate and the only physical barriers are Interstate 690 and Interstate 481 going through the area. Customers are served via fifteen 13.2kV feeders and eleven 4.8kV feeders.

The Manlius Fayetteville study area serves approximately 24,300 customers. The study area is a residential suburb of Syracuse. The distribution system consists of one 115-34.5kV, four 115-13.2kV and one 34.5-4.8kV substation. Most new load additions to the area are residential developments.

The North Syracuse study area serves approximately 71, 800 customers. The study area is the northern suburb of the City of Syracuse. It has experienced the majority of the new housing which has been built in the Syracuse metropolitan area. The distribution system consists of one 115-34.5kV, eight 115-13.2kV and five 34.5-4.8kV stations. The physical barriers in the North Syracuse area are the two interstates highways, I-81 and I-90.

The Syracuse study area serves approximately 61,400 customers. The study area is made up of the City of Syracuse in central New York as well as the Village of Skaneateles about 20 miles southwest of the city. The primary distribution system voltages in Syracuse are 13.2kV and 4.16kV. There is also a 12kV network fed out of Ash St. substation. Most of the area is fed from a 34.5kV sub transmission system supplied by Ash St, Elbridge, Solvay, Teall Ave., and Tilden substations. There is also some 13.2kV fed directly from the 115kV transmission system.

The Volney study area serves approximately 55,300 customers. The study area includes the cities of Oswego and Fulton. The distribution system consists of four 115-34.5kV, seven 115-13.2kV, five 34.5-13.2kV, eight 34.5-4.8kV and one 34.5-4.16kV substations. A physical barrier in this area is the Oswego River, which is also a canal.

The West Syracuse study area serves approximately 22,700 customers. The study area is a suburb west of the City of Syracuse. The distribution system consists of one 115-34.5kV, two 115-13.2kV, and four 34.5-4.16kV substations.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-4
Syracuse Oswego Cortland Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	Dist	Syracuse	Syr_Connective Corridor_Ductline	C045334
		SubT	Syracuse	Old Jewitt-Solvay 26(lns 30,31,26)-	C046438
	Cable Replacement	SubT	Syracuse	Solvay-Ash #28 34.5kV Replace Cable	C045629
				Solvay Ash 27 Cable Repl SubT	C032147
	Substation Indoor	Dist	Syracuse	Rock Cut #286 2nd Tranf and Metalc	CD00882
	Substation Metal-Clad Switchgear	Dist	North Syracuse	Hopkins 253 - Replace Metalclad Gea	C046741
	Substation Power Transformer	Dist	Cortland	Cuyler#24 Inst 34/4kV MITS	C036102
			North Syracuse	Galeville Station Rebuild	C050746
				Galeville 71,72&73 fdrs conversion	C050749
			Syracuse	Hancock#137 Station conversion	C050521
				Hancock 13773 and 13772 Conversion	C050606
	Sub-T Overhead Line	SubT	Syracuse	Re-furbish Teall 25/Woodard 24-34.5	C046446
				Woodard-Teall 32-34.5kV refurbish	C050322
				Elbridge-Glenside 31-34.5kV refurb	C050959
				Solvay 22-34.5 kV line Refur.	C046685
				Woodard 29-34.5kv	C046473
				LHH-Mallory 22-34.5kv	C046441
				Mallory-Cicero L33-34.5 kV line Ref	C046681
	Component Fatigue/Deterioration	Tran	None	Battle Hill - replace 3 OCBs	C049543
				Tilden - replace OCBs	C049556
				Ash Street-Replace Metal Clad Sub	C036104
				Teal Ave. Transformer Replacement	C047865
				GE-Geres Lock 8 T2240 ACR	C047835
System	Capacity	Dist	Cortland	Cortland Area Study	C046526

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Capacity & Performance	Planning		East Syracuse	Fly Rd. Transformer Addition	C036189
				East Malloy Second Transformer	C036188
				Bridge St. Second Transformer	C036185
			North Syracuse	New Cicero Substation Dline	C046476
				New Cicero Substation DSub	C046475
			Syracuse	Teal Substation Rebuild-Feeders	C046505
				Fly Rd Feeder Work	C046594
				Fly Rd Low side substation equipmen	C046722
				DLine -To expand Rock Cut Sub Retir	CD00881
				Teal Substation Rebuild-Swgr	C046511
			Volney	Paloma Feeder Getaway	C032498
				New Haven Xfmr Upgrade-Xmfr	C046562
				Fairdale Dsub	C046640
				Whitaker 2nd Transformer	C046592
				Paloma new switchgear	CD01190
				Whitaker Dsub	C046636
				Paloma Second Transformer	C032495
			West Syracuse	Milton Ave 2nd Switchgear	C046609
				Milton Ave DLine	C046643
				Harris 54 Relief	C032446
				Milton Ave second transformer	C046642
				Harris Road Second SWGR	CD01088
	TO Led System Studies	Tran	None	Central Breaker Upgrades - Oswego	C043426
				New Watertown 115-13.2kV T - Line	C053155
				Dewitt - add brkrs to 345kV bay	C053142
				New Watertown 115-13.2kV T-Sub	C053157
				Clay Substation Reconfiguration	C047275
				Clay-Teall#10,Clay-Dewitt#3 Recond	C043995
	Generator Retirements	Tran	None	Reconfigure Elbridge Sub	C047299

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				New Elbridge - State St Line	C047298
				Reconductor #5 Elbridge - State St	C047297
				Clay - GE 14 Reconductoring	C045253
Customer & Public Requirement	Public Requirements	Dist	Syracuse	DOT PIN 3754.56 Connective Corridor	CD01183

Chapter 5 E. Utica Rome Transmission Study Area

Area Summary

The drivers behind the transmission capacity related projects in this study area are:

- The need to address thermal and voltage issues drive projects that will rebuild the Porter, Rome, and Inghams substations. This will include replacement of the Inghams phase shifting transformer with a new one that will have a larger range of variation in angle.
- Other issues found in this area are addressed by operational solutions, given current NERC TPL Planning Criteria and the current BES definition.
- Upon adoption of new NERC TPL Planning Criteria and the new BES definition (>= 100 kV), further study will determine permanent fixes for certain issues for which operational solutions are currently acceptable.

Key sub-transmission and distribution drivers include the following:

- Rebuilding of the Poland 62258 feeder along NYS Route 8 to improved reliability and loading profile.
- Metalclad switchgear replacements at Whitesboro and Conkling are major asset condition drivers.

Area Description

The Utica Rome transmission study area includes the 115kV and above transmission system with the northern boundaries at Boonville and Lighthouse Hill substations, west at Oneida, and east at Inghams substation. Within the Utica Rome study area, there are four distribution study areas: Oneida, Rome, Utica and WLOF-MV (Old Forge area).

The Oneida study area serves approximately 18,500 customers. The study area includes the City of Oneida and the Village of Canastota. In the City of Oneida the Oneida Hospital has dual distribution supplies. Across the street from the hospital is the H.P.Hood Dairy Products Inc. facility which represents 4MVA of the load and also has dual distribution supplies. The Village of Canastota which is located in western section of the Oneida area has several large commercial and industrial customers including Canastota Industrial Park, Owl Wire and Cable, Inc and Die Molding Inc. A geographic constraint is the distance to other substations and the lack of feeder ties. There have been improvements to feeder ties between the Oneida and Peterboro substations. Developing these ties was challenging due to the New York State Thruway which has stringent road crossing regulations, which is located between the two substations.

The Rome area serves approximately 26,400 customers. There are thirty 4.8kV feeders and seventeen 13.2kV feeders in the study area. All distribution substations are supplied from the 115kV system. As a result there are no sub-transmission lines in the area.

The Utica study area serves approximately 81,500 customers. The study area includes the City of Utica. The distribution system consists of four 115-46kV, ten 115-13.2kV, four 46-

13.2kV and seven 46-5kV substations.

The WLOF-MV study area serves approximately 7,900 customers in Old Forge with 18MVA of load. There are five 46-4.16kV substations supplying nine 4.8kV feeders and one 13.2kV substation supplied out of Aldercreek substation. The 46kV sub-transmission system is supplied out of the Boonville substation.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-5
Utica Rome Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	Dist	WLOF-MV	MV-Poland 62258 Route 8 Reconductor	C046605
				MV- Poland 62258 Route 8 Reconducto	C046606
	Sub-T Overhead Line	SubT	Utica	Yahnundasis-Clinton 24 and 27-46kv	C046449
	Component Fatigue/Deterioration	Tran	None	LightHH 115kV Yard Repl & cntrl hse	C031662
				Porter-Rotterdam 31 T4210 ACR	C030890
				Rome 115 kV Station	C003778
				Edic Relay Replacement	C047855
				Schoharie substation reconfiguratio	C046494
				Boonville-Rome 3-4 T4060-T4040 ACR	C047795
System Capacity & Performance	SC&P Other	Dist	Utica	Whitesboro 64, 65 and 66 Retirement	C050878
	TO Led System Studies	Tran	None	New bay at Edic 345kv substation	C044674
	NERC/NPCC Standards	Tran	None	Porter 115 kV Rebuild	C028686
				Porter 230kV-Upgrade Brks/Disc/PT's	C036866

Chapter 5 F. Genesee Transmission Study Area

Area Summary

Key transmission projects in the Genesee study area have the following drivers:

- Low post-contingency voltages in the area in general and at Golah in particular, especially for bus faults at Lockport or Mortimer that affect the entire 115kV bus.
- Low post-contingency voltages developing in the 2016 to 2026 time frame in the Batavia and Brockport areas as a result of load growth.
- Heavy post-contingency conductor loadings in the Batavia Station (existing loads), on the Lockport-Batavia #107 line, and the Mortimer-Golah #110 line.
- In addition to the addition of tie breakers at Lockport and Mortimer, other recommended projects include construction of a four breaker ring splitting the National Grid #119 circuit and the RG&E #906 circuit.

Key sub-transmission and distribution drivers include the following:

- Reliability issues are being addressed with the addition of second transformers and new distribution feeders supplied from West Hamlin and Mumford Stations.
- Capacity concerns in the area are being address by a transformer upgrade at Attica and a new distribution substation near North Lakeville Station.

Area Description

The Genesee transmission study area includes National Grid assets within NYISO Zone B. The area includes assets as far west as Lockport and as far east as Mortimer. The system consists of several 115kV circuits between Lockport and Mortimer stations. Three circuits go directly from Lockport to Mortimer, three circuits go from Lockport to Batavia and several circuits in series connect Batavia and Golah. Today one 115kV line and one 69kV line travel between Mortimer and Golah.

Two 345kV circuits owned by NYPA travel parallel to this area from Niagara to Rochester. At Rochester Station 80, RG&E has four 345-115kV transformers with 115kV connections to Rochester Station 82. Station 82 is the RG&E 115kV station adjacent to National Grid's Mortimer Station.

At Lockport, one circuit connects the station to the NYSEG Hinman Rd. Station. Hinman Rd. is connected by a single circuit to Delphi, a load and generator, and Delphi is connected by a single line to Robinson Rd. Station. At Robinson Rd., a 230-115kV transformer is connected to the Niagara – Robinson #64 and Robinson – Stolle #65 230kV circuits.

This area also includes some of the assets stretching between Mortimer in the Western Region and Elbridge in the Central Region.

Within the Genesee study area, there are three distribution study areas: Genesee North, Genesee South and Livingston.

The Genesee North study area serves approximately 41,200 customers. There are a total of 51 distribution feeders that supply customers in this area. There are twenty 13.2kV feeders, with four being supplied from 34.5-13.2kV transformers, and the rest are fed from 115-13.2kV transformers. The thirty-one 4.8kV feeders are all fed from 34.5-4.8kV transformers. There are ten 34.5kV sub-transmission lines that supply the distribution step down transformers in the area.

The Genesee South study serves approximately 32,300 customers. The study area is defined by the region that includes the City of Batavia and the surrounding towns and villages. It is located east of Buffalo and southwest of the City of Rochester. The primary distribution system voltages in Genesee South are 13.2kV and 4.8kV. Most of the 13.2kV system is fed from the area 115kV transmission system. The rest of the 13.2kV system, as well as the 4.8kV system, are fed from a 34.5kV sub-transmission system supplied out of the North Akron, Batavia, North Leroy, and Oakfield substations. There are several customers supplied directly from the sub-transmission system.

The Livingston study area serves approximately 28,700 customers. The study area is made up of Livingston County which is south of Rochester and east of Batavia. The primary distribution system voltages in Livingston are 13.2kV and 4.8kV. Half of the load is supplied from the 115-13.2kV East Golah substation. The remainder is supplied from 69kV and 34.5kV sub-transmission system supplied out of the Golah and North Lakeville substations. Two customers are supplied directly from 115kV.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-6
Genesee Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	SubT	Genesee North	Phillips-Telegraph 304-34.5kv	C046466
			Genesee South	Oakfield - Caledonia LN201 reconduc	C046707
			Livingston	N.Lakeville - Ridge LN 218 Refurbis	C046766
	Component Fatigue/Deterioration	Tran	None	Alabama-Telegraph 115 T1040 ACR	C033014
				Batavia Station Relay Replacement	C043506
				Lockport-Batavia 112 T1510 ACR	C003422
				Pannell-Geneva 4-4A T1860 ACR	C030889
				Rochester UG Pumping Plant	C015988
				Mortmr-Pannll 24-25 T1590-T1600 ACR	C047816
System Capacity & Performance	Capacity Planning	Dist	Genesee North	West Sweden - Install New Station	C046593
				West Hamlin #82 - Install Transform	CD01089
				West Sweden -New Sta - Install Fdrs	C046591
				West Hamlin #82 - New TB2 - Install	CD01090
			Genesee South	Attica Station transformer upgrade	C046611
				Mumford #50 -Install Transformer #2	C046590
			Livingston	S.Livingston relief: F5 work	C051692
				S.Livingston relief: Fd4 work	C051691
				South Livingston relief - DLine Fdr	C046759 C046552
				S.Livingston rSlief: Dist Fder Work	C051694
				N.Lakeville new 115 - 13.2kV Dist	C051585
	SC&P Other	Dist	Genesee North	Lyndonville Station 34.5kV cap bank	C046569

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
	TO Led System Studies	Tran	None	TP West Golah Substation	C050695

Chapter 5 G. Frontier Transmission Study Area

Area Summary

The principal drivers for transmission projects in this area are:

- Low post-contingency voltages at Huntley and Gardenville.
- Fault current levels that result in overdutied breakers at Gardenville.
- High post-contingency autotransformer loadings on the 230-115kV banks at Gardenville.
- High post-contingency 115kV line loadings on lines extending south and east from Niagara, Packard, and Gardenville.
- Recommended major projects that address capacity issues include reconfiguring or reconductoring of the #181, #54, and #195 lines, the addition of a 115 kV capacitor bank and bus tie breaker at Huntley, and some reconfiguration and upgrading of limiting elements at Lockport and Mountain stations.
- The proposed rebuild of Old Gardenville Station to address station configuration issues as well as asset condition issues will also partially address capacity needs.

Key sub-transmission and distribution drivers include the following:

- Reliability issues and load growth in the Amherst area. There is approximately 10MVA of new load identified in the area. The new Frankhauser Substation will alleviate these issues.
- Load growth in the Tonawanda area. New commerce/industrial parks will require a new distribution station.
- Planned development in the City of Buffalo at Riverbend will require a new substation to supply that area.
- 5 to 10MW of load growth by the new Buffalo Niagara Medical Campus will be served by Elm Street substation.
- Area loading requiring the upgrade of multiple Buffalo area substations, including Buffalo Station 56, 77, 214.
- Indoor substations are an asset condition issue and there are several replacement projects in progress in Buffalo and new projects to start in Niagara Falls.

Area Description

The Frontier transmission study area includes assets within NYISO Zone A. The area includes assets as far east as Lockport, the Niagara and Buffalo areas and the system stretching south to Gardenville. The system consists primarily of 115kV and 230kV double circuit transmission lines. The major substations are Packard (230 and 115kV), Huntley (230 and 115kV), and Lockport (115kV). There is a joint National Grid and NYSEG substation at Gardenville (230 and 115kV). National Grid has three 230/115kV transformers at

Gardenville and two at Packard. NYSEG and NYPA also have their own substations in the area.

Within the Frontier study area there are ten distribution study areas: Amherst, Cheektowaga, Elm, Grand Island, Kensington, Niagara, Niagara Falls, Sawyer, Seneca and Tonawanda.

The Amherst study area serves approximately 65,100 customers. The study area is located east of Tonawanda and Niagara, and north of the City of Buffalo and encompasses the towns of Amherst, Pendleton, Wheatfield, Wilson and Lewiston. The Erie Canal divides the study area and may present challenges in creating new feeder ties and recommended supply expansion. The primary distribution system in Amherst is predominantly 13.2kV and 4.16kV, with Buffalo Station 138 supplying two 4.8kV distribution feeders. The area substations are supplied by the 115kV transmission system with the exception of Buffalo Station 58 and Buffalo Station 124, which are supplied by 34.5kV sub-transmission lines originating from Youngman Terminal Station and Buffalo Station 67, which is supplied by the 34.5kV sub-transmission lines originating from Walden substation.

The Cheektowaga study area serves approximately 7,900 customers. The area is located east of the City of Buffalo. There are several stations in this area that are supplied by 115kV transmission lines. Walden is the largest and has two transformers that serve the 34.5kV sub-transmission system. Dale Rd. substation is 115-13.2kV, while Buffalo substations 61 and 154 are 115 - 4.16kV. The remaining substations in the area are 34.5-4.16kV. Buffalo Substation 146 has a 34.5-4.8kV and a 34.5-13.2kV transformer.

The Elm study area serves approximately 3,300 customers and is part of the City of Buffalo. It contains the downtown area as well as surrounding urban areas with a mix of residential, commercial and industrial loads. Elm Street Substation is a 230-23kV station that supplies the Buffalo network as well as the sub-transmission supply to several distribution stations. The Buffalo network has approximately 120MW of load. Most of the load is served by a low voltage AC general network which is supplied by multiple paralleled transformers with multiple 23kV supply cables thus providing very high reliability.

The Grand Island study area serves approximately 8,700 customers. The study area is made up of Grand Island which is between the City of Buffalo and Niagara Falls. It is primarily suburban and rural residential with areas of commercial and industrial parks. There are two National Grid substations supplied from 115kV lines with distribution feeders at 13.2kV.

The Kensington study area serves approximately 35,600 customers. There are eighty 4.16kV feeders, all fed from thirty-eight 23-4.16kV transformers and nineteen 23kV sub-transmission lines. The Kensington Substation has four 115-23kV transformers, and provides the supply to the 23kV sub-transmission system. This substation is located in the City of Buffalo and the study area contains significant amounts of underground distribution mainlines and overhead laterals. The Kenmore Terminal Station supplies several smaller commercial customers and the South Campus of the SUNY at Buffalo.

The Niagara study area serves approximately 12,800 customers. The study area encompasses the towns of Lewiston, Porter, and Wilson. The study area is bordered to the west by Niagara River, to the North by Lake Ontario, and to the south by Power Reservoir. Area distribution is served primarily at 4.8kV and supplied by a 34.5kV sub-transmission network. The 34.5kV sub-transmission network operates in a loop system that is supplied

by both Mountain and Sanborn 115-34.5kV substations. Swann Road supplies a significant portion of this area and is 115-13.2kV.

The Niagara Falls study area serves approximately 38,700 customers. The study area is bordered to the north, south, and west by the Niagara River. The Power Reservoir also borders the area to the north, east of the Niagara River. Interstate 190 runs from the north to the south along the eastern section of the study area. The CSX Railroad runs from the east to the west along the northern section of the area. The Niagara Falls International Airport lies east of the city. These boundaries limit feeder ties and distribution supply expansion in the area. The area is supplied primarily by the 115kV transmission system, however, a 12kV sub-transmission system is supplied by Harper and Gibson substations. Distribution load is served by 13.2kV, 4.8kV, and 4.16kV circuits.

The Sawyer study area serves approximately 63,700 customers. The study area contains portions of the City of Buffalo and the Town of Tonawanda. There are 154 4.16kV feeders supplying the area which are supplied by 23kV supply cables and multiple, paralleled transformers.

The Seneca study area serves approximately 44,100 customers. The study area is the southeast section of Buffalo. It is served primarily from the Seneca Terminal Station which has four 115-23kV transformers and serves 25 supply lines at 23kV. Most of the distribution substations are served by four supply cables and have four 23-4.16kV transformers. As throughout the City of Buffalo, almost all distribution load is served at 4.16kV.

