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, 2013

nationalgrid

Table of Contents

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 on January 24, 2011 in Case 10-E-0050.[1] The Plan submitted here relates to fiscal years 2014 to 2018 (FY14 to FY18).[2] The investment levels in the Plan are summarized by system in Table 1-1, below. The Plan reflects total investment levels agreed under the Joint Proposal pending in the Company's current electric rate case (12-E-0201) for FY14 to FY16, and the Company's present estimate of investment levels needed in FY17 and FY18 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	FY14	FY15	FY16	FY17	FY18	Total
Transmission	152.3	163.3	163.7	190.0	180.0	849.3
Sub-transmission	41.0	42.0	42.0	46.0	50.0	221.0
Distribution	233.0	242.0	247.0	272.0	280.0	1274.0
Total	**426.3**	**447.3**	**452.7**	**508.0**	**510.0**	**2344.3**

National Grid's commitment to safety, reliability and efficiency is paramount, and is the foundation for all that we do. Like the January 2012 Capital Investment Plan, the five-year investment plan presented here continues to balance the need to constrain infrastructure cost while simultaneously mitigating some of the significant risks on the system. While this Plan represents the Company's present priorities, 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.

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[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,* and specifically, the August 15, 2008 Order Concerning Transmission and Distribution Capital Investment Plan in that case ("August 15 Order"). The August 15 Order directs the Company to annually file an updated five-year investment plan.

[2] The period FY14 to FY18 covers April 1, 2013 - March 31, 2018.

[3] Differences between FY14-FY16 system level sub-totals in this Plan and corresponding system level sub-totals in the Joint Proposal are primarily due to shifts in investment amounts from sub-transmission to transmission to implement projects responsive to recent generator mothballing plans.

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: (A) Statutory or Regulatory; (B) Damage/Failure; (C) System Capacity and Performance; (D) Asset Condition; or (E) Non-infrastructure.

Statutory or Regulatory
Statutory or Regulatory projects are required to respond to, or comply with statutory or regulatory mandates. These include those expenditures needed to ensure the minimum compliance with the requirements of the North American Electric Reliability Corporation ("NERC"), Northeast Power Coordinating Council ("NPCC"), New York State Reliability Council ("NYSRC"), the Occupational Safety and Health Administration ("OSHA"), and the PSC. It also includes expenditures that are part of the Company's regulatory, governmental or contractual obligations, such as responding to new service requests, transformer and meter purchases and installations, outdoor lighting requests and service, and facility relocations related to public works projects. With some exceptions, the scope and timing of work in this rationale is generally defined by others.

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, 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 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, resiliency, or operability to meet the growing and/or shifting demands of the system and our customers, as well as changes in the generator landscape. 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 needed to address reliability issues resulting from the mothballing or retirement of certain generation assets, as well as improve performance of the network through the reconfiguration of feeders and the installation of feeder ties.

Asset Condition
Asset Condition projects are required to reduce the likelihood and consequences of failures of transmission and distribution assets, such as replacing system elements such as overhead lines, underground cable or substation equipment. The Company's Asset Management approach relies on a holistic, longer-view assessment of assets and asset systems to inform capital-investment decisions. As part of this approach, the Company conducts assessments of major asset classes such as circuit breakers or subsets of asset classes such as a circuit breaker manufactured by a particular vendor. The assessments focus on the identification of specific susceptibilities for assets and asset systems and the development of potential remedies. In light of current economic conditions, however, the Company presents a modified approach in this Plan that reduces near-term capital costs. The result is greater reliance on spare equipment to replace damaged equipment that may fail in service for certain elements of the transmission and distribution system. The modified approach also calls for a 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. This approach results in lower capital investment in the near term, but may result in poorer performance in the long term as compared to higher investment levels. Closer monitoring of system performance as it relates to asset condition causes will be necessary.

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.

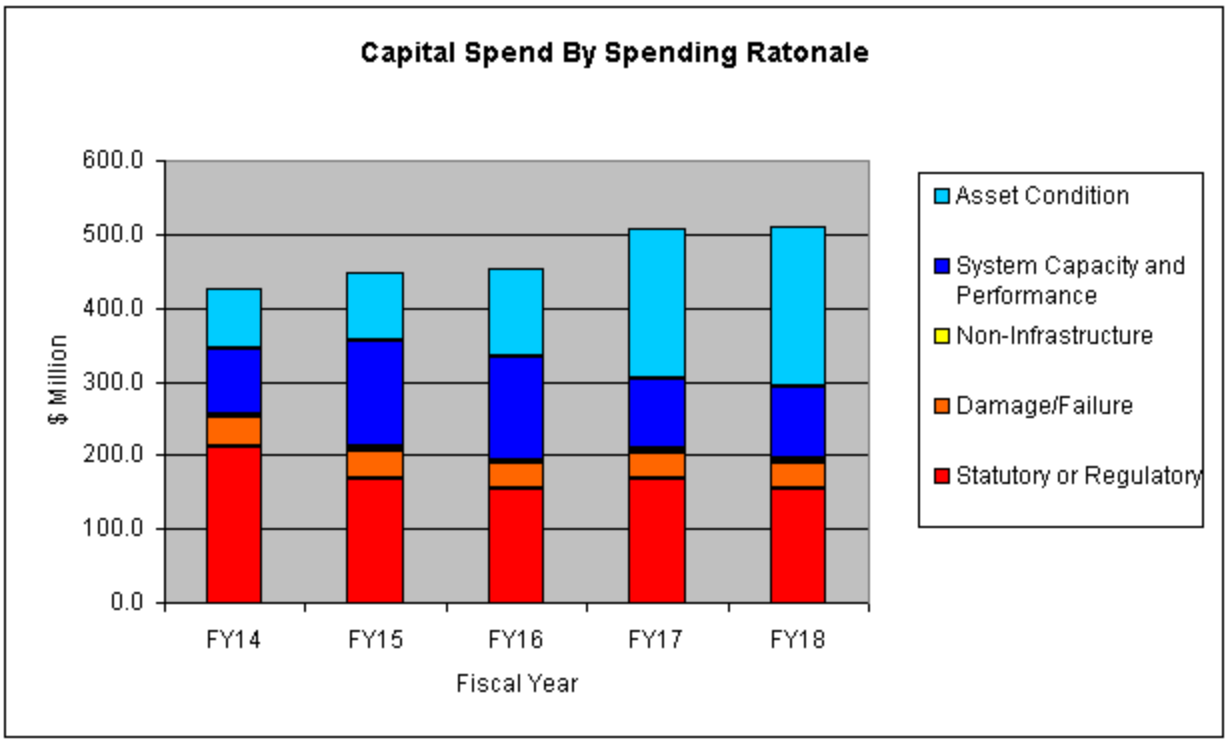
Investment by spending rationale for fiscal years FY14 to FY18 is provided in Table 1-2, and Figure 1-1.

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

	FY14	FY15	FY16	FY17	FY18	Total
Statutory or Regulatory	211.2	169.3	154.5	168.7	154.6	858.2
Damage/Failure	40.8	38.4	35.0	35.4	36.1	185.7
System Capacity and Performance	88.3	143.1	141.4	96.3	96.7	565.8
Asset Condition	81.8	92.3	117.5	203.2	218.0	712.6
Non-Infrastructure	4.3	4.2	4.4	4.5	4.7	22.1
Total	**426.3**	**447.3**	**452.7**	**508.0**	**510.0**	**2344.3**

*Of the total, $6.9m involves projects that have been accelerated or augmented by announcements in 2012 of generator shutdowns at Dunkirk and Cayuga. Another $72.8m of the total represents new investment that has been added to mitigate the long term impact of these generator shutdowns.

Figure 1-1
Investment by Spending Rationale by Year FY14-FY18



Spending Rationale Totals

Forty five percent ($ 1043.9 million) of the planned infrastructure investment in the FY14 to FY18 period is in the Statutory or Regulatory and Damage/Failure spending rationales. This work is required to address items that are mandatory and non-discretionary in terms of timing. Examples of investments in these categories include: work at Clay and Porter substations to bring them into compliance with Northeast Power Coordinating Council ("NPCC") design, protection and operation standards; capital work done to repair a portion of a distribution feeder damaged in a storm event; and the extension of service to new customers. This work can not be deferred for long periods without potentially violating mandatory reliability standards, degrading near-term service reliability to existing customers or delaying service to new customers.

The System Capacity and Performance spending rationale accounts for approximately 24 percent ($565.8 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 address reliability issues presented as a result of the mothballing of the Dunkirk generating station, as well as 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 30 percent ($712.6 million) of total planned investment for the FY14 to FY18 period. 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 rebuilding of the Gardenville Station, which is a 230/115kV complex south of the Buffalo area.

Deferring capital investment on projects in the System Capacity and Performance, and Asset Condition, categories would likely lead to increasing failure rates (increasing costs in the Damage/Failure spending rationale) and reduced service reliability for customers over time.

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 $849 million on the transmission system, as shown in Table 1-4 below. Although the Statutory or Regulatory spending rationale reflects a significant downward trend due to the completion of specific major projects, the FERC's recent rule affecting the definition of "Bulk Electric System" (FERC Order No. 773) is expected to increase investment in the Statutory or Regulatory spending rationale in future plans. In addition, the System Capacity and Performance spending rationale reflects substantial generation retirement/mothballing-related costs through FY16. To the extent there are additional retirement announcements in the future that result in reliability concerns, future plans would likely reflect increased investment in this spending rationale.

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

Spending Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/ Regulatory	74.2	38.6	20.6	32.0	14.6	180.0
Damage/ Failure	15.1	12.5	8.8	8.9	9.1	54.4
Non-Infrastructure	0.1	0.0	0.0	0.0	0.0	0.1
System Cap /Perform	28.2	69.7	68.0	8.9	5.1	180.0
Asset Condition	34.7	42.5	66.3	140.2	151.2	434.8
Total	**152.3**	**163.3**	**163.7**	**190.0**	**180.0**	**849.3**

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 $221 million on the sub-transmission system, as shown in Table 1-5 below.

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

Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/Regulatory	13.9	12.8	12.8	12.9	13.0	65.4
Damage/Failure	3.3	3.4	3.5	3.5	3.6	17.3
System Capacity & Performance	6.8	7.6	7.6	8.1	8.7	38.6
Asset Condition	17.1	18.3	18.2	21.5	24.8	99.8
Total	**41.0**	**42.0**	**42.0**	**46.0**	**50.0**	**221.0**

This five year Plan envisions significant expenditures on the sub-transmission system in the areas of asset condition and system capacity and performance.

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 421 substations providing service to the Company's 1.6 million electric customers.[4] The current five year plan for distribution is represented in Table 1-6.

Table 1-6
Distribution System Capital Expenditure by Spending Rationale ($millions)

Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/Regulatory	123.1	117.9	121.0	123.8	127.1	612.8
Damage/Failure	22.4	22.6	22.8	23.0	23.4	114.1
System Capacity & Performance	53.3	65.8	65.8	79.3	82.9	347.2
Asset Condition	30.0	31.5	33.0	41.5	42.0	178.0
Non-Infrastructure	4.2	4.2	4.4	4.5	4.7	22.0
Total	**233.0**	**242.0**	**247.0**	**272.0**	**280.0**	**1274.0**

This Plan envisions the majority of investment in the distribution system will be in the Statutory or Regulatory Requirements spending rationale.

[4] The distribution system data was taken January 7, 2013 from National Grid Asset Information Website located at http://usinfonet/sites/asset_info/Pages/AssetStatistics.aspx.

Chapter 1 C. Opportunities and Challenges

In developing and implementing the Plan presented here, the Company has made and will continue to make adjustments to reduce costs and maximize opportunities for greater efficiency, consistent with the provision of safe and adequate service to customers. 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 identified in the Governor's Energy Highway Blueprint or coming from the work of the Moreland Commission, including: efforts to 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, investments to improve storm resilience, and processes to evaluate and accommodate generation repowering.
- Changes in the existing generation supply portfolio in the region, and which may require electric delivery infrastructure solutions to address. Specifically, the retirement of large units such as the coal-fired plants at Dunkirk and Cayuga have forced large shifts in the capital plan. The shifts are required to accelerate the necessary system upgrades to minimize the duration of payments to generator-owners to operate their units to maintain system stability.
- 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.

Non-Wires Alternatives

The Company has reviewed five locations (shown below) for a potential pilot to test Non-Wires Alternatives (NWAs) capabilities. Only the North Eden substation project in the Southwestern region is potentially viable for a pilot and the Company is further exploring this site. If the site appears to be a potentially viable pilot location, the Company will discuss options for a pilot program with Department of Public Service Staff. The Company will continue to review opportunities as they arise for application of NWAs.

Western Region

A. Conesus Substation – (A on Map) – Station 52, Southwestern Region – Feeders 61 and 62
    - 1692 Premises; Residential (1534), Commercial, SBS Commercial, Industrial (158)
    - Project Estimate approximately $285K
    - Project cost is too low to provide any significant deferral value

B. North Eden Substation (B on Map) – Station 82, Southwestern Region – Feeder 51
- 1258 Premises; Residential (1098), Commercial, SBS Commercial, Industrial (160)
- Project estimate approximately $1.2 M

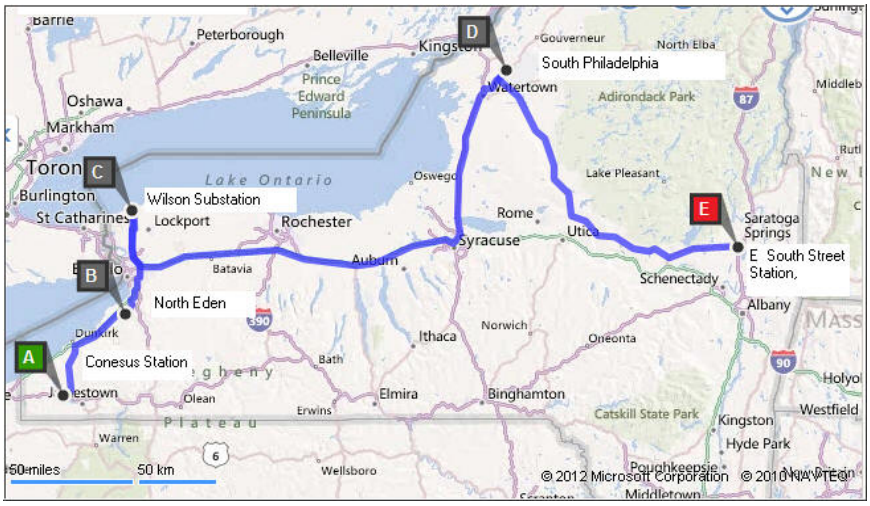
C. Wilson Substation (C on Map) – Station 93, Frontier Region - Feeders 61, 62 and 63
- 2158 Premises; Residential (1935), Commercial, SBS Commercial, Industrial (223)
- Project estimate approximately $2.5 M
- Timing of need for relief makes NWA unfeasible

<u>Central Region</u>

D. South Philadelphia Substation (D on Map)
- 650 premises; Residential (598), Commercial, SBS Commercial, Industrial (52)
- Preliminary Engineering Estimate for station improvements (including transformer upgrade) is approximately $750K.
- Asset condition and age of existing equipment require replacement—NWA not feasible

<u>Eastern Region</u>

E. Saratoga, South Street Substation (E on Map)
- Capacitor bank addition (relatively inexpensive solution—estimated at $75k) identified through project development process



Bill Impacts

The Company prepared a simplified analysis to estimate the revenue requirement effects in fiscal years 2014, 2015 and 2016 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 $0.00253/kWh in FY2014; $0.00414/kWh in FY2015; and $0.005935/kWh in FY2016. Details of the simplified analysis are included in Exhibit 4 of this filing.

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 Statutory or Regulatory 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.

Once the mandatory budget level has been established, programs and projects in the other categories (i.e., System Capacity and Performance and Asset Condition spending categories) are reviewed 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 $849 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)

Spending Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/ Regulatory	74.2	38.6	20.6	32.0	14.6	180.0
Damage/ Failure	15.1	12.5	8.8	8.9	9.1	54.4
Non-Infrastructure	0.1	0.0	0.0	0.0	0.0	0.1
System Cap /Perform	28.2	69.7	68.0	8.9	5.1	180.0
Asset Condition	34.7	42.5	66.3	140.2	151.2	434.8
Total	**152.3**	**163.3**	**163.7**	**190.0**	**180.0**	**849.3**

The level of investment on the transmission system presented in this Plan is increased from the $772 million shown in the 2012 Plan by $77 million. This increase is due primarily to the advancement of certain projects and the addition of new projects required to stabilize the transmission system related to the closure of the Dunkirk and Cayuga generating stations. To manage the budget to the capital investment agreed under the Joint Proposal pending in the Company's current electric rate case (12-E-0201) while addressing system needs, funding was transferred from sub-transmission and distribution capital investment budgets to the transmission budget to support the increased transmission spend. In addition, numerous transmission projects were re-phased/deferred to FY17 and beyond to accommodate the Dunkirk and Cayuga related projects. The latter projects are discussed under the System Capacity and Performance rationale.

The Company's investment in the past ten years has slowed the decline in reliability performance due to asset condition issues and, as a result, reliability performance for the Company has remained below regulatory limits for SAIFI and CAIDI. The Company is committed to maintaining safe and adequate service to customers, and the investment levels presented here are necessary to provide such service over the next 5 years.

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. The descriptions are segregated by spending rationale (e.g., Statutory or Regulatory, Damage/Failure). 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, 2012. Each section describes the drivers for capital investment programs and the projected customer benefits along with a description of significant changes between the 2012 Capital Investment Plan and this filing.

Chapter 2 A. Statutory or Regulatory Strategies and Programs

Statutory or Regulatory work includes capital expenditures required to respond to, or comply with, statutory or regulatory mandates. These include expenditures needed to ensure minimum compliance with the requirements of the North American Electric Reliability Corporation ("NERC"), Northeast Power Coordinating Council ("NPCC"), New York State Reliability Council ("NYSRC"), the Occupational Safety and Health Administration ("OSHA"), National Electrical Safety Code ("NESC") and the New York Public Service Commission. It also includes expenditures that are part of the Company's regulatory, governmental or contractual obligations. For the most part, the scope and timing of this work is generally defined by others and is non-discretionary for the Company.

With regard to regulatory mandates, FERC recently approved a new definition of the Bulk Electric System (BES) to which NERC standards will apply. FERC also approved the implementation timeline proposed by NERC for entities to become compliant with the definition within 24 months. Because the new definition approved by FERC modified the definition originally proposed by NERC, the changes needed to comply with the NERC standards in the future must be re-evaluated. National Grid believes the new BES definition may require capital projects that are currently in the Capital Investment Plan to be accelerated as well as addition of some new capital projects implemented to maintain compliance. In some cases new capital projects are only required under a combination of the new BES definition and the new, Transmission Planning Standard TPL-001-2 that has also been submitted to FERC for approval. In addition, if the NERC Alert on Facility Ratings is applied to the newly defined BES circuits, then capital expenditures on the order of $75 million dollars are expected to be needed. While the conductor clearance strategy discussed later in this chapter includes plans to address all of these circuits, the timing of review and mitigation would be advanced if the NERC Alert needs to be applied to a new BES definition.

Due to this uncertainty, in this submission of the Capital Investment Plan, National Grid has not reflected capital investment requirements to comply with these anticipated requirements. Rather, the Company will determine the requirements based on the new rules and then identify the needed investments to comply. Prior to approval of the new definition, National Grid estimated approximately $46.4 million dollars over the period FY14-FY18 to address NERC Transmission Planning Standards (TPL).

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 each with a total forecasted spending level of $2 million or more under this program during the period covered by this Plan[1], 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 - $16.1m & C031419 - $6.9m)
- Installation of a new 115kV line parallel to the existing Spier Falls to Rotterdam #1 & #2 circuits. This line will reinforce the west side of the 115kV system that serves the Northeast Region. (Project # C031418 - $19.7m)
- 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 available August 2013, with a target Commission approval by Nov/Dec 2013. Construction could then start as early as January 2014. (Project # C034528 - $29.0m)
- Installation of reactive compensation at distribution and transmission substations in the Northeast Region. (Project # C035773 – $3.9m)
- Reconductoring of 22.9 miles of existing 115 kV lines in the Northeast Region. (Project # C035771 - $15.6m)

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. 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

[1] The dollars shown for projects below within this program are the spending forecasted for the project within the term of this 5 year Plan (FY14-FY18), not the total capital cost for the projects. The same is true for all projects listed with dollars in this Plan.
[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

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 just under 1% for loads within all of Eastern NY. However, a forecast specific to the Northeast Region that reflects higher residential growth and anticipated ancillary loads based on economic development following the addition of Global Foundries, and as such the Northeast Region has a projected growth rate of approximately 2.5% over the next five years. 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.

2012 to 2013 Variance:

The primary variance between the 2012 and the 2013 Capital Investment Plans (CIP) results from spend that occurred in FY13 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.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	41.9	44.4	24.3	8.6	9.0	-	128.2
2013	-	44.6	30.9	4.7	9.0	2.3	91.4

Substation Compliance Upgrades

This program relates to the need to upgrade the Clay 115kV (C028705) and Porter 115kV (C028686) substations to meet recently applicable NPCC criteria. The

latter DPS report included spending prior to FY13 whereas the investments shown in this five year Plan exclude spending prior to FY13.

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.[4]

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.

2012 to 2013 Variance:

The scope of work for the Clay 115kV project has become better defined as project experience has been gained by field forces allowing for more efficient implementation.

In 2010, the project at Porter was re-phased and broken out into 115 and 230kV portions. A breaker-and-a-half configuration was initially proposed, but further analysis determined that a 115kV straight bus design could be utilized by rebuilding in place. A straight bus design will require less total bus work to be installed and will avoid the need to expand the substation yard to accommodate a breaker-and-a-half configuration. Thus, considerable CAPEX savings will be realized. The current construction sequence has the project completing by FY16

Table 2-3
Transmission – Substation Compliance Upgrades
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	13.9	22.2	12.3	0.8	0.0	-	49.2
2013	-	24.5	0.8	0.1	0.0	0.0	25.4

Conductor Clearance Strategy

On October 7, 2010 a NERC Alert (Recommendation to Industry: Consideration of Actual Field Conditions in Determination of Facility Ratings) was issued stating that:

[4] 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).

> "NERC and the Regional Entities have become aware of discrepancies between the design and actual field conditions of transmission facilities, including transmission conductors. These discrepancies may be both significant and widespread, with the potential to result in discrepancies in line ratings. The terms "transmission facilities" and "transmission lines" as used herein include generator tie lines, radial lines and interconnection facilities."

All recipients of the NERC Alert were required to review their current Facility Ratings Methodology for their solely and jointly owned transmission lines to verify that the methodology used to determine facility ratings is based on actual field conditions. The Company believes its current program will be sufficient to address NERC's concern on this issue. However, as more information is reviewed, NERC could impose further requirements on the industry.

In response to this alert, strategy SG163 (Conductor Clearance Program for the A-10 Bulk System) was approved on June 30, 2011. This impacted about 65 transmission circuits in New York including most 345 kV and 230 kV lines, as well as a number of 115 kV transmission lines classified as bulk power. This program is expected to be completed by the end of FY13. 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.

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 code requirements vary depending on when the transmission line went into service. Clearance projects will be prioritized based upon NERC requirements. This is also expected to enhance public safety by assuring appropriate codes are met.