The Tonawanda study area serves approximately 27,400 customers. The study area encompasses the City of North Tonawanda as well as a portion of the City and Town of Tonawanda. Bordering the western section of the area is the Niagara River. Ellicott Creek flows parallel to Tonawanda Creek in the northern part of the town of Tonawanda, with a confluence just east of the Niagara River. These creeks flow through the central part of the area from east to west. The eastern section of the area is bordered by the Town of Amherst and forming the southern border is the Village of Kenmore and the City of Buffalo. The area is served primarily by the 115kV transmission system and the 23kV sub-transmission system. Distribution voltage is served primarily by 4.16kV feeders.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-7
Frontier Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	Dist	Niagara Falls	New Harper Substation D Line	C046417
			Seneca	Buffalo Station 42 Rebuild - D Stat	C046854
			Tonawanda	Buffalo Station 122 Rebuild - Sub	CD00782
		SubT	Niagara	Phillips-Medina 301-34.5kv	C046465
			Sawyer	Refurbish H-Lns 27h,28h,33h	C046470
	Buffalo Street Light	Dist	None	Buffalo Street Light Cable Replacem	CD00851
	Cable Replacement	Dist	ELM	Network Secondary Cable Replacement	C052924
	Substation Indoor	Dist	Kensington	Buffalo Station 31 Rebuild - Sub	C046952
				Buffalo Station 27 Rebuild - Sta	C033473
			Niagara Falls	Eighth St 80 - Indoor Substation Re	C046585
				Welch 83 Indoor Substation Refurbis	C046583
				Stephenson 85 - Indoor Substation R	C046580 C046581
			Sawyer	Buffalo Station 25 Rebuild - Line	C036458
				Buffalo Station 37 Rebuild - Line	C033477
				Buffalo Indoor Sub. #29 Refurb.	C006722
				Buffalo Station 25 Rebuild - Sta	C036456
				Buffalo Station 37 Rebuild - Sub	C033474
			Seneca	Buffalo Station 41 Rebuild - Line	C046938
				Buffalo Station 34 Rebuild - Line	C046932
				Buffalo Station 41 Rebuild - Sub	C046956
				Buffalo Station 34 Rebuild - Sub	C046953
				Buffalo Station 59 Rebuild -	C033475

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				Sub	
	Substation Metal-Clad Switchgear	Dist	Kensington	Station 162 - Metalclad Replacement	C052706
			Cheektowaga	Station 61 - Metalclad Replacement	C051707
	Substation Power Transformer	Dist	Amherst	Station 124 - Almeda Ave Transforme	C046670
	Sub-T Overhead Line	SubT	Sawyer	Refurbish H Lns 26H, 34H	C048910
	Component Fatigue/Deterioration	Tran	None	Gard-Dun 141-142 T1260-T1270 ACR	C003389
				Gardenville 180-182 T1660-T1780 ACR	C027436
				Gardenville Rebuild	C005156
				Gardenville-Rebuild Line Relocation	C030084
				Gard-HH 151-152 T1950-T1280 S ACR	C027425
				LockportSubstationRebuildCo 36TxT	C035464
				Seneca Terminal Transformer Replace	C049744
				Rebuild Huntley Station	C049902
Damage Failure	Damage/Failure	Tran	None	Elm St. Station #4 TRF D/F	C051039
System Capacity & Performance	Capacity Planning	Dist	Amherst	Frankhauser New Station - T Sub Wor	C036520
				New Dist Sub -Tonawanda NYW DLine	C051265
				Frankhauser-115-13.2KV-Bus & Bkrs	C028931
				New Dist Sub - Tonawanda NYW DSub	C051266
				Shawnee Road 76	C036059
				Frankhauser New Station - Line Work	C028929
			Grand Island	Long Rd 209 - New F20955	CD00964
			Niagara	Wilson 93 Load Relief - Replace TB1	C035743
			Niagara Falls	Military Road 210 - Install TB#2	C036056
			Sawyer	Sawyer - two new additional 23kV Ca	C046523
				Buffalo Sta 56- upgrade 4 Xfmrs	C036502
			Seneca	New Abby Street Substation - DxD Li	C046497
				New Abby Street Substation -	C046496

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				DxD Su	
			Tonawanda	Station 214 - New F21466/67	C029187
				Station 214 - Install TB2	C029186
				Buffalo Station 77 - Add TB3 (DxD S	C046531
		SubT	Kensington	Buffalo 23kV Reconductor - Kensing.	C028894
				Buffalo 23kV Reconductor - Kens2	C028903
			Sawyer	Buffalo 23kV Reconductor - Huntley2	C028893
			Seneca	Buffalo 23kV Rec.-Sen. 1,2,3,19,31S	C048826
	SC&P Other	Dist	ELM	Buffalo Station 49 - UG Upgrades	CD01128
			Grand Island	Long Road #209 new TB#2 - DxT Sub -	C046411
			Niagara Falls	Sodeman Rd - New station - dist get	C046796
		SubT	ELM	Elm St Relief_23kV Line work	C046546
	TO Led System Studies	Tran	None	Frankhauser New Station - T Line Wo	C030744
				New Tonawanda Station	C053154
				Upgrade Niagara - Packard #195	C029945
				Huntley Grounding Banks	C050918
				West Hamlin 82 (TXT-Sub)	C043977
				Sanborn upgrade 115 - 34.5kV transf	C044361
				Sawyer Fourth 230-23kV Bank	C053147
				W. Ashville substation TxT	C043833
				N.Lakeville new 115 - 13.2kV sub	C043533
				Mountain upgrade 115 - 34.5kV trans	C044359
				New Buffalo Station 42 - T Sub	C040944
				New Harper Substation - TxT Sub	C044874
				Elm St Relief_Add 4th Xfer	C049594
				TP Reconductor line #181	C050744
	UG Structures and Equipment	Dist	Seneca	Ohio Street - North	C050405

Chapter 5 H. Southwest Transmission Study Area

Area Summary

The primary drivers of the transmission capacity related projects in the Southwest study area are:

- A wide range of contingencies that can result in voltages well below criteria at various locations in this study area. The vulnerability of the area to these voltage issues is significantly amplified if certain key generators are not operating.
- Projects to address capacity problems in this area, irrespective of Dunkirk generation mothballing, including the new Five-Mile Road 345/115kV station north of Homer Hill, the addition of a second capacitor bank at Homer Hill, the closing of a normally open breaker at Andover, and the addition of a second bus tie breaker in the Dunkirk substation.
- Projects to address the longer-term impacts of the reduction of generating capacity at Dunkirk, including two 33.3 MVAr capacitor banks at Dunkirk, a second 75 MVAr capacitor bank at the Huntley 115 kV switchyard and reconductoring of two 115kV lines between Five Mile Rd and Homer Hill.

Key sub-transmission and distribution drivers include the following:

- The 34.5kV sub-transmission system, which consists of several very long loops that traverse rugged territory.
- Load growth and reliability concerns in the South Chautauqua portion of the area are driving new station projects.
- Expansion/upgrade of Delameter Road Station will address loading and asset condition concerns.

Area Description

The Southwest transmission study area includes the system as far north as Gardenville station, east into Wellsville and the system stretching south into Pennsylvania. The transmission system consists primarily of 115kV and 230kV double circuit transmission lines. The major stations are Gardenville (230 and 115kV), a joint National Grid and NYSEG station, Dunkirk (230 and 115kV), Falconer (115kV) and Homer Hill (115kV). National Grid has 230-115kV transformers at Gardenville (3) and Dunkirk (2). NYSEG also has two 230-115kV transformers at Gardenville.

Within the Southwest study area, there are six distribution study areas: Cattaraugus – North, Chautauqua North, Chautauqua South, Erie South, Olean and Wellsville.

The North Cattaraugus study area serves approximately 15,200 customers. There are seven 13.2kV feeders, five of which are fed via two 115-13.2kV transformers at the Valley substation. The remaining two 13.2kV feeders are fed from 34.5-13.2kV transformers at the Price Corners and Reservoir substations. There are also twenty 4.8kV feeders, all supplied by 34.5-4.8kV transformers at various area substations. There are seven 34.5kV sub-transmission lines that provide supply for the 34.5-4.8kV transformers and a minimal number of industrial customers that are supplied directly from the 34.5kV system. There are several

NYSEG substations and municipal electric departments supplied from the 34.5kV system.

The North Chautauqua study area serves approximately 22,900 customers. There are ten 4.8kV feeders, which are all fed from 34.5-4.8kV transformers. There are also twenty 13.2kV distribution feeders with all but one fed by 115-13.2kV transformers at various substations in the area. One 13.2kV feeder is supplied by a 34.5-13.2kV transformer at the West Portland substation. There are also eight 34.5kV sub-transmission lines which provide the supply to the 34.5-4.8kV step-down transformers in the area.

The Chautauqua South study area serves approximately 17,900. Customers are supplied by twenty 4.8kV delta feeders, which are all fed from 34.5-4.8kV transformers. There are four 13.2kV feeders with three fed by the Baker Street 115-13.2kV transformer and one fed by the French Creek 34.5-13.2kV transformer. There are five 34.5kV sub-transmission lines that are supplied from Hartsfield and South Dow 115kV substations.

The Erie South study area serves approximately 34,100 customers. The study area includes the Buffalo outer harbor area and those areas south of the City of Buffalo with approximately half the feeders served at 13.2kV. The 115kV system supplies the 13.2kV stations. The rest of the feeders operate at 4.8kV or 4.16kV.

The Olean study area serves approximately 18,500 customers. There are twenty distribution feeders that provide service to area customers. There are eight 4.8kV feeders supplied by 34.5-4.8kV transformers at various stations. Eleven of the area's twelve 13.2kV feeders are fed from 115-13.2kV transformers. The remaining single feeder is served from a 34.5-13.2kV transformer at the Vandalia substation.

The Wellsville study area serves approximately 4,400 customers. This study area is a small rural region located near the Pennsylvania border and is supplied by the 115-34.5kV Andover and Nile substations. There are two 34.5kV supply lines in the area. Load is served by five substations serving nine 4.8kV feeders.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-8
Southwest Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
Asset Condition	AC Other	SubT	Chautauqua South	W. Portland-Sherman 867-34.5kv	C046468
	Sub-T Overhead Line	SubT	Cattaraugus North	Bagdad-Dake Hill 815-34.5kV refurb.	C050292
			Chautauqua South	Relocate S. Dow-Poland 865-34.5kV	C050177
				Hartfield-S. Dow 859 Refurbish	C033180
			Wellsville	Nile-S. Wellsville 812-34.5kV ref.	C050290
	Component Fatigue/Deterioration	Tran	None	Dunkirk Rebuild	C005155
				Falconer-HH 153-154 T1160-T1170 ACR	C027422
				Homer Hill-Bennett Rd 157 T1340 ACR	C027429
System Capacity & Performance	Capacity Planning	Dist	Erie South	Eden Switch Structure-New Fdr 1	C048015
				Eden Switch Structure-New fdr# 2	C048016
				Delameter F9356-express& rebuild	C047877
				Delameter new F9355 - express	C047885
				Delameter F9352 reconfigured layout	C047886
				Bflo Sta 139 - Replace Transformers	C036639
				Delameter Install two 20/26/33MVA	C046536
				Eden switch structure - install 2-10	C046538
	SC&P Other	SubT	Chautauqua South	LN863 Findley Lake - French Creek e	C046510
	TO Led System Studies	Tran	None	Dunkirk Second Bus Tie - Line	C031460
				Dunkirk Second Bus Tie - Station	C031459
				Falconer PAR - Line Work	C053145
				Construct Five Mile Station - Line	C024016
				Falconer PAR - Station Work	C053146
				Construct Five Mile	C024015

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				Station	
	Generator Retirements	Tran	None	Five Mile to Homer Hill reconduct	C047319

2014 Capital Investment Plan — Exhibits

Exhibit 1 - 2014 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
Asset Condition	Asset Condition I&M	NY Inspection Repairs - Capital	C026923	6,200,000	12,300,000	4,300,000	3,000,016	3,000,000	28,800,016
	Asset Condition I&M Total			6,200,000	12,300,000	4,300,000	3,000,016	3,000,000	28,800,016
	Component Fatigue/Deterioration	Alabama-Telegraph 115 T1040 ACR	C033014	150,000	200,000	1,015,000	-	-	1,365,000
		Alps relay replacement	C049296	145,000	-	-	-	-	145,000
		AMT PW - NMO	C031545	400,000	1,000,000	1,000,000	1,000,000	1,000,000	4,400,000
		Andrews Sub - Remove/Retire Station	C029213	2,000	-	-	-	-	2,000
		Ash Street-Replace Metal Clad Sub	C036104	1,310,360	-	-	-	-	1,310,360
		Batavia Station Relay Replacement	C043506	872,081	164,810	-	-	-	1,036,891
		BatteryRplStrategyCo36TxT	C033847	170,400	220,080	159,996	159,996	684,000	1,394,472
		Battle Hill - replace 3 OCBs	C049543	50,000	1,000,000	-	-	-	1,050,000
		Bethlehem Relay Replacem't Strategy	C049583	-	-	20,000	120,000	-	140,000
		Boonville Rebuild	C049903	-	-	50,000	100,000	500,000	650,000
		Boonville-Rome 3-4 T4060-T4040 ACR	C047795	50,000	100,000	200,000	200,000	8,000,000	8,550,000
		Boonvill-Portr 1-2 T4020-T4030 ACR	C047818	-	50,000	100,000	200,000	200,000	550,000
		Br F-Taylorville 3-4 ACR	C024359	3,611,040	5,800,000	-	-	-	9,411,040
		Breaker T Repl Program 4-69kV NYC	C049258	350,000	350,000	350,000	350,000	350,000	1,750,000
		Breaker T Repl Program 4-69kV NYE	C049257	350,000	350,000	350,000	350,000	350,000	1,750,000
		Breaker T Repl Program 4-69kV NYW	C049260	1,200,000	350,000	350,000	350,000	350,000	2,600,000
		Browns Falls - OCB replacements	C043043	690,500	-	-	-	-	690,500
		BrownsFallsPlWLightningProtection	C037387	35,720	-	-	-	-	35,720
		Capital Reserve - Asset Condition	CNYX31AC	(3,818,998)	(7,000,000)	(2,400,000)	(7,000,000)	(4,400,000)	(24,618,998)
		Carr St./E.Syracuse CO-Gen Relays	C049739	-	-	50,000	440,000	-	490,000
		Colton-BF 1-2 T3140-T3150 ACR	C036164	100,000	500,000	6,200,000	2,000,000	100,000	8,900,000
		Colton-Replace CBs and Disconnects	C029844	1,297,593	389,879	-	-	-	1,687,472
		Curtis Relay /Breaker Replacement	C049584	-	-	40,000	360,000	-	400,000
		Curtis St - replace OCBs	C049557	-	50,000	650,000	-	-	700,000
		DeWitt Station Relay Strategy	C043503	75,000	-	-	-	-	75,000
		Dunkirk Rebuild	C005155	-	-	250,000	4,500,000	8,212,000	12,962,000
		Edic Relay Replacement	C047855	130,000	105,000	765,000	-	-	1,000,000
		Elbridge Relay Replacement	C047856	525,000	-	-	-	-	525,000
		Elm St. Replace 67L Relays	CD00728	116,862	-	-	-	-	116,862
		Falconer-HH 153-154 T1160-T1170 ACR	C027422	200,000	1,100,000	260,000	12,500,000	3,065,000	17,125,000
		Feura Bush Relay Replacement	C049585	-	-	90,000	720,000	-	810,000
		Gard-Dun 141-142 T1260-T1270 ACR	C003389	999,960	8,400,000	10,700,000	200,000	-	20,299,960
		Gardenville 180-182 T1660-T1780 ACR	C027436	100,000	200,000	200,000	5,810,000	1,960,000	8,270,000
		Gardenville Rebuild	C005156	2,796,200	5,788,600	14,800,000	18,500,000	4,500,000	46,384,800
		Gardenville-Rebuild Line Relocation	C030084	105,280	105,280	3,700,000	500,000	-	4,410,560
		Gard-HH 151-152 T1950-T1280 S ACR	C027425	100,000	200,000	200,000	8,800,000	8,800,000	18,100,000
		GE Butyl Rubber VT Replacement	C049002	259,000	264,000	271,000	278,000	285,000	1,357,000
		GE-Geres Lock 8 T2240 ACR	C047835	25,000	400,000	10,000,000	4,000,000	-	14,425,000
		Geres Lock - Rplc R815 OCB	C049138	-	170,000	-	-	-	170,000
		Gibson Substation Retirement	C046579	-	-	-	77,350	-	77,350
		Golah Relay & Breaker Strategy Repl	C050920	-	-	25,000	165,000	-	190,000
		Greenbush Relay Replacement	C049587	-	-	50,000	330,000	-	380,000
		Headson - OCB Replacements	C043044	-	200,000	-	-	-	200,000
		Homer Hill Switch Relay Replacement	C043505	666,000	-	-	-	-	666,000
		Homer Hill-Bennett Rd 157 T1340 ACR	C027429	100,000	1,000,000	14,500,000	21,280,000	5,000,000	41,880,000
		Hoosick - Replace Bank 1 & relays	C053132	-	1,000,000	3,000,000	-	-	4,000,000
		Huntley Sub-Rem TB130 & 140 cables	C028089	3,200	-	-	-	-	3,200
		Independence Station relay Replace	C049598	-	-	80,000	540,000	-	620,000
		Inghams Phase Shifting Transformer	C047864	2,700,000	-	-	-	-	2,700,000
		Kensington DOC Relay Replacemt	C052703	400,000	-	-	-	-	400,000
		Leeds - Replace U Series Relays	C024663	1,851,472	625,000	-	-	-	2,476,472
		Leeds Station Service	C049900	100,000	1,000,000	-	-	-	1,100,000
		LightHH 115kV Yard Repl & cntrl hse	C031662		500,000	1,500,000	5,500,000	15,500,000	23,000,000
		LN17 - Replace U Series Relays	C024661	669,540	-	-	-	-	669,540
		Lockport 103-104 T1620-T1060 STR	C027432	-	-	50,000	100,000	200,000	350,000
		Lockport-Batavia 112 T1510 ACR	C003422	25,000	100,000	1,000,000	17,000,000	25,600,000	43,725,000
		LockportSubstationRebuildCo36TxT	C035464	-	-	50,000	500,000	1,500,000	2,050,000
		Long Lane Relay Replacement	C049600	-	-	100,000	660,000	-	760,000
		Maplewood-Norton-Replace Pilot Wire	C036006	406,065	-	-	-	-	406,065
		Marshville - replace R11 OCB	C049547	-	35,000	315,000	-	-	350,000
		McIntyre Relay Replacement	C047860	175,000	-	-	-	-	175,000
		Menands Station Relay Replacement	C049601	585,000	4,640,000	500,000	-	-	5,725,000
		Mohican - Replace Bank 1 and Relays	C053133	-	-	-	1,000,000	3,000,000	4,000,000
		Mortmr-Pannll 24-25 T1590-T1600 ACR	C047816	50,000	100,000	200,000	200,000	6,000,000	6,550,000
		Mountain Station Relay Replacement	C049603	-	-	-	300,000	-	300,000
		New Scotland - replace 345kV OCBs	C049553	125,000	1,375,000	-	-	-	1,500,000
		New Scotland Relay Replacement	C047861	365,000	75,000	615,000	-	-	1,055,000
		North Ogdensburg Relay Replacement	C047862	175,000	-	-	-	-	175,000
		North Troy Relay Replacement	C049605	-	-	25,000	165,000	-	190,000
		NY Oil Circuit Breaker Replacements	C037882	-	-	-	-	1,600,000	1,600,000
		Old Gardenville - 25 Cycle Retireme	C046849	211,650	-	-	-	-	211,650
		Oneida Transformer Replacement # 4	C037876	90,720	-	-	-	-	90,720
		Packard Relays line 191 to 195	C051423	750,000	-	-	-	-	750,000
		Packard-Urban 181 T1850 ACR-STR	C047834	-	-	-	-	200,000	200,000
		Pannell-Geneva 4-4A T1860 ACR	C030889	50,000	100,000	200,000	200,000	5,110,000	5,660,000
		Porter-Rotterdam 31 T4210 ACR	C030890	500,000	9,500,000	15,500,000	-	-	25,500,000
		Purchase a 230-23kV NY system spare	C044196	2,142,000	-	-	-	-	2,142,000
		Purchase Spare Brkrs/Disconnects	C053134	1,000,000	-	-	-	-	1,000,000
		Purchase Spare Transformers	C053135	500,000	3,000,000	-	-	-	3,500,000
		Pyrites New Battery House	C051704	75,000	-	-	-	-	75,000
		Queensbury - replace OCBs	C049554	-	50,000	1,000,000	-	-	1,050,000
		Rebuild Huntley Station	C049902	-	-	500,000	2,500,000	5,100,000	8,100,000
		Relay Replacement Program NY-T	C034690	-	-	-	-	8,000,000	8,000,000
		Repl Pilot Wire-Central Ave-Patroon	C036031	126,285	-	-	-	-	126,285
		Replace NG ALCOA 115 kV Breakers	C030545	59,325	-	-	-	-	59,325

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Replace/Relocate 13.8kV SG @Oneida	C025139	704,700	-	-	-	-	704,700
		Ridge Substation - 34.5kV System Re	C046693	76,500	288,150	-	-	-	364,650
		Rochester UG Pumping Plant	C015988	100,800	700,000	300,000	-	-	1,100,800
		Rome 115 kV Station	C003778	1,510,020	-	-	-	-	1,510,020
		Rome Rebuild Line Part	C034983	75,275	-	-	-	-	75,275
		Rosa Road Replace Ground Grid	C052704	86,000	114,000	-	-	-	200,000
		Rotterdam 115kV SubRebuild(AIS)	C034850	-	-	50,000	300,000	6,750,000	7,100,000
		Rotterdam-Bear Swamp E205 T5630 ACR	C047832	-	-	-	-	200,000	200,000
		Schoharie substation reconfiguratio	C046494	-	-	914,600	938,400	-	1,853,000
		Schuyler - replace OCBs	C049562	-	50,000	650,000	-	-	700,000
		Schuyler Rd Repl 918 928 CirSws	C050799	750,000	-	-	-	-	750,000
		Schuyler Relay Replacement	C049610	-	50,000	350,000	-	-	400,000
		Scriba Relay Replacement	C049611	150,000	780,000	-	-	-	930,000
		Seneca Term Relay Replacement	C049613	-	-	70,000	470,000	-	540,000
		Seneca Terminal Transformer Replace	C049744	-	350,000	3,000,000	3,000,000	-	6,350,000
		Shield Wire: Gardenville-Depew 54	C028706	300,880	-	-	-	-	300,880
		Spier-West 9 T5770 ACR	C021694	50,000	100,000	200,000	6,000,000	500,000	6,850,000
		Taylorville-B 5-6 T3320-T3330 ACR	C027437	4,448,500	4,458,300	541,500	-	-	9,448,300
		Taylorville-Moshier 7 T3340 LER	C024361	1,200,220	-	-	-	-	1,200,220
		Teal Ave. Transformer Replacement	C047865	1,900,000	4,600,000	500,000	-	-	7,000,000
		Terminal Station Relay Replacement	C049624	50,000	350,000	-	-	-	400,000
		Terminal-Schuyler 7 T4260 ACR	C047833	-	-	50,000	100,000	200,000	350,000
		Ticonderoga - replace R4 OCB	C049552	-	50,000	650,000	-	-	700,000
		Ticonderoga 2-3 T5810-T5830 ACR	C039521	100,000	1,000,000	5,000,000	14,500,000	20,500,000	41,100,000
		Ticonderoga 2-3 T5810-T5830 SXR2	C039487	2,103,673	-	-	-	-	2,103,673
		Tilden - replace OCBs	C049556	50,000	1,000,000	-	-	-	1,050,000
		Tilden Station Relay Strategy	C043504	20,000	-	-	-	-	20,000
		Trinity UG Pumphouse Redesign	C011318	100,000	840,000	-	-	-	940,000
		Turner D Switch Replacements	C052603	-	100,000	800,000	690,000	690,000	2,280,000
		UF Relays TxT Strategy	C043508	160,000	-	-	-	-	160,000
		Volney station Relay Replacement	C049626	100,000	650,000	-	-	-	750,000
		Walck RD Relay Replacement	C049628	-	-	25,000	165,000	-	190,000
		Whitehall - replace OCBs	C049564	-	75,000	975,000	-	-	1,050,000
		Wood Pole Mgmt Prgm (Osmose)	C011640	1,000,400	2,000,000	2,500,500	1,500,000	1,500,000	8,500,900
		Woodard Relay Replacement	C047863	220,000	-	-	-	-	220,000
		Woodlawn Transformer Replacement	C051986	2,000,000	3,200,000	-	-	-	5,200,000
		Yahnundasis Relay replacement	C049629	-	-	-	370,000	-	370,000
	Component Fatigue/Deterioration Total			43,556,223	64,313,099	105,157,596	132,988,746	141,106,000	487,121,664
	Failure Trend	Higley-Repl Fuses w/Ckt Switcher	C034664	25,000	655,000	-	-	-	680,000
		Osprey Mitigation Sleight-Auburn #3	C049288	250,000	-	-	-	-	250,000
	Failure Trend Total			275,000	655,000	-	-	-	930,000
	NERC/NPCC Standards	Adams-Packard 187 T1010 &Taps CCR	C034927	-	20,000	-	-	-	20,000
		Adams-Packard 188 T1020 &Taps CCR	C034928	-	20,000	-	-	-	20,000
		Bethlehem-Albany 18 T5070 CCR	C034967	-	10,000	-	-	-	10,000
		Br. Falls-Taylorville 4 T3090 CCR	C048221	1,800,000	450,000	-	-	-	2,250,000
		Browns Falls-Taylorville 3 T3080CCR	C048218	3,000,000	600,000	-	-	-	3,600,000
		Conductor Clearance - NY Program	C048678	1,880,000	9,250,000	10,700,000	10,700,000	15,000,000	47,530,000
		Gardenville-Buf Rvr T1210-T1220 CCR	C031155	-	20,000	-	-	-	20,000
		Gardnvl-Beth149-150 T1190-T1200 CCR	C034957	-	20,000	-	-	-	20,000
		Geres Lock-Solvay 2 T2270 &Taps CCR	C034971	-	10,000	-	-	-	10,000
		Golah-Lakville 116 T1320 & Taps CCR	C034954	-	20,000	-	-	-	20,000
		Greenbush-Stephentown 993 T5190 CCR	C031132	-	20,000	-	-	-	20,000
		Hartfield-Moons 159 T1330 &Taps CCR	C034926	-	20,000	-	-	-	20,000
		Homer H-Dugan Rd 155 T1350&Taps CCR	C034962	-	20,000	-	-	-	20,000
		Hudson-Pleasant Valley 12 T5230 CCR	C031145	-	20,000	-	-	-	20,000
		Meco-Rotterdam 10 T5390 CCR	C031134	-	20,000	-	-	-	20,000
		Mortimer-Elbridge 2 T1570 CCR	C031135	-	20,000	-	-	-	20,000
		Mortimer-Golah 110 T1580 CCR	C031150	-	20,000	-	-	-	20,000
		Mortimer-Pannell T1590-T1600 CCR	C031148	-	20,000	-	-	-	20,000
		Mortimer-Quaker 23 T1610 CCR	C031146	-	20,000	-	-	-	20,000
		NERC CIP - NMPC	C049085	467,400	-	-	-	-	467,400
		New Scotlnd-Albany 8 T5980&Taps CCR	C034959	-	20,000	-	-	-	20,000
		Niagara-Lockport 101 T1690 CCR	C031151	-	20,000	-	-	-	20,000
		Niagara-Lockport 102 T1700 CCR	C031152	-	20,000	-	-	-	20,000
		NS-Feura Bush 9 T5500 &Taps CCR	C034966	-	10,000	-	-	-	10,000
		NS-Long Lane 7 T5470 &Taps CCR	C034968	-	10,000	-	-	-	10,000
		Packard-Huntley 130 T1820 CCR	C031154	10,000	-	-	-	-	10,000
		Reynolds Rd-Alps 1 T5560 CCR	C034964	-	10,000	-	-	-	10,000
		Rotterdam-Altamont 17 T5620 CCR	C031131	10,000	-	-	-	-	10,000
		Stoner - Rotterdam 12 T5800 CCR	C048222	300,000	-	-	-	-	300,000
		Valley Sta 44-Isshua 158 T1900 CCR	C034965	-	10,000	-	-	-	10,000
	NERC/NPCC Standards Total			7,467,400	10,700,000	10,700,000	10,700,000	15,000,000	54,567,400
Asset Condition Total				57,498,623	87,968,099	120,157,596	146,688,762	159,106,000	571,419,080
Customer Requests/Public Requirements	Customer Interconnection	Byrne Dairy Load Expansion	C052843	30,000	-	-	-	-	30,000
		Cape Vincent Wind Sub	CNYX60	200,000	2,730,000	-	-	-	2,930,000
		Cape Vincent Wind Sub Reimbursement	CNYX60R	(200,000)	(2,730,000)	-	-	-	(2,930,000)
		Everpower Allegany IA-Tap/ Switches	C047385	100,000	1,010,000	-	-	-	1,110,000
		Everpower Allegany IA-Tap/ Switches Reimb	C047385R	(100,000)	(1,010,000)	-	-	-	(1,110,000)
		Everpower Wind IA- SUF & AF Work	C047387	100,000	1,520,000	-	-	-	1,620,000
		Everpower Wind IA- SUF & AF Work Reimb	C047387R	(100,000)	(1,520,000)	-	-	-	(1,620,000)
		Horse Creek Wind Line	CNYX70	100,000	2,000,000	250,000	-	-	2,350,000
		Horse Creek Wind Line Reimbursement	CNYX70R	(100,000)	(2,000,000)	(250,000)	-	-	(2,350,000)
		Horse Creek Wind Sub	CNYX71	100,000	1,100,000	120,000	-	-	1,320,000
		Horse Creek Wind Sub Reimbursement	CNYX71R	(100,000)	(1,100,000)	(120,000)	-	-	(1,320,000)
		Nine Mile 2 Uprate	C039171	(84,500)	-	-	-	-	(84,500)
		Nine Mile 2 Uprate- Tx Line Work	C052163	100,000	-	-	-	-	100,000
		Nine Mile 2 Uprate -Tx Line Work	C052163R	(100,000)	-	-	-	-	(100,000)
		Roaring Brook Wind Line	CNYX61	20,000	324,000	-	-	-	344,000
		Roaring Brook Wind Line Reimbursement	CNYX61R	(20,000)	(324,000)	-	-	-	(344,000)
		Roaring Brook Wind Sub	CNYX62	211,000	1,083,000	-	-	-	1,294,000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Roaring Brook Wind Sub Reimbursement	CNYX62R	(211,000)	(1,083,000)	-	-	-	(1,294,000)
	Customer Interconnection Total			(54,500)	-	-	-	-	(54,500)
	Public Requirement	FAA Obstruction Lighting - West	C027954	100,000	-	-	-	-	100,000
		TP Relocate Lafarge-Pleasant Vly#8	C050745	10,000	10,000	-	-	-	20,000
	Public Requirement Total			110,000	10,000	-	-	-	120,000
Customer Requests/Public Requirements Total				55,500	10,000	-	-	-	65,500
Damage Failure	Damage/Failure	Arcade-H Hill 167 T6450 Sw D-F	C048105	86,000	-	-	-	-	86,000
		Beck-Mtn-Lockport 103-104 Str 88 DF	C040504	105,000	-	-	-	-	105,000
		Dennison-Coltn 4 T3180 Sw X4-1 D-F	C047698	89,500	-	-	-	-	89,500
		Dennison-Coltn 4 T3180 Sw X4-3 D-F	C052317	20,000	75,000	-	-	-	95,000
		Elm St. Station #4 TRF D/F	C051039	2,800,000	-	-	-	-	2,800,000
		Gardenville-Seneca 82 T1300 Sw D-F	C047645	206,400	-	-	-	-	206,400
		GE-Geres Lock 8 D/F Structures	C044933	110,000	-	-	-	-	110,000
		G-HH 151-52 T1950-T1280 Str265 D-F	C042184	77,000	-	-	-	-	77,000
		Hudson Sub #3 TRF damage/failure	C051764	600,000	-	-	-	-	600,000
		Huntley Station Replace MODisc #239	C042865	89,000	-	-	-	-	89,000
		Luth F-Rottrdm 2 Tap T6500-1 Sw D-F	C049857	99,000	-	-	-	-	99,000
		Mohawk River Crossing D-F	C041086	147,640	-	-	-	-	147,640
		OHL D-F Disconnect Switch Spares	C048159	314,100	925,000	1,000,000	-	-	2,239,100
		Oneida - TB#3 Failure	C022391	117,600	-	-	-	-	117,600
		Packard-Gardv 182 T1780 D-F	C042364	110,000	-	-	-	-	110,000
		Packard-Urban 181 T1850 Str 409 D-F	C041163	172,000	-	-	-	-	172,000
		S Oswego-Geres Lock 9 T2600 Sw D-F	C047690	86,000	-	-	-	-	86,000
		Storm Budgetary Reserve - NMPC	C003481	500,000	1,000,000	1,000,000	1,000,000	1,000,000	4,500,000
		Ticonderoga Line Portion via C37108	C039484	37,000	-	-	-	-	37,000
		TiconderogaSubPlWReplace115kVSwitch	C037108	768,000	-	-	-	-	768,000
		Trans Station Failure Budget Reserv	C003792	4,750,000	4,750,000	4,750,000	5,000,000	5,000,000	24,250,000
		TransLine Damage-Failure Budget Res	C003278	450,000	450,000	450,000	450,000	450,000	2,250,000
		Warrensburg OHL Bus Tie D-F Sw	C048106	99,000	-	-	-	-	99,000
		Yahnudasis T4160-T4300 D-F Struc	C038162	175,000	-	-	-	-	175,000
	Damage/Failure Total			12,008,240	7,200,000	7,200,000	6,450,000	6,450,000	39,308,240
Damage Failure Total				12,008,240	7,200,000	7,200,000	6,450,000	6,450,000	39,308,240
Non-Infrastructure	Station Control and Monitoring System	Edic Security Upgrades	C051894	950,000	-	-	-	-	950,000
		IntrMeterInvestmentPrgmCo36	C035267	1,138,700	-	-	-	-	1,138,700
		Jamestown Muni Dow St Stat. Mtr upg	C046999	10,000	-	-	-	-	10,000
		Porter Security Upgrades	C051895	800,000	-	-	-	-	800,000
		Program-Remote Terminal Unit (RTU)	C003772	893,050	696,800	-	-	-	1,589,850
		Substation Security Program	C053136	-	1,500,000	1,500,000	1,500,000	1,500,000	6,000,000
	Station Control and Monitoring System Total			3,791,750	2,196,800	1,500,000	1,500,000	1,500,000	10,488,550
Non-Infrastructure Total				3,791,750	2,196,800	1,500,000	1,500,000	1,500,000	10,488,550
System Capacity & Performance	Generator Retirements	Clay - GE 14 Reconductoring	C045253	10,110,000	3,260,000	-	-	-	13,370,000
		Five Mile to Homer Hill reconduct	C047319	9,699,600	6,368,800	-	-	-	16,068,400
		Huntley 2nd 75MVAr Perm Cap Bank	C047316	711,600	-	-	-	-	711,600
		Install 2 115kV Cap Banks - Dunkirk	C047318	727,000	-	-	-	-	727,000
		New Elbridge - State St Line	C047298	9,000,000	-	-	-	-	9,000,000
		New Elbridge - State St Line Reimb	C047298R	(9,000,000)	-	-	-	-	(9,000,000)
		Reconductor #5 Elbridge - State St	C047297	7,500,688	3,135,147	321,549	-	-	10,957,384
		Reconductor #5 Elbridge - State St Reimb	C047297R	(7,500,688)	(3,135,147)	(321,549)	-	-	(10,957,384)
		Reconfigure Elbridge Sub	C047299	3,078,503	-	-	-	-	3,078,503
		Reconfigure Elbridge Sub Reimb	C047299R	(3,078,503)	-	-	-	-	(3,078,503)
	Generator Retirements Total			21,248,200	9,628,800	-	-	-	30,877,000
	NERC/NPCC Standards	Clay 115 kV Rebuild	C028705	648,000	-	-	-	-	648,000
		Porter 115 kV Rebuild	C028686	2,733,750	100,050	-	-	-	2,833,800
		Porter 230kV-Upgrade Brks/Disc/PT's	C036866	-	25,000	250,000	1,000,000	15,000,000	16,275,000
	NERC/NPCC Standards Total			3,381,750	125,050	250,000	1,000,000	15,000,000	19,756,800
	TO Led System Studies	#171 Reconductor	C024017	50,000	50,000	-	-	-	100,000
		Add Brkr to Mortimer-Elbridge #2	C053139		-	-	50,000	200,000	250,000
		ALCOA - Add Annunciator	C019934	12,000	-	-	-	-	12,000
		Alcoa R8105 Tie SPS Retirement	C044132	3,000	-	-	-	-	3,000
		Ash 34.5 Install Capacitors	C027987	-	549,950	224,400	-	-	774,350
		Bethlehem L10, L14 Relay Upgrade	C045624	336,647	-	-	-	-	336,647
		Capital Reserve - System Capacity & Performance	CNYX31SCP	(11,280,000)	(4,552,196)	(3,239,488)	(4,055,333)	(5,333,917)	(28,460,933)
		CCR Correction - Central 2013 Study	C053140	450,000	-	-	-	-	450,000
		Central Breaker Upgrades - Ash	C043424	650,000	314,000	-	-	-	964,000
		Central Breaker Upgrades - Oswego	C043426	459,200	5,350,000	-	-	-	5,809,200
		Central Breaker Upgrades - Teall	C043427	247,390	-	-	-	-	247,390
		Clay Substation Reconfiguration	C047275	8,006,240	-	-	-	-	8,006,240
		Clay-Teall#10,Clay-Dewitt#3 Recond	C043995	1,530,000	5,700,000	22,470,000	8,510,000	-	38,210,000
		Construct Five Mile Station	C024015	21,372,276	2,884,000	-	-	-	24,256,276
		Construct Five Mile Station - Line	C024016	1,753,330	41,204	-	-	-	1,794,534
		Dewitt - add brkrs to 345kV bay	C053142	200,000	1,200,000	-	-	-	1,400,000
		Dunkirk Second Bus Tie - Line	C031460	-	55,000	1,246,507	-	-	1,301,507
		Dunkirk Second Bus Tie - Station	C031459	-	150,000	1,184,000	-	-	1,334,000
		Eastover Rd - New 230-115kV Station	C031326	9,750,600	-	-	-	-	9,750,600
		Eastover Rd-New Line Taps	C031419	2,864,000	-	-	-	-	2,864,000
		Elm St Relief_Add 4th Xfer	C049594	1,100,000	3,276,000	3,000,000	3,000,000	-	10,376,000
		Ephratah Sub Rebuild - Line Portion	C053144	-	50,000	750,000	750,000	-	1,550,000
		Ephratah substation rebuild	C046486	-	50,000	1,200,000	1,300,000	-	2,550,000
		Falconer PAR - Line Work	C053145	-	-	50,000	100,000	1,000,000	1,150,000
		Falconer PAR - Station Work	C053146	-	-	50,000	1,000,000	6,000,000	7,050,000
		Forbes Ave TSub	C043593	1,556,600	950,100	-	-	-	2,506,700
		Frankhauser New Station - T Line Wo	C030744	1,100,100	-	-	-	-	1,100,100
		Frankhauser New Station - T Sub Wor	C034427	764,100	-	-	-	-	764,100
		Golah Sub rebuild	C051831	-	-	-	-	54,576	54,576
		Greenbush-Schodack 13&15 Tline	C052324	763,000	-	-	-	-	763,000
		Greenbush-Schodack/Hudson Sub	C052319	35,000	-	-	-	-	35,000
		Harper sub new 115 kV line taps	C044594	182,000	141,000	486,000	-	-	809,000
		Hudson Valley Reinforcement	C053148	-	-	100,000	400,000	8,000,000	8,500,000
		Huntley Grounding Banks	C050918	-	-	-	50,000	950,000	1,000,000
		Inghams Station Re-vitalization	C050917	-	-	110,000	113,000	500,000	723,000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Install Head End EMS Equipment for 218 DA	CD00618	3,000	-	-	-	-	3,000
		Install Head End EMS Equipment for 861 DA	CD00470	16,863	-	-	-	-	16,863
		Install Series Reactor at LN10 at B	C045599	90,500	-	-	-	-	90,500
		Install series reactor at LN14 at B	CD01083	84,566	-	-	-	-	84,566
		Line 116 tap to new N.Lakeville Sub	C052024	20,000	-	-	240,000	240,000	500,000
		Lockport Rd #216 Install 2nd transf	C044093	-	80,000	80,000	210,000	-	370,000
		Long Road #209 New TB2 - TxT Line	C043595	-	-	170,000	-	-	170,000
		Long Road #209 New TB2 - TxT Sub	C043596	-	-	221,400	180,230	-	401,630
		Lowville Automated 115 kV Switches	C032259	510,000	-	-	-	-	510,000
		Luther Forest/Malta Diff. Scheme	C047897	292,980	-	-	-	-	292,980
		McCrea Line	C053150	-	-	25,000	100,000	-	125,000
		McCrea Sub	C053151	-	25,000	100,000	-	-	125,000
		Military Road #210 - TxT Substation	C043614	-	152,470	124,820	-	-	277,290
		Mohican Battenkill#15 Rebuild Recon	C034528	12,846,000	17,373,000	-	-	-	30,219,000
		Mountain upgrade 115 - 34.5kV trans	C044359	1,162,900	2,572,760	20,160	-	-	3,755,820
		N.Lakeville - Add 34.5kV LN226 bker	C051826	-	-	32,000	485,000	60,000	577,000
		N.Lakeville new 115 - 13.2kV sub	C043533	-	81,824	490,944	957,341	957,341	2,487,450
		New Abby St Station - Line Portion	C053152	30,000	200,000	358,000	20,000	-	608,000
		New bay at Edic 345kv substation	C044674	850,130	650,000	-	-	-	1,500,130
		New Buffalo Station 42 - T Line	C040943	10,000	290,000	290,000	30,000	-	620,000
		New Buffalo Station 42 - T Sub	C040944	50,000	1,500,000	2,550,000	100,000	-	4,200,000
		New Harper Substation - TxT Sub	C044874	4,110,000	3,285,000	45,000	-	-	7,440,000
		New Maple Ave - Line Portion	C053153	-	40,000	450,000	10,000	-	500,000
		New Maple Avenue Substation	C051705	58,000	103,000	44,000	-	-	205,000
		New Tonawanda Station	C053154	30,000	370,000	360,000	240,000	-	1,000,000
		New Tonawanda Station - Line Taps	C053156	25,000	240,000	240,000	-	-	505,000
		New Watertown 115-13.2kV T - Line	C053155	50,000	450,000	450,000	50,000	-	1,000,000
		New Watertown 115-13.2kV T-Sub	C053157	98,000	930,000	841,000	89,000	-	1,958,000
		New West Sweden Station - Line Work	C053159	-	-	-	-	30,000	30,000
		New West Sweden Station - Sub Work	C053160	-	-	-	-	36,000	36,000
		Porter 230kV Breaker Overduty Mitig	C044772	75,000	-	-	-	-	75,000
		Queensbury TB3 & TB4 upgrades (sub)	C036822	2,100,000	1,500,000	-	-	-	3,600,000
		Randall Rd Transmission Line	C043672	15,000	148,600	713,500	237,500	-	1,114,600
		Randall Road Substation Trans work	C043673	10,000	95,600	1,188,000	237,500	-	1,531,100
		Recond 1/2 Mile of Dewitt-Tilden 19	C053143	-	-	-	100,000	825,000	925,000
		Recond Cortland Clarks Corners	C053141	-	-	-	25,000	325,000	350,000
		Reconductor L #54 Gardenville-Erie	C031463	90,000	-	-	-	-	90,000
		Reconductoring 115kv NE reg NRRP	C035771	-	100,000	1,500,000	4,700,000	8,800,000	15,100,000
		Replacement of #171 connections	C033884	187,600	-	-	-	-	187,600
		Ridge sub - Split 38kV cap bank	C051390	345,780	40,680	-	-	-	386,460
		River Tower Crossings - Spare Struc	C053158	-	50,000	5,000,000	-	-	5,050,000
		Riverside-Reynolds Rd#4 Forbes Tap	C043592	259,700	1,525,340	-	-	-	1,785,040
		Rock Cut Substation - Transmission	C040685	262,080	-	-	-	-	262,080
		Sanborn upgrade 115 - 34.5kV transf	C044361	510,720	1,056,640	15,680	-	-	1,583,040
		Sawyer Fourth 230-23kV Bank	C053147	-	-	110,000	732,000	750,000	1,592,000
		Second 115 kV bus tie at Lockport	C031482	483,300	-	-	-	-	483,300
		Shawnee 76 Sub TxT	C043616	286,920	234,960	287,000	-	-	808,880
		Sodeman Rd 115kV station equipment	C043754	750,400	550,000	-	-	-	1,300,400
		Sodeman Rd Install New taps	C043755	750,400	550,000	-	-	-	1,300,400
		Spier Rotterdam NEW Line	C031418	1,983,354	-	-	-	-	1,983,354
		Taps to 115 kV new Cicero Sub	C050939	-	-	50,000	250,000	200,000	500,000
		TP Mortimer Second Bus tie	C050696	525,000	150,000	-	-	-	675,000
		TP Reconductor line #181	C050744	200,000	1,000,000	24,000,000	13,000,000	-	38,200,000
		TP West Golah Substation	C050695	1,000,000	5,750,000	500,000	-	-	7,250,000
		Trans Study Budgetary Reserve NY	C008376	150,000	150,000	150,000	150,000	150,000	750,000
		Upgrade Niagara - Packard #195	C029945	5,224,020	35,000	-	-	-	5,259,020
		Van Dyke 115-13.2 Sub Taps	C044173	-	153,000	-	-	-	153,000
		W. Ashville sub 115kV In 160 tap	C043832	200,000	300,000	-	-	-	500,000
		W. Ashville substation TxT	C043833	500,000	1,200,000	580,000	-	-	2,280,000
		West Hamlin 82 (TXT-Sub)	C043977	-	464,320	644,480	-	-	1,108,800
		West Hamlin 82 TXT Line	C048901	-	100,000	130,000	-	-	230,000
		Wetzel Rd. Substation T-Line	C036983	163,240	-	-	-	-	163,240
	TO Led System Studies Total			78,315,937	59,706,251	69,392,404	33,361,238	23,744,000	264,519,830
System Capacity & Performance Total				102,945,887	69,460,101	69,642,404	34,361,238	38,744,000	315,153,630
Grand Total				176,300,000	166,835,000	198,500,000	189,000,000	205,800,000	936,435,000