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 October 7, 2010 NERC Alert forced the Company to prioritize bulk power circuits ahead of other transmission lines. The NESC sets required conductor clearances of overhead lines from the ground and other ground based objects. The NERC Alert places a reliability driver on a portion of this work. This program assures that transmission lines meet the governing National Electrical Safety Code (NESC) under 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.

2012 and 2013 Variance:

The Company has re-estimated the remaining projects based on experience with bulk power circuits under SG163 resulting in a lower overall expected spend profile.

Table 2-4
Transmission – Conductor Clearance Strategy
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	5.9	7.3	15.4	15.0	15.0	-	58.6
2013	-	7.0	7.4	10.7	10.7	10.7	46.4

BES 100 kV Brightline

Investments in FY14 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). A definition was officially approved by FERC at the end of calendar year 2012. However, the FERC Final Order on BES that was approved is slightly different than what was filed by NERC in 2012. Therefore, the Company has not entered specific line items into this plan related to this definition change because the impact of the new definition must still be determined. The implementation plan submitted by NERC includes a two year period for all NERC registered entities to bring BES elements of the transmission system into compliance with the new standards.

There are four main areas where the Company previously 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 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, instead of a 2-3 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 definition in combination with the new NERC stricter planning criteria would impose such criteria on a larger set of facilities. In 2012, this was expected to increase capital costs in the range of $50 million over 10 years; however, making more specific cost estimates is difficult until the impact of the new definition as approved is fully evaluated and the new NERC Transmission Planning TPL standards are also approved by FERC.

- The new NERC definition in combination with the NPCC/NERC Regional Standard, PRC-002-NPCC-01—Disturbance Monitoring, would require disturbance monitoring equipment to be installed to cover all of the newly defined BES elements. Any regionally approved standards that are submitted to NERC and FERC for approval are subject to the NERC BES definition and not the Region’s definition. This change has an impact of approximately $10 million over the next 4 years; again, more specific cost estimates will be developed now that the new BES definition has been approved by FERC. In addition the Company will be working with NPCC to identify if there are any opportunities for modifying the Regionally-approved standard to be specifically applicable to NPCC’s defined Bulk equipment. However, this change would need to be submitted to NERC and FERC for approval for that change to be effective.

- New Cyber Security standards version 4 (and 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 (Version 5 only) to be included. These changes in conjunction with the new BES definition are

expected to add 23 facilities 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 the new definition as approved is fully evaluated and the new Cyber standard(s) are approved by FERC.

Drivers:

FERC's final rule on the BES definition (Order No. 773) was issued December 20, 2012. The primary driver for the redefinition of BES proposed by NERC was FERC Order No. 743 issued in November of 2010. That order was aimed at improving clarity, reducing ambiguity, and establishing consistency in the definition of the BES and in its application across regions of the country. The use of a 100kV threshold in the new definition is intended make the line of demarcation between the BES and non-BES system "brighter" and easier to manage, and is expected to improve the reliability of the BES.

Customer Benefits:

The redefinition of BES using the lower voltage of 100 kV will enlarge the portion of the total system to which BES planning criteria are applied. This broader application of such criteria is expected to improve the reliability and security of that portion of the system to which it is extended. Because extension of the BES will bring its demarcation closer to customers, the reliability of customer service will improve to the degree that such reliability is affected by the reliability of the BES portion of the system. Because the extension of the BES will require some additional investments, capital investment and customer electricity bills will also be impacted accordingly.

2012 and 2013 Variance:

No specific program or project funding was included in the 2012 or 2013 CIP related to the anticipated BES definition change.

Remote Terminal Unit Replacement Strategy

The ongoing Remote Terminal Unit ("RTU") Strategy (C003772) involves replacing obsolete monitoring and control equipment with current and fully functional equipment.[5] There are currently approximately 550 operating RTUs under the Company's control, of which 158 transmission and distribution units are being replaced under this program.[6]

NERC Recommendation 28, released in response to the August 2003 blackout, requires the use of, among other things, more modern, time-synchronized data recorders. Many in-service RTUs do not satisfy this requirement; and obsolete RTUs will not work with the new Energy Management Systems ("EMS") the Company expects to implement.

[5] The Remote Terminal Unit Strategy (SG 002) was included as Exhibit 20 in Volume 5 of 9 of the September 17, 2007 Transmission and Distribution Capital Investment Plan, Case 06-M-0878.
[6] Some of the proposed RTU replacements are in generator owned facilities, not just National Grid substations.

To date, 117 of the 158 RTU replacements have been completed. Another 38 have completed engineering and are awaiting installation; and 3 still need to be scoped.

Drivers:

The RTUs are being replaced under this program for the following reasons:

- The target RTUs do not meet the criteria outlined in NERC Recommendation 28,[7] which places the Company at risk for being unable to provide synchronized system data during a system emergency.
- The target RTUs and equipment are obsolete and in most cases no longer supported by the manufacturer. Replacement parts are either difficult to obtain or unavailable.[8] Failure of an RTU may be un-repairable, requiring a complete unplanned replacement on short notice. This situation could occur when data from the failing RTU is most critical, such as during system events, resulting in reduced reliability performance.
- Test equipment is obsolete and cannot be readily obtained or maintained. The PC based test equipment required for maintenance was acquired in the early 1990s and uses a DOS software platform. Both the RTUs and test sets utilize the M9000s communication protocol. This protocol is the legacy protocol of the original Energy Management System ("EMS") and cannot be upgraded to be compatible with the planned EMS system replacement.
- The target RTUs are not suitable for future integration of new substation devices and technology. The equipment does not have and cannot be modified to provide the capabilities required for modern supervisory control and data acquisition.[9] This type of functionality is becoming standard to meet current reliability needs.

Customer Benefits:

The new RTUs will provide more timely and reliable data than their predecessors. In the event of a system disturbance, accurate data received in a timely manner is a necessity in the customer restoration process. Data received from the new RTUs will quickly identify key devices that have failed or have been affected by the event. The data will expedite isolation of the problem, reduce the duration of the outage and in some cases avoid expansion of the outage to other system components. Furthermore, if obsolete RTUs are not replaced, they will not be able to communicate with the new Energy Management System which would then prevent the required modern supervisory control and data acquisition of the transmission system from taking place. This type of functionality is required to meet the reliability needs of customers.

2012 to 2013 Variance:

Generally the targeted RTU replacements have been delayed due to challenges in outage scheduling, length of time necessary to install the digital communication circuitry needed for the new RTUs and the availability of labor resources. Also, several of the

[7] North American Electric Reliability Council (NERC) "Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations," April 5, 2004 Page-162
[8] SG002 – Revised Asset Replacement Strategy for RTUs, October 31, 2005.
[9] SG002 – Revised Asset Replacement Strategy for RTUs, October 31, 2005.

remaining sites are in NYSEG stations and coordination with NYSEG has been difficult. The completion date is now expected to be FY15 rather than FY13.

Table 2-5
Transmission – Remote Terminal Unit Replacement Strategy
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	3.9	0.0	0.0	0.0	0.0	-	3.9
2013	-	2.0	1.1	0.0	0.0	0.0	3.1

NYISO Interconnection Meter Investment Program (C035267)

There are approximately 230 NYISO reportable points in New York State for which National Grid is the metering authority. These reportable points include generation points and transmission tie line points between zone and sub-zones in the NYISO that are required to settle commodity charges between market participants. The meter authority is responsible for meter accuracy and the transmission of meter data in accordance with the NYISO meter standards, tariff and Transmission Owners agreement. Metering authority responsibilities also include the calibration, repair, and maintenance of the metering circuits at these points. Documentation and reporting of compliance concerning the performance of these responsibilities is also required, and to be made available on request by the NYISO or other market participants. These requirements are mandates and are specified in the NYISO Revenue Metering Requirements Manual (Manual 25) and the NYISO Control Center Policies and Procedures Manual that National Grid is bound to follow based on our Transmission Owner Agreement with the NYISO.

Drivers:

Compliance with the NYISO's requirement for revenue grade metering circuits at all ISO reportable points.

Customer Benefits:

The use of revenue grade meters at zone and sub-zone points is necessary for settlement purposes as to not adversely affect the competitive energy market, which is highly dependent on accurate and timely information.

2012 to 2013 Variance:

The Company has revised its estimate of sites that require upgrades to revenue grade meters down from 55 to 18. Because each site will have unique needs depending on the instrument transformers available and whether they can be reused, there is not a linear correlation between the $8.3 million estimate for 55 sites to the $2.7 million estimate for 18 sites.

Table 2-6
Transmission – Interconnection Meter Investment Program
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	5.1	3.2	0.0	0.0	0.0	-	8.3
2013	-	2.0	0.7	0.0	0.0	0.0	2.7

Chapter 2 B. Damage/Failure Strategies and Programs

Damage/Failure category projects are those capital expenditures 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 events or deterioration. The Company views the Damage/Failure category as a mandatory category of work that is non-discretionary in terms of scope and timing.

The Damage/Failure investment levels are based on historical actual costs. Most distribution damage/failure occurrences are single structure events and are handled under blanket projects. Individual work orders are used to capture small value, relatively high volume work that is of standard construction and scope, short duration, and limited to a maximum of $100,000.

Inspection Projects

The goal of this program (C026923) is to replace those damaged or failed components on the transmission overhead line system identified during field inspections (five-year foot patrols).

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 Regulatory. Historically, this program has been categorized as Damage/Failure and the Company recognizes both rationales as mandatory spend.

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.

2012 to 2013 Variance:

Spending levels during the last two years were lower than originally projected due to implementation and preliminary engineering lead times. Increase in FY14 and FY15 primarily due to higher number of maintenance units identified as Level 3 during recent foot patrol inspections.

Table 2-7
Transmission – New York Inspection Projects
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.1	1.1	1.1	1.1	1.1	-	5.5
2013	-	4.1	4.1	1.1	1.2	1.2	11.7

Wood Pole Management

This program (C011640) 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. As with the New York Inspection Projects, described previously, since this work is required to meet governing NESC standards, the program could equally be categorized as Statutory or Regulatory. Historically, this program has been categorized as Damage/Failure and the Company recognizes both rationales as mandatory spend.

Drivers:

As discussed in the Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2012, 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.

2012 to 2013 Variance:

The $5.2 million spent in FY13 was part of a catch up effort to replace poles. Spending levels in FY14 and beyond are expected to remain consistent to the prior plan.

Table 2-8
Transmission – Wood Pole Management
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	5.2	2.7	1.4	1.4	1.4	-	12.2
2013	-	2.5	2.6	1.5	1.5	1.5	9.6

Chapter 2 C. System Capacity and Performance Strategies and Programs

System Capacity and Performance projects are required to ensure that 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.

Reliability Criteria Compliance

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 strategy 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 an area study in 2012. The more cost effective solution recommended in the 2012 study results

in the cancellation of certain projects previously planned and the addition of new projects in their place. Some projects in this program were also accelerated as near-term measures to mitigate the planned shutdown of generation at Dunkirk that was announced in 2012. Additional long term reinforcements beyond those identified as near-term measures were also determined by further study and are described separately in the last section of this chapter.

The major components in this program with investment levels greater than $2 million (costs shown are for the period covered by this Plan) include:

- Constructing a new 345/115kV Southwest 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) - $43.8m.
- Re-conductoring 6 miles of the Falconer-Warren 115kV #171 circuit to prevent the circuit from being opened by FirstEnergy due to their loading concerns (C024017) - $3.8m.
- Constructing a new 115kV substation and ring bus at West Golah that ties together the National Grid #119 and NYSEG # 906 lines (CNYPL37) - $7.0m.

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 confirmed in 2011 and 2012 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. Issues 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).

In the Southwest Region, multiple reinforcement projects are required to correct all N-1 conditions. In addition to the problems in the Homer Hill area, bus faults at Dunkirk will create low voltage problems on the circuits between Dunkirk and Falconer. For the Genesee Region, several voltage related problems were found in the Batavia and Golah areas. For bus faults at Lockport, voltage problems develop in the Batavia area. Thermal concerns were also present on one of the circuits between Lockport and Batavia. At Golah, an outage of the circuit between Mortimer and Golah (N-1) would result in Golah being fed radially from Batavia. This in turn would cause low voltage levels at Golah. This contingency can also be caused by bus faults at Mortimer and Golah.

Customer Benefits:

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

- Exposure to service interruptions, including load shedding, in the event that certain key contingencies which may occur 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 future costs of dispatching the generation out of NYISO 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.

2012 to 2013 Variance:

The major reason for the variance in this Plan relates to the acceleration and expansion of scope of certain projects related to mitigation of the Dunkirk generation shutdown, and at the same time the further development of more cost effective plans to mitigate for voltages in the Genesee area. These two developments result in a net decrease in total spending over the entire five year period of this plan.

Table 2-9
Transmission – Reliability Criteria Compliance
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.1	3.4	7.4	20.9	46.6	-	78.5
2013	-	11.3	26.3	19.1	2.4	0.0	59.1

Generator Plant Shutdowns

Dunkirk

In 2011, National Grid performed a study of Western New York and identified a set of projects that were classified under the Reliability Criteria Compliance Program within the System Capacity and Performance spending rationale. On March 14, 2012, NRG gave notice that it planned to mothball its coal fired generation located at Dunkirk for an unknown amount of time. An analysis by National Grid (Part 1) of the impact of this plan identified near-term projects that would be required to mitigate the mothballing of all but one 115kV generating unit. These projects are expected to be 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 that would allow all units to be retired and which met the long term needs of the area.

The Company's long term program to mitigate the reliability problems resulting from retirement of all Dunkirk generation comprises the following major components with investment levels greater than $2 million (costs shown are for the period covered by this Plan):

- Installing 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. (NMPL13-08, NMPL13-07 respectively) - $3.9m.
- Re-conductoring two 115 kV lines between Five Mile Road and Homer Hill, each 7.4 miles in length. (NMPL13-11) - $18.0m.

Drivers:

A National Grid study in 2011 of Western New York tested 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. 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 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, but merely restored the system to a state similar to the existing system with all four Dunkirk units running in 2013. The analysis of the Part 2 impact study incorporates all recommendations of the Part 1 impact study, and addresses long term exposure to N-1 and N-1-1 low voltages and overloads using NPCC testing requirements.

Customer Benefits:

Exposure to service interruptions, including load shedding in the event that certain key contingencies may occur, would be reduced significantly. The Dunkirk generation that currently must be run at times to support voltage and transmission thermal capacity will no longer be required for these purposes, avoiding the cost of the contract to delay the mothballing of the units.

2012 to 2013 Variance:

. These projects were not in the previous CAPEX Plan for the FY14-FY18 time period.

Table 2-10
Transmission – Reliability Criteria Compliance
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	-	-	-	-	-	-	-
2013	-	2.9	10.9	8	-	-	21.8

Cayuga

The #5 115kV line between the Elbridge and State Street substations supplies load in the 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 that also includes other lines.

In September of 2012, the owner of two generators at Cayuga, New York, gave notice of its intent 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 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 between Auburn and Elbridge (C047298) - $18m.
- Increase the capacity of the #5 115kV line between Elbridge and State Street (C047297) - $32.2m.
- Add a breaker position in the Elbridge substation for a new 115kV line (C047299) - $2m.
- Re-conductor the Clay – GE #14 115kV line (C045253) - $8.4m
- Reconfiguring Transformer connection at Clay Substation (C047275)- $9.9m

The original plan and the estimated cost of increasing the rating of the #5 line is based on the assumption that the line would be reconductored. Since the #5 line is on a double circuit tower, the project would require tower replacements to accommodate a larger size conductor. In addition, the construction of a new line between Elbridge and State Street is also based on the assumption that a new set of single circuit towers would be constructed in the right-of-way. An alternative construction plan that may have additional benefits has recently been suggested and is under review by the joint analysis team involving the new line and the upgrading of the #5 line. This alternative plan, however, would not change the number of projects involved and it would still involve creation of a new circuit between Elbridge and State Street and an upgrade in the capacity of the #5 line.

A project to replace the Clay 345/115kV #1 transformer already existed prior to the announcement of the Cayuga shutdown. However, the cost of this project has been increased by $5m in order to rearrange the way in which the transformer is connected in order to mitigate the effects of the Cayuga shutdown.

Drivers:

Both the normal and contingency peak thermal loading of the # 5 line is currently stressed by historical load growth in the Auburn area. This stress currently exists even when Cayuga generators are available. In order to relieve this stress, NYSEG planned to build a new 115kV line between Elbridge and State Street within the existing right-of-way.

The mothballing of Cayuga generation further stresses the existing system. The analysis of N-1 and N-1-1 contingency reveals that 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.

While a long term solution set of reinforcements to National Grid facilities that will mitigate the impact of shutdown of Cayuga generation is included in this Investment Plan, specific issues involving design, construction, and final ownership of facilities have not been resolved at this time.

Customer Benefits:

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

- Exposure to service interruptions, including load shedding, in the event that certain key contingencies which may 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, avoiding the cost of the contract to delay the mothballing of the units.

2012 to 2013 Variance:

These projects were not in the previous CAPEX Plan for the FY14-FY18 time period.

Table 2-11
Transmission – Reliability Criteria Compliance
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	-	-	-	-	-	-	-
2013	-	12.3	26.7	28.7	2.8	0.0	70.5

Other System Capacity & Performance

There are currently four separate projects with investment levels greater than $2 million each included in the Other System Capacity and Performance program. The largest item is the Syracuse area re-conductoring program.

Syracuse Area Re-Conductoring

This program reinforces the transmission system in and around the Syracuse area. These reinforcements are necessary to respond to a system capacity and performance need caused by load growth in the area over the period of time between 2010 and 2015.

Without this program, the 115kV system will be exposed to thermal overloads during contingency conditions.

The program scope includes the following projects:

- Re-conductor two separate sections of the Clay–Teall 115kV Line #10. The sections targeted for re-conductoring are 6.75 miles, and 6.08 miles. This project is required for compliance with mandatory NERC standards (C043995) - $6.7m.
- Re-conductor 10.24 miles of Clay–Dewitt 115kV Line #3. This project is required for compliance with mandatory NERC standards (C043996) - $7.4m.

Drivers:

Studies of the 115kV and 345kV transmission systems were conducted for the Central region of central 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. These studies were performed in 2008, and then reconfirmed in 2010, and evaluated the system for existing load levels up to a 15 year forecasted load level.

Included within both of these evaluations were 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.

Several reliability criteria issues for the area were discovered under study conditions. Issues include thermal overloads on 115kV circuits in the Central Region.

Following completion of annual area studies, the analysis of the Cayuga generator shutdown identified impacts in the Clay area. The projects that were identified as necessary to mitigate these impacts are described in a later section of this chapter.

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.

2012 to 2013 Variance:

This project continues to move forward as expected with only minor variances due to re-phasing of the work.

Table 2-12
Transmission – Syracuse Area Reconductoring
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.2	0.2	2.0	13.0	.9	-	16.3
2013	-	2.1	4.6	7.4	0.0	0.0	14.1

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. During the previous ten years, the Company adopted an Asset Management approach that relied on a holistic, longer-view assessment of assets and asset systems to inform capital-investment decisions. As part of this approach, the Company conducted assessments of major asset classes such as circuit breakers or subsets of asset classes such as a circuit breaker manufactured by a particular vendor. These assessments focused on the identification of specific susceptibilities for assets and asset systems and the development of potential remedies.

In light of current economic conditions, however, the Company presents a modified approach in this Plan that reduces near-term capital costs. 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. The modified approach calls for a 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, the Plan seeks to achieve compliance with NESC requirements, and will attempt 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 starting in calendar year 2012, the engineering economics of various options such as a complete reconductoring versus a life extension will be reviewed. In addition, longer term impacts 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 property abutters, among other things will be evaluated to determine if it is most economical scope of work for the benefit of customers. Therefore, in the longer term, a more holistic approach to the management of overhead line condition issues may be more appropriate and cost effective.

Further detail on specific asset condition programs and projects is given below.

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 their condition, performance or obsolescence. The program 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.

Strategy SG157 (C034690), approved in late 2010, identifies relay replacement candidates based on historical performance (relay models from the same manufacturer with known performance issues) or obsolescence where parts and technical support are no longer available. The sanctioned scope included the replacement of about 245 high priority relay packages, 18 communication packages and 7 control houses over the next six years[10], however, to reduce the costs of the Plan, the replacement period has been extended a further two years. The conceptual funding level (-25%/+50%) for this project is expected to be $55 million. Specific projects are being engineered and will be sanctioned in due course.

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

[10] For the list of specific relays, sites and timescales please refer to Strategy paper SG157

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.

2012 to 2013 Variance:

The difference between the 2012 and 2013 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	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.3	8.6	11.4	14.7	16.9	-	52.9
2013	-	2.6	4.9	4.8	9.7	10.7	32.7

U Series Relay Strategy

The Westinghouse U series line of relays was introduced in the early to mid 1970s and production and support for these relays ceased in the mid 1980s. Westinghouse U series relays are installed on a number of important 345kV lines. The replacement of these relays with new technology presents significant advantages such as enhanced reliability, improved protection schemes and the ability to record operational data for system performance analysis.

Drivers:

Replacement parts and support for the Westinghouse U Series Relays are no longer available making continued maintenance of these devices difficult. Spare parts removed from previously replaced units have been depleted, and procurement of spare parts from outside sources is not an option.

An un-repairable U Series Relay could be out-of-service for an extended period of time before a replacement relay can be installed. This situation could leave the bulk power transmission line with a single system of protection for a prolonged period of time. Any period greater than 24 hours requires an analysis of the system to be carried out with the likely result that the circuit will have to be taken out of service or a constraint placed on the system to minimize the impact of a single protection failure outside the local area.

Customer Benefits:

This program will improve the overall reliability of the protection system. The replacement relays will have the capability of providing fault and operational data which is currently not available. This data can be used in the future when it comes to analyzing and improving the system as a whole. Both of these factors will promote reliable customer service.

2012 to 2013 Variance:

The timing of the U Series Relay replacement strategy (SG012) has been reassessed The replacement at Rotterdam on the E205-E line was completed in FY13. Relays at LaFayette (LN17), Elbridge (LN17) and Oswego (LN17) are to be completed in FY14 (C024661) while the Leeds (LN92 & LN301) relays will be replaced in FY15 and FY16 (C024663).

Table 2-14
Transmission – U Series Relay Strategy
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	3.2	0.0	0.0	1.5	1.5	-	6.2
2013	-	2.0	1.7	.5	0.0	0.0	4.2

Flying Ground Strategy

There are a number of flying ground switches manufactured by Haefely Trench and Delta Star currently being utilized as transformer protection devices that are no longer considered a suitable method of fault clearance. Their operation introduces additional bolted faults on the 115kV transmission system to clear transformer faults at remote stations. Their operation creates a potential hazard to personnel, and may lead to additional transformer failures. As such, Strategy Paper SG124 was approved to replace all seventeen flying ground switches that are in service in the Western Division with new circuit switchers, as well as the removal of two flying ground switches at Trinity Station in the Albany.

Drivers:

This project (C033613) was driven by the need to improve reliability, ensure the safety of personnel and prevent damage to equipment. Existing flying ground switches are deteriorated and require replacement. The flying ground switches were installed in the mid to late 1950s and over time their operating speed has decreased because of worn linkages and other mechanical components. Due to this wear, there is a higher probability of equipment mis-operations or even inability to operate the equipment. A significant delay in clearing a fault may lead to customer interruptions as a consequence. In addition, slow clearance of faults could also result in significant equipment damage, potential safety issues and longer customer outages. Replacing the flying ground

switches with new circuit switchers will provide both switching and fault interrupting capabilities.