Exhibit 2 - 2014 Sub-Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
Asset Condition	AC Other	Rankine - Adams - 25 Cycle Line Ret	C046620	0	0	0	1000	1000	2000
		Genesee South 34.5kV relief	C046711	0	0	0	0	50000	50000
		New Gardenville Substation-SubT Lin	CD00636	80460	0	0	0	0	80460
		Defective 1980 chance insulators-34	C046445	0	0	16000	85000	0	101000
		Regulator site fencing west-34.5kv	C046444	0	0	11000	103000	0	114000
		Sta 66 repl./new Subt pole mtd sta.	CD00544	136000	0	0	0	0	136000
		Maplewood-Latham#9 Mapleview Tap Re	CD00832	183000	0	0	0	0	183000
		Amsterdam 69 KV reconfig and LB SWs	C049299	233333.33	0	0	0	0	233333.33
		Buffalo Station 122 Rebuild - 23kV	CD00780	17600	133600	78400	10400	0	240000
		Buffalo Station 42 Rebuild - SubT L	C046853	27000	116000	118000	30000	0	291000
		Ohio-Ridge 613-34.5kv	C046453	0	27000	276000	9000	0	312000
		Station 126 taps 33h/34h-23kv	C046450	0	0	27000	323000	0	350000
		Fort Covington-Malone 26-34.5kV	C050197	75000	300000	0	0	0	375000
		N. Ashford-Nuclear Fuel Services 81	C046467	413950	0	0	0	0	413950
		Hartfield-S. Dow 859-Relocate Part	C052209	424000					424000
		Galleria Mall Loop - 1/0 Cable Rep	CD00869	489300	0	0	0	0	489300
		Shaleton-Ridge 610, Station 207 Tap	C046779	0	0	78000	425000	0	503000
		Sta 122 taps 622/623-23kv	C046461	0	0	27000	497000	9000	533000
		L226 - Extend line to N LVille Sta	C015766	0	0	0	34000	606000	640000
		LN404 Moutain - Sanborn reconductor	CD01276	708900	22100	0	0	0	731000
		Dake Hill-W. Salamanca 816-34.5kv	C046469	0	0	52000	400000	400000	852000
		M&T bank Tap 701-34.5kv	C046462	925000	0	0	0	0	925000
		Refurbish H-Lns 27h,28h,33h	C046470	0	0	120000	950000	0	1070000
		Phillips-Telegraph 304-34.5kv	C046466	0	0	0	81000	994000	1075000
		N.Lakeville - Ridge LN 218 Refurbis	C046766	0	59000	572000	531000	0	1162000
		W. Portland-Sherman 867-34.5kv	C046468	50000	470000	470000	250000	0	1240000
		Old Jewitt-Solvay 26(lns 30,31,26)-	C046438	0	118150	548900	624100	0	1291150
		Phillips-Medina 301-34.5kv	C046465	0	0	80000	1076000	497000	1653000
		Callanan Tap - Install new Sub-T li	C046641	1809650	946900	0	0	0	2756550
		Oakfield - Caledonia LN201 reconduc	C046707	621050	1257200	1826600	0	0	3704850
		Beth-Voorheesville-Retire Callanan	C027582	1000	1000	0	0	0	2000
	AC Other Total			6195243.33	3450950	4300900	5429500	2557000	21933593.33
	Blanket	ENY Sub Trans-Line Asset Replace	CNE0075	213000	216000	219000	222000	225000	1095000
		CNY Sub Trans-Line Asset Replace	CNC0075	244000	248000	252000	256000	260000	1260000
		WNY Sub Trans-Line Asset Replace	CNW0075	355000	360000	365000	370000	376000	1826000
	Blanket Total			812000	824000	836000	848000	861000	4181000
	Cable Replacement	IE - NE Sub-T UG Cable Replacement	C032146	0	754607.4945	0	0	0	754607.4945
		Partridge-Ave A # 5 Cable Replaceme	C036273	849550	653250	0	0	0	1502800
		Solvay-Ash #28 34.5kV Replace Cable	C045629	393550	821950	635800	0	0	1851300
		Solvay Ash 27 Cable Repl SubT	C032147		40000	614800	614040	730040	1998880
		Buffalo 23Kv Cable Replacement Program	c052483	150000	2900000	3100000	3100000	5460000	14710000
	Cable Replacement Total			1393100	5169807.495	4350600	3714040	6190040	20817587.49
	Inspection & Maintenance	I&M - NC Sub-T Line Work From Insp	C026166	2297833	2000000	1739467	1500000	1500000	8000000
		I&M - NE Sub-T Line Work From Insp	C026165	3797834	2518600	1739466	1500000	1500000	10000000
		I&M - NW Sub-T Line Work From Insp	C026167	5297833	4500000	2239467	2000000	2000000	15000000
	Inspection & Maintenance Total			11393500	9018600	5718400	5000000	5000000	33000000
	Substation Indoor	Buffalo Station 53 Rebuild - 23 kV	C046928	0	0	0	0	30000	30000
		Buffalo Station 30 - Rebuild - 23kV	C015755	0	0	0	30000	17000	47000
		Buffalo Station 27 Rebuild - 23 kV	C033470	84000	0	0	0	0	84000
		Buffalo Station 59 Rebuild - 23 kV	C033472	0	21250	0	63750	0	85000
		Buffalo Station 37 Rebuild - 23 kV	C033471		10000	105000	17640	0	132640
		Buffalo Station 29 Rebuild - 23 kV	C006724	95100	39625	0	0	0	134725
		Buffalo Station 41 Rebuild - 23 kV	C046937	0	0	30000	17000	101000	148000
		Buffalo Station 25 Rebuild - 23 kV	C036457	0	30000	17000	101000	17000	165000
		Buffalo Station 34 Rebuild - 23 kV	C046944	0	30000	17000	101000	17000	165000
	Substation Indoor Total			179100	130875	169000	330390	182000	991365
	Sub-T Line Removal	Jeliff Tap 34.5kV -remove	C049097	1000	0	0	0	0	1000
		Station 150 Tap 701-34.5kV remove	C049499	1000	0	0	0	0	1000
		Rankine-Harper 16/17 and Adams -Har	C046514	1000	0.001	0.001	0.001	0	1000.003
		Bennett Bridge-Solvay 6-69kV-remove	C048824	0	1000	1000	1000	0	3000
		Remove School St. -Watervliet 3/4	C046512	4500	0	0.00001	0.00001	0	4500.00002
		Terminal-Cornelia 43 13.2kV-remove	C049037	10000	0	0	0	0	10000
		Lockport - Maple Rd L92E&W Removal	C036200	5000	125000	120000	0	0	250000
		Lisbon-Heuvelton #25 Removal	C025079	425000	0	0	0	0	425000
		Harper-Sta 104 32-12kv	C046615	1000		0	0	0	1000
	Sub-T Line Removal Total			448500	126000.001	121000.001	1000.00101	0	696500.003
	Sub-T Overhead Line	Battenkill-Cem Mntn 5, fort miller	C048827	50000	0	0	0	0	50000
		Homer Hill-Nile 811-34.5kv ION	CD01216	89250	0	0	0	0	89250
		Union-Lake Clear 35-46kV refurb	C050324	0	0	0	0	100000	100000
		Trenton-Whitesboro 25-46kv	C046458	141100	0	0	0	0	141100
		Deerfield-whitesboro 26-46kv	C046459	0	150450	0	0	0	150450
		Woodard 24/Teall 25-34.5kv	C046447	217600	0	0	0	0	217600
		Taylorville-Effley 24-23kv	C046437	0	36550	221850	0		258400
		Krumkill-Delmar-Bethlehem 9/8 34.5k	C046463	317000	0	0	0	0	317000
		Trenton-Deerfield 21/27-46kv	C046464	30000	382000	0	0	0	412000
		Cottrell Paper Tap 11-34.5kv	C046443	27000	232000	185000	0	0	444000
		Tonawanda Lines 601-604-23kv	C046451	0	0	44000	400000	12000	456000
		Trenton-Prospect 23-46kv	C046448	0	36550	455600	0		492150
		Queensbury-Henry Street 14-34.5kv	C046442	0	0	27000	387000	85000	499000
		Woodard 28-34.5kv	C046440	0	48450	446250	13600	0	508300
		Maplewood-Menands 17/18 d/c-34.5kv	C046432	0	0	54000	54000	442000	550000
		W. Salamanca-Homer Hill 805-34.5kV	C050293	0	0	0	50000	500000	550000
		Tonawanda Lines 622-624-23kv	C046452	0	0	27000	138000	400000	565000
		Refurbish H lines 26H, 33H, 34H	C048911	0	0	30000	70000	500000	600000
		Rebuild SubT line Crossings	C050328	0	0	200000	200000	200000	600000
		Rotterdam-Scotia-Rosa Road 32/6 -	C046455	0	54000	552000	9000	0	615000
		Ballston-Shore Rd-Rosa Rd 5 and 8-3	C046457	0	0	80000	538000	0	618000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Burnett-Headson 34-34.5kV	C050199	0	0	25000	150000	450000	625000
		N. Angola-Bagdad 857-34.5kV Catt.	C050289	0	0	0	25000	600000	625000
		Deerfield-Schuyler 22-46kV	C050288	50000	150000	450000	0	0	650000
		Epratah-Caroga 2-23kv	C046456	0	0	27000	663000	9000	699000
		Solvay/Woodard-Ash st 27&27&28- 34.	C046439	0	0	71400	523400	112200	707000
		Varick-Bristol Hill 202-34.5kv	C046460	0	0	0	43350	704650	748000
		Bethlehem-Selkirk 5-34.5kV	C048817	70000	705000	0	0	0	775000
		Teall-Headson L31-L29-34.5 kV line	C046686	627000	200000	0	0	0	827000
		Refurbish H-Lns 27h,25h,33h,36h	C048909	0	36000	144000	750000	0	930000
		Homer Hill-Nile 811-34.5kV	C050326	0	0	50000	900000	15000	965000
		Bristol Hill-Phoenix 23-34.5kv	C046474	0	77350	579750	313600	0	970700
		Amsterdam-Rotterdam 3/4 Relocation	C033182	1021200	0	0	0	0	1021200
		Re-furbish Teall 25/Woodard 24-34.5	C046446	0	45050	918850	95200	0	1059100
		Union-Ausable Forks 36-46kV ref	C050320	0	0	0	75000	1000000	1075000
		Woodard-Teall 32-34.5kV refurbish	C050322	0	0	0	100000	1000000	1100000
		Elbridge-Glenside 31-34.5kV refurb	C050959	0	0	0	100000	1000000	1100000
		Refurbish H Lns 26H, 34H	C048910	0	36000	144000	950000	0	1130000
		Yahnundasis-Clinton 24 and 27-46kv	C046449	0	41000	571000	540000	126650	1278650
		Solvay 22-34.5 kV line Refur.	C046685	550000	950000	0	0	0	1500000
		Woodard 29-34.5kv	C046473	0	751400	779450	0	0	1530850
		Bagdad-Dake Hill 815-34.5kV refurb.	C050292	0	0	0	100000	1500000	1600000
		Carthage-Taylorville 21/22/26-23kv	C046436	0	0	0	76500	1645600	1722100
		LHH-Mallory 22-34.5kv	C046441	0	0	45000	1200000	545000	1790000
		Relocate S. Dow-Poland 865-34.5kV	C050177	100000	900000	800000	0	0	1800000
		Mech-Schuylerville 4-34.5kV refurb	C050323	0	0	0	100000	2000000	2100000
		Nile-S. Wellsville 812-34.5kV ref.	C050290	0	0	0	125000	2000000	2125000
		Hartfield-S. Dow 859 Refurbish	C033180	2583273	0	0	0	0	2583273
		Ballston-Mechanicville 6-34.5kv	C046472	100000	1210000	1520000	0	0	2830000
		Mallory-Cicero L33-34.5 kV line Ref	C046681	412000	1500000	1800000	0	0	3712000
		W. Milton Tap-34.5kV new line	CD00898	150000	1000000	1075000	405000	0	5855500
		Carthage-N. Carthage-Deferiet 23kv	C046435	0	0	96900	4935000	4602000	9633900
	Sub-T Overhead Line Total			6535423	8541800	11420050	14029650	19549100	63301523
	TBD	TxD RESERVE for Asset Replacement U	C046910	-3387784	-4131032	-4393950	-3125230	-2404340	-17531336
	TBD Total			-3387784	-4131032	-4393950	-3125230	-2404340	-17531336
	De-energized Transmission Lines Str	Remove Atlantic Ref Tap 23-34.5kV	C049338	63750	0	0	0	0	63750
	De-energized Transmission Lines Strategy Total			63750	0	0	0	0	63750
Asset Condition Total				23632832.33	23131000.5	22522000	26227350	31934800	127453982.8
Damage/Failure	Blanket	CNY Sub Trans-Line Damage Failure	CNC0073	305000	310000	315000	320000	325000	1575000
		ENY Sub Trans-Line Damage Failure	CNE0073	396000	402000	408000	414000	420000	2040000
		WNY Sub Trans-Line Damage Failure	CNW0073	1218000	1236000	1255000	1274000	1293000	6276000
	Blanket Total			1919000	1948000	1978000	2008000	2038000	9891000
	D/F Other	69kV Tap to New Florida Substation	CD01170	637500	0	0	0	0	637500
	D/F Other Total			637500	0	0	0	0	637500
	TBD	TxD RESERVE for Damage/Failure Unid	C046911	0	200000	210000	220000	230000	860000
	TBD Total			0	200000	210000	220000	230000	860000
Damage/Failure Total				2556500	2148000	2188000	2228000	2268000	11388500
System Capacity & Performance	Blanket	ENY Sub Trans-Line Load Relief	CNE0077	1000	1000	1000	1000	1000	5000
		CNY Sub Trans-Line Load Relief	CNC0077	10000	10000	10000	10000	10000	50000
		WNY Sub Trans-Line Load Relief	CNW0077	10000	10000	10000	10000	10000	50000
		CNY Sub Trans-Line Reliability	CNC0076	152000	154000	156000	158000	160000	780000
		ENY Sub Trans-Line Reliability	CNE0076	173000	176000	179000	182000	185000	895000
		WNY Sub Trans-Line Reliability	CNW0076	305000	310000	315000	320000	325000	1575000
	Blanket Total			651000	661000	671000	681000	691000	3355000
	Capacity Planning	Van Dyke Station - Beth-Delmar #6 l	C046482	0	0	108000	0	0	108000
		New Dist Sub -Tonawanda NYW subT	C051267	20000	150000	150000	40000	0	360000
		New Tonawanda Substation - 23kV Lin	C046529	392700	0	0	0	0	392700
		South Livingston - 34.5KV Line Work	C028405	30000	150000	350000	110000	126000	766000
		Golah Avon 217 line reconductoring	C036054	0	50000	813200	0	0	863200
		s Livingston	C051583	0	0	52000	676000	187200	915200
		Buffalo 23kV Rec.-Sen. 1,2,3,19,31S	C048826	1382100	0	0	0	0	1382100
		Buffalo 23kV Reconductor - Huntley2	C028893	42000	2500000	0	0	0	2542000
		Buffalo 23kV Reconductor - Kensing.	C028894	0	500000	4400000	0	0	4900000
		Buffalo 23kV Reconductor - Kens2	C028903	0	0	500000	4400000	0	4900000
	Capacity Planning Total			1866800	3350000	6373200	5226000	313200	17129200
	SC&P Other	Price Corners Rebuild - Line 804	CD01202	52250	20000	0	0	0	72250
		Kenmore-Winspear 630/631-ref	C050318	0	0	0	40000	300000	340000
		Menands-Liberty 9 Relocation	C033172	75000	400000	150000	0	0	625000
		Wellsville Relief SubT-Line work	C046541	0	0	323000	279000	286000	888000
		LN863 Findley Lake - French Creek e	C046510	0	200000	1110000	213000	0	1523000
		Elm St Relief_23kV Line work	C046546	0	0	0	50000	2410000	2460000
	SC&P Other Total			127250	620000	1583000	582000	2996000	5908250
	Sub-T Automation	WD - Install ScadaMates on the 803	CD00514	100000	0	0	0	0	100000
		WD - Install ScadaMates on the 301	CD00474	188000	0	0	0	0	188000
		WD - Install ScadaMates on 861 Line	CD00516	396000	0	0	0	0	396000
		WD - Install ScadaMates on 218 Line	CD00519	396000	0	0	0	0	396000
		DA - NE SubT Automation Wilton Sub	C035863	0	50000	728450	127500	0	905950
		DA-NY SubT Automation Place Holder	C036661	50000	500000	500000	2000000	2000000	5050000
	Sub-T Automation Total			1130000	550000	1228450	2127500	2000000	7035950
	Sub-T Line Removal	Beck - Harper L105 Removal	C036195	1000	0	0	0	0	1000
		Gardenville-Blasdell L131/L132 Rem.	C036201	1000	0	0	0	0	1000
		Balstn-Randall-W. Milton 34.5kV rem	C048968	0	1000	0	0	0	1000
		Terminal Sta B - R48, R46, R25 Rem.	C036204	0	0	1000	1000	0	2000
		TSC - Gardenville L92 Removal	C036199	1000	1000	1000	0	0	3000
		Castleton Greenbush Line 5	C036365	11130	0	0.00001	0.00001	0	11130.00002
		Beck - Harper L106 Removal	C036196	1000	0	0	0	0	1000
		Terminal Sta C - C12 & C14 Removal	C036203	1000	1000	0	0	0	2000
	Sub-T Line Removal Total			16130	3000	2000.00001	1000.00001	0	22130.00002
	Reliability	W.Ashville substation TxD LN863 tap	C048152	32000	212500	0	0	0	244500
	Reliability Total			32000	212500	0	0	0	244500
System Capacity & Performance Total				3823180	5396500	9857650	8617500	6000200	33695030