Customer Benefits:

Replacing flying ground switches with circuit switchers would meet modern protection requirements and provide both switching and interrupting capabilities. Installation of these capabilities would contribute to the overall maintenance of system reliability which benefits customers in terms of security and quality of service by isolating faults to individual stations rather than interrupting entire transmission lines. In addition to reliability benefits, there would be safety improvements for site personnel through this program.

2012 to 2013 Variance:

The Company reestablished this program in FY12 and is working toward replacing the flying ground switches in the Buffalo area by FY15. Flying grounds in Albany are now only being removed, not replaced, resulting in a $1 million difference from the 2012 CIP.

Table 2-15
Transmission Flying Ground Strategy
Program Variance ($millions)

	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.2	0.9	1.4	0.0	0.0	-	2.5
2013	-	0.9	0.6	0.0	0.0	0.0	1.5

Substation Battery Replacement

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 the Battery Replacement Strategy (C033847) is to replace battery and charger systems that are 20 years old. The 20 year limit is based on industry best practice and Company experience in managing battery systems.

Drivers:

Battery and charger systems are critical components that are needed to ensure substation operational capability during both normal and abnormal system conditions. A long term Battery Replacement Strategy Paper was approved by the Company in 2009. Battery systems will now have a planned replacement schedule or as condition warrants based on periodic testing. Not adopting a planned replacement approach for battery systems may, in the longer term; lead to failures of interrupting devices to trip in the event of a fault and extended fault duration on the power system with the consequential possibility of system instability. Common end of life failure modes are positive grid

corrosion and electrolyte dilution. These failure modes are inherent in the design, inevitable and irreversible.[11]

Customer Benefits:

This program provides for the proactive replacement of battery systems at end of their expected life based on industry data and Company experience, minimizing the risk of battery system failure. A battery system that does not perform adequately could result in serious reliability consequences, including over-tripping of the system for a fault, thus impacting customers.

2012 to 2013 Variance:

This is a recurring program that will replace station batteries and chargers that are over 20 years old or as condition dictates. The difference in projected spend for the program was a result of re-estimating projects for the next five years utilizing recently completed projects for reference .

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.6	0.6	0.6	0.6	0.6	-	3.0
2013	-	0.5	0.2	0.2	0.2	0.2	1.2

Shield Wire Replacement Strategy

This program concerns the replacement of shield wire on 115 kV transmission lines. The overhead assets targeted by this program are referenced in the 2011 Asset Condition report[12]. Two remaining projects within this program remain; the Gardenville-Buffalo 145-146 project (C028683) and the Gardenville-Depew 54 (C028706) project.

Drivers:

A significant driver of this strategy is enhanced reliability of the transmission system. Shield wire serves as a grounding element deflecting the lightning strikes away from energized conductors and conveying it to ground without permitting flashover to occur. A well grounded shield wire system significantly reduces the likelihood of an outage due to a lightning strike.

In addition to lightning protection, the shield wire provides critical structural support against imbalance caused by heavy wind, conductor drop or failure, splice failure,

[11] David Linden and Thomas B Reddy, Handbook of Batteries, McGraw-Hill, New York, 2002

[12] Report on the Condition of Physical Elements of Transmission and Distribution Systems, 06-M-0878, October 1, 2011, pg. II-21.

localized wind shear, ice loading and other related elements.[13] These imbalances occur more often than originally suspected and as long as the shield wire system is intact, they can go unnoticed. An intact shield wire will help minimize structural related outages. Safety is also a major factor in the shield wire strategy. A dropped shield wire that goes unnoticed (no outage) creates a public safety concern if the line remains energized.

Customer Benefits:

The Shield Wire program targets reliability improvements of the 115kV transmission system. There will also be a benefit in the improvement in the performance of each circuit. Even those shield wire failures that do not result in an unplanned outage generally require a scheduled outage for repairs. Consequently, the reliability of the circuit suffers, as does service to customers.

2012 to 2013 Variance:

The Gardenville-Buffalo 145-146 and Gardenville-Depew 54 shield wire replacements are proceeding as expected and will be completed in FY14.

Table 2-17
Transmission – Shield Wire Replacement Strategy
Program Variance ($million)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.4	2.6	0.0	0.0	0.0	-	5.0
2013	-	2.8	0.0	0.0	0.0	0.0	2.8

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 were eight stations being studied for either upgrades or rebuilds to better meet the current and future needs of customers on the transmission system: Gardenville, Dunkirk, Rome, Rotterdam, Lockport, Lighthouse Hill, Huntley and Oneida.

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 eight projects will require fairly

[13] The Company will consider the installation of Optical Ground wire (OPGW) during replacement of shield wire where cost beneficial.

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, Rome, Lighthouse Hill, Dunkirk and Huntley stations are now proposed to be rebuilt during the FY14 – FY18 period with most of the spending occurring in the later years of the Plan and 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.[14] Included with the station name is the forecasted spend amount within this Plan.

Gardenville (C005156 & C030084) $53.3m

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 has been extended to FY18 to accommodate the projects related to the Dunkirk and Cayuga plant closures.

[14] 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.

Rome (0C03778 and C034983) $8.2m

The Rome station was constructed in the early 1920s. It has received several reconfigurations over the years with the current 115kV to 13.2kV dual bus built in the early 1970s. The 115kV system at the Rome Station experiences periods of low voltage particularly if the tie-breaker is opened. Station property near the north bus section has been under environmental remediation the past several years due to a former coke plant that was located on the site. Assets located on the North yard will be relocated away from this remediation site.

There are multiple asset condition issues affecting the station noted in the 2011 Asset Condition Report. A Strategy paper proposing a station rebuild was sanctioned in October 2010 and engineering has been completed. Project completion is targeted for spring of 2015.

Rotterdam (C034850) $0.3m

Rotterdam is a large station with 230kV, 115kV, 69kV, 34.5kV and 13.2kV sections spread out over multiple tiers on a hillside. The 230kV yard is the main source for Schenectady, Saratoga and Warren counties. Rotterdam is supplied from the Porter Lines #30 and #31 and from Bear Swamp on the E205 line to Massachusetts. As discussed in the 2011 Asset Condition Report, the 230kV yard has had performance issues and there have been three (R23, R24 and R84) catastrophic failures of Federal Pacific Electric RHE breakers. Two of the three 230kV auto transformers #7 and #8 have a higher than normal failure likelihood due to their design; specifically due to "T" beam heating and static electrification. There has also been an issue with capacitor bank #4 tripping off line on differential protection if capacitor bank #3 is put into service while capacitor bank #4 is on line.[15]

The 115kV circuit breakers at Rotterdam are a mixture of Westinghouse, McGraw Edison, Allis-Chalmers, General Electric, and ABB. The disconnect switches are deteriorated and many have had problems in the past with breaking or not operating correctly. The original 115kV yard has multiple foundation problems with listing pads and crumbling foundations especially some of the tower supports. The containment pit around the single phase transformers of TB#4 have collapsed in sections. The 115kV yard has inadequate thermal performance with respect to the existing transmission system in the Capital/Northeast Region, which will be exacerbated by the addition of Global Foundries (Luther Forest) and projected load growth. This will worsen with time as Global Foundries is connected to the Northeast Region transmission system and as the load grows as projected.

Given the uncertainty over the 230kV station and the necessity to reduce capital investment to minimize Plan costs, 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 is expected to begin in FY18.

[15] Report on the Condition of Physical Elements of Transmission and Distribution Systems," October 1, 2009, Page III-73 and III-74.

Dunkirk (C005155) $4.8m

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.

A project was completed in September 2010 to install a new cable trench in the 230kV yard. Control cables deemed "faulty" can then be replaced using these new facilities. A thorough conceptual engineering analysis to construct a new control house and completely separate assets in this station has been finished. Other equipment at Dunkirk, such as disconnects and PTs (potential transformers), will be replaced during a separate project to install a second bus tie.

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 last section of this chapter.

Huntley (CNYAS119) $3.0m

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 misoperation, inconsistent maintenance and uncontrolled conditions and access.

The analysis of the impact of Dunkirk generation shutdown has identified the need for two 115kV capacitor banks at Huntley for the purpose of system reliability. This is described separately in the last section of this chapter.

Lighthouse Hill (C031662) $7.5m

This facility is a significant switching station with two 115kV buses and seven transmission lines connecting to the station, allowing power to flow from the Oswego generating complex to the Watertown area in the north 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.

2012 to 2013 Variance:

Apart from Gardenville and Rome, 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 2-18
Transmission – Substation Rebuilds
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	6.4	7.9	23.5	24.2	17.0	-	78.9
2013	-	9.6	4.4	6.6	23.1	33.7	77.3

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 cursory 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.

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.

2012 to 2013 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 2012 to 2013 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 2-19
Transmission – Overhead Line Refurbishment Program
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	23.2	27.8	46.3	56.9	68.2	-	222.4
2013	-	12.0	21.7	47.5	103.0	83.8	268.0

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 - (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 plenty of capacity for future load as determined by distribution planning.

Seneca Terminal - 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.

Inghams – 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.

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.

2012 to 2013 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. Three transformers have been identified for replacement within the term of this plan compared to the 2012 plan which had two transformer replacements and included funds for spare transformers. This 2013 capital investment plan does not include spare transformers (which were addressed in FY13).

Table 2-20
Transmission – Transformer Replacement Program
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	4.9	0.8	0.0	0.0	0.0	-	5.7
2013	-	0.8	6.3	3.4	3.5	3.0	16.9

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.

The strategy paper SG158 proposed the replacement of three 345kV, nine 230kV and seventy-five 115kV large volume oil circuit breakers on the transmission system over a ten year period. However, in order to reduce capital investment costs of the period of the Plan, the Company has slowed its plans for circuit breaker replacement.

Drivers:

There are 726 circuit breakers installed on the transmission system. Of these, 368 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 87 circuit breakers addressed in this strategy were 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. Due to the deferral and re-phasing of planned investment, several of these projects have been postponed and a reassessment of replacement priorities is needed. 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

The following circuit breaker types are ranked the highest priority for replacement;

Allis Chalmers Type BZO – The operating mechanisms in this family of breakers, manufactured in the 1950s through 1980s, are showing an increase in accumulator pump and O-ring failures. Design changes and changes in component manufacture over the years require different replacement parts for various vintages and these parts are difficult to obtain. Mechanism wear has resulted in reduced levels of reliability, increased

maintenance costs and a number of failures. There are currently 109 Allis Chalmers Type BZO circuit breakers installed on the system.

Westinghouse GM - Test results from this family of breakers indicate contact timing problems and questionable insulation integrity. There are currently 38 Westinghouse GM circuit breakers installed on the system.

General Electric Type FK – There have been problems with bushing oil leaks and lift rods issues due to moisture ingress with these circuit breakers. In addition, lead paint is prevalent in this family of breakers. There are currently 115 General Electric Type FK circuit breakers installed on the system.

Due to the key function carried out by circuit breakers, particularly for fault clearance, they cannot be allowed to become unreliable, and should be replaced. The average age of the Company's oil circuit breakers is 44 years. Approximately two percent are greater than 60 years old and 59 percent of the total population is between 40 and 59 years old. The typical expected life for oil circuit breakers is 45 years.

Examples of recent Oil Circuit Breaker failures in the past year include:

- 2011: Cortland Station; WE GO-3A oil circuit breaker R30
- 2011: Geres Lock Switching Station; ABB 121PM oil circuit breaker R80
- 2011; Porter Station; AC BZO oil circuit breaker R100

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.

2012 to 2013 Variance:

The Company is committed to planned replacement of oil circuit breakers to maintain the reliability of its transmission system. Minor variance in spending from the 2012 to 2013Plans is due to the re-phasing of replacements to accommodate projects related to the Dunkirk and Cayuga plant closures.

Table 2-21
Transmission – Circuit Breaker Replacements
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.4	2.5	3.5	4.5	6.0	-	16.9
2013	-	1.8	3.3	3.7	4.5	1.6	14.9

Other Asset Condition

The other asset condition classification includes all of the smaller, typically lower cost, capital investment projects that do not fit within any of the longer-term major programs. There are approximately 40 individual projects within the Other Asset Condition category; the largest of these projects are associated with underground cables, surge arrestors and Problem Identification Worksheets. Total planned investment in the Transmission -- Other Asset Condition category for the Plan period, and comparison to the amounts included in last year's capital investment plan, are shown in the table below.

Table 2-22
Transmission – Other Asset Condition
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.9	2.9	2.5	2.8	1.0	-	12.3
2013	-	5.4	3.1	4.8	2.8	1.0	17.2

Underground Cables (Multiple Projects)

Drivers:

Included under this classification are improvements to the underground cable system. Although the number and circuit miles of transmission underground cables are low, these cables are an important part of the overall electrical system. Projects in the Plan for the underground system include an upgrade to the aging Rochester (C015988 and C029946) and Temple (CNYAS26) pumping plants, improved reliability to the Albany area underground system (Trinity – C011318), and improved alarming and tripping schemes (Elm – C030528, Gardenville – C030530, and Huntley – C030531,). Although these projects are relatively small, they are critical components to maintain a safe and reliable electrical system and minimize any environmental risks.

Customer Benefits:

The improvements described not only provide improved safety and reliability to the underground cable system, but they also minimize environmental risks. Faults experienced on an underground cable can take weeks to locate and repair. Many of the cables are operated by pressurized oil systems and proper maintenance is essential to avoid potential leaks.

2012 to 2013 Variance:

These projects are progressing as expected with some minor schedule changes.

Table 2-23
Transmission – Underground Cables (Multiple Projects)

Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.4	1.7	.7	0.0	0.0	-	2.8
2013	-	0.6	0.8	1.2	0.8	0.0	3.4

Problem Identification Worksheets (PIWs) (CNYX72)

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.

2012 to 2013 Variance:

The investment levels in FY14 to FY18 have been held the same as the 2012 Plan except for FY14; however, PIW driven projects are likely to increase over the Plan period as a result of other capital investment reductions.

Table 2-24
Transmission – Problem Identification Worksheets
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.0	1.0	1.0	1.0	1.0	-	4.0
2013	-	0.5	1.0	1.0	1.0	1.0	4.5

Line Disconnect Switch Replacements (NMAMT13-40)

Drivers:

A recent assessment by field personnel has identified 25 transmission line disconnect switches that no longer function properly and require replacement due to their condition and unavailability of spare parts.

Customer Benefits:

Disconnect switches are typically installed to sectionalize double-ended transmission lines which supply distribution substations through "tapped" connections. This arrangement allows the distribution station to remain in service to serve customers while maintenance or other work is carried out on de-energized section of the transmission line.

2012 to 2013 Variance:

This is a new project starting in FY14 and was not part of the 2012 Plan.

Table 2-25
Transmission – Line Disconnect Switch Replacements
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.0	0.0	0.0	0.0	0.0	-	0.0
2013	-	1.0	1.0	1.0	1.0	0.0	4.0

Chapter 2 E. Non-Infrastructure

Transmission - Physical Security

This program (CNYAS86) provided state-of-the-art security measures to deter and/or detect unauthorized access to fifteen bulk power substations. The security measures were intended to deter intrusion by the obviousness of the measures such as camera installations and card readers, while at the same time providing technology to detect and

report intrusions to a 24 x 7 security control center. The project was completed on June 30, 2013 with only punchlist items remaining for final closeout.

Drivers:

This program was 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.[16] 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 provided 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

2012 to 2013 Variance:

This program will be completed in FY14.

Table 2-26
Transmission – Physical Security
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.5	0.0	0.0	0.0	0.0	-	1.5
2013	-	0.05	0.0	0.0	0.0	0.0	0.05

[16] 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.

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 $221 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)

Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/Regulatory	13.9	12.8	12.8	12.9	13.0	65.4
Damage/Failure	3.3	3.4	3.5	3.5	3.6	17.3
System Capacity & Performance	6.8	7.6	7.6	8.1	8.7	38.6
Asset Condition	17.1	18.3	18.2	21.5	24.8	99.8
Total	**41.0**	**42.0**	**42.0**	**46.0**	**50.0**	**221.0**

Chapter 3 A. Statutory or Regulatory

Statutory or Regulatory 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 Plan and the 2012 Plan are also discussed below.

Table 3-2
Statutory or Regulatory
Variance Summary ($millions)

	CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
Specific Projects	2012	3.4	3.3	3.4	4.7	4.7	-	19.4
	2013	-	2.2	1.4	1.5	1.5	1.6	8.2
Inspection and Maintenance	2012	13.4	12.7	11	11	11	-	59.1
	2013	-	11.4	11.0	11.0	11.0	11.0	55.4
Blankets	2012	0.7	0.7	0.8	0.8	0.8	-	3.8
	2013	-	0.3	0.3	0.4	0.4	0.4	1.8
Total	2012	17.6	16.7	15.1	16.5	16.5	-	82.4
	2013	-	13.9	12.8	12.8	12.9	13.0	65.4

Aside from blanket and program projects, 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.

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.

Drivers:
The Company implements the Inspection and Maintenance program in accordance with the Commission's directives in Case 04-M-0159. The 2012 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.

2012 to 2013 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 3-3
Inspection and Maintenance
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	13.4	12.7	11.0	11.0	11.0	-	59.1
2013	-	11.4	11.0	11.0	11.0	11.0	55.4

[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 06-M-0878, October 1, 2012, page 77.

Steel Towers

There are approximately 3,790 steel towers on the sub-transmission system,[3] the majority of which are 60-90 years old. Above ground inspection of towers and associated equipment is coordinated through the Inspection and Maintenance Program, which also identifies towers that require further engineering analysis.

Drivers:
Corrosion is the natural life limiting failure mechanism for towers. Replacement is called for when it is more economic to replace the entire tower than to replace or perform welding repairs to a number of steel members. Alternatively, replacement may be necessary when it is no longer safe to work on the tower.

Customer Benefits:
Maintaining Reliability by preventing tower failures which may result in customer interruptions is the key driver for this program.

2012 to 2013 Variance:
The program is being phased out as a stand alone program. As lines with steel towers are identified with steel tower issues through the inspection and maintenance program, they will be incorporated into the line refurbishment program.

Table 3-4
Steel Tower
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.8	1.8	1.8	1.8	1.8	-	8.8
2013	-	0.8	0.0	0.0	0.0	0.0	0.8

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. Comparison of the sub-transmission Damage/Failure investment levels from the 2012 Plan and the 2013 Plan is set forth in Table 3-5 below.

2012 to 2013 Variance:
The variance between the 2012 Plan and this year's Plan is based on recent historical spending.

Table 3-5
Damage/Failure
Variance Summary ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	4.0	3.6	3.8	3.9	4.1	-	19.5
2013	-	3.3	3.4	3.5	3.5	3.6	17.3

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 is associated with specific projects while later year investment levels are based on historical spending levels and forecasted growth in peak demand.

2012 to 2013 Variance:
The projected program investment is based on the specific projects discussed following the table below.

Table 3-6
System Capacity and Performance
Variance Summary ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	8.2	9.0	9.0	9.7	10.1	-	46.0
2013	-	6.8	7.6	7.6	8.1	8.7	38.6

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

- Project CD00899, Queensbury Station – Replace M/C S/G's & Install Cap Banks. This project will replace existing metalclad switchgear and install 15kV capacitor banks.
- 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 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 C036054, Golah Avon 217 Line Reconductoring. This project will reconductor approximately 5 miles of Line 217 from Golah Substation to Avon Substation.

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.

2012 to 2013 Variance:
The projected investment in the table below shows a decrease year on year to account for decreased scope on two of the 23kV reconductoring projects, rephasing of the projects and a decrease in budgetary reserve.

Table 3-7
Capacity Planning
Program Variance ($millions)

	CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
Specific Projects	2012	4.4	4.5	5.2	5.7	6.1	-	25.9
	2013	-	2.7	3.3	3.2	3.5	3.8	16.5
Load Relief Blankets	2012	0.1	0.1	0.1	0.1	0.1	-	0.6
	2013	-	0.0	0.0	0.0	0.0	0.0	0.1
Total	2012	4.5	4.6	5.3	5.8	6.3	-	26.4
	2013	-	2.8	3.3	3.3	3.6	3.8	16.7

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 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.
- Project C046546, Elm St Relief_23kV Line Work – This project provides for 23kV recabling or new cables/circuits associated with relieving Elm St Station.
- Project C036542, Mountain Station Rebuild – This project will replace existing the existing transformers (2) and associated equipment with larger transformers.
- Project C046361, Sanborn Station Rebuild TxD – This project will replace the existing transformer and associated equipment with a larger transformer.

- Project C046416, South Livingston Relief – Station Work DxT. This project provides for a new 115-13.2kV station to relieve several stations in the Geneseo/Lakeville area.

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 in nature 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.

2012 to 2013 Variance:
The projected investment is shown in the table below and the current forecast is based on individual project estimates through FY15 and an expectation to continue this program throughout the plan horizon. The prioritization of projects and the timing of their implementation will be based on the performance of the various individual circuits.

Table 3-8
Sub-Transmission Automation
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.0	3.7	2.9	3.0	3.0	-	14.6
2013	-	2.6	2.4	2.5	2.5	2.5	12.6

The following specific project will exceed $1 million:

- Project C035866, DA - NC Sub-Transmission Auto Lines 21/23/26. This project provides for sub-transmission automation in the form of sectionalizing via automatic remotely operated isolating switches on the Nicholville-Malone 34.5kV sub-transmission loops (Lines 21, 23 and 26).

Chapter 3 D. Asset Condition

Planned asset condition investment levels for the sub-transmission system, and comparison to investment levels from last year's Plan, are shown in Table 3-9.

2012 to 2013 Variance:
The lower level of forecasted spending for asset condition replacement is due to the transfer of funding to the transmission budget to accommodate Dunkirk and Cayuga 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 3-9
Asset Condition
Variance Summary ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	16.1	20.6	26.1	27.9	32.4	-	123.2
2013	-	17.1	18.3	18.2	21.5	24.8	99.8

There is one specific project identified under this spending rationale that exceeds $1 million in any fiscal year:

Project Candidate, Randall Road New Substation Install and Remove Sub-transmission Lines. Remove 34.5kV line from Ballston to Randall Road Substation.

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 in the Statutory or Regulatory spending rationale.

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.

2012 to 2013 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	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	7.7	9.5	0.1	-	-	-	17.3
2013	-	1.5	6.3	2.9	6.9	2.9	20.5

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.
- Project C046466, Phillips-Telegraph 304-34.5kV Refurbishment. Refurbish 34.5kV line including pole replacements.
- 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 aermotor 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.

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.

2012 to 2013 Variance:
The projected program investment is shown in the table below. The decreased levels of sub-transmission underground cable funding reflect recognition of the complexity of the underground cable replacement work and the high concentration of work required in the Western Division resulting in rephrasing to accommodate outage coordination and resource priorities. This is also a reflection of some the cable work being addressed in other rationales as described below.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.1	1.9	3.2	2.9	1.4	-	11.6
2013	-	1.8	3.1	2.7	1.3	0.0	8.8

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.

Metal-Clad Switchgear

Deteriorated metal-clad switchgear can be prone to water and animal ingress which leads to failures from moisture, dust or animals. 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 have 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.

2012 to 2013 Variance:
The projected program investment is shown in the table below. The capital forecast reflects a prioritized replacement schedule for switchgear replacement based on condition assessment data and analysis.

Table 3-12
Metal-Clad Switchgear
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	4.3	6.2	-	-	-	-	10.4
2013	-	5.3	1.1	0.0	0.0	0.0	6.4

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

- Project C025139, Replace 13.8kV Metal-Clad Switchgear at Oneida Substation. Replace metal-clad substation at Oneida substation with new metal-clad switchgear.
- Project C036104, Ash Street Replace Metal-Clad. Replace 12kV metal-clad substation at Ash Street substation with new open-air bus station.

Additional metal-clad switchgear replacement projects are listed in Chapter IV for distribution substations.

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.

2012 to 2013 Variance:
The projected investment is shown in the table below and is based on specific project estimates.

Table 3-13
Pilot Wire
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.3	1.1	0.9	-	-	-	2.3
2013	-	1.0	0.8	0.0	0.0	0.0	1.7

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 421 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)

Rationale	FY14	FY15	FY16	FY17	FY18	Total
Statutory/Regulatory	123.1	117.9	121.0	123.8	127.1	612.8
Damage/Failure	22.4	22.6	22.8	23.0	23.4	114.1
System Capacity & Performance	53.3	65.8	65.8	79.3	82.9	347.2
Asset Condition	30.0	31.5	33.0	41.5	42.0	178.0
Non-Infrastructure	4.2	4.2	4.4	4.5	4.7	22.0
Total	**233.0**	**242.0**	**247.0**	**272.0**	**280.0**	**1274.0**

[1] The distribution system data was taken January 7, 2013 from National Grid Asset Information Website located at http://usinfonet/sites/asset_info/Pages/AssetStatistics.aspx.

Chapter 4 A. Statutory or Regulatory

Statutory or Regulatory projects are required to respond to, or comply with statutory or regulatory mandates. These include those expenditures that are part of the Company's regulatory, governmental or contractual obligations, such as responding to new service requests, transformer and meter purchases and installations, outdoor lighting requests and service, and facility relocations related to public works projects. With some exceptions, the scope and timing of work in this rationale is generally defined by others.

Statutory or Regulatory 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 2012 Plan and this year's Plan 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 forecasted in the 2013 Plan and the 2012 Plan are set forth below.

Table 4-2
Statutory or Regulatory Spending Rationale
Variance Summary ($millions)

	CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
Blankets	2012	87.0	91.3	96.6	100.9	104.2	-	480.0
	2013	-	75.3	78.8	82.7	86.6	90.8	414.2
Inspection and Maintenance	2012	36.7	29.2	20.6	20.6	20.6	-	127.7
	2013	-	28.6	20.6	20.6	20.6	20.6	111.1
Specific Projects	2012	17.4	17.2	17.8	18.3	18.5	-	89.2
	2013	-	19.2	18.4	17.7	16.6	15.7	87.5
Total	2012	141.1	137.6	135.1	139.8	143.3	-	696.9
	2013	-	123.1	117.9	121.0	123.8	127.1	612.8

Blankets

The distribution Statutory or Regulatory 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;

Municipality requests to relocate overhead facilities underground;

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

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.

2012 to 2013 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 4-3
Inspection and Maintenance
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	36.7	29.2	20.6	20.6	20.6	-	127.7
2013	-	28.6	20.6	20.6	20.6	20.6	111.1

[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").

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. Comparison of the distribution Damage/Failure investment levels from the 2012 Plan and the 2013 Plan is set forth in Table 4-4 below.

2012 to 2013 Variance:
Spending in the damage failure category is forecasted lower than in last year's plan based on the current rate of spending in this reactionary category. The reduction is consistent with the review of the most recent rate case.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	25.9	26.1	26.4	26.7	27.5	-	132.6
2013	-	22.4	22.6	22.8	23.0	23.4	114.1

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 in Table 4-5 below.

2012 to 2013 Variance:
The forecasted investment levels represent the cash flow of specific projects. The variance between the 2012 and 2013 CIP is based on the scope and timing of the specific projects in this category as discussed following the tables below.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	43.1	52.1	53.4	55.3	56.2	-	260.1
2013	-	53.3	65.8	65.8	79.3	82.9	347.2

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 0.7 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.

2012 to 2013 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	FY13	FY14	FY15	FY16	FY17	FY18	Total
Specific Projects	2012	15.3	22.5	22.4	21.3	21.3	-	102.9
	2013	-	11.7	25.9	38.2	52.2	50.9	178.8
Load Relief Blankets	2012	1.5	1.6	1.6	1.7	1.7	-	8.1
	2013	-	2.0	2.1	2.3	2.4	2.6	11.3
Total	2012	16.8	24.1	24.1	23.0	23.1	-	111.0
	2013	-	13.7	28.0	40.4	54.6	53.4	190.1

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 exceed 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 C036985, North Syracuse Area Substation. This project provides for the transformer work 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 CD046732, East Malloy Low Side Substation Equipment. This project provides for the 15kV station equipment associated with project C36188.
- 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.
- Project C006848, Whitaker Dline Work. This project provides for the distribution line work associated with the expansion of Whitaker Substation described above.
- 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 Candidate 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.
- Project CD00881, DLine- To Expand Rock Cut Sub Retire Brighton Ave. This project provides for distribution feeder extensions and conversions to allow for the retirement of the Brighton Ave Indoor Substation.
- 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 C032597, Ogden Brook Substation - Install 15kV Metal Clad. This project provides for the installation of a second switchgear, capacitor banks and new feeder. This project will resolve loading above summer normal rating of the existing substation transformer, MWh criteria violations and distribution feeder loading issues. There is an associated transmission substation transformer project, C034783.
- 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 C029437, Saratoga 4.16kV Conversion. This project provides for the conversion of the 4.16kV distribution feeder to 13.2V to address feeder loading issues and improve feeder ties in the area.
- 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 C036520, Frankhauser Area New Station - Substation Work. Transmission component of a new distribution substation to address loading above summer normal ratings and transformer contingency exposure.

- Project C028929, Frankhauser New Station - Line Work. Line work associated with project C36520 described above.
- 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.
- Project C046146, South Livingston Load Relief Substation. This project installs a new 115-13.2kV station to address loading above summer normal ratings at two stations and on the sub-transmission system in the southern part of Livingston County.
- Projects C046552 and C046759, South Livingston Load Relief Distribution Line. Line work associated with Project C046146.
- 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 C044623, 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 Transformer. 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 C046537, Delameter – New Feeders. This project provides 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 C046528 and C046534, 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 C043594, 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 C032313, N Collins Repl T1 Xfrm. This and associated projects provide for the replacement of the existing North Collins transformer and feeder rearrangement to address loading concerns in the area.
- 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 CD00970, Buffalo Station 64 – New F6453. This project provides for a new feeder to provide capacity for the southern portion of Grand Island.
- 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 Candidate, 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 C046523, Sawyer – two new additional 23kV cables on Kenmore Ave. This project provides for the installation of two circuits to relieve 23kV cable loading in the area.
- Projects C046701, C046690, C046518, C046522, Chautauqua South, new Stedman Station. This and associated projects provide for a new station and line work to relieve/reinforce the South Chautauqua 34.5kV loop.
- Project CD01154, Buffalo 47, - New 4762. This project provides for a new feeder to supply loads in Riverview Industrial Park.

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.

2012 to 2013 Variance:
The Heavily Loaded Line Transformer program is 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	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	3.0	3.2	3.6	3.7	3.9	-	17.3
2013	-	3.1	3.2	3.2	3.3	3.4	16.2

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 also a significant investment in replacing outdated RTUs based on their asset condition. That investment is documented in the Asset Condition spending rationale section, and in Chapter 2 in the Statutory and Regulatory 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.

2012 to 2013 Variance:
The projected investment is shown in the table below, with projected spending comparable to that reflected in last year's Plan.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.8	2.8	2.7	2.7	2.7	-	13.5
2013	-	2.6	2.6	2.7	2.8	2.8	13.5

Engineering Reliability Review

An Engineering Reliability Review (ERR) can be completed for any feeder experiencing reliability problems or any localized pocket of poor performance. ERR's 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.

2012 to 2013 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.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	5.9	3.8	3.5	3.5	3.5	-	20.2
2013	-	3.4	3.7	3.8	3.9	4.0	18.7

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 include: reconductoring using conductors covered with tree resistant insulation. 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), addition of additional sectionalizing points as appropriate (reclosers, fuses and switches) enhanced lightning protection and enhanced vegetation management in the area.

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 improve enhance distribution resiliency in targeted areas.

2012 to 2013 Variance:
This is a new program and did not exist in 2012. As such, specific projects are only identified in the early years of the plan and future spending is maintained in a targeted budget reserve.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	-	-	-	-	-	-	-
2013	-	2.7	3.2	3.2	3.3	3.4	15.8

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

- 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 as 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 to continue to meet its service quality metrics.

2012 to 2013 Variance:
The program is expected to be completed in FY17 and therefore total remaining budget is less than in the 2012 plan.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.8	1.8	1.8	1.8	1.8	-	9.0
2013	-	1.9	1.9	2.0	2.0	0.0	7.7

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.

2012 to 2013 Variance:
Consistent with the position of Department Staff in the recent rate case, the Company has phased the project funding to allow for a ramp up in spending. The FY14 project funding was halved to $2.0 million and spending was added in FY18 to complete the project. The projected investment is shown in the table below.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.2	4	4	4	4	-	16.2
2013	-	2.0	4.0	4.0	4.0	2.1	16.1

System Capacity and Performance – Other

The following specific projects are proposed under the System Capacity and Performance rationale 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 C032496, Harris Substation Second Transformer Addition. This project will resolve loading above summer normal ratings of the Milton Ave. Station transformer as well as MWh criteria violations for contingency loss of the existing Harris Ave. substation transformer.
- Projects CD01120 and CD01124 – Price Corners Rebuild. These projects provide for the rebuild of 34.5-13.2kV Price Corners Station and feeder extensions respectively to address asset conditions at Steamburg Station.

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 in the table below.

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

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	29.2	34.5	44.3	47.8	49.8	-	205.7
2013	-	30.0	31.5	33.0	41.5	42.0	178.0

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

Underground Cable

Various projects are completed each year to refurbish and/or replace distribution underground assets to ensure the system continues to perform in a safe and reliable manner. Distribution cable replacement opportunities are being aligned with other projects such as Buffalo Substation rebuild projects and load relief projects.

Drivers:
Typically, underground cables are the third highest contributor of deteriorated equipment to CAIDI and SAIFI.

Customer Benefits:
Cable replacement projects reduce the likelihood and consequences of cable failures.

2012 to 2013 Variance:
The projected investment is shown in the table below. The spending has been modified based on recent experience.

Table 4-14
Primary Underground Cable
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	5.4	2.5	3.4	4.5	4.5	-	20.2
2013	-	5.4	5.9	3.4	0.0	0.0	14.7

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 of the distribution system during adverse weather conditions.

Replacement will also improve voltage performance.

2012 to 2013 Variance:
The projected investment is shown in the table below.

Table 4-15

Conductor Replacement
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	0.9	-	1.5	1.5	0.5	-	4.4
2013	-	0.9	1.6	1.6	0.7	0.0	4.8

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:
The program, in its second year, continues 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 the area is due to the deteriorated physical condition of the street light cable. Spot repairs have only marginally remedied the incidence rates. Current incident rates in 8 of the 11 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.

2012 to 2013 Variance:
The program expects to spend $2.5M annually to replace approximately 14% of the existing street light cable over a 10 year period. The projected investment is shown in the table below. The pilot projects used for analysis purposes were not funded in the 2012 CIP.

Table 4-16
Buffalo Streetlight Cable Replacement
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.5	2.5	2.5	2.5	2.5	-	12.5
2013	-	2.5	2.5	2.5	2.5	2.5	12.5

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.[3]

[3] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2010, pg. III-119.

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.[4]

Drivers:
There are approximately 779 power transformers plus 21 spares with primary voltages 69kV and below.[5] Each unit is given a condition code based on individual transformer test and assessment data, manufacture/design and available operating history.[6] 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.

2012 to 2013 Variance:
The projected program investment is shown in the table 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 4-17
Substation Power Transformers
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	3.8	1.9	1	1	2.8	-	10.5
2013	-	2.9	3.4	2.1	6.4	3.9	18.8

The capital investment plan in Exhibit 3 shows the current list of transformers expected to be replaced within the next five years.

[4] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2011, pages II-116 to II-117.
[5] Id, pg. II-112.
[6] Id, pg. II-113.

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.[7]

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.

2012 to 2013 Variance:
The projected program investment is shown in the table 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 4-18
Indoor Substations
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	9.3	5.1	8	3.6	5.8	-	31.8
2013	-	7.5	7.7	12.2	11.1	12.3	50.7

- In Buffalo, seven indoor substation projects are expected to exceed $1 million: Buffalo Stations #29, #27, #37 #59, #30, #34 and #31.
- In Niagara Falls, five substations are expected to exceed $1 million: Eighth Street #80, Eleventh Street #82, Welch #83, Beech Street #81 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 substation.

[7] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2011, pg. II-109.

Metal-Clad Switchgear

Deteriorated metal-clad switchgear can be prone to water and animal ingress which leads to failures from moisture, dust or animals. 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.[8]

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.

2012 to 2013 Variance:
The projected program investment is shown in the table 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 4-19
Metal-Clad Switchgear
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.1	2.0	5.2	3.9	4.1	-	16.4
2013	-	0.2	0.0	4.2	7.9	6.9	19.2

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

[8] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2011, pg. II-111.

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

- Project C032296, Altamont Substation Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project C032298, Market Hill Substation Replace Metal-Clad Switchgear. This project provides for a new substation located near Maple Ave in the Town of Amsterdam to replace the existing Market Hill Substation.
- 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 C036213, Chrisler Substation Replace 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 Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new position metal-clad switchgear.
- Project Candidate, Henry Street Station 316 Replace Metal-Clad Switchgear. This project provides for the replacement of the existing metal-clad switchgear with new metal-clad switchgear.

Substation Circuit Breakers and Reclosers

As noted in the annual asset condition report,[9] 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).

2012 to 2013 Variance:
The projected program investment is shown in the table below. The overall spend has been modified based on lessons learned regarding scheduling, the availability of resources and further development of the plan for each substation. The reduction in FY17 and FY18 reflects the completed replacement of a group of 115 kV breakers.

Table 4-20
Circuit Breakers and Reclosers
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	3.0	6.5	7.0	6.8	6.8	-	30.0
2013	-	2.6	2.6	2.6	2.1	1.8	11.5

[9] Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 06-M-0878, October 1, 2011, page II-118.

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:
This 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.

2012 to 2013 Variance:
The projected program investment is shown in the table below. The budget has been reduced due in part to the progress made in replacing batteries that are 20 years or over. Additional batteries will approach 20 years of age in the outer years.

Table 4-21
Substation Battery and Related
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.1	1.1	1.1	0.9	0.9	-	5.0
2013	-	0.5	0.5	0.5	0.6	0.5	2.5

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.

2012 to 2013 Variance:
The projected investment is shown in the table below. The revised plan is based on identified work related to the strategy.

Table 4-22
Mobile Substation
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	1.7	1	1.1	1.1	-	-	4.8
2013	-	0.6	0.0	1.7	0.4	0.0	2.7

Within this program, there is one specific project identified that exceeds $1 million in any fiscal year:

- Project CD01182 New NY Mobile Substation 69-13.8x4.8x4.16kV - A highly utilized mobile substation has been identified in the eastern region of New York as a new system requirement to sustain our emergency and maintenance needs by providing additional coverage for 30 substations.

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.

2012 to 2013 Variance:
The spending in the table below represents a rephrasing of the remaining work.

Table 4-23
Circuit Switcher
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	-	2	1	-	5	-	8.0
2013	-	1.0	1.0	1.0	2.5	2.5	8.0

Remote Terminal Unit Replacement

Work in this program relates to distribution assets identified as part of the Transmission - Remote Terminal Unit Replacement strategy in the Statutory or Regulatory Requirements section of Chapter 2.

There is also significant investment in installing upgraded distribution Remote Terminal Unit (RTU) equipment as documented in the System Capacity and Performance spending rationale section.

2012 to 2013 Variance:
The projected program investment is shown in the table below. Additional stations requiring RTU replacements have recently been identified.

Table 4-24
Remote Terminal Unit Replacement
Program Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	2.2	0.5	-	-	-	-	2.7
2013	-	0.5	0.5	0.6	1.0	0.0	2.6

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 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 a 50% reimbursement of the Company's $19M investment by DOE with the remaining 50% 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 near

complete. Final installation of the capacitor banks will primarily take place through 2nd quarter calendar year 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.[10] 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.

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

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.

2012 to 2013 Variance:
The projected investment is shown in the table below. The reduction results from a change in historical trend.

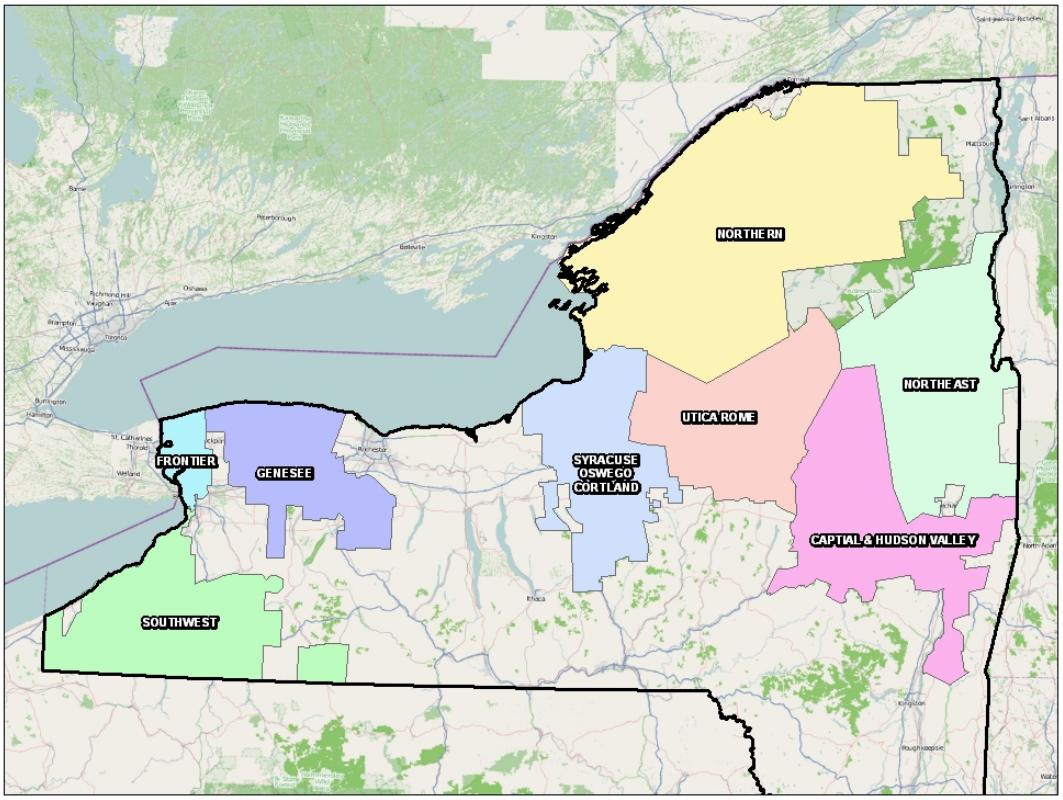
Table 4-25
Non-Infrastructure Spending Rationale
Variance ($millions)

CIP	FY13	FY14	FY15	FY16	FY17	FY18	Total
2012	4.7	4.7	5.8	5.3	5.1	-	25.7
2013	-	4.2	4.2	4.4	4.5	4.7	22.0

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



Due to the changing nature of the system and customer load patterns, projected overloads on the distribution and sub-transmission system are monitored but may not be addressed with solutions until the year the overload is projected. The projected overloads are included in a separate table.

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

- Area Summary
- Area Description
- Area Load Forecast
- Asset Condition Programs
- Forecasted Capacity Constraints

The tables of Transmission Capacity Constraints list transmission assets within each region on which voltage, thermal, or short circuit problems occur under normal or contingency conditions - problems which require capital investment to resolve. There are other problems and circumstances identified during planning studies which can be resolved by permissible (as defined by the governing planning criteria) operator actions such as generation redispatch, switching, or load shedding which do not require capital investment. The latter problems are not included in the Transmission Capacity Constraints tables. Note that operational actions involving generation redispatch make use of generating units currently available. The effectiveness of such actions in the future can be critically affected by future generator retirements. Future planning studies will identify capacity constraints and mitigating capital investments that are needed when such retirements occur, or when revisions to planning criteria - such as the BES definition and TPL standards, change the circumstances under which operator actions are permissible solutions.

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 144,200 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 111 distribution feeders that supply customers in this area. There are eighty-seven 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	Oil Circuit Breaker Strategy	Tran	None	Queensbury - OCB Repl. - R10, R5, R81	NMAMT13-51
				Whitehall Station - OCB Repl. - R13, R3, R6	NMAMT13-55
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Spier-West 9 T5770 ACR	C021694
				Ticonderoga 2-3 T5810-T5830 ACR	C039521
				Ticonderoga 2-3 T5810-T5830 SXR2	C039487
	Substation Metal-Clad Switchgear	Dist	Northeast	05024 Rebuild Saratoga Substation	C029436
				13341 Union St 376 - Replace Metalclad Gear	C046745
System Capacity & Performance	Capacity Planning	Dist	Northeast	06573 Saratoga 4.16 kV Conversion	C029437
				11933 Sodeman Rd Station - new station - M/C & cap bank	C046798
				11958 McCrea Station - New station - Install M/C & cap bank	C046790
		SubT	Northeast	11955 Queensbury Station - Replace M/C S/G's & install cap banks	CD00899
	Other System Capacity & Performance	Tran	None	Queensbury - Replace TB3 & TB4	C036822
	SC&P Other	Dist	Northeast	17887 Bolton 51/Warrensburg 51 Feeder Tie	CD00606

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
	System Capacity & Performance	Tran	None	Sodeman Rd 115kV station equipment	C043754

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, and the Central Hudson Gas and Electric (CHG&E) and Consolidated Edison (ConEd) systems in the south. 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 88,400 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 88,200 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 80,900 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 55,600 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 58,100 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 21,500 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	SubT	Capital Central	18347 Callanan Tap - Install new Sub-T line from Selkirk Sta.	C046641
			Mohawk	19226 Ephratah substation rebuild	C046486
				19229 New Maple Ave Substation	C046478
			Schoharie	19215 Schoharie substation reconfiguration	C046494
				19224 Delanson substation TB1 replacement	C046485
	Cable Replacement	Dist	Capital Central	09224 Riverside 28855 UG Cable Replacement	C036468
			Capital East Hudson Valley	09220 Liberty St. UG Cable Replacement	C036469
		SubT	Capital Central	09223 Partridge-Ave A # 5 Cable Replaceme	C036273
	Oil Circuit Breaker Strategy	Tran	None	New Scotland - OCB Repl. - R61, R81, R82	NMAMT13-50
	Other Asset Condition	Tran	None	Leeds - Station Service	NMAMT13-44
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Bethlehem - Albany 18 T5070 ACR	CNYAS71
				Taylorville-B 5-6 T3320-T3330 ACR	C027437
	Relay Replacement Strategy	Tran	None	Menands Station Relay/Control Building Replacement	NMAMT13-22
				New Scotland Station Relay Replacement	NMAMT13-11
	Substation Metal-Clad	Dist	Capital Central	13342 Johnson Rd - Replace Metalclad Gear	C046747

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
	Switchgear			13343 Pinebush - Replace Metalclad Gear	C046744
			Schenectady	05846 Emmet St - Repl TB1 and mclad	C017952
	Sub-T Overhead Line	SubT	Capital North	11888 Randall Rd - New station - Inst/Rem sub-T lines	CD00898
			Mohawk	05275 Amsterdam-Rotterdam 3/4 Relocation	C033182
	Transformer Replacement Program	Tran	None	Inghams Station Phase Shifting Transformer Replacement	NMAMT13-06
	U-Series Relay Strategy	Tran	None	Leeds - Replace U Series Relays	C024663
Damage/Failure	D/F Other	Dist	Mohawk	17430 New Florida Substation	CD01168
				17432 Florida Substation Distribution Feeders	CD01172
Statutory Regulatory	Northeast Region Reinforcement	Tran	None	Eastover Rd - New 230-115kV Station	C031326
				Eastover Rd-New Line Taps	C031419
				Mohican Battenkill#15 Rebuild Recon	C034528
				Reactive Comp prog in NE Reg NRRP	C035773
				Reconductoring 115kv NE reg NRRP	C035771
				Spier Rotterdam NEW Line	C031418
System Capacity & Performance	Capacity Planning	Dist	Capital Central	06855 Van Dyke Subst-New 51 Dist Feeder	C016087
				15749 DeLaet's Landing - Land and Civil Portion	CD00901
				15754 DeLaet's Landing DxD	CD00893
				19218 Van Dyke Station - New 56 Dist Feeder	C046487
				19220 Van Dyke Station - New 115/13.2kV station	C046490
				19219 Van Dyke Subst-New 57 Dist Feeder	C046488
			Capital North	11886 Randall Rd - New station - M/C S/G & Cap Bank	CD00896

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				11887 Randall Rd - New station - Dist getaways, etc	CD00897
	System Capacity & Performance	Tran	None	Forbes Ave TSub	C043593
				Randall Rd Transmission Line	C043672
				Randall Road Substation Trans work	C043673
				Riverside-Reynolds Road#4 115kV Tap	C043592

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. There has been no activity from NCPA since the last filing of this report in January 2012.