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
Customer & Public Requirement	Blanket	NY Central Sub T Line Third Party	CNC0078	10000	10000	10000	10000	10000	50000
		NY West Sub T Line Third Party	CNW0078	10000	10000	10000	10000	10000	50000
		NY East Sub T Line Third Party	CNE0078	15000	15000	15000	15000	15000	75000
		CNY Sub Trans-Line Public Require	CNC0072	21000	22000	23000	24000	25000	115000
		ENY Sub Trans-Line Public Require	CNE0072	21000	22000	23000	24000	25000	115000
		WNY Sub Trans-Line New Business	CNW0071	63000	66000	69000	72000	75000	345000
		WNY Sub Trans-Line Public Require	CNW0072	63000	66000	69000	72000	75000	345000
		CNY Sub Trans-Line New Business	CNC0071	84000	88000	92000	96000	100000	460000
		ENY Sub Trans-Line New Business	CNE0071	94000	98000	102000	107000	112000	513000
	Blanket Total			381000	397000	413000	430000	447000	2068000
	New Business	Harbor Center - 23kV, 6E, 10E & 23E	C049837	122000	0	0	0	0	122000
		Buffalo Life Science Center	C050237	221000	0	0	0	0	221000
		East - West Medical Corridor Cable	CD00823	616000	0	0	0	0	616000
		TxD RESERVE for New Business Commer	C046913	600000	1100000	1050000	1100000	1150000	5000000
	New Business Total			1559000	1100000	1050000	1100000	1150000	5959000
	Public Requirements	DOT NYRt28 in State Forest Preserve	C034704	40800	80750				121550
		Karner - Patroon #5 - Duravent Tap	C047003	145000	0	0	0	0	145000
		Storm Budgetary Res. (line)- NMPC	C040891	200000	200000	200000	200000	200000	1000000
		DOTR NYSRt28 White Lk-McKeever SubT	C034722	0	46750	94350	1597150		1738250
	Public Requirements Total			385800	327500	294350	1797150	200000	3004800
	S or R Other	Waterfront School - 2nd 23kV Cable	CD01017	850	0	0	0	0	850
		Mortimer-Solvay 5-69kV -remove	C049335	1000	0	0	0	0	1000
	S or R Other Total			1850	0	0	0	0	1850
	Sub-T Tower	IE - NW SubT Towers	C031855	200000	0	0	0	0	200000
		IE - NC SubT Towers	C031853	234837.3708	250000	250000	0	0	734837.3708
	Sub-T Tower Total			434837.3708	250000	250000	0	0	934837.3708
Customer & Public Requirement Total				2762487.371	2074500	2007350	3327150	1797000	11968487.37
Grand Total				32774999.7	32750000.5	36575000	40400000	42000000	184506000.2

Exhibit 3 - 2014 Distribution Capital Investment Plan

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
Asset Condition	AC Other	Syr_Connective Corridor_Ductline	C045334	0	1178000	0	0	0	1178000
		Buffalo Station 14 - 25 Cycle Feede	C046616	0	0	1000	1000	0	2000
		Bufalo Station 17 - 25 Cycle Feeder	C046617	0	0	0	1000	1000	2000
		Buffalo Station 20 - 25 Cycle Feede	C046618	0	0	0	1000	1000	2000
		Buffalo Station 72 - 25 Cycle Feede	C046619	0	0	0	1000	1000	2000
		Station 06 - 25 Cycle Feeder Remova	C046622	0	1000	1000	0	0	2000
		Station 05 - 25 Cycle Feeder 0528 R	C046623	0	1000	1000	0	0	2000
		Station 01 - Remove 25 Cycle Feeder	C046624	0	1000	1000	0	0	2000
		Station 08 - 25 Cycle Feeder Remova	C046625	0	0	1000	1000	0	2000
		NY Abandoned Oil-filled Equip Remov	C051714	1000	1000	1000	1000	1000	5000
		Buffalo Station # 138 ¿ Retirement	C046833	0	24000	0	0	0	24000
		F22653 Relocate Primary	C048618	34000	0	0	0	0	34000
		Orangeville Substation - Upgrade By	CD00703	36000	0	0	0	0	36000
		Station 36 Voltage Reduction Replac	C049677	46112.5	0	0	0	0	46112.5
		Delmar Distribution Removal	C050241	16000	64000	0	0	0	80000
		Grand St. 51 - Route 7 Gap Closing	CD00374	80000	0	0	0	0	80000
		Station 66 (Union Rd) Rebuild - DLi	CD00685	80000	0	0	0	0	80000
		Caledonia Substation 44 - Line Rela	C052444	0	30000	55000			85000
		Crown Point 51 - White Church Road	C048867	93500	0	0	0	0	93500
		Reservoir Staiton - Bank Replacemen	CD01122	0	58000	36000	0	0	94000
		NR-T.I.81452-County Route 100-Overl	CD01132	127500	0	0	0	0	127500
		NR-Fine 97866-NYS Hwy 3-Rolcation	C049754	131750	0	0	0	0	131750
		Middleburgh 51 - West Fulton Rd.	C046408	148750	0	0	0	0	148750
		Carthage Reploace Struct Footings	C036183	154050	0	0	0	0	154050
		*NR-81452-Jolly Island Grp-Upgrade	C049780	80516	80516	0	0	0	161032
		Castleton Line Work	C036323	182750	0	0	0	0	182750
		Minoa Upgrade Station Regulator	C046806	0	225000	0	0	0	225000
		Burgoyne 51 - Rebuild Durkeetown Rd	CD00222	247000	0	0	0	0	247000
		NY GE Butyl Rubber PT Replacement	C051745	50000	50000	50000	50000	50000	250000
		Western New York - Metering Upgrade	C046515	0	0	10000	125000	125000	260000
		*NR-Westville 88561-Donovan Rd	C010695	276250	0	0	0	0	276250
		Buffalo Station 42 Rebuild - D Line	C046859	20000	127000	111000	30000	0	288000
		Saratoga Springs Substation - Repla	CD01054	0	0	0	0	450000	450000
		*NR-81452-Lake of the Isles-Upgrade	C049782	17000	457300	0	0	0	474300
		NR_Dexter_72661-NYS Route 3-FdrTie	CD01186	243100	242250	0	0	0	485350
		Maple Ave Feeder Getaways	C046479	0	20000	480000	0	0	500000
		Karner 31718 new tie with Patroon	C049984	144354	122275	122275	122275	0	511179
		Karner 31717 Feeder Convertion	C049980	164123	127652	127652	127652	0	547079
		NR-E Watertown 81758-Spring ValleyD	CD01300	30600	237150	280500	0	0	548250
		MV- Poland 62258 Route 8 Reconducto	C046606	62000	1073158	1344656	620000	0	3099814
			CD00883	585000	0	0	0	0	585000
		Canajoharie 03122 - Rebuild Rt 162	C000329	30000	565000	0	0	0	595000
		Karner ties-Reconduct Sections	C049989	184490	143492	143492	143492	0	614966
		Karner 31715 Feeder Convertion	C049964	209017	162569	162569	162569	0	696724
		Delanson 51 - Route 7 Rebuild/Conve	C046424	722500	0	0	0	0	722500
		Karner 31707 Feeder Convertion	C049958	233282	181442	181442	181442	0	777608
		MV-Poland 62258 Route 8 Reconducto	CD00885	778500	0	0	0	0	778500
		Middleburgh 51 - Route 145 Extend/C	CD01010	50000	757500	0	0	0	807500
		Whitehall 51 Conversion	CD00831	840000	0	0	0	0	840000
		Karner 31716 Feeder Convertion	C049979	254072	197612	197612	197612	0	846908
		Buffalo Station 122 Rebuild - Line	CD00779	64000	470400	274400	39200	0	848000
		NR-Bremen 81556-Kirchnerville Rd_St	C046689	963900	0	0	0	0	963900
		State St Feeder Convension	C050697	0	50000	525000	625000	0	1200000
		New Harper Substation D Line	C046417	84000	460000	696000	0	0	1240000
		Karner - Station Ties Getaway Work	C049982	401650	312394	312394	312394	0	1338832
		MV-Poland 62258 Route 8 Reconductor	C046605	50000	1577000	0	0	0	1627000
		MOD Switch "Whip Design" ARP	C051948	280500	683400	772650	0	0	1736550
		Buffalo Station 42 Rebuild - D Stat	C046854	50000	650000	1224000	594000	0	2518000
		New Maple Ave Substation	C046478	190000	1940000	1940000	40000	0	4110000
		Buffalo Station 122 Rebuild - Sub	CD00782	50000	1455300	4081770	12870	0	5599940
		Buffalo Station 12 - 25 Cycle Retir	CD00969	1000	0	0	1000	0	2000
		Buffalo Station 14 - 25 Cycle Retir	CD00974	1000	0	0	1000	0	2000
	AC Other Total			8489266.5	13726410	13134412	3391506	629000	39370594.5
	Arc Flash Mediation	NY West Div Arc Flash 480V Spot NW	C047461	1333333	1333333	1333333	701333	0	4701332
		Arc Flash NY East Div 480V Spot NW	C047464	1333333	1333333	1333333	701333		4701332
		Arc Flash Mediation - 480V spot net	CD01278	1333333	1333333	1333333	701333	0	4701332
	Arc Flash Mediation Total			3999999	3999999	3999999	2103999	0	14103996
	Blanket	Cent NY-Dist-Asset Replace Blanket	CNC0017	1117000	1134000	1151000	1168000	1186000	5756000
		East NY-Dist-Asset Replace Blanket	CNE0017	1827000	1854000	1882000	1910000	1939000	9412000
		West NY-Dist-Asset Replace Blanket	CNW0017	2335000	2370000	2406000	2442000	2479000	12032000
	Blanket Total			5279000	5358000	5439000	5520000	5604000	27200000
	Buffalo Street Light	Buffalo Street Light Cable Replacem	CD00851	2440000	2440000	2440000	2440000	2500000	12260000
	Buffalo Street Light Total			2440000	2440000	2440000	2440000	2500000	12260000
	Cable Replacement	Schroon 51 - Submarine Cable Repair	C050333	85000	0	0	0	0	85000
		Buffalo- Recond Sta 22 4 kV Getaway	CD00472	161453.11	0	0	0	0	161453.11
		*NR-81452-Head Island Rd-Upgrade	C049785	197200	0	0	0	0	197200
		Henry St 36 - River Crossing	C029432	395250	0	0	0	0	395250
		UG Cable Repl Temple Street Fdr 243	CD00914	560000	0	0	0	0	560000
		Hague Rd 53 - Submarine Cable.	C050522	637500	0	0	0	0	637500
		Riverside 28855 UG Cable Replacemen	C036468	1974000	0	0	0	0	1974000
		IE-NC Cable Replacements	C013822	1250000	1250000	0	0	0	2500000
		Network Secondary Cable Replacement	C052903	3000000	3000000	2000000	2000000	1000000	11000000
			C052923	1000000	1000000	1000000	1000000	1000000	5000000
			C052924	1000000	1000000	2000000	2000000	3000000	9000000
	Cable Replacement Total			10260403.11	6250000	5000000	5000000	5000000	31510403.11
	Conductor Replacement	STA197 - 19752 small wires recondu	C046389	2000	0	0	0	0	2000
		SW - Replace Steel Conductor on Cub	CD00593	151200	0	0	0	0	151200

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		*NR-N Gouverneur 98352-Lead Mine Rd	C049635	170000	0	0	0	0	170000
		Schuylerville 11 - Route 32 Rebuild	C048081	340000	0	0	0	0	340000
		*Rome 76254-HWY 49 Reconductor	C050005	19000	356000	0	0	0	375000
		F1662 Reconductor Rt 20 Broadway	C048615	426700	0	0	0	0	426700
		IE - NE Replace open wire primary	C031860	0	1391000	1432000	1475000	1519000	5817000
		IE - NC Replace open wire primary	C031861	0	1391000	1432000	1475000	1519000	5817000
		IE - NW Replace open wire primary	C031862	0	1391000	1432000	1475000	1519000	5817000
	Conductor Replacement Total			1108900	4529000	4296000	4425000	4557000	18915900
	Inspection & Maintenance	I&M - NC D-Line UG Work From Insp	C026163	565080	565080	565080	565080	565080	2825400
		I&M - NE D-Line UG Work From Insp	C026162	952880	952880	952880	952880	952880	4764400
		I&M - NW D-Line UG Work From Insp	C026164	1049950	1049950	1049950	1049950	1049950	5249750
		I&M - NC D-Line OH Work From Insp	C026160	5522380	5522380	5522380	5522380	2408525.67	24498045.67
		I&M - NE D-Line OH Work From Insp	C026159	8652215	5833500	5833500	5833500	5833500	31986215
		I&M - NW D-Line OH Work From Insp	C026161	8687000	7920000	7920000	7920000	7920000	40367000
	Inspection & Maintenance Total			25429505	21843790	21843790	21843790	18729935.67	109690810.7
	Substation Battery and Related	Batts/Charg--NY East	C032012	300000	300000	300000	300000	300000	1500000
		Batts/Charg- NY Central	C032013	300000	300000	300000	300000	300000	1500000
		Batts/Charg- NY West	C032014	300000	300000	300000	300000	300000	1500000
	Substation Battery and Related Total			900000	900000	900000	900000	900000	4500000
	Substation Breaker	Peat St - replace R825 OCB	C049550	0	35000	315000	0	0	350000
		NY Oil Circuit Breaker Replacements	C037883	0	646000	412500	0	0	1058500
		NC ARP Breakers & Reclosers	C032253	350000	350000	350000	350000	350000	1750000
		NE ARP Breakers & Reclosers	C032252	687000	572000	522000	522000	522000	2825000
		NW ARP Breakers & Reclosers	C032261	587000	572000	622000	522000	522000	2825000
	Substation Breaker Total			1624000	2175000	2221500	1394000	1394000	8808500
	Substation Circuit Switcher	Circuit Switcher Strategy Co:36 DxT	C018850	300000	600000	2000000	2000000	0	4900000
	Substation Circuit Switcher Total			300000	600000	2000000	2000000	0	4900000
	Substation Indoor	Buffalo Station 53 Rebuild - Line	C046929	0	0	0	0	30000	30000
		Removal of Brighton Ave 4 kV Sub	CD00886	10000	10000	10000	0	0	30000
		Buffalo Station 32 Rebuild - Sta	C036459	0	0	0	0	50000	50000
		Buffalo Station 27 Rebuild - Line	C033476	79900	0	0	0	0	79900
		Buffalo Station 30 Rebuild - Sta	C046519	0	0	0	0	90000	90000
		Buffalo Station 29 Rebuild - Fdrs	C006723	127800	53250	0	0	0	181050
		Buffalo Station 59 Rebuild - Line	C033478	0	21000	250000	250000	0	521000
		Buffalo Station 30 - Rebuild - Fdrs	C015754	0	0	0	30000	638000	668000
		Welch 83 - Indoor Substation Refurb	C046584	0	112000	280000	528000	0	920000
		Eighth St 80 - Indoor Substation Re	C046585	0	0	23000	925000	75000	1023000
			C046586	0	30000	312000	220000	358000	920000
		Buffalo Station 41 Rebuild - Line	C046938	0	0	30000	638000	425000	1093000
		Buffalo Station 25 Rebuild - Line	C036458	0	30000	638000	425000	85000	1178000
		Buffalo Station 34 Rebuild - Line	C046932	0	30000	638000	425000	85000	1178000
		Buffalo Station 37 Rebuild - Line	C033477		40000	1058200	90950	0	1189150
		Buffalo Station 41 Rebuild - Sub	C046956	0	0	0	90000	1258000	1348000
		Buffalo Station 31 Rebuild - Sub	C046952	0	0	0	1614000	50000	1664000
		Welch 83 Indoor Substation Refurbis	C046583	0	245000	1100000	640000	0	1985000
		Stephenson 85 - Indoor Substation R	C046580	48000	960000	1272000	0	0	2280000
			C046581	45000	1300000	700000	0	0	2045000
		Buffalo Station 27 Rebuild - Sta	C033473	2086000	0	0	0	0	2086000
		Rock Cut #286 2nd Tranf and Metalc	CD00882	2616000	661000	0	0	0	3277000
		Buffalo Indoor Sub. #29 Refurb.	C006722	2958120	616770	0	0	0	3574890
		Buffalo Station 25 Rebuild - Sta	C036456	0	0	90000	1258000	3952000	5300000
		Buffalo Station 34 Rebuild - Sub	C046953	0	60000	90000	1258000	3952000	5360000
		Buffalo Station 37 Rebuild - Sub	C033474	400000	1008000	4017000	535000	0	5960000
		Buffalo Station 59 Rebuild - Sub	C033475	62000	500000	4031000	1962000	62000	6617000
	Substation Indoor Total			8432820	5677020	14539200	10888950	11110000	50647990
	Substation Metal-Clad Switchgear	Market Hill substation retirement	C046367	0	0	0	1000	0	1000
		Whitesboro 632 - Replace Metalclad	C046742	0	0	0	10000	0	10000
		Chrisler Metal Clad Replacement	C036213	0	10000	10000	0	0	20000
		Conkling 652 - Replace Metalclad Ge	C046743	0	0	0	0	327000	327000
		Johnson Rd - Replace Metalclad Gear	C046747	0	0	0	0	327000	327000
		Pinebush - Replace Metalclad Gear	C046744	0	0	0	327000	1218000	1545000
		Emmet St - Repl TB1 and mclad	C017952	8500	285600	1108400	512550	0	1915050
		Union St 376 - Replace Metalclad Ge	C046745	0	327000	1218000	516000	0	2061000
		Station 61 - Metalclad Replacement	C051707	0	0	327000	1218000	561000	2106000
		Station 162 - Metalclad Replacement	C052706	20000	327000	1218000	561000	0	2126000
		Hopkins 253 - Replace Metalclad Gea	C046741	50000	300000	2800000	1716000	0	4866000
		NY Metalclad Switchgear Replacement	C051713	0	0	981000	4635000	5664000	11280000
	Substation Metal-Clad Switchgear Total			78500	1249600	7662400	9496550	8097000	26584050
	Substation Mobile	Mobile Substation 4E - Refurbish an	C046667	0	0	0	560	0	560
		Mobile 8C Upgrade	C051743	0	520000	0	0	0	520000
		Mobile Substation 7C - Refurbish an	C046673	560000	0	0	0	0	560000
		Mobile Substation 6E - Rewind	C046668	0	0	0	560000	200000	760000
		Mobile Substation 2E - Replacement	C046666	10000	719000	690000	0	0	1419000
		NY Mobile Substation Program	C051744	0	560000	1779000	1542000	823000	4704000
	Substation Mobile Total			570000	1799000	2469000	2102560	1023000	7963560
	Substation Power Transformer	State St 954 Station Retirement	C050640	0	0	0	0	1000	1000
		Indian Lake Feeder Conversion	C050246	267750	0	0	0	0	267750
		Fisher Ave Replace 34/13kV Trans	C036101	480000	0	0	0	0	480000
		Indian Lake - Replace Transformers	C046672	386280	137344	0	0	0	523624
		Peterboro TRF #2 damage/failure	C051785	600000					600000
		Rock City Station 623 - Transformer	C046671	0	0	377000	412000	0	789000
		Collins Station - Replace Transform	C046602	722000	200000	0	0	0	922000
		Galeville Station Rebuild	C050746	0	0	50000	420000	600000	1070000
		Hancock#137 Station conversion	C050521	50000	800000	350000	0	0	1200000
		Liberty Street Station 94-Replace T	C046676	1007000	242000	0	0	0	1249000
		NY xfrmr Replacement DxT	C034585	0	350000	350000	350000	350000	1400000
		IE - NY ARP Transformers	C025801	0	0	0	550000	950000	1500000
		Hancock 13773 and 13772 Conversion	C050606	55000	778500	722800	0	0	1556300
		Galeville 71,72&73 fdrs conversion	C050749	0	0	50000	849000	849000	1748000
		Cuyler#24 Inst 34/4kV MITS	C036102	50000	800000	950000	0	0	1800000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Grooms Rd Transformer Replacement	C051706	50000	1250000	850000	0	0	2150000
		Station 124 - Almeda Ave Transforme	C046670	10000	242000	2585000	354000	0	3191000
	Substation Power Transformer Total			3678030	4799844	6284800	2935000	2750000	20447674
	Substation RTU	NY RTU Program - DxT Subs	C022151	250000	0	0	0	0	250000
	Substation RTU Total			250000	0	0	0	0	250000
	TBD	Reserve for Asset Replacement Unide	C046917	-6074314	-3511126	5032000	12723790	17863973	26034323
			C046947	-3643035	-3964093	-18538804	-12957341	-5120835	-44224108
	TBD Total			-9717349	-7475219	-13506804	-233551	12743138	-18189785
	Pilot Wire	Partridge St.-Riverside-Repl PW	C036007	167602.677	0	0	0	0	167602.677
		Weaver St. - Emmet -Repl Pilot Wire	C036009	203661	0	0	0	0	203661
	Pilot Wire Total			371263.677	0	0	0	0	371263.677
	UG Structures and Equipment	CR_Syracuse_West St_MH 2-5_U_051_Co	CD00489	80000	0	0	0	0	80000
	UG Structures and Equipment Total			80000	0	0	0	0	80000
	Regulatory Feeder Improvements	Schuylerville 11 - Casey Rd Rebuild	C048066	110500	0	0	0	0	110500
	Regulatory Feeder Improvements Total			110500	0	0	0	0	110500
	Network	Norton Street UG Civil Rebuild	C050138	424000	0	0	0	0	424000
	Network Total			424000	0	0	0	0	424000
Asset Condition Total				64108838.29	67872444	78723297	74207804	75037073.67	359949457
Damage/Failure	Blanket	Cent NY-Dist-Subs Blanket	CNC0002	152000	154000	156000	158000	160000	780000
		East NY-Dist-Subs Blanket	CNE0002	812000	824000	836000	849000	862000	4183000
		West NY-Dist-Subs Blanket	CNW0002	1015000	1030000	1045000	1061000	1077000	5228000
		West NY-Dist-Damage/Failure Blanket	CNW0014	4771000	4843000	4916000	4990000	5065000	24585000
		Cent NY-Dist-Damage/Failure Blanket	CNC0014	5177000	5255000	5334000	5414000	5495000	26675000
		East NY-Dist-Damage/Failure Blanket	CNE0014	5481000	5563000	5646000	5731000	5817000	28238000
	Blanket Total			17408000	17669000	17933000	18203000	18476000	89689000
	D/F Other	Balmat 23kV switch replacement	C048103	10200	0	0	0	0	10200
		Florida Substation Distribution Fee	CD01172	960000	0	0	0	0	960000
		New Florida Substation	CD01168	1500000	0	0	0	0	1500000
	D/F Other Total			2470200	0	0	0	0	2470200
	Major Storms	Storm Damage-Dist-Cent Div	C012965	89675.86207	89675.86207	44837.93103	44837.93103	0	269027.5862
		Storm Damage - Dist - Western Div	C000056	178551.0468	178551.0468	133713.1158	133713.1158		624528.3251
		Storm Damage Distribution East Div.	C000328	450000	450000	450000	450000	0	1800000
	Major Storms Total			718226.9089	718226.9089	628551.0468	628551.0468	0	2693555.911
	TBD	Reserve for Damage/Failure Unidenti	C046918	1000000	2000000	2100000	2200000	2300000	9600000
			C046948	900000	2754000	2800000	2850000	2900000	12204000
	TBD Total			1900000	4754000	4900000	5050000	5200000	21804000
	Relay Replacements	Temple D/F Cable 9 & 11 Relays	C048960	10000	0	0	0	0	10000
	Relay Replacements Total			10000	0	0	0	0	10000
Damage/Failure Total				22506426.91	23141226.91	23461551.05	23881551.05	23676000	116666755.9
Non-Infrastructure	Blanket	Cent NY-Dist-Telecomm Blanket	CNC0021	1000	1000	1000	1000	1000	5000
		East NY-Dist-Telecomm Blanket	CNE0021	1000	1000	1000	1000	1000	5000
		West NY-Dist-Telecomm Blanket	CNW0021	1000	1000	1000	1000	1000	5000
		East NY-Genl Equip Budgetary Reserv	CNE0070	609000	618000	627000	636000	646000	3136000
		West NY-General-Genl Equip Blanket	CNW0070	711000	722000	733000	744000	755000	3665000
		Cent NY-General-Genl Equip Blanket	CNC0070	914000	928000	942000	956000	970000	4710000
		Telecom and Radio Equipment	C004157	995000	995000	995000	995000	995000	4975000
	Blanket Total			3232000	3266000	3300000	3334000	3369000	16501000
Non-Infrastructure Total				3232000	3266000	3300000	3334000	3369000	16501000
System Capacity & Performance	AC Other	Tonawanda - F7128 Removal	C036206	0	0	1000	1000	0	2000
		F22653 PIW Dorsch Rd Relocate Pri	C049017	85000	0	0	0	0	85000
		Brook Road 55 - Barney Rd. Rebuild	C047978	127500	0	0	0	0	127500
		Butler 53 - Build 36253 feeder - OH	C047455	212500	0	0	0	0	212500
	AC Other Total			425000	0	1000	1000	0	427000
	Blanket	East NY-Dist-Load Relief Blanket	CNE0016	451000	462000	474000	486000	498000	2371000
		Cent NY-Dist-Load Relief Blanket	CNC0016	523000	536000	549000	563000	577000	2748000
		West NY-Dist-Load Relief Blanket	CNW0016	846000	884000	924000	966000	1009000	4629000
		East NY-Dist-Reliability Blanket	CNE0015	1117000	1134000	1151000	1168000	1186000	5756000
		Cent NY-Dist-Reliability Blanket	CNC0015	1218000	1236000	1255000	1274000	1293000	6276000
		West NY-Dist-Reliability Blanket	CNW0015	1320000	1340000	1360000	1380000	1401000	6801000
	Blanket Total			5475000	5592000	5713000	5837000	5964000	28581000
	Capacity Planning	Reserve for Load Relief Unidentifie	C046919	-13965955	-13372000	15016910	21260101	32330927	41284983
			C046949	-3964035	-5000000	-18500000	-8000000	7000000	-28464035
		Mexico Substation Demo	C046629	0	0	1000	0	0	1000
		East Fulton demo	C046630	0	0	1000	0	0	1000
		Camillus Dsub	C046637	0	0	1000	0	0	1000
		Hinsdale Dsub	C046638	0	0	1000	0	0	1000
		Van Dyke Station - New 55 Dist Feed	C046489	0	7000	0	0	0	7000
		Retirement of Juniper sub #500	C049685	0	0	5000	16000	0	21000
		8th St Conversion Niagara Falls	C046841	40800	0	0	0	0	40800
		Starr Rd Second Xfrm-13kv Bus Exten	C032368	44000	8000	0	0	0	52000
		Union St 53 - Kenyon Hill Road	C050779	68000	0	0	0	0	68000
		CR- Ash Street 26 State St Reconduc	CD00866	80000	0	0	0	0	80000
		Callanan Tap - Distribution transfe	C046413	85000	0	0	0	0	85000
		Union St 52 - Route 372 Rebuild	C049263	85000	0	0	0	0	85000
		Euclid 26756 Getaway Cable Reconduc	C046771	0	93000	0	0	0	93000
		Pine Grove Transformer 2	C047683	102000	0	0	0	0	102000
		Delameter F9356 Rebuild & Convert 1	C047879	105000	0	0	0		105000
		Union St. 53 - County Hwy 67	C050777	136000	0	0	0	0	136000
		Delameter F9356 Rebuild & convert 3	C047882	153000	0	0	0		153000
		Delameter F9356 Rebuild &convert 2	C047880	154000	0	0	0		154000
		PS&I Activity - New York	C008153	52000	52000	52000	0	0	156000
		Butler 53 - Add breaker for 53 ckt	C047481	204425	0	0	0	0	204425
		CR- Reconductor 12861	C048591	221000	0	0	0	0	221000
		*CR - Tully Ctr 53 Woodmancy Rd	C049713	238000	0	0	0	0	238000
		Mayfield 51 - Paradise Point Rd	C050069	267750	0	0	0	0	267750
		Delameter F9356 Eden ctr make ready	C047884	276250	0	0	0		276250
		Shawnee Road 76 (DLine)	CD00967		32000	242550	9350		283900
		Genesee North 34.5kV Relief	C046708	0	0	0	65000	242000	307000
		CR- 23553 Cedarvale ratio relief	C051803	310250	0	0	0	0	310250
		Malone new feeder 89554 (Station wo	C046631	311950	0	0	0	0	311950