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 18,500 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 44,100 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. Brown Falls substation is the main supply for the 34.5kV sub-transmission system.

The Tri-Lakes area serves approximately 11,300 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 75,700 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	Oil Circuit Breaker Strategy	Tran	None	Browns Falls - OCB replacements	C043043
				Colton-Replace CBs and Disconnects	C029844
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Br F-Taylorville 3-4 ACR	C024359
				Colton-BF 1-2 T3140-T3150 ACR	C036164
				Taylorville-Moshier 7 T3340 LER	C024361
	Sub-T Overhead Line	SubT	WLOF	19327 Carthage-Taylorville 21/22/26-23kv D/C	C046436
Damage Failure	Damage Failure	Tran	None	Malone D/F #2 TRF Spare	C042512
Statutory/Regulatory	Public Requirements	SubT	WLOF	05769 DOTR NYSRt28 White Lk-McKeever SubT	C034722
System Capacity & Performance	Capacity Planning	Dist	WLOF	18429 Watertown New 115/13.2 kV Substation (D-Sub)	C046627
				18522 Watertown New 115/13.2 kV Substation(D-Line)	C046610

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.
- 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 6,500 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 consist one 34.5-13.2kV, three 34.5kV-4.8kV substations and one 34.5-4.16V substation. The only physical constraint is the Cazenovia Lake and the residential load which is spread around the Cazenovia Lake.

The Cortland study area serves approximately 32,800 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 16,000 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 22,400 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 65,800 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 58,100 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 53,800 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 21,000 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
	Cable Replacement	Dist	Syracuse	Solvay Ash 28 Cable Repl Subt T	C045629
		SubT	Syracuse	06018 Solvay Ash 27 Cable Repl SubT	C032147
	Oil Circuit Breaker Strategy	Tran	None	Battle Hill - OCB Repl. R80, R40, R70	NMAMT13-46
				Tilden Station - OCB Repl. - R150, R160, R190	NMAMT13-52
	Other Asset Condition	Tran	None	Temple Pressuring Plant	CNYAS26
	Relay Replacement Strategy	Tran	None	DeWitt Station Relay Strategy	C043503
				Teall Ave. Station Relay/Control Building Replacement	NMAMT13-21
	Substation Indoor	Dist	Syracuse	11877 Rock Cut #286 2nd Tranf and Metalclad	CD00882
	Substation Metal-Clad Switchgear	Dist	North Syracuse	13345 Hopkins 253 - Replace Metalclad Gear	C046741
	Sub-T Overhead Line	SubT	Syracuse	19291 Woodard 29-34.5kv	C046473
				19325 LHH-Mallory 22-34.5kv	C046441
	Transformer Replacement Program	Tran	None	Teall Avenue Transformer Replacement	NMAMT13-01
	U-Series Relay Strategy	Tran	None	LN17 - Replace U Series Relays	C024661
Statutory Regulatory	Clay Station Rebuild	Tran	None	Clay Station Line Project	C032539
	Station Upgrade	Tran	None	Clay 115 kV Rebuild	C028705
Statutory/Regulatory	Public Requirements	Dist	Syracuse	19573 DOT PIN 3754.56 Connective Corridor Phase 2/3	CD01183

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
System Capacity & Performance	Capacity Planning	Dist	Cortland	19064 Cortland Area Study	C046526
			East Syracuse	09236 Bridge St. Second Transformer	C036185
				09250 East Malloy-low side sub equipment	C036188
			North Syracuse	19232 New Cicero Substation DxT	C046480
				19233 New Cicero Substation DSub	C046475
				19234 New Cicero Substation Dline	C046476
			Syracuse	19065 Syracuse UG Study	C046527
				19150 Teal Substation Rebuild-Swgr	C046511
			Volney	04994 Paloma Second Transformer	C032495
				05637 Whitaker Dline work	C006848
				18393 Fairdale Dsub	C046640
				18396 New Haven xfmr upgrade-Dline	C046635
				18397 Whitaker Dsub	C046636
				18720 Paloma new switchgear	CD01190
				18764 Whitaker 2nd Transformer	C046592
				18823 New Haven Xfmr Upgrade-Xmfr	C046562
			West Syracuse	05973 Harris Road DLine	C032446
				18370 Milton Ave second transformer	C046642
				18371 Milton Ave DLine	C046643
				18497 Harris Road Second SWGR	CD01088
				18516 Milton Ave 2nd Switchgear	C046609
	Other System Capacity & Performance	Tran	None	Clay TB1 Replacement	C047275
				Reconductor Clay - GE #14 (Cayuga)	C045253

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				Reconductor Elbridge - State Street #5 (Cayuga)	C047297
	SC&P Other	Dist	Syracuse	17185 DLine -To expand Rock Cut Sub Retire Brighton 4kV	CD00881
	System Capacity & Performance	Tran	None	Central Breaker Upgrades - Ash	C043424
				Central Breaker Upgrades - Oswego	C043426
				Clay-Dewitt Line 3 Reconductoring	C043996
				Clay-Teal Line 10 Reconductoring	C043995

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 21,200 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 27,500 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 91,100 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 5,600 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	18571 MV-Poland 62258 Route 8 Reconductor Phase 3	C046605
				18572 MV- Poland 62258 Route 8 Reconductor Phase 4	C046606
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Boonville - Rome #3	CNYAS54
				Porter-Rotterdam 31 T4210 ACR	C030890
	Relay Replacement Strategy	Tran	None	Edic Station Relay Replacement	NMAMT13-26
	Substation Metal-Clad Switchgear	Dist	Utica	13346 Whitesboro 632 - Replace Metalclad Gear	C046742
				13348 Conkling 652 - Replace Metalclad Gear	C046743
		SubT	Oneida	05059 Replace/Relocate 13.8kV SG @Oneida	C025139
	Substation Rebuild	Tran	None	LightHH 115kV Yard Repl & cntrl hse	C031662
				Rome 115 kV Station	C003778
Statutory Regulatory	Other Statutory Regulatory	Tran	None	Porter 230kV Upgrade/Disc/PT's	C036866
	Station Upgrade	Tran	None	Porter 115 kV Rebuild	C028686
Statutory/Regulatory	Public Requirements	Dist	Utica	19236 DOT PIN 2134.50 Utica Arterial	CD01009
System Capacity & Performance	Other System Capacity & Performance	Tran	None	Edic 345-115kV TB2 Reconnect	C044674

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 44,300 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 37,100 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 21,700 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	19297 Phillips-Telegraph 304-34.5kv	C046466
			Genesee South	15729 Oakfield - Caledonia LN201 reconductoring	C046707
				16881 Genesee South 34.5kV relief	C046711
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Alabama-Telegraph 115 T1040 ACR	C033014
				Lockport-Batavia 108 T1500 STR	C027431
				Lockport-Batavia 112 T1510 ACR	C003422
				Lockport-Mortimer 111 T1530 ACR	C003417
				Mortimer - Pannell Road #24 &25	CNYAS65
				Pannell-Geneva 4-4A T1860 ACR	C030889
System Capacity & Performance	Capacity Planning	Dist	Genesee North	18709 West Hamlin #82 - Install Transformer #2	CD01089
				18710 West Hamlin #82 - New TB2 - Install new feeders	CD01090
				18761 West Sweden - Install New Station	C046593
				18763 West Sweden - New Station - Install new feeders	C046591
			Genesee South	18544 Attica Station transformer upgrade	C046611
				18765 Mumford #50 - Install Transformer #2	C046590
		SubT	Livingston	09216 Golah Avon 217 line reconductoring	C036054
				19486 South Livingston Relief - Station Work	C046416

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				TxD	
	Reliability Criteria Compliance	Tran	None	West Golah 115 kV substation	CNYPL37
	SC&P Other	Dist	Genesee South	Mumford DxT (need real name)	C044623
			Livingston	13246 South Livingston relief - DLine Fdr 2 & Fdr 3	C046759
				18851 South Livingston relief - DLine Fdr 1 & Fdr 4	C046552
		SubT	Genesee North	18822 Lyndonville Station 34.5kV cap bank installation	C046569

Chapter 5 G. Frontier Transmission Study Area

Area Summary

The principal drivers for transmission projects in this area, from a capacity and asset condition perspective, 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.
- Projects in the Frontier Region involving the Gardenville, Huntley, and Packard substations are accelerated or augmented to provide short-term mitigation of the shutdown of all but one 115kV Dunkirk generator.
- Projects in the Frontier Region involving the Huntley substation, and the reconductoring of the #180 line between Niagara and Gardenville and the #181 line between Packard and Erie are recommended to provide long-term mitigation of a complete shutdown of all Dunkirk generation. Additional analysis is ongoing to review level of risk if the #181 reconductoring is not completed and all Dunkirk generation is shut down.

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 58,900 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 8,000 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 1,700 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 8,000 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 37,100 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 12,400 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 62,500 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 48,400 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. The majority 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 41,300 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	Seneca	11194 Buffalo Station 42 Rebuild - D Station	C046854
			Tonawanda	11299 Buffalo Station 122 Rebuild - Sub	CD00782
		SubT	Niagara	19296 Phillips-Medina 301-34.5kv	C046465
			Niagara Falls	12846 New Harper Substation - TxD Sub	CD00310
			Sawyer	19295 Frontier H lines 23kv	C046470
	Buffalo Street Light	Dist	None	18022 Buffalo Street Light Cable Replacement	CD00851
	Flying Ground Strategy	Tran	None	Buffalo/AlbanyFlyingGroundsSwitcRpl	C033613
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Gard-Dun 141-142 T1260-70 ACR Senec	C034193
				Gard-Dun 141-142 T1260-T1270 ACR	C003389
				Gardenville 180-182 T1660-T1780 ACR	C027436
				Gard-HH 151-152 T1950-T1280 S ACR	C027425
	Shieldwire Strategy	Tran	None	ShieldW. GardenvilleBuffalo 145/146	C028683
	Substation Indoor	Dist	Kensington	04654 Buffalo Station 27 Rebuild - Sta	C033473
				04657 Buffalo Station 31 Rebuild - Sub	C046952
				05419 Buffalo Station 31 Rebuild - Line	C046943
			Niagara Falls	18783 Welch 83 Indoor Substation Refurbishment - DSub	C046583
				18786 Eighth St 80 - Indoor Substation Refurbishment - DSub	C046585

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
				18787 Eighth St 80 - Indoor Substation Refurbishment - DLine	C046586
				18789 Stephenson 85 - Indoor Substation Refurbishment - DSub	C046581
				18790 Stephenson 85 - Indoor Substation Refurbishment - DLine	C046580
				18794 Eleventh St 82 - Indoor Substation Refurbishment - DSub	C046582
				18797 Beech St 81 - Indoor Substation Refurbishment - DSub	C046577
			Sawyer	04635 Buffalo Indoor Sub. #29 Refurb.	C006722
				04663 Buffalo Station 37 Rebuild - Sub	C033474
				05430 Buffalo Station 37 Rebuild - Line	C033477
			Seneca	04665 Buffalo Station 41 Rebuild - Sub	C046956
				04670 Buffalo Station 59 Rebuild - Sub	C033475
		SubT	Seneca	05433 Buffalo Station 41 Rebuild - 23 kV	C046937
				17355 Buffalo Station 42 Rebuild - Sub T Station	C046692
	Substation Power Transformer	Dist	Amherst	17805 Station 124 - Almeda Ave Transformer Replacement	C046670
	Substation Rebuild	Tran	None	Gardenville Rebuild	C005156
				Gardenville-Rebuild Line Relocation	C030084
				Huntley Rebuild	CNYAS119
	Transformer Replacement Program	Tran	None	Seneca Terminal Transformer Replacement	NMAMT13-02
Statutory/Regulatory	New Business	SubT	ELM	18628 East - West Medical Corridor Cable Group	CD00823
System Capacity & Performance	Capacity Planning	Dist	Amherst	09273 Shawnee Road 76 (DSub)	C036059
			Grand Island	18570 Long Rd 209 - New F20955	CD00964
			Niagara	09279 Wilson 93 Load Relief - Replace TB1	C035743

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
			Sawyer	09239 Buffalo Station 56 Transformer Replacement	C036502
				19072 Sawyer - two new additional 23kV Cables on Kenmore Ave	C046523
			Seneca	19205 New Abby Street Substation - DxD Sub	C046496
				19206 New Abby Street Substation - DxD Line	C046497
			Tonawanda	05139 Station 214 - Install TB2 (DxD Sub)	C029186
				06675 Station 214 - Install TB2 (DxD Line)	C029187
				19050 New Tonawanda Substation - DxD Line	C046534
				19051 New Tonawanda Substation - DxD Sub	C046528
				19054 Buffalo Station 77 - Add TB3 (DxD Sub)	C046531
		SubT	Kensington	05380 Buffalo 23kV Reconductor - Kens2	C028903
				05381 Buffalo 23kV Reconductor - Kensing.	C028894
			Niagara	09267 Mountain Substation Rebuild	C036542
			Sawyer	05379 Buffalo 23kV Reconductor - Huntley2	C028893
	Other System Capacity & Performance	Tran	None	Fourth Elm 230-23kV Bank (N-1-1)	CNYPL14
				N. Lakeview new 115 13.2kV Sub	C043533
				Stedman Substation Installation	CNYPL30
				Upgrade Niagara - Packard #195	C029945
				Huntley Permanent Capacitor Banks (Dunkirk)	NMPL13-07
	Reliability Criteria Compliance	Tran	None	#171 Reconductor	C024017
	SC&P Other	Dist	Amherst	04792 Frankhauser New Station - T Sub Work	C036520
				04793 Frankhauser-115-13.2KV- Bus & Bkrs	C028931
				05920 Frankhauser New Station - Line Work	C028929

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
			ELM	17837 Buffalo Station 49 - UG Upgrades	CD01128
			Grand Island	17511 - Buffalo Station 64 - New F6453	CD00970
				19503 Long Road #209 new TB#2 - DxT Sub - C43594	C046411
			Niagara Falls	11943 Sodeman Rd - New station - dist getaways, reconductoring, etc.	C046796
			Sawyer	18403 Buffalo 47 - New F4762	CD01154
		SubT	ELM	18876 Elm St Relief_23kV Line work	C046546
				18877 Elm St Relief_station work TxD	C046547
			Niagara	19693 Sanborn Substation Rebuild_TxD	C046361
	System Capacity & Performance	Tran	None	Bus Tie Breaker - Huntley (Dunkirk)	C043737
				Bus Tie Breaker - Packard (Dunkirk)	C043736
				Cap Banks - Gardenville (Dunkirk)	C043735
				West Hamlin 82 TxT sub	C043977

Chapter 5 H. Southwest Transmission Study Area

Area Summary

The driver behind the transmission capacity related projects in the Southwest study area is:

- A wide range of contingencies 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.
- Major projects that drive the solutions to capacity problems in this area, irrespective of Dunkirk generation mothballing, include the new Five-Mile Road 345/115kV station north of Homer Hill, the addition of a second capacitor bank at Homer Hill, the reconductoring of the Warren-Falconer #171 line, the closing of a normally open breaker at Andover, and the addition of a second bus tie breaker in the Dunkirk substation.
- Additional short-term projects in the Southwest Region that will allow all but one of the Dunkirk generators to be shut down include the addition of 115kV capacitor banks at Dunkirk and Homer Hill, changing the transmission line supply for several distribution stations, and upgrading of limiting terminal equipment at Dunkirk. Completion of these short-term projects is expected by June 1, 2013
- Long-term projects in the Southwest Region that will allow all Dunkirk generation to be shut down include two 33.3 MVAr capacitor banks at Dunkirk 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 that consists of several very long loops that traverse through 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 14,700 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 26,100 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 17,000. 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 36,800 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 18,700 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 5 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	05976 Hartfield-S. Dow 859 Refurbish	C033180
				19293 W. Portland-Sherman 867-34.5kv	C046468
	Overhead Line Refurbishment Program - Asset Condition	Tran	None	Falconer-HH 153-154 T1160-T1170 ACR	C027422
				Homer Hill-Bennett Rd 157 T1340 ACR	C027429
	Relay Replacement Strategy	Tran	None	Homer Hill Switch Relay Replacement	C043505
	Substation Rebuild	Tran	None	Dunkirk Rebuild	C005155
System Capacity & Performance	Capacity Planning	Dist	Chautauqua South	17471 Chautauqua South: Stedman Rd substation Dline work	C046690
				18864 Baker St - Install 2nd xfmr	C046553
				19082 Chautauqua South: new Stedman 115 - 13.2kV substation DxD	C046518
			Erie South	04950 N Collins Repl T1 Xfrm	C032313
				09234 Bflo Sta 139 - Replace Transformers	C036639
				19029 Delameter Install two 20/26/33MVA xfmrs	C046536
				19030 Delameter New Feeders	C046537
				19032 Eden switch structure -install 2-10/12.5MVA XFMRS	C046538
				19033 Eden Switch Structure - New Feeders	C046532

Spending Rationale	Program	System	Distribution Study Area	Project Name	Funding Number
	Other System Capacity & Performance	Tran	None	Dunkirk Permanent Capacitor Banks (Dunkirk)	NMPL13-08
				Reconductoring of Five Mile – Homer Hill Circuits (Dunkirk)	NMPL13-11
	Reliability Criteria Compliance	Tran	None	Construct Southwest Sta (line work)	C024016
				Construct Southwest Station (sub work)	C024015
				Dunkirk Second Bus Tie - Line	C031460
				Dunkirk Second Bus Tie - Station	C031459
	SC&P Other	Dist	Cattaraugus North	17938 Price Corners Rebuild - Upgrade transformer	CD01124
				17939 Price Corners Rebuild - New Feeder	CD01120
			Erie South	19345 North Collins New Feeder	C046433
		SubT	Chautauqua South	19108 LN863 Findley Lake - French Creek expansion	C046510

2013 Capital Investment Plan — Exhibits

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Asset Condition	3A/3B Tower Strategy	NS-Leeds 93-94 T5480-T5490 SXR	C007918	-	-	-	-	50,000	50,000
	3A/3B Tower Strategy Total			**-**	**-**	**-**	**-**	**50,000**	**50,000**
	Battery Strategy	BatteryRplStrategyCo36TxT	C033847	450,000	170,000	220,000	160,000	160,000	1,160,000
	Battery Strategy Total			**450,000**	**170,000**	**220,000**	**160,000**	**160,000**	**1,160,000**
	Flying Ground Strategy	Buffalo/AlbanyFlyingGroundsSwitcRpl	C033613	900,000	600,000	-	-	-	1,500,000
	Flying Ground Strategy Total			**900,000**	**600,000**	**-**	**-**	**-**	**1,500,000**
	Oil Circuit Breaker Strategy	Battle Hill - OCB Repl. R80, R40, R70	NMAMT13-46	-	50,000	1,000,000	-	-	1,050,000
		Browns Falls - OCB replacements	C043043	900,000	694,700	-	-	-	1,594,700
		Colton-Replace CBs and Disconnects	C029844	100,000	2,350,000	-	-	-	2,450,000
		Curtis Station - OCB Repl. - R100, R130	NMAMT13-53	-	-	50,000	650,000	-	700,000
		Headson - OCB replacements	C043044	371,000	-	-	-	-	371,000
		Marshville - OCB Repl. R11	NMAMT13-47	-	-	35,000	315,000	-	350,000
		New Scotland - OCB Repl. - R61, R81, R82	NMAMT13-50	-	125,000	1,375,000	-	-	1,500,000
		NY Oil Circuit Breaker Replacements	C037882	-	-	-	-	1,600,000	1,600,000
		Peat Street - OCB Repl. - R825	NMAMT13-48	-	-	35,000	315,000	-	350,000
		Queensbury - OCB Repl. - R10, R5, R81	NMAMT13-51	-	-	50,000	1,000,000	-	1,050,000
		Replace NG ALCOA 115 kV Breakers	C030545	427,140	-	-	-	-	427,140
		Schuyler Station - OCB Repl. - R130, R70	NMAMT13-54	-	-	50,000	650,000	-	700,000
		Ticonderoga - OCB Repl. - R4	NMAMT13-49	-	-	50,000	650,000	-	700,000
		Tilden Station - OCB Repl. - R150, R160, R190	NMAMT13-52	-	50,000	1,000,000	-	-	1,050,000
		Whitehall Station - OCB Repl. - R13, R3, R6	NMAMT13-55	-	-	75,000	975,000	-	1,050,000
	Oil Circuit Breaker Strategy Total			**1,798,140**	**3,269,700**	**3,720,000**	**4,555,000**	**1,600,000**	**14,942,840**
	Other Asset Condition	Alps #188 Obsolete Circuit Switcher	C028304	164,280	-	-	-	-	164,280
		Asset Condition/PIW	CNYX72	500,000	1,000,000	1,000,000	1,000,000	1,000,000	4,500,000
		Bristol Hill Sub - Repl SWs 46 & 47	C031005	21,500	-	-	-	-	21,500
		Elm Terminal Station - HPFF Alarms	C030528	54,900	-	-	-	-	54,900
		Gardenville Station - HPFF Alarms	C030530	49,500	-	-	-	-	49,500
		HarperStationTransformerReplacement	C037203	650,000	-	-	-	-	650,000
		Higley-Repl Fuses w/Ckt Switcher	C034664	-	25,000	655,000	-	-	680,000
		Huntley Station - HPFF Alarms	C030531	54,000	-	-	-	-	54,000
		Huntley Sub-Rem TB130 & 140 cables	C028089	100	-	-	-	-	100
		Leeds - Station Service	NMAMT13-44	-	100,000	1,000,000	-	-	1,100,000
		Line Disconnect Sw Replacement	NMAMT13-40	1,000,000	1,000,000	1,000,000	1,000,000	-	4,000,000
		Ln182 RFL Eq (Sta 64/Gard/Pack)	C031950	583,400	-	-	-	-	583,400
		NY System Spare 345, 230, 115kV breakers	C044513	1,650,000	-	-	-	-	1,650,000
		Osprey Mitigation	NMAMT13-41	150,000	250,000	-	-	-	400,000
		Porter - Repl 11 GE 230kV RF2 Discs	C020912	10,000	-	-	-	-	10,000
		Rochester Pump - LPFF Trip Scheme	C029946	300,500	-	-	-	-	300,500
		Rochester UG Pumping Plant	C015988	100,000	700,000	140,000	-	-	940,000
		Temple Pressuring Plant	CNYAS26	24,000	61,000	940,000	-	-	1,025,000
		Trinity UG Pumphouse Redesign	C011318	-	-	100,000	840,000	-	940,000