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Buffalo Station 57 - F5768 Reconduc	C046557	318750	0	0	0	0	318750
		*CR- Cuyler-Delphi Feeder Tie	C049740	318750	0	0	0	0	318750
		CR- G.C. 29351 Conversion south	C049500	340000	0	0	0	0	340000
		Albion Station Install a 34.5kV cap	CD01016	349248	0	0	0	0	349248
		Lockport Road 216 - Install TB#2 -	CD01252	80000	30000	50000	200000	0	360000
		Center St 54 - Mill Point Rd	C049788	382500	0	0	0	0	382500
		Gilbert Mills Xfmr Upgrade-Xfmr	C046563	50000	350000	0	0	0	400000
		Buffalo Station 129 - F12974 Recond	C046558	410550	0	0	0	0	410550
		Bolton 51 - Trout Lake Rd 3 Phase	C049560	425000	0	0	0	0	425000
		Raquette Lake Transformer Upgrade	CD01139		8500	389300	63750	0	461550
		Van Dyke Station-New 54 Dist Feed.	C046495	0	280000	210000	0	0	490000
		Little River new 95555 feeder	C050922	0			175000	325000	500000
		Wellsville Relief substation work	C046535	0	0	0	280000	242000	522000
		Welch Ave Conversion Load Relief	C046842	28000	518700	0	0	0	546700
		North Creek 52 - Peaceful Valley Rd	C049622	573750	0	0	0	0	573750
		Long Road 209 - Install TB2	CD00977	0	24000	16000	294400	240800	575200
		Beech Ave Conversion Niagara Falls	C032751	578850	0	0	0	0	578850
		CR- Convert 29351 north of station	C049397	595000	0	0	0	0	595000
		CR- S.C. 6651 Convert CR 13	C049498	595000	0	0	0	0	595000
		Reconductor 5552 tie to 5262	C048837	602000	0	0	0	0	602000
		Wellsville Relief D-Line work	C046540	0	0	220000	190000	195000	605000
		Terminal Station: Install Reactors	C046613	0	0	0	605200	0	605200
		S.Philadelphia Transformer Upgrade	CD01293	399500	235450	0	0	0	634950
		Lockport Road 216 - Install TB#2	C036057	17000	127500	127500	365500		637500
		Buffalo Station 77 - Add TB3 (DxD L	C046524	52000	212000	323000	56000	0	643000
		Baker St - Install 2nd xfmr	C046553	0	0	0	127000	549000	676000
		Malone new 89554 feeder (Line work	C046626	682550	0	0	0	0	682550
		McCrea Station - New station - Geta	C046791	50000	221000	390000	61000	0	722000
		CR_Hopkins Rd-25355-Upgrade	C049714	400000	340000	0	0	0	740000
		CR_Hopkins Rd 25357-Upgrade	C049716	400000	340000	0	0	0	740000
		Van Dyke Subst- new feeders	C016087	420000	322000	0	0	0	742000
		Fairdale DLine	C046633	0	0	187500	450000	112500	750000
		North Bangor Conversion (D-Line)	C046418	751400	0	0	0	0	751400
		Van Dyke Subst- New 57 Dist Feeder	C046488	343000	420000	0	0	0	763000
		New Haven xfmr upgrade-Dline	C046635	85000	685950	0	0	0	770950
		Stoner 52 - Mohawk Dr Conversion	C050421	786250	0	0	0	0	786250
		Mumford #50 - TB2 - Install New Fdr	C046589	0	0	420000	220000	160000	800000
		Center St 52 - Route 5 Rebuild/Conv	C048833	807500	0	0	0	0	807500
		Buffalo Station 56 - New F5664	C046530	0	0	54000	773000	0	827000
		Ohio Street Conduit Bank - South	C050404	841500	0	0	0	0	841500
		New Wetzel Rd. Substation	C028831	888520	0	0	0	0	888520
		East Malloy- feeders and getaways	CD01279		30000	380000	380000	100000	890000
		Van Dyke Station - New 53 Dist Feed	C046493	0	893000	0	0	0	893000
		Syracuse UG Study	C046527	0	300000	200000	200000	200000	900000
		S.Livingston relief: Fd3 work	C051690	40912	0	305942	308942	266000	921796
		N Syracuse Sub Getaways	C030506	969000	0	0	0	0	969000
		New Haven xfmr upgrade-Buswork	C046634	0	48450	627300	301750	0	977500
		Attica Station transformer upgrade	C046611	920550	84150	0	0	0	1004700
		Eden Switch Structure- New Fdr 1	C048015	16000	323000	331000	340000	0	1010000
		Eden Switch Structure- New fdr# 2	C048016	16000	323000	331000	340000	0	1010000
		S.Livingston relief: F5 work	c051692	40912	0	466397	514903		1022212
		Paloma Feeder Getaway	C032498	955000	95000	0	0	0	1050000
		S.Livingston relief: Fd4 work	c051691	61788	60000	308942	358942	266000	1055672
		Fly Rd. Transformer Addition	C036189	0	10000	480000	470000	120000	1080000
		West Sweden - Install New Station	C046593	0	0	0	122000	972000	1094000
		Delameter F9356-express& rebuild	C047877	34333.33333	264333.3333	627666.6667	184000	0	1110333.333
		Delameter new F9355 - express	C047885	34333.33333	264333.3333	627666.6667	184000	0	1110333.333
		Delameter F9352 reconfigured layout	C047886	34333.33333	264333.3333	627666.6667	184000	0	1110333.333
		Frankhauser New Station - T Sub Wor	C036520	1174000	0	0	0	0	1174000
		Teal Substation Rebuild-Feeders	C046505	0	72000	660000	360000	120000	1212000
		Butler 53 - Build 36253 feeder - UG	C028878	672800	540000	0	0	0	1212800
		North Bangor new 34.5/13.2kV Statio	C046423	0	60000	425000	730000	0	1215000
		West Hamlin #82 - Install Transform	CD01089	161500	866745	192397.5	0	0	1220642.5
		Milton Ave 2nd Switchgear	C046609	120000	820000	290000	0	0	1230000
		Randall Rd - New station - Dist get	CD00897	30000	75000	1000000	140000	5000	1232000
		South Livingston relief - DLine Fdr	C046552	40912	318942	736416	736416	556397	2389083
			C046759	61788	308942	308942	266000	288942	1234614
		S.Livingston rSlief: Dist Fder Work	c051694	40912	60000	308942	466397	358942	1235193
		Queensbury Station - Reroute getawa	CD00895	680000	600000	0	0	0	1280000
		N.Lakeville new 115 - 13.2kV Dist	C051585	54576	80227	467034	685611	0	1287448
		West Sweden -New Sta - Install Fdrs	C046591	0	0	0	100000	1233000	1333000
		Bflo Sta 139 - Replace Transformers	C036639	0	0	0	53000	1291000	1344000
		New Haven Xfmr Upgrade-Xmfr	C046562	0	40800	866150	441150	0	1348100
		Sawyer - two new additional 23kV Ca	C046523	0	0	0	637000	731000	1368000
		Long Rd 209 - New F20955	CD00964	0	51850	755650	620500	0	1428000
		Van Dyke - UG - Civil & Elec work	C052098	0	1491000	0	0	0	1491000
		Fairdale Dsub	C046640	0	0	50000	944400	586100	1580500
		Whitaker 2nd Transformer	C046592	0	50000	385560	925344	231336	1592240
		Station 214 - New F21466/67	C029187	50000	1572000	0	0	0	1622000
		Fly Rd Feeder Work	C046594	0	570000	340000	700000	70000	1680000
		Van Dyke Station - New 56 Dist Feed	C046487	700000	987000	0	0	0	1687000
		Wilson 93 Load Relief - Replace TB1	C035743	20000	1470500	204000	0	0	1694500
		*Randall Rd 46357 Rebuild & Conv	C049883	100000	1605000	0	0	0	1705000
		Paloma new switchgear	CD01190	782500	927500	0	0	0	1710000
		Milton Ave DLine	C046643	470000	1150000	300000	0	0	1920000
		Station 214 - Install TB2	C029186	0	100000	400000	1400000	100000	2000000
		Sodeman Rd Station - new station -	C046798	500000	1500000	0	0	0	2000000
		Buffalo Station 77 - Add TB3 (DxD S	C046531	0	38000	106000	1317000	552000	2013000
		New Dist Sub -Tonawanda NYW DLine	C051265	100000	800000	1000000	130000	0	2030000
		Whitaker Dsub	C046636	0	50000	532440	1277856	289464	2149760