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Asset Condition	Other Asset Condition	Whitehall Station 187-rplc Cts/Vts	C042643	46,000	-	-	-	-	46,000
	Other Asset Condition Total			**5,358,180**	**3,136,000**	**4,835,000**	**2,840,000**	**1,000,000**	**17,169,180**
	Overhead Line Refurbishment Pr	Alabama-Telegraph 115 T1040 ACR	C033014	250,000	900,000	3,600,000	-	-	4,750,000
		Bethlehem - Albany 18 T5070 ACR	CNYAS71	65,000	11,000	11,000	450,000	500,000	1,037,000
		Boonville - Porter [1]-2 [T4020]-T4030 ACR	CNYAS48	-	-	75,000	100,000	100,000	275,000
		Boonville - Rome #3	CNYAS54	75,000	100,000	500,000	9,100,000	1,000,000	10,775,000
		Br F-Taylorville 3-4 ACR	C024359	100,000	3,642,000	5,800,000	-	-	9,542,000
		Coffeen-LH 5 T2120 ACR	C024360	15,000	-	-	-	-	15,000
		Colton-BF 1-2 T3140-T3150 ACR	C036164	50,000	50,000	250,000	1,000,000	11,000,000	12,350,000
		Dunkirk - Falconer #161 & 162	CNYAS62	-	-	-	-	50,000	50,000
		Falconer-HH 153-154 T1160-T1170 ACR	C027422	200,000	1,500,000	500,000	14,000,000	2,000,000	18,200,000
		Gard-Dun 141-142 T1260-70 ACR Senec	C034193	50,000	1,000,000	-	-	-	1,050,000
		Gard-Dun 141-142 T1260-T1270 ACR	C003389	100,000	1,000,000	8,400,000	18,300,000	13,200,000	41,000,000
		Gardenville 180-182 T1660-T1780 ACR	C027436	50,000	100,000	500,000	11,000,000	400,000	12,050,000
		Gard-HH 151-152 T1950-T1280 S ACR	C027425	25,000	330,000	1,230,000	3,000,000	15,000,000	19,585,000
		GE - Geres Lock 8 T2240 D-F Refurb	CNYAS117	-	-	-	-	70,000	70,000
		Homer Hill-Bennett Rd 157 T1340 ACR	C027429	400,000	1,000,000	8,500,000	14,500,000	-	24,400,000
		Lake Colby - Lake Placid 3 T3210	CNYAS57	-	-	-	-	70,000	70,000
		Lockport-Batavia 108 T1500 STR	C027431	25,000	25,000	50,000	1,450,000	6,800,000	8,350,000
		Lockport-Batavia 112 T1510 ACR	C003422	50,000	200,000	200,000	1,000,000	4,000,000	5,450,000
		Lockport-Mortimer 111 T1530 ACR	C003417	5,125,000	-	-	-	-	5,125,000
		Mortimer - Pannell Road #24 &25	CNYAS65	-	50,000	50,000	500,000	5,700,000	6,300,000
		Packard-Urban 181 T1850 STR	CNYAS116	-	-	-	50,000	100,000	150,000
		Pannell-Geneva 4-4A T1860 ACR	C030889	-	50,000	100,000	500,000	1,600,000	2,250,000
		Porter-Rotterdam 31 T4210 ACR	C030890	1,000,000	4,000,000	9,500,000	15,500,000	-	30,000,000
		Rotterdam - Bear Swamp E205 T5630 ACR	CNYAS76	-	-	-	85,000	175,000	260,000
		Spier-West 9 T5770 ACR	C021694	15,000	65,000	65,000	330,000	6,000,000	6,475,000
		Taylorville-B 5-6 T3320-T3330 ACR	C027437	150,000	6,252,000	6,700,000	-	-	13,102,000
		Taylorville-Moshier 7 T3340 LER	C024361	3,000,000	-	-	-	-	3,000,000
		Terminal - Schuyler 7 T4260 ACR	CNYAS112	-	-	-	65,000	20,000	85,000
		Ticonderoga 2-3 T5810-T5830 ACR	C039521	100,000	150,000	1,500,000	12,000,000	16,000,000	29,750,000
		Ticonderoga 2-3 T5810-T5830 SXR2	C039487	1,176,450	1,245,450	-	-	-	2,421,900
		Warrensburg - Scofield Road 10 T5880 ACR	CNYAS50	-	-	-	70,000	40,000	110,000
	Overhead Line Refurbishment Program - Asset Condition Total			**12,021,450**	**21,670,450**	**47,531,000**	**103,000,000**	**83,825,000**	**268,047,900**
	Relay Replacement Strategy	Alps Station Relay Replacement	NMAMT13-10	25,000	145,000	-	-	-	170,000
		Altamont Station Relay Replacement	NMAMT13-36	-	-	-	20,000	120,000	140,000
		Batavia Station Relay Replacement	C043506	-	-	60,000	715,000	-	775,000
		Bethlehem Station Relay Replacement	NMAMT13-37	-	-	-	20,000	120,000	140,000
		Carr Street Station Relay Replacement	NMAMT13-29	-	-	-	50,000	440,000	490,000
		Curtis Station Relay Replacement	NMAMT13-35	-	-	-	40,000	360,000	400,000
		DeWitt Station Relay Strategy	C043503	-	1,430,000	-	-	-	1,430,000

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Asset Condition	Relay Replacement Strategy	Edic Station Relay Replacement	NMAMT13-26	20,000	130,000	105,000	765,000	-	1,020,000
		Elbridge Station Relay Replacement	NMAMT13-08	75,000	525,000	-	-	-	600,000
		Feura Bush Station Relay Replacement	NMAMT13-28	-	-	-	90,000	720,000	810,000
		Golah Station Relay Replacement	NMAMT13-33	-	-	-	25,000	165,000	190,000
		Grand Island Station 64 Relay Replacement	NMAMT13-24	-	-	-	60,000	355,000	415,000
		Greenbush Station Relay Replacement	NMAMT13-30	-	-	-	50,000	330,000	380,000
		Grooms Road Station Relay Replacement	NMAMT13-38	-	-	-	20,000	120,000	140,000
		Homer Hill Switch Relay Replacement	C043505	580,000	490,000	-	-	-	1,070,000
		Independence Station Relay Replacement	NMAMT13-25	-	-	-	80,000	540,000	620,000
		Long Lane Station Relay Replacement	NMAMT13-31	-	-	-	100,000	660,000	760,000
		McIntyre Station Relay Replacement	NMAMT13-12	25,000	175,000	-	-	-	200,000
		Menands Station Relay/Control Building Replacement	NMAMT13-22	-	-	-	585,000	4,640,000	5,225,000
		Mountain Station Relay/Control Building Replacement	NMAMT13-15	-	-	-	-	300,000	300,000
		New Scotland Station Relay Replacement	NMAMT13-11	55,000	365,000	75,000	615,000	-	1,110,000
		North Ogdensburg Station Relay Replacement	NMAMT13-09	25,000	175,000	-	-	-	200,000
		North Troy Station Relay Replacement	NMAMT13-32	-	-	-	25,000	165,000	190,000
		Relay Replacement Program NY-T	C034690	1,135,000	-	500,000	560,000	630,000	2,825,000
		Riverside Station Relay Replacement	NMAMT13-20	-	60,000	490,000	340,000	-	890,000
		Rotterdam - Repl LN 14&15 Relays	C029949	600,000	-	-	-	-	600,000
		Schuyler Relay Replacement	NMAMT13-39	-	-	50,000	350,000	-	400,000
		Scriba Station Relay Replacement	NMAMT13-16	-	150,000	780,000	-	-	930,000
		Seneca Terminal Station Relay Replacement	NMAMT13-27	-	-	-	70,000	470,000	540,000
		South East Batavia Station Relay Replacement	NMAMT13-18	-	25,000	190,000	165,000	-	380,000
		Teall Ave. Station Relay/Control Building Replacement	NMAMT13-21	-	10,000	500,000	4,930,000	-	5,440,000
		Temple Station Relay Replacement	NMAMT13-17	-	80,000	595,000	-	-	675,000
		Terminal Station Relay Replacement	NMAMT13-13	-	50,000	350,000	-	-	400,000
		Tilden Station Relay Strategy	C043504	-	735,000	-	-	-	735,000
		Trinity Station Relay Replacement	NMAMT13-19	-	60,000	470,000	-	-	530,000
		Volney Station Relay Replacement	NMAMT13-14	-	100,000	650,000	-	-	750,000
		Walck Road Station Relay Replacement	NMAMT13-34	-	-	-	25,000	165,000	190,000
		Woodard Relay Replacement	NMAMT13-07	30,000	220,000	-	-	-	250,000
		Yahnundasis Station Relay/Control Building Replacement	NMAMT13-23	-	-	-	-	370,000	370,000
	Relay Replacement Strategy Total			**2,570,000**	**4,925,000**	**4,815,000**	**9,700,000**	**10,670,000**	**32,680,000**
	Reserve - Asset Condition	Capital Reserve - Asset Condition	CNYX31AC	(3,591,609)	(3,656,979)	(5,255,554)	(6,701,874)	16,921,874	(2,284,141)
	Reserve - Asset Condition Total			**(3,591,609)**	**(3,656,979)**	**(5,255,554)**	**(6,701,874)**	**16,921,874**	**(2,284,141)**
	Shieldwire Strategy	Shield Wire: Gardenville-Depew 54	C028706	429,600	-	-	-	-	429,600
		ShieldW. GardenvilleBuffalo 145/146	C028683	2,354,900	-	-	-	-	2,354,900
	Shieldwire Strategy Total			**2,784,500**	**-**	**-**	**-**	**-**	**2,784,500**
	Steel Tower Strategy	Lockport 103-104 T1620-T106 STR	C027432	-	-	-	50,000	100,000	150,000
		Visual Grade 6 Tower Replacements	C025539	42,800	-	-	-	125,000	167,800
	Steel Tower Strategy Total			**42,800**	**-**	**-**	**50,000**	**225,000**	**317,800**

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Asset Condition	Substation Rebuild	Boonville Rebuild	CNYAS121	-	-	-	-	250,000	250,000
		Dunkirk Rebuild	C005155	-	-	-	250,000	4,500,000	4,750,000
		Gardenville Rebuild	C005156	2,500,000	3,000,000	6,000,000	18,500,000	18,800,000	48,800,000
		Gardenville-Rebuild Line Relocation	C030084	100,000	100,000	100,000	2,330,000	1,870,000	4,500,000
		Huntley Rebuild	CNYAS119	-	-	-	500,000	2,500,000	3,000,000
		LightHH 115kV Yard Repl & cntrl hse	C031662	-	-	500,000	1,500,000	5,500,000	7,500,000
		Rome 115 kV Station	C003778	6,525,000	1,224,900	-	-	-	7,749,900
		Rome Rebuild Line Part	C034983	428,000	58,700	-	-	-	486,700
		Rotterdam 115kV SubRebuild(AIS)	C034850	-	-	-	-	250,000	250,000
	Substation Rebuild Total			**9,553,000**	**4,383,600**	**6,600,000**	**23,080,000**	**33,670,000**	**77,286,600**
	Transformer Replacement Progr	Greenbush Replace TB3	C031663	75,040	-	-	-	-	75,040
		Inghams Station Phase Shifting Transformer Replacement	NMAMT13-06	100,000	2,700,000	-	-	-	2,800,000
		Oneida Transformer Replacement # 4	C037876	280,230	63,840	-	-	-	344,070
		Seneca Terminal Transformer Replacement	NMAMT13-02	-	-	350,000	3,000,000	3,000,000	6,350,000
		Teall Avenue Transformer Replacement	NMAMT13-01	350,000	3,500,000	3,000,000	500,000	-	7,350,000
	Transformer Replacement Program Total			**805,270**	**6,263,840**	**3,350,000**	**3,500,000**	**3,000,000**	**16,919,110**
	U-Series Relay Strategy	Leeds - Replace U Series Relays	C024663	251,415	1,700,000	500,000	-	-	2,451,415
		LN17 - Replace U Series Relays	C024661	1,790,000	-	-	-	-	1,790,000
	U-Series Relay Strategy Total			**2,041,415**	**1,700,000**	**500,000**	**-**	**-**	**4,241,415**
Asset Condition Total				**34,733,146**	**42,461,611**	**66,315,446**	**140,183,126**	**151,121,874**	**434,815,204**
Damage Failure	Damage Failure	Gard-Dk 141-142 T1260-T1270 Str 409	C036051	164,580	-	-	-	-	164,580
		G-HH 151-52 T1950-T1280 Str265 D-F	C042184	2,100	-	-	-	-	2,100
		Leeds-PV 92 T5330 Str 361	C032964	100,000	-	-	-	-	100,000
		Lockport-Mortimer 111 sw 68 D/F	C043932	360,000	-	-	-	-	360,000
		Malone D/F #2 TRF Spare	C042512	1,250,000	-	-	-	-	1,250,000
		Storm Budgetary Reserve - NMPC	C003481	500,000	500,000	1,000,000	1,000,000	1,000,000	4,000,000
		Teal Ave #7 TRF D/F	C043933	500,000	-	-	-	-	500,000
	Damage Failure Total			**2,876,680**	**500,000**	**1,000,000**	**1,000,000**	**1,000,000**	**6,376,680**
	NY Inspection Program	NY Inspection Repairs - Capital	C026923	4,132,000	4,132,000	1,116,000	1,150,000	1,150,000	11,680,000
	NY Inspection Program Total			**4,132,000**	**4,132,000**	**1,116,000**	**1,150,000**	**1,150,000**	**11,680,000**
	Other Damage Failure	Beck-Mtn-Lockport 103-104 Str 88 DF	C040504	101,500	-	-	-	-	101,500
		Mohawk River Crossing D-F	C041086	150,000	-	-	-	-	150,000
		New Scotland	C039722	196,960	-	-	-	-	196,960
		Oneida - TB#3 Failure	C022391	483,780	80,640	-	-	-	564,420
		Packard -Gard 182, T1780	C040784	39,920	-	-	-	-	39,920
		Packard-Urban 181 T1850 Str 409 D-F	C041163	70,000	-	-	-	-	70,000
		T1060 X0045 Retired Olin Tap D/F	C038884	223,000	-	-	-	-	223,000
		Ticonderoga Line Portion via C37108	C039484	398,850	-	-	-	-	398,850
		TiconderogaSubPlWReplace115kVSwitch	C037108	191,000	-	-	-	-	191,000
		Trans Station Failure Budget Reserv	C003792	3,000,000	4,750,000	4,750,000	4,750,000	5,000,000	22,250,000
		TransLine Damage-Failure Budget Res	C003278	450,000	450,000	450,000	450,000	450,000	2,250,000

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Damage Failure	Other Damage Failure	Trinity UG CP D/F	C040364	8,800	-	-	-	-	8,800
		Yahnudasis T4160-T4300 D-F Struc	C038162	250,000	-	-	-	-	250,000
	Other Damage Failure Total			**5,563,810**	**5,280,640**	**5,200,000**	**5,200,000**	**5,450,000**	**26,694,450**
	Woodpole Strategy	Wood Pole Management - NY	C011640	2,500,000	2,598,500	1,500,000	1,500,000	1,500,000	9,598,500
	Woodpole Strategy Total			**2,500,000**	**2,598,500**	**1,500,000**	**1,500,000**	**1,500,000**	**9,598,500**
Damage Failure Total				**15,072,490**	**12,511,140**	**8,816,000**	**8,850,000**	**9,100,000**	**54,349,630**
Non-Infrastructure	Physical Security	Physical Security Strategy	CNYAS86	50,000	-	-	-	-	50,000
	Physical Security Total			**50,000**	**-**	**-**	**-**	**-**	**50,000**
Non-Infrastructure Total				**50,000**	**-**	**-**	**-**	**-**	**50,000**
Other	Other	Finch Paper	C033591	1,000	-	-	-	-	1,000
		Finch Paper Reimbursement	C033591R	(1,000)	-	-	-	-	(1,000)
	Other Total			**-**	**-**	**-**	**-**	**-**	**-**
Other Total				**-**	**-**	**-**	**-**	**-**	**-**
Statutory Regulat	Clay Station Rebuild	Clay Station Line Project	C032539	1,253,000	-	-	-	-	1,253,000
	Clay Station Rebuild Total			**1,253,000**	**-**	**-**	**-**	**-**	**1,253,000**
	Clearance Strategy	Adams-Packard 187 T1010 &Taps CCR	C034927	10,000	-	-	-	-	10,000
		Adams-Packard 188 T1020 &Taps CCR	C034928	10,000	-	-	-	-	10,000
		Bethlehem-Albany 18 T5070 CCR	C034967	10,000	-	-	-	-	10,000
		Dunkirk-South Ripley 68 T1110 CCR	C034912	10,000	-	-	-	-	10,000
		Gardenville-Buf Rvr T1210-T1220 CCR	C031155	10,000	-	-	-	-	10,000
		Gardnvl-Beth149-150 T1190-T1200 CCR	C034957	10,000	-	-	-	-	10,000
		Geres Lock-Solvay 2 T2270 &Taps CCR	C034971	10,000	-	-	-	-	10,000
		Golah-Lakville 116 T1320 & Taps CCR	C034954	10,000	-	-	-	-	10,000
		Greenbush-Stephentown 993 T5190 CCR	C031132	10,000	-	-	-	-	10,000
		Group Clearance Improvement - NMPC	C003256	6,650,000	7,000,000	10,700,000	10,700,000	10,700,000	45,750,000
		Hartfield-Moons 159 T1330 &Taps CCR	C034926	10,000	-	-	-	-	10,000
		Homer H-Dugan Rd 155 T1350&Taps CCR	C034962	10,000	-	-	-	-	10,000
		Hudson-Pleasant Valley 12 T5230 CCR	C031145	10,000	-	-	-	-	10,000
		Lockport-Batavia 107 T1490 CCR	C031149	10,000	351,200	-	-	-	361,200
		Meco-Rotterdam 10 T5390 CCR	C031134	10,000	-	-	-	-	10,000
		Mortimer-Elbridge 2 T1570 CCR	C031135	10,000	-	-	-	-	10,000
		Mortimer-Golah 110 T1580 CCR	C031150	10,000	-	-	-	-	10,000
		Mortimer-Pannell T1590-T1600 CCR	C031148	10,000	-	-	-	-	10,000
		Mortimer-Quaker 23 T1610 CCR	C031146	10,000	-	-	-	-	10,000
		Mountain-Lockpt 103 T1620 &Taps CCR	C034955	10,000	-	-	-	-	10,000
		New Scotland-Bethlehem 4 T5460 CCR	C034910	10,000	-	-	-	-	10,000
		New Scotlnd-Albany 8 T5980&Taps CCR	C034959	10,000	-	-	-	-	10,000
		Niagara-Lockport 101 T1690 CCR	C031151	10,000	-	-	-	-	10,000
		Niagara-Lockport 102 T1700 CCR	C031152	10,000	-	-	-	-	10,000
		NS-Feura Bush 9 T5500 &Taps CCR	C034966	10,000	-	-	-	-	10,000
		NS-Long Lane 7 T5470 &Taps CCR	C034968	10,000	-	-	-	-	10,000

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Statutory Regulat	Clearance Strategy	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
		Rotterdam-New Scotland 13 T5680 CCR	C034963	10,000	-	-	-	-	10,000
		Valley Sta 44-Isshua 158 T1900 CCR	C034965	10,000	-	-	-	-	10,000
	Clearance Strategy Total			**6,950,000**	**7,351,200**	**10,700,000**	**10,700,000**	**10,700,000**	**46,401,200**
	Generation	Arkwright Summit Wind Line	CNYX65	648,000	36,000	-	-	-	684,000
		Arkwright Summit Wind Line Reimbursement	CNYX65R	(648,000)	(36,000)	-	-	-	(684,000)
		Arkwright Summit Wind Sub	CNYX66	1,396,000	78,000	-	-	-	1,474,000
		Arkwright Summit Wind Sub Reimbursement	CNYX66R	(1,396,000)	(78,000)	-	-	-	(1,474,000)
		Athens Redundant SPS	CNYX83	338,000	-	-	-	-	338,000
		Athens Redundant SPS Reimbursement	CNYX83R	(338,000)	-	-	-	-	(338,000)
		Ball Hill Wind Line	CNYX74	1,026,000	300,000	-	-	-	1,326,000
		Ball Hill Wind Line Reimbursement	CNYX74R	(1,026,000)	(300,000)	-	-	-	(1,326,000)
		Ball Hill Wind Sub	CNYX75	2,258,000	300,000	-	-	-	2,558,000
		Ball Hill Wind Sub Reimbursement	CNYX75R	(2,258,000)	(300,000)	-	-	-	(2,558,000)
		Cape Vincent Wind Sub	CNYX60	75,000	2,730,000	-	-	-	2,805,000
		Cape Vincent Wind Sub Reimbursement	CNYX60R	(75,000)	(2,730,000)	-	-	-	(2,805,000)
		EDGE Line Relocation	C045094	4,940,000	-	-	-	-	4,940,000
		EDGE Line Relocation Reimbursement	C045094R	(4,940,000)	-	-	-	-	(4,940,000)
		Everpower Allegany Line Tap	CNYX78	960,000	25,000	-	-	-	985,000
		Everpower Allegany Line Tap Reimbursement	CNYX78R	(960,000)	(25,000)	-	-	-	(985,000)
		Everpower Allegany Sub	CNYX79	1,445,000	25,000	-	-	-	1,470,000
		Everpower Allegany Sub Reimbursement	CNYX79R	(1,445,000)	(25,000)	-	-	-	(1,470,000)
		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	(2,400)	(121,200)	-	-	-	(123,600)
		North Wind Line	CNYX88	250,000	250,000	-	-	-	500,000
		North Wind Line Reimbursement	CNYX88R	(250,000)	(250,000)	-	-	-	(500,000)
		North Wind Sub	CNYX89	1,500,000	1,500,000	-	-	-	3,000,000
		North Wind Sub Reimbursement	CNYX89R	(1,500,000)	(1,500,000)	-	-	-	(3,000,000)
		NY Power Authority Pathway West Point Line	CNYX90	-	-	500,000	-	-	500,000
		NY Power Authority Pathway West Point Line Reimbursement	CNYX90R	-	-	(500,000)	-	-	(500,000)
		NY Power Authority Pathway West Point Sub	CNYX91	-	-	3,000,000	-	-	3,000,000
		NY Power Authority Pathway West Point Sub Reimbursement	CNYX91R	-	-	(3,000,000)	-	-	(3,000,000)
		Roaring Brook Wind Line	CNYX61	324,000	20,000	-	-	-	344,000
		Roaring Brook Wind Line Reimbursement	CNYX61R	(324,000)	(20,000)	-	-	-	(344,000)
		Roaring Brook Wind Sub	CNYX62	1,083,000	211,000	-	-	-	1,294,000
		Roaring Brook Wind Sub Reimbursement	CNYX62R	(1,083,000)	(211,000)	-	-	-	(1,294,000)