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Paloma Second Transformer	C032495	1136850	1046250	0	0	0	2183100
		Frankhauser-115-13.2KV- Bus & Bkrs	C028931	2220000	28000	0	0	0	2248000
		Fly Rd Low side substation equipmen	C046722	0	10000	1140000	1100000	0	2250000
		New Dist Sub - Tonawanda NYW DSub	C051266	50000	400000	1500000	300000	0	2250000
		West Hamlin #82 - New TB2 - Install	CD01090	30000	1115000	1115000	0	0	2260000
		New Cicero Substation Dline	C046476	0	30000	688000	1459000	100000	2277000
		Military Road 210 - Install TB#2	C036056	50000	259400	1190000	850000	0	2349400
		Watertown New 115/13.2 kV Substatio	C046610	50000	865450	1084400	500000	0	2499850
			C046627	80750	300000	1831750	1445000	0	3657500
		Harris 54 Relief	C032446	1500000	1140000	0	0	0	2640000
		Milton Ave second transformer	C046642	260000	1730000	680000	0	0	2670000
		East Malloy Second Transformer	C036188	0	50000	936750	1372750	350200	2709700
		McCrea Station - New station - Inst	C046790	50000	410000	1390000	1030000	0	2880000
		Mumford #50 -Install Transformer #2	C046590	0	20000	550000	1100000	1425000	3095000
		DeLaet's Landing DxD	CD00893	750000	1500000	850000	0	0	3100000
		Harris Road Second SWGR	CD01088	2007300	1240550	0	0	0	3247850
		DLine -To expand Rock Cut Sub Retir	CD00881	2400000	960000	0	0	0	3360000
		Shawnee Road 76	C036059	1235050	2217650	0	0		3452700
		Buffalo Sta 56- upgrade 4 Xfmrs	C036502	200000	1440000	1618000	240000	0	3498000
		New Abby Street Substation - DxD Li	C046497	80000	1807000	1552000	400000	0	3839000
		Randall Rd - New station - M/C S/G	CD00896	300000	500000	1500000	1500000	163000	3970000
		Cortland Area Study	C046526	0	100000	900000	2400000	600000	4000000
		Frankhauser New Station - Line Work	C028929	2943384.441	1284572.785	0	0	0	4227957.226
		Delameter Install two 20/26/33MVA	C046536	0	31000	634000	3872000	78000	4615000
		Bridge St. Second Transformer	C036185	0	0	100000	2820000	1805000	4725000
		DaLaet's Landing - Land and Civil	C053137	1750000	2500000	750000			5000000
		Teal Substation Rebuild-Swgr	C046511	0	258050	2838550	1548300	516100	5161000
		Eden switch structure -install 2-10	C046538	199000	424000	3926000	1416000	0	5965000
		New Abby Street Substation - DxD Su	C046496	50000	352000	6071000	114000	0	6587000
		Van Dyke Station - New 115/13.2kV s	C046490	3500000	2950000	575000	0	0	7025000
		New Cicero Substation DSub	C046475	1200000	260000	2396000	3303000	590000	7749000
	Capacity Planning Total			28500537.44	30329128.78	49666322.5	59800562	55361708	223662258.7
	ERR	CR- Delphi 53 Erieville Rd	C049861	15000	0	0	0	0	15000
		Amsterdam 51/53 Widow Susan area	C028835	72900	0	0	0	0	72900
		*St Johnsville 51-Bellinger Rd Ph4	C050381	85000	0	0	0	0	85000
		Port Henry 51 - Rebuild Route 9N fr	CD00326	117250	0	0	0	0	117250
		Florida 51 - Mead Road	C050692	97750	0	0	0	0	97750
		NR_Lyme 73351-Breezy Point Rd-Overl	CD01142	102850	0	0	0	0	102850
		St Johnsville - Sanders Road (ERR)	C029439	10000	95000	0	0	0	105000
		Florida 51 - Fort Hunter Road	C050693	106250	0	0	0	0	106250
		NR_T.I. 81455-Mils Road-Overloaded	CD01135	127500	0	0	0	0	127500
		Center St 54 - Hyney Hill Road Rebu	CD00357	139500	0	0	0	0	139500
		NR_T.I. 81455-Breezey Pines Rd-Over	CD01137	65450	80750	0	0	0	146200
		CR- 6651, Relocte Ballou Rd	C049353	170000	0	0	0	0	170000
		Middleburgh 51 - Relocate Route 30	CD00324	0	199500	0	0	0	199500
		NR-T.I.81452-Grandview Park Rd-Rebu	CD01188	204850	0	0	0	0	204850
		Center St. 54 - Extend 3Ph on State	CD00329	245000	0	0	0	0	245000
		NR-T.I.81452-Cross Island Rd	C022912	361250	0	0	0	0	361250
		NR-Lowville 77354-Otter Creek Road-	CD01223	0	0	57800	378250	0	436050
		NR-Lowville-77354-Burdick Crossing	CD01074	83300	357850	0	0	0	441150
		NR-98454-95554-Co Rt 25-FdrTie	C050518	17000	470050	0	0	0	487050
		NR-Brady 95757-Riverside Dr-FdrTie	CD01191	268600	274550	0	0	0	543150
		*Wilton 52 - Rt 32 3 Phase Ext.	C019570	0	600000	0	0	0	600000
		NR_Lyme 73351_T.I. 81455-NYSHwy12E_	CD01295	340000	280500	0	0	0	620500
		NR-Lowville 77354-Pine Grove Road-F	C046866	0	90100	270300	277100	0	637500
		NR-North Carthage 81652-53 Fdr Tie	C010693	0	41650	358700	244800	0	645150
		*Vail Mills 53 - Union Mills Rd.	C019352	0	800000	0	0	0	800000
		NR-T.I.81458-County Route 7-FdrTie	CD01187	510000	275400	282200	0	0	1067600
		*NR_Hammond 37061_Pleasant Val Rd	C049725	600000	654500	0	0	0	1254500
		ERR Program Placeholder	C046684	0	2000000	7000000	7000000	7000000	23000000
	ERR Total			3739450	6219850	7969000	7900150	7000000	32828450
	Heavily Loaded Transformer	IE - NW Dist Transformer Upgrades	C010967	1057000	1076000	1104000	1133000	1133000	5503000
		IE - NC Dist Transformer Upgrades	C014846	1057000	1076000	1104000	1133000	1133000	5503000
		IE - NE Dist Transformer Upgrades	C015828	1057000	1076000	1104000	1133000	1133000	5503000
	Heavily Loaded Transformer Total			3171000	3228000	3312000	3399000	3399000	16509000
	Overhead Distribution Fusing	IE - NW Side Tap Fusing	C015509	800000	800000	800000	400000	0	2800000
		IE - NE Side Tap Fusing	C015510	800000	800000	800000	400000	0	2800000
		IE - NC Side Tap Fusing	C015511	800000	800000	800000	400000	0	2800000
	Overhead Distribution Fusing Total			2400000	2400000	2400000	1200000	0	8400000
	SC&P Other	F3253 CR40 PIW	C048141	100	0	0	0	0	100
		West Valley 25 Relief	CD00616	800	0	0	0	0	800
		NR-Lowville-SW528 Replacement	CD00959	5000	0	0	0	0	5000
		Sheppard Rd replace regulators	C046419	10000	0	0	0	0	10000
		Orangeville Substation - Modify Reg	CD00833	16000	0	0	0	0	16000
		Steamburg Station Retirement	CD01123	10000	10000	1000	0	0	21000
		BuffaloAlbanyFlyingGroundsSwitchRpl	C033636	30000	0	0	0	0	30000
		*Brook Rd 57 - Braim Rd Conversion	C049791	40000	0	0	0	0	40000
		Reservoir Station - Dline work	CD01200	46750	0	0	0	0	46750
		Starr Road Feeder Work	C046363	50000	2000	0	0	0	52000
		NR-83462-Hoffman Rd-Rebuild	C050198	72250	0	0	0	0	72250
		NR-Riverview 84762-French Rd-Rbld	C050183	74045	0	0	0	0	74045
		Middleport St F7765 - Small wires	C049904	77690	0	0	0		77690
		*Schroon Lake 51-Blue Ridge P60-68	C049721	78000	0	0	0	0	78000
		Middleport St F7765- small wire -2	C049905	80500	0	0	0	0	80500
		Crown Pt. 51 - Creek Rd Gap Closing	C048906	85000	0	0	0	0	85000
		St Johnsville 51 - Bellinger Rd Ph1	C050377	85000	0	0	0	0	85000
		St Johnsville 51 - Bellinger Rd Ph2	C050379	85000	0	0	0	0	85000
		S Lima Rd PIW feeder tie	C047788	88800	0	0	0	0	88800
		Ashley 51 - Baldwin Corners Rd Ph3	CD01117	89250	0	0	0	0	89250
		*Crown Pt. 51 - Breed Hill Rd	C049750	90000	0	0	0	0	90000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		Curry Rd 36556 / Lynn St 32052 - He	CD01218	94350	0	0	0	0	94350
		Buffalo Station 49 - UG Upgrades (D	CD01125	96900	0	0	0	0	96900
		NW Panama Retirement	C032306	0	0	97000	0	0	97000
		F4361 PIW - Littleville Road	C047870	99900	0	0	0	0	99900
		*Burgoyne 51 - County Hwy 41	C049790	5000	95000	0	0	0	100000
		F0153 - Walker Rd PIW	C048179	105080	0	0	0	0	105080
		Butler 52 - Farnan Rd 51 Tie	C050360	106250	0	0	0	0	106250
		Hanson Aggregate Regulators	C046508	112000	0	0	0	0	112000
		F3851 - Bald Hill Rd PIW	C047895	112480	0	0	0	0	112480
		F7863 Carmen Rd PIW	C048146	112480	0	0	0	0	112480
		Milton Ave 58 - Voltage Improvement	CD00091	123250	0	0	0	0	123250
		Schroon Lake 51 - Blue Ridge Rd Ph1	C049457	127500	0	0	0	0	127500
		Middleburgh 51/Schoharie 51 LS	C050764	127500	0	0	0	0	127500
		Starr Rd. Second Xfrm	C032503	139650	7600	0	0	0	147250
		*Trinity 52- Delaware/Park Ave Conv	C049999	0	150000	0	0	0	150000
		F9263 - Phipps Road PIW	C049079	157250	0	0	0	0	157250
		Gasport St F9063 -small wire	C049908	157500	0	0	0	0	157500
		F9263 - Route 31 PIW	C049084	161500	0	0	0	0	161500
		*Grooms Rd 34556 - Rte 146 Reconduc	C050105	0	170000	0	0	0	170000
		CR- 6651 Reconducor Haverster Mill	C049355	175000	0	0	0	0	175000
		F3261 PIW - Pine Hill Rd	C047941	178500	0	0	0	0	178500
		CR- Sandy Creek 51 Wart Rd rebuild	C050679	178500	0	0	0	0	178500
		*Sharon 52 - State Route 145	C049792	10000	170000	0	0	0	180000
		*Middleburgh 51 - Mallon Road	C049758	185000	0	0	0	0	185000
		Brook Road 55/57 - Daniels Rd	C029425	189000	0	0	0	0	189000
		*McClellan 51 - Union ST Conversion	C050085	200000	0	0	0	0	200000
		*Hudson Falls 51 - Convert Broadway	C050023	200000	0	0	0	0	200000
		*NR-Parishville 93961-Relocate Fdr	C049751	208250	0	0	0	0	208250
		*Bethlehem 02155 Glenmont Rd Conv	C049990	11000	200000	0	0	0	211000
		*Eagle Harbor F9263 Tie with F7951	C049688	11000	205000	0	0	0	216000
		*NR-Higley 92451-NYSHwy56_Number9	C046865	219158	0	0	0	0	219158
		*Selkirk 52/ Beth 58-Creble Rd Conv	C050001	0	225000	0	0	0	225000
		*Hoosick 31451 - Conversion	C050082	225000	0	0	0	0	225000
		Groveland St. F4161 - small wire	C049909	226100	0	0	0	0	226100
		CR_Milton Avenue 26657-Overload	C049184	233750	0	0	0	0	233750
		Wolf Rd Feeder Tie (34452/54/57)	C050877	238000	0	0	0	0	238000
		*Rebuild portion of E.Otto F2861	C049718	0	240000	0	0	0	240000
		Pottersville 51 - East Shore Dr	C050682	240000	0	0	0	0	240000
		East Batavia Sta. Install Feeder Po	CD01310	210000	33000	0	0	0	243000
		*Farnan Rd 51 - Bluebird Road	C029431	11900	238000	0	0	0	249900
		*Cedar 51 - Buttermilk Falls Rd	C049764	0	250000	0	0	0	250000
		*Rome 54 - Oswego Rd Reconductoring	C050098	0	262500	0	0	0	262500
		CR Brewton Retire	C010751	0	0	0	0	263450	263450
		Burdeck 26552 - Burnett St Conversi	C046632	267750	0	0	0	0	267750
		Oneida 50153-Arquint Rd-VC	CD01068	267750	0	0	0	0	267750
		*Rome 54 - Hogsback Rd Reconductor	C050097	0	281250	0	0	0	281250
		*Firehouse 44953 - Dunsbach Rd Conv	C049864	0	285000	0	0	0	285000
		Trinity 16452 - Myrtle Ave Conversi	C046427	300000	0	0	0	0	300000
		*Trinity 16458 - McCarty Ave Conv	C050000	0	300000	0	0	0	300000
		*Rome 54-Lauther Rd - Reconductor	C050086	0	300000	0	0	0	300000
		*NR-Hammond 37061-Calaboga Rd	C010688	320616	0	0	0	0	320616
		CR- Pebble Hill Burke Rd Ratio	C051710	323000	0	0	0	0	323000
		*Rbld/Conv to Create tie F7652-7651	C049802	0	325000	0	0	0	325000
		Sycaway 37253 - Brunswick Rd (Rte 2	C046431	340000	0	0	0	0	340000
		*Vail Mills 51 - County Hwy 107	C049793	17500	332500	0	0	0	350000
		*Rosa Rd 57-Balltown Rd Conversion	C050084	18000	332000	0	0	0	350000
		Butler 52 - Convert Route 9	C045495	352750	0	0	0	0	352750
		Ash St. LVAC Network-Armory Square A	CD00820	364800	0	0	0	0	364800
		*Rebuild Darien F1662 Limited Tie	C049634	0	375000	0	0	0	375000
		*Lehigh 51 & 54 Tie Creation	C050004	20000	355000	0	0	0	375000
		*Hudson 08753 - Rte 9G Conversion	C050108	375000	0	0	0	0	375000
		*Rebuild portions of Catt. F1562	C049686	20000	365000	0	0	0	385000
		Military Rd New Feeder (D-Line)	C036566	50000	341000	0	0	0	391000
		*Create Full Tie F9354 to F9353	C049783	400000	0	0	0	0	400000
		*Create Full tie F18251 to F18254	C049882	0	400000	0	0	0	400000
		Radio Upgrade- NY Northeast	C051473	200000	200000	0	0	0	400000
		Bald Radio site-Tower upgrade	C051474	200000	200000	0	0	0	400000
		Midler Station Retirement	C046702	0	0	0	263450	161135	424585
		Schodack fdr rbld -retire castleton	C017957	425000	0	0	0	0	425000
		*NR-Chasm Falls 85251-Pond Rd-Rbld	C049777	216000	216000	0	0	0	432000
		*Middleport F7765 Tie w/Shelby 7656	C049711	0	442000	0	0	0	442000
		*Firehouse Rd Station - New Feeder	C050081	443750	0	0	0	0	443750
		*NR-Higley 92451-Joe Indian Area	C049745	21250	425000	0	0	0	446250
		*Relieve Overloaded Ratio F7652	C049801	450000	0	0	0	0	450000
		*Blue Stores 30352 - Conversion	C050107	23000	427000	0	0	0	450000
		*Menands 10151 / 52 Relocations	C049998	23000	444500	0	0	0	467500
		Grooms Rd 34557 - Saratoga Rd Conve	C046761	480000	0	0	0	0	480000
		Price Corners Rebuild - New Feeder	CD01120	435350	50000	0	0	0	485350
		*Hoosick 31452 Conversion- High St.	C050083	487500	0	0	0	0	487500
		*Pawling Ave Conv (29252/37253)	C050103	0	487500	0	0	0	487500
		*Selkirk 14951 -Thatcher/River Conv	C049985	26000	500000	0	0	0	526000
		Caledonia Substation 44 - Addition	C052446	0	265600	263200			528800
		West Hamlin 82 (DxT-Sub)	C044339	153000	344250	34000	0	0	531250
		F0456/0457 Build feeder tie	C049540	151250	380000	0	0	0	531250
		*E.Golah 5157 Tie w/Lakeville 19752	C049880	0	532000	0	0	0	532000
		*Create Full Tie F15351 to F15352	C049720	0	540000	0	0	0	540000
		*NR-Malone 89551-Railroad St-Ratio	C049763	17000	535500	0	0	0	552500
		*Lehigh 66954 Reconductoring	C050003	28000	534500	0	0	0	562500
		CR- Paloma 55 convert NYS 48	C051832	17000	548250	0	0	0	565250
		*Rbld/Conv F15352 to full tie F6353	C049878	30000	550000	0	0	0	580000

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		*Byron F1863 - Rebuild /Reconductor	C049762	29000	555000	0	0	0	584000
		Bolton 51/Warrensburg 51 Feeder Tie	CD00606	66000	550000	0	0	0	616000
		*Church St 53 - Cnty Hwy 132 Convrt	C049652	0	630000	0	0	0	630000
		*NR-Higley 92451-NYS Hwy 56-FdrTie	C046864	637500	0	0	0	0	637500
		Knapp Rd 22651 Feeder Tie	C026716	641750	0	0	0	0	641750
		Price Corners Rebuild - Upgrade tra	CD01124	643450	0	0	0	0	643450
		*Florida-Stoner Feeder Tie	C050438	0	30000	650000	0	0	680000
		*Salisbury 57 / Middleville 71 Tie	C049966	35000	665000	0	0	0	700000
		Military Road #210 - DxT Substation	C046412	0	393550	321300	0	0	714850
		- Buffalo Station 64 - New F6453	CD00970	723434.4	0	0	0	0	723434.4
		NR_Port Lyden 75563-Moose River Rd	CD01197	255000	11050	252450	259250	0	777750
		*Hague Rd 52 - Convert Route 22	C050717	0	300000	500000	0	0	800000
		*Stoner 52 - Stoner Trail Extension	C050437	0	30000	850000	0	0	880000
		*Turin 65355 & 56 Tie creation	C050002	0	720000	180000	0	0	900000
		Long Road #209 new TB#2 - DxT Sub -	C046411	0	42500	28900	521900	426700	1020000
		*NR_Hammond 37061-Oak Point Rd	C049723	600000	556750	0	0	0	1156750
		Lyndonville Station 34.5kV cap bank	C046569	0	32000	216000	961000	0	1209000
		*NR_76462-CoRte28-Rebuild	C049197	700000	637500	0	0	0	1337500
		Buffalo Station 49 - UG Upgrades	CD01128	1340000	0	0	0	0	1340000
		*NR-Bremen 81556-Beech Hill Rd	C049789	700000	641750	0	0	0	1341750
		*NR-Chasm Falls 85251-Duane Rd-Tie	C049757	700000	680000	0	0	0	1380000
		NY New Mobile Substation 34.5 kV -	C046410	0	719000	690000	0	0	1409000
		NY New Mobile Substation 23 kV - 13	C046402			719000	823000	0	1542000
		NY New Mobile 115 kV - 13.2x4.4 kV	C046409	1578000	0	0	0	0	1578000
		NR-85251-NYS Hwy 30-FdrTie	C049760	0	0	543333.33	543333.34	543333.33	1630000
		Whitesboro 64, 65 and 66 Retirement	C050878	0	0	630000	970000	200000	1800000
		Sodeman Rd - New station - dist get	C046796	250000	1750000	0	0	0	2000000
		*Brook Rd 52 - Lewis Rd Conversion	C049761	100000	2000000	0	0	0	2100000
	SC&P Other Total			22366333.4	24816050	5976183.33	4341933.34	1594618.33	59095118.4
	Substation Relay/Protection	UF Relays DxT Strategy	C043509	101200	0	0	0	0	101200
		Altamont Relay Replacement Strategy	C049581	0	0	20000	120000	0	140000
		Grooms Rd. Relay Replacement	C049597	0	0	20000	120000	0	140000
		Station 64 Grand Island Relays	C049586	0	0	60000	355000	0	415000
		Trinity Station Relay Replacement	C049625	60000	470000	0	0	0	530000
		Temple Station Relay Replacement	C049616			80000	595000	0	675000
		Riverside Relay Replacement	C049606	0	60000	490000	340000	0	890000
	Substation Relay/Protection Total			161200	530000	670000	1530000	0	2891200
	Substation RTU	Install EMS at Rock City Sub with D	CD00949	242500	0	0	0	0	242500
		Station 126 - EMS Expansion/RTU Ins	CD01299	0	275000	0	0	0	275000
		Station 79 - EMS Expansion/RTU Repl	CD01296	360000	0	0	0	0	360000
		Station 63 - EMS Expansion/RTU Inst	CD01303	375000	0	0	0	0	375000
		Station 74 - EMS Expansion/RTU Inst	CD01294	0	380000	0	0	0	380000
		REP - Dist Subs Without RTUs	C019851	1500000	750000	1000000	1500000	2200000	6950000
	Substation RTU Total			2477500	1405000	1000000	1500000	2200000	8582500
	TBD	Reserve for Reliability Unidentifie	C046923	-12833333	-10000000	4878646	9850000	14844000	6739313
			C046950	0	0	-1500000	-5500000	2000000	-5000000
	TBD Total			-12833333	-10000000	3378646	4350000	16844000	1739313
	Storm Hardening	Storm Hardening - Hague Rd 41853 fe	C046394	323850	0	0	0	0	323850
		Storm Hardening - Lowville 77354 fe	C046396	500000	0	0	0	0	500000
		Storm Hardening - Placeholder for N	C046390	1000000	1030000	1061000	1093000	1126000	5310000
			C046391	1000000	1030000	1061000	1093000	1126000	5310000
			C046392	1000000	1030000	1061000	1093000	1126000	5310000
	Storm Hardening Total			3823850	3090000	3183000	3279000	3378000	16753850
	Reliability	North Creek 52 - Edwards Hill Road	C050688	63750	0	0	0	0	63750
		Vail Mills 53 - Northville 52 Tie	C050694	68000	0	0	0	0	68000
		F8566 Rebuild Various Sections	C028692	85850	0	0	0	0	85850
		Clinton 53 - Baum & Burrell Roads	C050684	182750	0	0	0	0	182750
		North Creek 52 - Convert Route 28	C050685	216750	0	0	0	0	216750
		Brook Road 55 - Lake Desolation Rd	C050691	395250	0	0	0	0	395250
		CR- Sandy Creek 51 rebuild CR 17	C050681	497250	0	0	0	0	497250
		*CR - McGraw-Truxton feeder tie	C049727	680000	0	0	0	0	680000
		Fort Gage 54 - Route 9L Rebuild	C050680	786250	0	0	0	0	786250
		Brook Road 55 - Corinth 51 Tie	C050690	790500	0	0	0	0	790500
	Reliability Total			3766350	0	0	0	0	3766350
	UG Structures and Equipment	Ohio Street - Buffalo River Bore	C050400	680000					680000
		Ohio Street - North	C050405	2805000	0	0	0	0	2805000
	UG Structures and Equipment Total			3485000	0	0	0	0	3485000
	Eng Reliability Review	Brunswick 26453 - South Rd Conv	C045696	85000	0	0	0	0	85000
		Port Henry 51 - Rebuild Route 9N fr	CD00306	96250	0	0	0	0	96250
		NR-Sunday Creek 87651-StillwaterRd-	CD01084	148750	0	0	0	0	148750
		Middleburgh 51 - North Road Rebuild	CD00312	0	367500	0	0	0	367500
		Brook Rd 54 - Route 50 Conversion	C048584	637500	0	0	0	0	637500
	Eng Reliability Review Total			967500	367500	0	0	0	1335000
System Capacity & Performance Total				67925387.84	67977528.78	83269151.83	93138645.34	95741326.33	408056040.1
Customer & Public Requirement	Blanket	East NY-Dist-Land/Rights Blanket	CNE0009	1000	1000	1000	1000	1000	5000
		East NY-Dist-3rd Party Attch Blankt	CNE0022	30000	30000	30000	30000	30000	150000
		East NY-Dist-Public Require Blanket	CNE0013	125000	128000	131000	134000	137000	655000
		West NY-Dist-3rd Party Attch Blankt	CNW0022	146000	148000	150000	152000	154000	750000
		Cent NY-Dist-3rd Party Attch Blankt	CNC0022	228000	231000	234000	238000	242000	1173000
		East NY-Dist-Meter Blanket	CNE0004	314000	328000	343000	358000	374000	1717000
		Cent NY-Dist-Meter Blanket	CNC0004	418000	437000	457000	478000	500000	2290000
		West NY-Dist-Land/Rights Blanket	CNW0009	639000	649000	659000	669000	679000	3295000
		Cent NY-Dist-Public Require Blanket	CNC0013	784000	819000	856000	895000	935000	4289000
		West NY-Dist-Meter Blanket	CNW0004	794000	830000	867000	906000	947000	4344000
		West NY-Dist-Public Require Blanket	CNW0013	1128000	1156000	1185000	1215000	1245000	5929000
		East NY-Dist-St Light Blanket	CNE0012	1320000	1340000	1360000	1380000	1401000	6801000
		Cent NY-Dist-Land/Rights Blanket	CNC0009	1421000	1442000	1464000	1486000	1508000	7321000
		Cent NY-Dist-St Light Blanket	CNC0012	2436000	2473000	2510000	2548000	2586000	12553000
		East NY-Dist-New Bus-Comm Blanket	CNE0011	2639000	2679000	2719000	2760000	2801000	13598000
		NiMo Meter Purchases	CN03604	2990000	3105000	3030000	3120000	3213600	15458600