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
Statutory Regulat	**Generation Total**			**(2,400)**	**(121,200)**	**-**	**-**	**-**	**(123,600)**
	Northeast Region Reinforcement	Eastover Rd - New 230-115kV Station	C031326	10,360,000	5,700,000	-	-	-	16,060,000
		Eastover Rd-New Line Taps	C031419	6,000,000	860,000	-	-	-	6,860,000
		Mohican Battenkill#15 Rebuild Recon	C034528	8,000,000	21,000,000	-	-	-	29,000,000
		Reactive Comp prog in NE Reg NRRP	C035773	50,000	1,800,000	-	200,000	1,800,000	3,850,000
		Reconductoring 115kv NE reg NRRP	C035771	100,000	1,500,000	4,700,000	8,800,000	500,000	15,600,000
		Spier Rotterdam NEW Line	C031418	19,650,000	-	-	-	-	19,650,000
		Sta Work to Suppt New Spier-Rtdm	C040346	416,400	-	-	-	-	416,400
	Northeast Region Reinforcement Total			**44,576,400**	**30,860,000**	**4,700,000**	**9,000,000**	**2,300,000**	**91,436,400**
	Other Statutory Regulatory	Critical Infrastructure Upgrades (Substation)	NMAMT13-45	200,000	1,000,000	-	-	-	1,200,000
		FAA Obstruction Lighting - Central	C040703	1,000	-	-	-	-	1,000
		FAA Obstruction Lighting - West	C027954	490,500	-	-	-	-	490,500
		IntrMeterInvestmentPrgmCo36	C035267	2,000,000	700,000	-	-	-	2,700,000
		Porter 230kV - Upgrade/Disc/PT's	C036866	150,000	1,000,000	9,000,000	14,000,000	-	24,150,000
	Other Statutory Regulatory Total			**2,841,500**	**2,700,000**	**9,000,000**	**14,000,000**	**-**	**28,541,500**
	Reserve - Statutory Regulatory	Capital Reserve - Statutory Regulatory	CNYX31SR	(7,820,910)	(3,991,716)	(3,906,551)	(1,665,374)	1,639,228	(15,745,322)
	Reserve - Statutory Regulatory Total			**(7,820,910)**	**(3,991,716)**	**(3,906,551)**	**(1,665,374)**	**1,639,228**	**(15,745,322)**
	RTU Strategy	Program - Remote Terminal Unit (RTU)	C003772	1,950,000	1,100,000	-	-	-	3,050,000
	RTU Strategy Total			**1,950,000**	**1,100,000**	**-**	**-**	**-**	**3,050,000**
	Station Upgrade	Clay 115 kV Rebuild	C028705	8,500,000	250,000	-	-	-	8,750,000
		Porter 115 kV Rebuild	C028686	15,985,600	500,000	100,050	-	-	16,585,650
	Station Upgrade Total			**24,485,600**	**750,000**	**100,050**	**-**	**-**	**25,335,650**
Statutory Regulatory Total				**74,233,189**	**38,648,284**	**20,593,499**	**32,034,626**	**14,639,228**	**180,148,827**
System Capacity	Frontier Region	Purchase a new 230-23kV NY System Spare	C044196	200,000	1,950,000	-	-	-	2,150,000
	Frontier Region Total			**200,000**	**1,950,000**	**-**	**-**	**-**	**2,150,000**
	Load	Frankhauser New Station - T Line Wo	C030744	50,000	650,000	-	-	-	700,000
		Frankhauser New Station - T Sub Wor	C034427	100,000	110,000	-	-	-	210,000
	Load Total			**150,000**	**760,000**	**-**	**-**	**-**	**910,000**
	Other System Capacity & Perfor	115 kV capacitor banks at Huntley	C037522	72,085	-	-	-	-	72,085
		Add inline Breaker on Mortimer - Elbridge #2 line	CNYPL33	-	-	-	-	50,000	50,000
		Auburn-Elbridge 115kV lne	C047298	9,000,000	9,000,000	-	-	-	18,000,000
		Auburn-Elbridge 115kV lne Reimbursement	C047298R	(9,000,000)	(9,000,000)	-	-	-	(18,000,000)
		Auburn-Elbridge Second Line (Elbridge Breaker	C047299	500,000	1,500,000	-	-	-	2,000,000
		Clay TB1 Replacement	C047275	1,400,000	8,500,000	-	-	-	9,900,000
		Edic 345-115kV TB2 Reconnect	C044674	50,000	1,380,000	100,000	-	-	1,530,000
		Ephratah substation rebuild	NMDP13-05	-	-	-	84,390	86,610	171,000
		Fourth Elm 230-23kV Bank (N-1-1)	CNYPL14	30,600	428,400	385,560	514,080	918,000	2,276,640
		Fourth Sawyer 230-23kV Bank (N-1-1)	CNYPL13	-	-	-	110,408	732,006	842,414
		Huntley Station Ground Banks	CNYPL11-6	-	-	-	-	50,000	50,000
		Inghams Station Revitalization	CNYPL03	-	-	-	110,408	112,616	223,024
		Install Circuit Switcher at Mumford	C044616	-	-	150,000	189,000	56,000	395,000

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
System Capacity	Other System Capacity & Perforr	Luther Forest - Line Diff Rlys	NMAMT13-43	150,000	-	-	-	-	150,000
		Malta - Line Diff Rlys - Luther Forest	NMAMT13-42	300,000	-	-	-	-	300,000
		McCrea Line	NMDP13-01	-	25,000	100,000	-	-	125,000
		McCrea Sub	NMDP13-02	-	25,000	100,000	-	-	125,000
		Mountain Upgrade	C044359	11,000	240,000	89,400	-	-	340,400
		N. Lakeview new 115 13.2kV Sub	C043533	50,000	250,000	1,000,000	250,000	-	1,550,000
		New Abby St Station	NMDP13-08	-	3,430	6,982	157,648	2,940	171,000
		New Cierco Station	NMDP13-09	100,000	100,000	-	-	-	200,000
		New Maple Ave Substation	NMDP13-06	-	-	48,414	85,998	36,588	171,000
		New Tonawanda Station	NMDP13-07	2,015	4,777	81,038	83,171	-	171,000
		Novelis Second Supply 345-115kV Study	NMPL13-02	5,430,000	3,620,000	-	-	-	9,050,000
		Novelis Second Supply 345-115kV Study - Reimb	NMPL13-03	(5,430,000)	(3,620,000)	-	-	-	(9,050,000)
		Porter - 230KV overdutied brkr mitigation	C044772	100,000	-	-	-	-	100,000
		Queensbury - Replace TB3 & TB4	C036822	500,000	2,100,000	-	-	-	2,600,000
		Reconductor Clay - GE #14 (Cayuga)	C045253	700,000	6,300,000	1,400,000	-	-	8,400,000
		Reconductor Elbridge - State Street #5 (Cayuga)	C047297	700,000	1,400,000	27,300,000	2,800,000	-	32,200,000
		Relocate Lafarge-Pleasant Valley #8 115 kV	NMPL13-12	100,000	500,000	-	-	-	600,000
		Replace 115 kV breaker at Maplewood	C039863	58,800	-	-	-	-	58,800
		Sanborn upgrade 115-34.5	C044361	11,000	83,400	30,000	-	-	124,400
		Stedman Substation Installation	CNYPL30	-	18,473	209,355	403,008	418,710	1,049,546
		Tap off Ln 116 N. Lakeville-Golah	C043532	50,000	100,000	50,000	-	-	200,000
		Trans Study Budgetary Reserve NY	C008376	150,000	150,000	150,000	150,000	150,000	750,000
		Upgrade Niagara - Packard #195	C029945	2,998,920	1,080,985	-	-	-	4,079,905
		West Sweden - Install New Station - Line	NMDP13-03	-	-	-	30,000	270,000	300,000
		West Sweden - Install New Station - Sub	NMDP13-04	-	-	-	30,000	220,000	250,000
		Wetzel Rd. Substation T-Line	C036983	327,914	165,280	-	-	-	493,194
		Huntley Permanent Capacitor Banks (Dunkirk)	NMPL13-07	1,400,000	-	-	-	-	1,400,000
		Dunkirk Permanent Capacitor Banks (Dunkirk)	NMPL13-08	1,300,000	1,200,000	-	-	-	2,500,000
		Reconductoring of Five Mile – Homer Hill Circuits (Dunkirk)	NMPL13-11	250,000	9,750,000	8,000,000	-	-	18,000,000
	Other System Capacity & Performance Total			**11,312,334**	**35,304,745**	**39,200,749**	**4,998,111**	**3,103,470**	**93,919,408**
	Reliability Criteria Compliance	#171 Reconductor	C024017	1,234,000	2,572,000	-	-	-	3,806,000
		Construct Southwest Sta (line work)	C024016	57,600	1,068,672	378,864	-	-	1,505,136
		Construct Southwest Station (sub work)	C024015	8,741,000	18,879,276	14,748,000	-	-	42,368,276
		Dunkirk Second Bus Tie - Line	C031460	-	-	55,000	1,246,507	-	1,301,507
		Dunkirk Second Bus Tie - Station	C031459	-	-	150,000	1,183,575	-	1,333,575
		Homer Hill 115 kV Capacitor Banks	C031457	176,000	-	-	-	-	176,000
		Reconductor L #54 Gardenville-Erie	C031463	67,500	90,000	-	-	-	157,500
		Second 115 kV bus tie at Lockport	C031482	558,000	162,000	-	-	-	720,000
		Second 115kV bus tie at Mortimer	CNYPL38	200,000	525,000	-	-	-	725,000
		West Golah 115 kV substation	CNYPL37	250,000	3,000,000	3,750,000	-	-	7,000,000
	Reliability Criteria Compliance Total			**11,284,100**	**26,296,948**	**19,081,864**	**2,430,082**	**-**	**59,092,994**

Exhibit 1 - 2013 Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Funding Number	Sum of FY14	Sum of FY15	Sum of FY16	Sum of FY17	Sum of FY18	Sum of Total FY14-18
System Capacity	Reserve - System Capacity & Pe	Capital Reserve - System Capacity & Performance	CNYX31SCP	(2,770,259)	(5,338,328)	(3,114,958)	(293,170)	575,428	(10,941,288)
	Reserve - System Capacity & Performance Total			**(2,770,259)**	**(5,338,328)**	**(3,114,958)**	**(293,170)**	**575,428**	**(10,941,288)**
	System Capacity & Performance	Bennett Rd Ln Supply Change (Dunkirk)	C043739	35,000	-	-	-	-	35,000
		Bus Tie Breaker - Huntley (Dunkirk)	C043737	1,000,000	-	-	-	-	1,000,000
		Bus Tie Breaker - Packard (Dunkirk)	C043736	1,399,000	-	-	-	-	1,399,000
		Cap Banks - Gardenville (Dunkirk)	C043735	1,687,000	-	-	-	-	1,687,000
		Central Breaker Upgrades - Ash	C043424	110,000	1,061,000	-	-	-	1,171,000
		Central Breaker Upgrades - Geres	C043425	50,000	230,000	-	-	-	280,000
		Central Breaker Upgrades - Oswego	C043426	110,000	1,060,000	-	-	-	1,170,000
		Central Breaker Upgrades - Teall	C043427	50,000	500,000	-	-	-	550,000
		Clay-Dewitt Line 3 Reconductoring	C043996	1,095,000	2,386,000	3,890,000	-	-	7,371,000
		Clay-Teal Line 10 Reconductoring	C043995	1,023,000	2,170,000	3,494,000	-	-	6,687,000
		Forbes Ave TSub	C043593	145,000	740,000	1,075,000	-	-	1,960,000
		Lockport Road #216 Install Second Transformer	C044093	-	-	80,000	80,000	210,000	370,000
		Long Road #209 New TB2 - TxT Line	C043595	-	19,000	170,000	-	-	189,000
		Long Road #209 New TB2 - TxT Sub	C043596	-	12,600	221,400	180,225	-	414,225
		Military Road #210 - TxT Substation	C043614	11,000	154,000	126,000	-	-	291,000
		Randall Rd Transmission Line	C043672	-	15,000	150,000	500,000	500,000	1,165,000
		Randall Road Substation Trans work	C043673	-	10,000	100,000	750,000	750,000	1,610,000
		Riverside-Reynolds Road#4 115kV Tap	C043592	100,000	260,000	1,525,000	-	-	1,885,000
		Shawnee 76 Sub TxT	C043616	29,000	287,000	235,000	287,000	-	838,000
		Sodeman Rd 115kV station equipment	C043754	100,000	1,150,000	1,000,000	-	-	2,250,000
		Sodeman Rd Install New taps	C043755	100,000	100,000	125,000	-	-	325,000
		Station #139 Ln Supply Change (Dunkirk)	C043740	70,000	-	-	-	-	70,000
		Station #55 Ln Supply Change (Dunkirk)	C043741	825,000	-	-	-	-	825,000
		VanDyke 115-13.2kV sub Taps	C044173	25,000	92,000	-	-	-	117,000
		West Hamlin 82 TxT sub	C043977	50,000	464,000	646,000	-	-	1,160,000
	System Capacity & Performance Total			**8,014,000**	**10,710,600**	**12,837,400**	**1,797,225**	**1,460,000**	**34,819,225**
System Capacity & Performance Total				**28,190,174**	**69,683,964**	**68,005,055**	**8,932,247**	**5,138,898**	**179,950,339**
Grand Total				**152,279,000**	**163,305,000**	**163,730,000**	**190,000,000**	**180,000,000**	**849,314,000**