Spending Rationale	Program	Project Name	Project #	FY15	FY16	FY17	FY18	FY19	Total
		West NY-Dist-New Bus-Comm Blanket	CNW0011	3366000	3433000	3502000	3572000	3643000	17516000
		West NY-Dist-St Light Blanket	CNW0012	3451000	3503000	3556000	3609000	3663000	17782000
		Cent NY-Dist-New Bus-Comm Blanket	CNC0011	3485000	3572000	3661000	3753000	3847000	18318000
		West NY-Dist-New Bus-Resid Blanket	CNW0010	3672000	3745000	3820000	3896000	3974000	19107000
		East NY-Dist-New Bus-Resid Blanket	CNE0010	6496000	6593000	6692000	6792000	6894000	33467000
		Cent NY-Dist-New Bus-Resid Blanket	CNC0010	6560000	6724000	6892000	7064000	7241000	34481000
		NiMo Transformer Purchases	CN03620	25287000	26046000	26827000	27632000	28461000	134253000
	Blanket Total			67730000	69412000	70946000	72688000	74476600	355252600
	New Business	Hanson Aggregates- Stafford, NY	C047216	850	0	0	0	0	850
		Ave A / Delaware Sub Remote Ends	C048483	51000	0	0	0	0	51000
		NR-T.I.81452-CoRt191	C031611	50000	50000	0	0	0	100000
		Cottages at Troutburg - Kendall, NY	C048999	112371	0	0	0	0	112371
		Oswego - Trolley Light Pole Replace	CD00810	160000	0	0	0	0	160000
		CR-Ash Street-13.2kV Feeder 22352	CD01217	296650	0	0	0	0	296650
		SU Hill Area Upgrades	CD00015	367500	0	0	0	0	367500
		Harbor Center - Spot Network	C048589	476000	0	0	0	0	476000
		Reserve for New Business Commercial	C046920	2500000	3000000	3100000	3150000	3200000	14950000
		Reserve for New Business Residentia	C046921	6629000	6100000	6150000	6200000	6250000	31329000
	New Business Total			10643371	9150000	9250000	9350000	9450000	47843371
	Public Requirements	DOT Cleveland Dr Bridge	C048677	850	0	0	0	0	850
		Nestle Substation Demo	CD01051	1000	0	0	0	0	1000
		Millennium Pkwy Dunkirk	CD00662	4000	0	0	0	0	4000
		NYSDOT Ridge Rd Bridge	C015724	8500	0	0	0	0	8500
		DOT-Lock St Baldwinsville	C050665	68000	0	0	0	0	68000
		OH Relocation 2452 Rte 9, Malta	CD00789	80000					80000
		DOT Paterson Street, Odgensburg	C045630	85000	0	0	0	0	85000
		PIN 1756.60 Ballston Ave	C050238	85000					85000
		Onon Co DOT Velasko Rd	C051866	85000	0	0	0	0	85000
		NYSDOT Pin #1089.1	CD00815	120000					120000
		DOTR RT28 White Lk - McKeever Dist	C035027	28800	176800	0	0		205600
		DOT Onondaga County Thompson Road	CD01141	297500	0	0	0	0	297500
		DOT PIN 3754.56 Connective Corridor	CD01183	1348100	0	0	0	0	1348100
		Reserve for Public Requirements Uni	C046922	3600376	7100000	7150000	7200000	7250000	32300376
	Public Requirements Total			5812126	7276800	7150000	7200000	7250000	34688926
	S or R Other	Waterfront School - 4.16kV Service	CD01015	850	0	0	0	0	850
		Rotterdam 13852 & 13853 Relocation	C046422	1320000	0	0	0	0	1320000
	S or R Other Total			1320850	0	0	0	0	1320850
Customer & Public Requirement Total				85506347	85838800	87346000	89238000	91176600	439105747
Grand Total				243279000	248095999.7	276099999.9	283800000.4	289000000	1340279000

Exhibit 4

NIAGARA MOHAWK POWER CORPORATION
Summary of Bill Impact Associated with FY14 - FY17 T & D Capex Only
For Fiscal Years 2015, 2016 & 2017
($000's)

	FY 2015	FY 2016	FY 2017
Depreciation Expense	7,535	15,509	23,141
Rate Base:			
Net Utility Plant	562,325	1,051,403	1,541,205
Accumulated Deferred Taxes	-39,888	-83,981	-123,104
Total Rate Base	522,437	967,422	1,418,100
ROR	9.44%	9.44%	9.44%
Return on Rate Base	49,313	91,316	133,855
Total Revenue Requirement Impact of FY14 - FY17 Capex Only	56,848	106,824	156,997
Rate Base Impact of Depreciation on 3/31/13 Embedded Plant	-81,032	-243,096	-405,161
ROR	9.44%	9.44%	9.44%
Total Revenue Requirement Impact of 3/31/13 Embedded Plant	-7,649	-22,946	-38,243
Total Revenue Requirement Impact of Capex less impact of Embedded Plant	**$49,199**	**$83,878**	**$118,753**
Allocation of Revenue Requirement to SC1 Residential Customers	29,229	49,657	70,303
SC1 Residential Customers Cumulative Bill Impact per kWh	**$0.00263**	**$0.00445**	**$0.00589**

Assumptions:

1) FY14 per Company forecast, FY15 - FY17 capex per the 1/31/2014 CIP filing (Transmission, Distribution & Sub-Transmission c
2) NYS PSC Staff's Depreciation Rates per - Case 12-E-0201
3) ROR based on 9.3% ROE per file Joint Proposal - Case 12-E-0201
4) Embedded historic plant generates depreciation expense that will reduce rate base (increase to depreciation reserve). Reduced the revenue requirement to include the inherent reduction to ratebase from depreciating embedded plant determined as follows:

March 31, 2013 Electric Depreciable Plant	7,372,810
Composite Electric Depreciation Rate	2.20%
Total Annual Electric Depreciation based on embedded plant	162,064

   Ratebase impact determined by using a half year average of annual depreciation per year
5) Allocated revenue requirement to SC1 customers based on 2015-2016 T&D Revenue at Proposed Rates per Appendix 2, Schedu pages 2-3 filed in the Joint Proposal in Case No. 12-E-0201. Used 2016 allocation for 2017.
6) SC1 bill impact utilized SC1 kWh per Appendix 2, Schedule 5-6, Page 1 filed in the Joint Proposal in Case No. 12-E-0201 for 2(For 2017, used 2017 sales forecast in Company's current business plan.

Exhibit 5: Non-Wires Alternatives Update

National Grid has guidelines for review and consideration of non-wires-alternative ("NWA") in its planning processes. The guidelines, developed in February 2011, outline two stages of review: one completed by transmission and distribution planners as they review potential capital investment needs and one completed by the Product & Energy Services group project managers in the customer organization.

Initial Feasibility Review

The initial review for projects with NWA potential takes place after the Company's transmission and distribution planning groups conduct their annual needs assessment analysis on their capital expenditures plans. This review is used to screen projects in those plans against specific criteria to determine whether they are potential candidates for a NWA. The initial review evaluates four factors:

1. Cost. The wires solution, based on engineering judgment, will likely cost more than $1Million.
2. Load Reduction Needed. If load reduction is necessary, then it must be less than twenty percent of the total load in the area of the defined need.
3. Timing. The start of construction must be at least thirty-six months in the future.
4. Asset Condition. The need cannot be based on asset condition.

Potential projects that satisfy these criteria are communicated to the Company's Product and Energy Services group for further review.

Secondary Review for NWA Development

The secondary review of needs that pass the initial feasibility review considers additional information to determine whether an NWA solution is viable. Typically, this review involves compiling historical electric load data and customer information, including usage, for all affected accounts. That information is used to determine the time of year and time of day of expected peak loads, as well as the drivers of those loads. To the extent they are available, energy efficiency measure installations, regional appliance saturation survey data and other applicable studies or databases are considered.

Once the circumstances and load drivers are determined, options for real-time load reduction, load shifting and conservation can be considered as best fits each situation. The Company considers energy efficiency products, distributed generation, demand response and other load control and conservation measures in developing components to an NWA plan. To be viable, an NWA must be cost competitive or more cost effective than their wires alternative counterpart, which is addressed further in the Benefit Cost Analysis Modeling section of this document.

Projects Reviewed

The Company's most recent review of anticipated capital expenditure projects in its New York service territory included approximately 1,600 line items. More than half of these were related to asset condition, and therefore unqualified for NWA consideration. More than 30% had lead times that were too immediate to allow time for an NWA, and a further 10% had cost estimates that did not meet the screening criteria. Of the remaining projects, there were a few that were unrelated to electric load (e.g. removing equipment that had been previously out-of-use and non-infrastructure projects).

Six projects were considered for NWA. These projects were further reviewed by the planners to determine whether they might fit the criteria set in the initial feasibility review. The table below lists each project, whether or not it passed the initial feasibility review and the reasons behind that determination.

Location	Brief Description	Load Relief Needed	Load Relief Start Date	Fits NWA Criteria?	Reason if No
Lockport Rd	Substation expansion.	N/A	N/A	No	Evolved into an asset replacement issue later in the process.
W. Sweden	Contingency load relief of Brockport 74.	2%	2016	Yes	N/A
Lyndonville Station	Normal summer load growth	2.5 MVA	2013	No	Not enough lead time.
Baker St.	Load growth – electrical island.	44%	2015	No	Load reduction % too high.
Sawyer	Normal summer load growth	15MW	2014	No	Not enough lead time, some cables are already being replaced because of asset condition.
Long Road	Substation expansion. Additional growth due to business park development.	32%	2016	No	Load reduction % too high.

One of the projects (W. Sweden/Brockport) satisfied the initial feasibility screen and is under secondary review. As of this writing, the Company is reviewing loads and evaluating NWA options.

Exhibit 6: Overhead Line Refurbishment Projects

Boonville-Rome 3 & 4 (C047795 - $8.6M)

This project involves the Boonville-Rome 3 T4060 and the Boonville-Rome 4 T4040-T4040 115 kV transmission circuits. These are doubled circuited.

The overhead line details:

Total length: Approximately 26 miles (main line only)
Conductor: 4/0 Copper and 336.4 ACSR
Number of steel structure units: 233
Number of wood structure units: 27
Steel: 206 (steel lattice type structures)
Typical Installation Date: 1930s

The project scope is a life extension project involving the targeted replacement of deteriorated structures, insulators and fittings, replacement of conductor splices, replacement of shield wire, tower painting, and footer repairs.

Browns Falls-Taylorville 3 & 4 (C024359 - $9.4M)

This project involves the double circuit Browns Falls-Taylorville 3 T3080 and the Browns-Taylorville 4 T3090 lines.

The overhead line details:

Total length: Approximately 27 miles
Conductor Types: 4/0 Copper
Total number of structures: 227
Number of wood structure units: 5
Number of steel structure units: 222
Type(s) of structures: Flex towers, lattice towers, and wood pole
Typical Installation Date: 1920s

The project scope involves the replacement of approximately 20% of the structures, shield wire, insulators and hardware, guys, and grounding improvements which are deteriorated. The project is in preliminary engineering.

Colton-Browns Falls 1 & 2 (C036164 - $8.9M)

This project involves the Colton-Browns Falls 1 & 2 T3140 and T3150 115 kV transmission lines. These are doubled circuited.

The overhead line details:

Total length: Approximately 30.5 miles
Conductor: 336.4 ACSR Linnet
Number of steel structure units: 273
Number of wood structure units: 13

Typical Installation Date: 1920s

The scope is a life extension project involving the targeted replacement of deteriorated structures, cross-arm hangers and conductor attachment plates on reused suspension flex towers. Replace original conductor hardware, nonstandard shieldwire, guys and anchors in poor condition. Improve structure grounding and install signage.

Falconer-Homer Hill 153 & 154 (C027422 - $17.1M)

This project involves the Falconer-Homer Hill 153 T1160 and the Falconer-Homer Hill 154 T1170 115 kV transmission circuits.

The overhead line details:

Total length: Approximately 44 miles (with 1 mile of taps)
Conductor Types: 336.4 ACSR Linnet and 336.4 ACSR Oriole
Total number of structures: 424
Number of wood structure units: 42
Number of steel structure units: 376 lattice type and 6 steel pole
Types of structures: Primarily double circuit steel structures
Typical installation date: 1930s

This project is currently in the Step 0 process of the Project Management Playbook, or conceptual engineering. The project scope is a life extension project involving the targeted replacement of deteriorated structures, insulators and fittings, replacement of conductor splices, replacement of shield wire, tower painting, and footer repairs.

Gardenville-Dunkirk 141 & 142 (C003389 - $20.3M)

This project involves the Gardenville-Dunkirk 141 (T1260) and the Gardenville-Dunkirk 142 (T1270) 115 kV transmission circuits.

The overhead line details:

Total length: Approximately 45 miles (main line, including the Seneca Nation)
Conductor Types: Varies – 250 kcm CU, 400 CU, 4/0 CU, 336 kcm ACSR, and 636 kcm AAC, and 795 ACSR.
Total number of structures: 586 structures
Number of wood structures: 39 structures
Number of steel structures: 547 structures (of which are 310 Ritter-Conley Flexible Towers with Z cross members)
Types of structures: Double circuit, primarily steel (Z type flex), structures
Typical Installation Date: 1930s vintage

Originally planned as a full reconductoring project, it was re-scoped after completion of conductor testing indicated that the conductor has the necessary strength to remain in service another 15-20 years. The scope is a life extension project involving the target replacement of deteriorated structures, insulators and fittings, replacement of conductor splices, replacement of shield wire, tower painting, and footer repairs. This scope will be done where necessary on the main line and on approximately 17 miles of tap lines.

Gardenville 180 & 182 (C027436 - $8.3M)

This covers the Packard-Gardenville 182 T1780 (in its entirety) and the Niagara-Gardenville 180 T1660 (from Packard to Ellicott Junction, Tonawanda).

The overhead line details:

Total length: Packard to Gardenville (Lines 180/182, 182/62, 182/54), approx. 29 miles
Conductor Types:
Packard-Tonawanda 180/182; varies - 795 ACSR “Drake”, 795 ACSR “Coot”, and 500 CU
Packard-Tonawanda 180/105; 795 ACSR “Coot”
Packard-Tonawanda 182/92; 500 CU
Tonawanda-Urban 182/92; varies - 636 ACSR “Kingbird”, 795 ACSR “Coot”, and 400 CU
Urban-Gardenville 182/54; varies - 636 ACSR “Kingbird”, 795 ACSR “Coot”, and 400 CU
Total number of structures: 417 (count includes 180 section north of Packard in CNAS118, about 10% of the line on a mileage basis)
Number of wood structures: 20
Number of steel pole/structures: 397
Types of structures: Lattice towers, flex towers, wood poles, and steel poles.
Typical Installation Date: 1930’s

The project scope is a life extension involving the targeted replacement of deteriorated structures (estimated around 5-10%), insulators and fittings, replacement of conductor splices, replacement of shield wire, and coordination of tower painting and footer repairs. This project is currently in the Step 0 process of the Project Management Playbook, or conceptual engineering. The final scope will be based upon an engineering field assessment, input from Transmission Planning, conductor testing, and shield wire testing.

Gardenville-Homer Hill 151 & 152 (C027425 - $18.1M)

This project involves the Gardenville-Arcade 151 (T1950), Gardenville-Homer Hill 152 (T1280), and the Arcade-Homer Hill 167 (T6450) 115 kV transmission circuits.

The overhead line details:

Total length: Approximately 62 miles (southern portion – main line only)
Conductor Types: Varies - 336.4 ACSR “Oriole”, 795 ACSR “Coot”, and 4/0 7-strand CU
Total number of structures: 435
Number of steel structures: 402
Number of wood structures: 33
Types of structures: Primarily double circuit steel flex towers and semi strain square base steel towers.
Typical Installation Date: Early 1920s

This project covers the southern portion (about 62 miles) of these double circuit lines from the Gardenville substation to the Homer Hill substation. The Company recently reconductored the northern 21 miles of this line under project C04718 (part of an Article VII submittal). These projects followed the failure of multiple structures on this line due to severe lattice tower deterioration.

This project is in Step 0 (conceptual engineering) and undergoing scope development based upon an engineering field assessment, input from Transmission Planning, conductor testing, and shield wire testing. The project scope is a life extension project involving the targeted replacement of deteriorated structures, insulators and fittings, replacement of conductor splices, replacement of

shield wire, tower painting, and footer repairs. This scope will be done where necessary on the main line and approximately 17 miles of tap lines to distribution stations.

Homer Hill-Bennett Road 157 (C027429 - $41.9M)

This project involves the Homer Hill-Bennett Road 157 T1340 115 kV transmission line.

The overhead line details:

Total length: 52.5 miles (includes taps)
Conductor Types: Varies – 4/0 CU, 4/0 ACSR, 336 kcm ACSR, 795 kcm ACSR, 1192 kcm ACSR
Total number of structures: 471
Number of wood structure units: 463
Number of steel structure units: 7
Types of structures: Single circuit, primarily wood structures
Typical Installation Date: 1950s (taps are 1970s vintage)

This project is in Step 0 (conceptual engineering) and undergoing scope development based upon an engineering field assessment, input from Transmission Planning, conductor testing, and shield wire testing. The project scope is the targeted replacement of deteriorated structures, insulators and fittings, and conductor splices.

Lockport-Batavia 112 (C003422 - $43.7M)

This project involves the Lockport-Mortimer 112 T1510 115 kV transmission circuit.

The overhead line details:

Total length: Approximately 34 miles
Conductor Types: Varies - 250 Copper 19-Strand, 795 ACSR “Coot” 36/1, 336.4 ACSR “Linnet” 26/7, 428 AAC 19-Strand, and 636 AAC “Orchid”
Total number of structures: 369
Number of wood structure units: 156
Number of steel structure units: 213
Types of structures: Steel towers (178 of which are tri-leg towers) and wood pole structures (111 of which are single pole with davit arms).
Typical Installation Date: 1930-1940’s

About 3.5 miles of the Lockport-Batavia 112 shares a double circuit with the Lockport-Batavia 108. In addition, for roughly the first third of these lines, both lines run parallel with and share the Lockport-Mortimer 111 right-of-way. Combining the 112 and 108 lines to the same structures where possible will be considered to relieve congestion in the corridor and open up access to it.

This project is in Step 0 (conceptual engineering) and undergoing scope development based upon an engineering field assessment, input from Transmission Planning, conductor testing, and shield wire testing. The project scope is a life extension involving the targeted replacement of deteriorated structures, insulators and fittings, replacement of conductor splices, replacement of shield wire, tower painting, and footer repairs.

Porter-Rotterdam 31 (C030890 - $25.5M)

This project involves the Porter-Rotterdam 31 T4210 230 kV transmission line.

The overhead line details:

Total length: 72 miles, Steel structures (dual circuit with NYPA)12 miles, wood structures (single circuit) 60 miles
Conductor Type: 1,431 kcm ACSR and 795 kcm ACSR
Total number of structures: 698 structures
Number of wood structure units: 610
Number of steel structure units: 88
Types of structures: Steel pole (double circuit) and wood H-frame (single circuit)
Typical Installation Date: 1940s – 1950

The project scope is the targeted replacement of approximately 65% of the wood structures that are deteriorated. This project is in Step 0 (conceptual engineering) and undergoing scope development based upon an engineering field assessment, input from Transmission Planning, conductor testing, and shield wire testing.

Taylorville-Boonville 5 & 6 (C027437 - $9.4M)

This project involves the Taylorville-Boonville 5 T3320 and the Taylorville-Boonville 6 T3330 115 kV transmission circuit.

The overhead line details:

Total length: Approx. 31 miles (main line)
Taps Included In Stats: No
Conductor Type: 4/0 copper
Total number of structures: 310
Number of wood structure units: 181
Number of steel structure units: 129
Types of structures: Primarily steel lattice towers (127) and double circuit wood pole structures (174 2-pole structures).

Typical Installation Date (mainline): Late 1920s to early 1930s; most of the wood structures from the 1990s.

The project scope is life extension with the targeted replacement of deteriorated structures, insulators and fittings replacements on the older steel structures, replacement of shield wire, tower painting, and footer repairs.

Ticonderoga 2 & 3 (C039521 - $41.1M)

This project targets the Ticonderoga-Republic 2 T5810 and the Ticonderoga-Whitehall 3 T5830 115 kV transmission circuits.

The overhead line details:

Total length: Approximately 46 miles total with about 23 miles on the T5810 and 23 miles on the T5830
Conductor Types: Ticonderoga-Republic 2 - 336.4 kcmil ACSR 30/7 “Oriole” and 4/0 Copper conductors. Ticonderoga-Whitehall 3 - 336.4 kcmil ACSR 30/7 “Oriole” conductor.
Total number of structures: 350
Number of wood structure units: 343
Number of steel structure units: 7
Types of structures: Single circuit, primarily consisting of wood pole H-frame structures and steel lattice towers
Typical Installation Date: 1920-1930s

The project scope is the targeted replacement of deteriorated structures (not previously replaced during the safety refurbishment project C39487), insulator and fittings replacement, replacement of shield wire and conductor splices. This project is in Step 0 (conceptual engineering) and undergoing scope development based upon the engineering field assessment performed, input from Transmission Planning, conductor testing, and shield wire testing.