Exhibit 2 - 2013 Sub-Transmission Capital Investment Plan

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
Asset Condition	AC Other	05976 Hartfield-S. Dow 859 Refurbish	C033180	1,800,000	800,000	-	-	-	2,600,000
		06093 L226 - Extend line to N LVille Sta	C015766	-	47,000	211,000	17,000	-	275,000
		06460 Ransom-Phillips Rd 402 Refurbish	C033181	300,000	-	-	-	-	300,000
		06971 Youngstown-Sanborn 403 Refurbish	C034462	629,000	-	-	-	-	629,000
		09272 Schuyler Rd Repl 918 928 CirSws	C035185	248,000	-	-	-	-	248,000
		09331 NE NYISO 34kV Sub Cap Banks	C036839	159,000	-	-	-	-	159,000
		11193 Buffalo Station 42 Rebuild - SubT Line	C046853	27,000	116,000	118,000	-	-	261,000
		11263 Terminal Station C - 25 Cycle Retirement	CD00976	-	1,000	-	-	-	1,000
		11264 Terminal Station D - 25 Cycle Retirement	CD00963	2,000	-	-	-	-	2,000
		11301 Buffalo Station 122 Rebuild - 23kV	CD00780	-	141,000	85,000	12,000	-	238,000
		11457 Maplewood-Latham#9 Mapleview Tap Relocation	CD00832	189,000	-	-	-	-	189,000
		12830 Shaleton-Ridge 610, Station 207 Tap Refurbishment	C046779	-	78,000	425,000	-	-	503,000
		12846 New Harper Substation - TxD Sub	CD00310	675,000	1,939,000	1,693,000	26,000	-	4,333,000
		13203 N.Lakeville - Ridge LN 218 Refurbish	C046766	50,000	354,000	415,000	126,000	-	945,000
		14890 Caledonia Substation 44 - Line Relay Replacement	CD00836	-	206,000	-	-	-	206,000
		15729 Oakfield - Caledonia LN201 reconductoring	C046707	106,000	733,000	855,000	880,000	-	2,574,000
		16881 Genesee South 34.5kV relief	C046711	-	798,000	909,000	933,000	143,000	2,783,000
		17357 Ridge Substation - 34.5kV System Relay Updates	C046693	-	90,000	339,000	-	-	429,000
		17459 Station 66 (Union Rd) Rebuild - SubT Line	CD00544	168,000	-	-	-	-	168,000
		17619 New Gardenville Substation-SubT Line work	CD00636	52,000	-	-	-	-	52,000
		17933 Elm St. Replace 67L Relays	CD00728	193,000	-	-	-	-	193,000
		18347 Callanan Tap - Install new Sub-T line from Selkirk Sta.	C046641	100,000	1,577,000	838,000	-	-	2,515,000
		18629 Galleria Mall Loop - 1/0 Cable Replacement	CD00869	655,000	-	-	-	-	655,000
		19119 LN404 Moutain - Sanborn reconductoring	CD01276	10,000	410,000	-	-	-	420,000
		19212 Middleburg TB2 replacement	C046491	-	-	-	158,000	-	158,000
		19215 Schoharie substation reconfiguration	C046494		-	-	1,076,000	1,104,000	2,180,000
		19224 Delanson substation TB1 replacement	C046485		-	-	1,406,000	398,000	1,804,000
		19226 Ephratah substation rebuild	C046486		-	-	646,000	663,000	1,309,000
		19229 New Maple Ave Substation	C046478		-	-	1,678,000	2,981,000	4,659,000
		19286 NY SubT PSI Underground Line Activity	CD01043	103,000	-	-	-	-	103,000
		19293 W. Portland-Sherman 867-34.5kv	C046468	52,000	50,000	931,000	250,000	-	1,283,000
		19294 Dake Hill-W. Salamanca 816-34.5kv	C046469	-	52,000	800,000	9,000	-	861,000
		19295 Frontier H lines 23kv	C046470	-	106,000	1,076,000	1,656,000	17,000	2,855,000
		19296 Phillips-Medina 301-34.5kv	C046465	-	80,000	1,076,000	497,000	9,000	1,662,000
		19297 Phillips-Telegraph 304-34.5kv	C046466	-	-	81,000	994,000	114,000	1,189,000
		19298 N. Ashford-Nuclear Fuel Services 817-34.5kv	C046467	139,000	139,000	-	-	-	278,000
		19299 M&T bank Tap 701-34.5kv	C046462	206,000	265,000	-	-	-	471,000
		19305 Sta 122 taps 622/623-23kv	C046461	-	-	27,000	497,000	9,000	533,000
		19310 Station 126 taps 33h/34h-23kv	C046450	-	-	-	27,000	323,000	350,000
		19313 Ohio-Ridge 613-34.5kv	C046453	-	-	27,000	276,000	9,000	312,000
		19320 Regulator site fencing west-34.5kv	C046444	-	-	-	11,000	103,000	114,000
		19321 Defective 1980 chance insulators-34.5kv	C046445	-	-	-	16,000	85,000	101,000
		19322 Old Jewitt-Solvay 26(lns 30,31,26)-34.5kv towers	C046438	-	-	81,000	718,000	85,000	884,000
		19565 station 55 115kv taps-rearrange Subt	CD01220	300,000	-	-	-	-	300,000
		19594 NY GE Type Butyl Rubber PTs - Replace	C046403	1,159,000	259,000	264,000	271,000	278,000	2,231,000
		Bethlehem L10, L14 Relay Upgrade	C045624	283,000		-	-		283,000
		06968 Yahnundasis-Schuyler 25/26 Refur.	C033174	470,000	-	-	-	-	470,000
		11259 Harper Station 25 Cycle Retirement	CD00966	-	-	1,000	-	-	1,000
		11260 Lockport Station 25 Cycle Retirement	CD00973	-	-	1,000	-	-	1,000
		11261 Old Gardenville - 25 Cycle Retirement	C046849	-	1,000	-	-	-	1,000
		18451 Rankine - Adams - 25 Cycle Line Retirements	C046620	0	0	0	1,000	1,000	2,000
		18800 Gibson Substation Retirement	C046579	-	-	-		1,000	1,000
	AC Other Total			8,075,000	8,242,000	10,253,000	12,181,000	6,323,000	45,074,000
	Blanket	05556 CNY Sub Trans-Line Asset Replace	CNC0075	144,000	148,000	153,000	158,000	163,000	766,000
		05848 ENY Sub Trans-Line Asset Replace	CNE0075	216,000	223,000	231,000	239,000	247,000	1,156,000
		06040 IE - NW Sub-T UG Cable Replacement	C032148	-	4,250,000	4,250,000	-	-	8,500,000
		06957 WNY Sub Trans-Line Asset Replace	CNW0075	422,000	435,000	450,000	465,000	480,000	2,252,000
	Blanket Total			782,000	5,056,000	5,084,000	862,000	890,000	12,674,000
	Cable Replacement	06018 Solvay Ash 27 Cable Repl SubT	C032147	-	794,000	667,000	667,000	-	2,128,000
		06030 IE - NE Sub-T UG Cable Replacement	C032146	-	799,000	799,000	-	-	1,598,000
		09222 Menands-Liberty #9 Cable Replacemen	C036276	294,000	-	-	-	-	294,000
		09223 Partridge-Ave A # 5 Cable Replaceme	C036273	1,000,000	1,100,000	489,000	-	-	2,589,000
		11064 South Mall cables replacements	CD00086	250,000	-	-	-	-	250,000
		18477 Buffalo 23kV Reconductor - Seneca/BNMC 16S, 17S, 18S, 27S	C046614	10,000	-	-	-	-	10,000
		Solvay Ash 28 Cable Repl Subt T	C045629	200,000	367,000	767,000	594,000		1,928,000
	Cable Replacement Total			1,754,000	3,060,000	2,722,000	1,261,000	-	8,797,000
	Substation Breaker	09247 Circuit Breaker Reclr Repl NYW TXD	C034883	1,120,000	320,000	320,000	320,000	320,000	2,400,000
		09246 Circuit Breaker Reclosr Rpl NYE TXD	C034882	680,000	320,000	320,000	320,000	320,000	1,960,000
		09245 Circuit Breaker Reclosr Rpl NYC TXD	C035142	320,000	320,000	320,000	320,000	320,000	1,600,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
	Substation Breaker Total			2,120,000	960,000	960,000	960,000	960,000	5,960,000
	Substation Indoor	05410 Buffalo Station 27 Rebuild - 23 kV	C033470	105,000	20,000	-	-	-	125,000
		05412 Buffalo Station 29 Rebuild - 23 kV	C006724	100,000	-	-	-	-	100,000
		05418 Buffalo Station 31 Rebuild - 23 kV	C046942	-	-	27,000	166,000	114,000	307,000
		05429 Buffalo Station 37 Rebuild - 23 kV	C033471	17,000	101,000	17,000	-	-	135,000
		05433 Buffalo Station 41 Rebuild - 23 kV	C046937	-	-	-	-	1,082,000	1,082,000
		05450 Buffalo Station 59 Rebuild - 23 kV	C033472	-	27,000	85,000	107,000	-	219,000
		17355 Buffalo Station 42 Rebuild - Sub T Station	C046692		1,000	78,000	1,113,000	1,088,000	2,280,000
	Substation Indoor Total			222,000	149,000	207,000	1,386,000	2,284,000	4,248,000
	Substation Metal-Clad Switchgear	04587 Ash Street-Replace Metal Clad Sub	C036104	2,491,000	812,000	-	-	-	3,303,000
		05059 Replace/Relocate 13.8kV SG @Oneida	C025139	2,803,000	261,000	-	-	-	3,064,000
	Substation Metal-Clad Switchgear Total			5,294,000	1,073,000	-	-	-	6,367,000
	Sub-T Line Removal	05342 Booher Lumber Tap Remove	C035607	85,000	-	-	-	-	85,000
		05476 Canajoharie Sub Retirem-Sub-T Line	C035502	7,000	-	-	-	-	7,000
		06150 Lockport - Maple Rd L92E&W Removal	C036200	-	-	8,000	43,000	50,000	101,000
		06459 Rankine/Adams - Harper - L16 & L17 Rem.	C036205	1,000	-	-	-	-	1,000
		05931 Gardenville-Symington 714 Remove	C033187	1,000	0	0	0	0	1,000
		17239 Hoosick-Clay Hill #8 SubT Tap to Bennington Paper retirement	CD00919	1,000	-	-	-	-	1,000
		19083 Remove School St. -Watervliet 3/4	C046512	1,000	0	0	0	0	1,000
		19103 Rankine-Harper 16/17 and Adams -Harper 416/418-remove	C046514	1,000	1,000	0	0	0	2,000
	Sub-T Line Removal Total			97,000	1,000	8,000	43,000	50,000	199,000
	Sub-T Overhead Line	05259 Albion - Brockport 308 Refurbish	C033131	14,000	-	-	-	-	14,000
		05275 Amsterdam-Rotterdam 3/4 Relocation	C033182	150,000	1,480,000	-	-	-	1,630,000
		05469 Caledonia-Golah 213-refurbish	C027586	110,000	-	-	-	-	110,000
		11888 Randall Rd - New station - Inst/Rem sub-T lines	CD00898	25,000	1,175,000	1,150,000	380,000	-	2,730,000
		17492 Trenton-Whitesboro L25 N of Marcy Hosp Refr.	CD00619	80,000	-	-	-	-	80,000
		17493 Solvay 22-34.5 kV line Refur.	C046685	75,000	512,000	43,000	-	-	630,000
		17494 Teall-Headson L31-L29-34.5 kV line Refurbishment	C046686	103,000	370,000	-	-	-	473,000
		17495 Mallory-Cicero L33-34.5 kV line Refurbishment	C046681	78,000	222,000	-	-	-	300,000
		19238 Tap to H&V Greenwich-34.5kv	C046477	247,000	634,000	-	-	-	881,000
		19290 Ballston-Mechanicville 6-34.5kv	C046472	52,000	634,000	9,000	-	-	695,000
		19291 Woodard 29-34.5kv	C046473	100,000	400,000	536,000	-	-	1,036,000
		19292 Bristol Hill-Phoenix 23-34.5kv	C046474	-	53,000	538,000	9,000	-	600,000
		19300 Krumkill-Delmar-Bethlehem 9/8 34.5kv	C046463	31,000	317,000	-	-	-	348,000
		19301 Trenton-Deerfield 21/27-46kv	C046464	26,000	265,000	-	-	-	291,000
		19302 Trenton-Whitesboro 25-46kv	C046458	309,000	106,000	-	-	-	415,000
		19303 Deerfield-whitesboro 26-46kv	C046459	-	-	103,000	-	-	103,000
		19304 Varick-Bristol Hill 202-34.5kv	C046460	-	-	-	26,000	423,000	449,000
		19307 Rotterdam-Scotia-Rosa Road 32/6 -34.5kv	C046455	-	-	54,000	552,000	9,000	615,000
		19308 Epratah-Caroga 2-23kv	C046456	-	-	27,000	663,000	9,000	699,000
		19309 Ballston-Shore Rd-Rosa Rd 5 and 8-34.5kv	C046457	-	-	-	80,000	538,000	618,000
		19311 Tonawanda Lines 601-604-23kv	C046451	-	-	44,000	166,000	12,000	222,000
		19312 Tonawanda Lines 622-624-23kv	C046452	-	-	27,000	138,000	9,000	174,000
		19314 Re-arrange Teall 28/Woodard 24-34.5kv	C046446	-	-	27,000	552,000	57,000	636,000
		19315 Woodard 24/Teall 28 -34.5kv	C046447	21,000	159,000	-	-	-	180,000
		19316 Trenton-Prospect 23-46kv	C046448	-	-	27,000	332,000	-	359,000
		19317 Yahnundasis-Clinton 24 and 27-46kv	C046449	-	-	54,000	718,000	85,000	857,000
		19318 Queensbury-Henry Street 14-34.5kv	C046442	-	-	27,000	387,000	85,000	499,000
		19319 Cottrell Paper Tap 11-34.5kv	C046443	-	-	27,000	332,000	85,000	444,000
		19323 Solvay/Woodard-Ash st 27&27&28- 34.5kv	C046439	-	-	54,000	387,000	85,000	526,000
		19324 Woodard 28-34.5kv	C046440	-	-	33,000	304,000	9,000	346,000
		19325 LHH-Mallory 22-34.5kv	C046441	-	-	54,000	1,049,000	9,000	1,112,000
		19326 Carthage-N. Carthage-Deferiet 23kv	C046435	-	-	54,000	525,000	57,000	636,000
		19327 Carthage-Taylorville 21/22/26-23kv D/C	C046436	-	-	-	53,000	1,022,000	1,075,000
		19328 Taylorville-Effley 24-23kv	C046437	-	-	27,000	166,000	-	193,000
		19329 Maplewood-Menands 17/18 d/c-34.5kv	C046432	-	-	-	54,000	442,000	496,000
		19365 Homer Hill-Nile 811-34.5kv ION	CD01216	75,000	-	-	-	-	75,000
	Sub-T Overhead Line Total			1,496,000	6,327,000	2,915,000	6,873,000	2,936,000	20,547,000
	TBD	05182 TxD RESERVE for Asset Replacement Unidentified Specifics & Schedule Changes (substation)	C046951	(4,689,000)	811,000	2,764,000	(1,134,000)	(1,173,000)	(3,421,000)
		06776 TxD RESERVE for Asset Replacement Unidentified Specifics & Schedule Changes	C046910	936,000	(8,143,000)	(6,753,000)	(947,000)	12,530,000	(2,377,000)
	TBD Total			(3,753,000)	(7,332,000)	(3,989,000)	(2,081,000)	11,357,000	(5,798,000)
	Pilot Wire	09259 Maplewood-Norton-Replace Pilot Wire	C036006	105,000	323,000	-	-	-	428,000
		09269 Partridge St.-Riverside-Repl PW	C036007	105,000	323,000	-	-	-	428,000
		09271 Repl Pilot Wire-Central Ave-Patroon	C036031	229,000	5,000	-	-	-	234,000
		09278 Weaver St. - Emmet -Repl Pilot Wire	C036009	524,000	108,000	-	-	-	632,000
	Pilot Wire Total			963,000	759,000	-	-	-	1,722,000
Asset Condition Total				17,050,000	18,295,000	18,160,000	21,485,000	24,800,000	99,790,000
Damage/Failure	Blanket	04707 CNY Sub Trans-Substation Blanket	CNC0074	124,000	128,000	133,000	138,000	143,000	666,000
		04778 ENY Sub Trans-Substation Blanket	CNE0074	392,000	406,000	421,000	435,000	450,000	2,104,000
		05220 WNY Sub Trans-Substation Blanket	CNW0074	134,000	139,000	144,000	149,000	154,000	720,000
		05557 CNY Sub Trans-Line Damage Failure	CNC0073	186,000	192,000	199,000	206,000	213,000	996,000
		05849 ENY Sub Trans-Line Damage Failure	CNE0073	403,000	417,000	432,000	447,000	462,000	2,161,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		06958 WNY Sub Trans-Line Damage Failure	CNW0073	1,446,000	1,496,000	1,550,000	1,603,000	1,658,000	7,753,000
	Blanket Total			2,685,000	2,778,000	2,879,000	2,978,000	3,080,000	14,400,000
	D/F Other	19035 Woodard 233 Cap switcher R910 replacement	CD01144	35,000	-	-	-	-	35,000
		19061 69kV Tap to Florida Substation	CD01170	43,000	344,000	-	-	-	387,000
	D/F Other Total			78,000	344,000	-	-	-	422,000
	TBD	05183 TxD RESERVE for Damage/Failure Unidentified Specifics & Schedule Changes (substation)	C046939	365,000	402,000	402,000	403,000	403,000	1,975,000
		06777 TxD RESERVE for Damage/Failure Unidentified Specifics & Schedule Changes	C046911	172,000	(149,000)	169,000	144,000	117,000	453,000
	TBD Total			537,000	253,000	571,000	547,000	520,000	2,428,000
Damage/Failure Total				3,300,000	3,375,000	3,450,000	3,525,000	3,600,000	17,250,000
Statutory/Regulatory	Blanket	05559 CNY Sub Trans-Line New Business	CNC0071	43,000	46,000	49,000	52,000	55,000	245,000
		05560 CNY Sub Trans-Line Public Require	CNC0072	64,000	68,000	72,000	77,000	82,000	363,000
		05851 ENY Sub Trans-Line New Business	CNE0071	53,000	56,000	60,000	64,000	68,000	301,000
		05852 ENY Sub Trans-Line Public Require	CNE0072	32,000	34,000	36,000	38,000	40,000	180,000
		06364 NY Central Sub T Line Third Party	CNC0078	10,000	10,000	10,000	10,000	10,000	50,000
		06366 NY EastáSub T Line Third Party	CNE0078	10,000	10,000	10,000	10,000	10,000	50,000
		06370 NY WestáSub T Line Third Party	CNW0078	10,000	10,000	10,000	10,000	10,000	50,000
		06960 WNY Sub Trans-Line New Business	CNW0071	64,000	68,000	72,000	77,000	82,000	363,000
		06961 WNY Sub Trans-Line Public Require	CNW0072	27,000	29,000	31,000	33,000	35,000	155,000
	Blanket Total			313,000	331,000	350,000	371,000	392,000	1,757,000
	Inspection & Maintenance	06001 I&M - NC Sub-T Line Work From Insp	C026166	3,915,000	3,667,000	3,667,000	3,667,000	3,667,000	18,583,000
		06004 I&M - NE Sub-T Line Work From Insp	C026165	3,666,000	3,666,000	3,666,000	3,666,000	3,666,000	18,330,000
		06007 I&M - NW Sub-T Line Work From Insp	C026167	3,838,000	3,667,000	3,667,000	3,667,000	3,667,000	18,506,000
	Inspection & Maintenance Total			11,419,000	11,000,000	11,000,000	11,000,000	11,000,000	55,419,000
	New Business	06779 TxD RESERVE for New Business Commercial Unidentified Specifics & Schedule Changes	C046913	(700,000)	678,000	692,000	706,000	721,000	2,097,000
		18628 East - West Medical Corridor Cable Group	CD00823	1,000,000	-	-	-	-	1,000,000
		19199 23kV Canal Side	CD01002	73,000	-	-	-	-	73,000
		19113 Buffalo Creek Casino	CD00946	270,000	-	-	-	-	270,000
		19019 23kV Tap to North Ephratah	CD00945	20,000	-	-	-	-	20,000
	New Business Total			663,000	678,000	692,000	706,000	721,000	3,460,000
	Public Requirements	05728 DOT NYRt28 in State Forest Preserve	C034704	9,000	43,000	85,000	-	-	137,000
		05769 DOTR NYSRt28 White Lk-McKeever SubT	C034722	-	-	43,000	85,000	1,445,000	1,573,000
		06782 TxD RESERVE for Public Requirements Unidentified Specifics & Schedule Changes	C046915	744,000	728,000	670,000	728,000	(608,000)	2,262,000
	Public Requirements Total			753,000	771,000	798,000	813,000	837,000	3,972,000
	Sub-T Tower	06017 IE - NC SubT Towers	C031853	250,000	-	-	-	-	250,000
		06029 IE - NE SubT Towers	C031852	250,000	-	-	-	-	250,000
		06039 IE - NW SubT Towers	C031855	250,000	-	-	-	-	250,000
	Sub-T Tower Total			750,000	-	-	-	-	750,000
Statutory/Regulatory Total				13,898,000	12,780,000	12,840,000	12,890,000	12,950,000	65,358,000
System Capacity & Performance	Blanket	05558 CNY Sub Trans-Line Load Relief	CNC0077	11,000	12,000	13,000	14,000	15,000	65,000
		05561 CNY Sub Trans-Line Reliability	CNC0076	155,000	160,000	166,000	172,000	178,000	831,000
		05850 ENY Sub Trans-Line Load Relief	CNE0077	1,000	1,000	1,000	1,000	1,000	5,000
		05853 ENY Sub Trans-Line Reliability	CNE0076	175,000	181,000	188,000	194,000	201,000	939,000
		06959 WNY Sub Trans-Line Load Relief	CNW0077	11,000	12,000	13,000	14,000	15,000	65,000
		06962 WNY Sub Trans-Line Reliability	CNW0076	309,000	319,000	331,000	342,000	354,000	1,655,000
	Blanket Total			662,000	685,000	712,000	737,000	764,000	3,560,000
	Capacity Planning	04586 Ash 34.5 Install Capacitors	C027987	-	-	525,000	212,000	-	737,000
		04977 NY SubT PS&I Activity	C008154	47,000	47,000	47,000	47,000	-	188,000
		05184 TxD RESERVE for Load Relief Unidentified Specifics & Schedule Changes (substation)	C046940	(1,457,000)	(5,309,000)	(2,481,000)	533,000	685,000	(8,029,000)
		05378 Buffalo 23kV Reconductor - Huntley	C028892	673,000	-	-	-	-	673,000
		05379 Buffalo 23kV Reconductor - Huntley2	C028893	42,000	1,680,000	-	-	-	1,722,000
		05380 Buffalo 23kV Reconductor - Kens2	C028903	-	-	43,000	1,700,000	-	1,743,000
		05381 Buffalo 23kV Reconductor - Kensing.	C028894	-	43,000	1,700,000	-	-	1,743,000
		05919 Frankhauser - Relocate L605 / L606	C030005	180,000	-	-	-	-	180,000
		06643 South Livingston - 34.5KV Line Work	C028405	30,000	250,000	250,000	110,000	126,000	766,000
		06778 TxD RESERVE for Load Relief Unidentified Specifics & Schedule Changes	C046912	488,000	(606,000)	(929,000)	(269,000)	1,690,000	374,000
		09216 Golah Avon 217 line reconductoring	C036054	-	266,000	720,000	739,000	903,000	2,628,000
		09267 Mountain Substation Rebuild	C036542	360,000	1,490,000	210,000	-	-	2,060,000
		11316 Spier-Rotterdam Project - Sub-T relocations	CD00190	76,000	-	-	-	-	76,000
		11955 Queensbury Station - Replace M/C S/G's & install cap banks	CD00899	750,000	750,000	-	-	-	1,500,000
		13392 Rock City Falls - Retire 34.5/4.8kV station	C046728	-	-	-	-	1,000	1,000
		18556 Install series reactor at LN14 at Bethlehem substation	CD01083	166,000	9,000	-	-	-	175,000
		18557 Install parallel cable of Newark-Maplewood #6	CD01121	62,000	-	-	-	-	62,000
		19052 New Tonawanda Substation - 23kV Line	C046529	26,000	212,000	269,000	83,000	-	590,000
		19076 Buffalo 23kV Reconductor - Seneca 1S, 2S, 3S, 19S, 31S	C046516	380,000	380,000	170,000	-	-	930,000
		19222 Van Dyke Station - Beth-Delmar #6 line work	C046482	20,000	-	-	108,000	-	128,000
		19486 South Livingston Relief - Station Work TxD	C046416	70,000	4,029,000	2,724,000	258,000	389,000	7,470,000
		Install Series Reactor at LN10 at B	C045599	166,000	9,000	-	-	-	175,000
		19225 Albion Station Install a 34.5kV cap bank	CD01016	650,000	-	-	-	-	650,000
	Capacity Planning Total			2,729,000	3,250,000	3,248,000	3,521,000	3,794,000	16,542,000
	SC&P Other	05186 TxD RESERVE for Reliability Unidentified Specifics & Schedule Changes (substation)	C046941	512,000	(1,395,000)	(420,000)	(884,000)	236,000	(1,951,000)
		06783 TxD RESERVE for Reliability Unidentified Specifics & Schedule Changes	C046916	(422,000)	(368,000)	(2,718,000)	(761,000)	(725,000)	(4,994,000)
		15000 Caledonia Substation 44 - Addition of 34.kV Breaker	CD00942	10,000	553,000	70,000	-	-	633,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		17223 Chautauqua South: new Stedman 115 - 13.2kV substation TxD	C046701		-	43,000	-	-	43,000
		17505 Elm Street Station Spare	CD00755	151,000	-	-	-	-	151,000
		17782 SW- Install arresters on the 852 Line	CD00614	160,000	-	-	-	-	160,000
		18488 Price Corners Rebuild - Line 804	CD01202	26,000	74,000	-	-	-	100,000
		18647 Buffalo 23kV Reconductor - Seneca 30S	C046599	-	-	589,000	-	-	589,000
		18812 N.Lakeville sub: Addition of a 34.5kV breaker position for LN226	C046566		-	69,000	578,000	-	647,000
		18822 Lyndonville Station 34.5kV cap bank installation	C046569	-	32,000	216,000	961,000	-	1,209,000
		18876 Elm St Relief_23kV Line work	C046546	-	54,000	756,000	699,000	955,000	2,464,000
		18877 Elm St Relief_station work TxD	C046547	-	22,000	308,000	284,000	388,000	1,002,000
		19027 Wellsville Relief SubT-Line work	C046541	-	-	323,000	279,000	286,000	888,000
		19081 Chautauqua South: new Stedman 115 - 13.2kV substation DxT	C046517		-	22,000	111,000	451,000	584,000
		19108 LN863 Findley Lake - French Creek expansion	C046510	-	341,000	1,110,000	72,000	-	1,523,000
		19388 Ridge sub - Split cap bank into 2-stage 5.4MVar	C046429	61,000	200,000	13,000	-	-	274,000
		19591 NY New Mobile Substation 34.5 kV - 13.2x4.4	C046410	10,000	719,000	690,000	-	-	1,419,000
		19693 Sanborn Substation Rebuild_TxD	C046361	162,000	894,000	14,000	-	-	1,070,000
	SC&P Other Total			670,000	1,126,000	1,085,000	1,339,000	1,591,000	5,811,000
	Sub-T Automation	05655 DA - NC SubT Automation Line 31	C035865	-	351,000	-	-	-	351,000
		05657 DA - NE SubT Automation Wilton Sub	C035863	-	787,000	-	-	-	787,000
		05666 DA-NY SubT Automation Place Holder	C036661	100,000	1,000,000	2,500,000	2,500,000	2,500,000	8,600,000
		12843 MV-Install ScadaMates on Valley-Inghams #27 Line	CD00522	144,000	-	-	-	-	144,000
		12897 WD - Install ScadaMates on 218 Line	CD00519	517,000	-	-	-	-	517,000
		12898 WD - Install ScadaMates on the 224/226 Lines	CD00517	675,000	-	-	-	-	675,000
		12899 WD - Install ScadaMates on the 301 Line	CD00474	396,000	180,000	-	-	-	576,000
		12906 WD - Install ScadaMates on the 803 Line	CD00514	180,000	112,000	-	-	-	292,000
		15722 WD - Install ScadaMates on 861 Line	CD00516	540,000	-	-	-	-	540,000
		15726 Install Head End EMS Equipment for 861 DA	CD00470	51,000	-	-	-	-	51,000
		17932 Install Head End EMS Equipment for 218 DA	CD00618	43,000	-	-	-	-	43,000
	Sub-T Automation Total			2,646,000	2,430,000	2,500,000	2,500,000	2,500,000	12,576,000
	Sub-T Line Removal	05316 Beck - Harper L105 Removal	C036195	41,000	53,000	-	-	-	94,000
		05317 Beck - Harper L106 Removal	C036196	1,000	1,000	1,000	-	-	3,000
		05930 Gardenville-Blasdell L131/L132 Rem.	C036201	1,000	1,000	0	0	0	2,000
		06744 Terminal Sta B - R48, R46, R25 Rem.	C036204	0	0	1,000	1,000	1,000	3,000
		06745 Terminal Sta C - C12 & C14 Removal	C036203	1,000	1,000	1,000	0	0	3,000
		06746 Terminal Sta D - 12D, 19D, 20D Rem.	C036202	0	1,000	1,000	1,000	0	3,000
		06773 TSC - Gardenville L92 Removal	C036199	-	1,000	1,000	1,000	-	3,000
		09212 Castleton Greenbush Line 5	C036365	1,000	1,000	0	0	0	2,000
	Sub-T Line Removal Total			45,000	59,000	5,000	3,000	1,000	113,000
System Capacity & Performance Total				6,752,000	7,550,000	7,550,000	8,100,000	8,650,000	38,602,000
Grand Total				41,000,000	42,000,000	42,000,000	46,000,000	50,000,000	221,000,000

Exhibit 3 - 2013 Distribution Capital Investment Plan

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
Asset Condition	AC Other	04908 Network Protector Replacement - C29206	C029206	24,000	24,000	24,000	-	-	72,000
		05215 White Lake Station Upgrades	C008435	30,000	-	-	-	-	30,000
		05473 Canajoharie 03122 - Rebuild Rt 162	C000329	200,000	-	-	-	-	200,000
		06353 NR-Westville 88561-Donovan Rd	C010695	206,000	-	-	-	-	206,000
		06623 Sharon 52 - Rebuild Routes 20 & 145	C006680	149,000	-	-	-	-	149,000
		09213 Castleton Line Work	C036323	206,000	-	-	-	-	206,000
		09221 Market Hill Convert Load	C036638	-	-	-	832,000	107,000	939,000
		09242 Carthage Reploace Struct Footings	C036183		10,000	196,000	-	-	206,000
		09254 Hoag Station Rehab	C036050	750,000	-	-	-	-	750,000
		11192 Buffalo Station 42 Rebuild - D Line	C046859	27,000	165,000	123,000	-	-	315,000
		11194 Buffalo Station 42 Rebuild - D Station	C046854		10,000	90,000	1,413,000	1,394,000	2,907,000
		11257 Buffalo Station 12 - 25 Cycle Retirement	CD00969	-	-	-	2,000	-	2,000
		11299 Buffalo Station 122 Rebuild - Sub	CD00782		1,456,000	4,081,000	12,000	-	5,549,000
		11300 Buffalo Station 122 Rebuild - Line	CD00779	0	494,000	296,000	43,000	-	833,000
		11458 MV- Poland 62258 Route 8 Reconductor Phase 1	CD00883	585,000	-	-	-	-	585,000
		11496 Burgoyne 51 - Rebuild Durkeetown Rd.	CD00222	114,000	-	-	-	-	114,000
		11581 Buffalo Station # 138 – Retirement of Station	C046833	-	24,000	-	-	-	24,000
		11833 Minoa Upgrade Station Regulator	C046806	210,000	-	-	-	-	210,000
		13180 MV Dyke Rd - Schuyler 66356	CD01048	200,000	-	-	-	-	200,000
		13279 Lenox Station D Line Work	CD00464	480,000	-	-	-	-	480,000
		15684 Orangeville Substation - Upgrade Bypass Switch	CD00703	36,000	-	-	-	-	36,000
		15690 Broadway Network Retirement	C046712	-	-	-	90,000	-	90,000
		17054 Grand St. 51 - Route 7 Gap Closing	CD00374	160,000	-	-	-	-	160,000
		17826 Milpine Staton 96 - Station Retirement	CD00594	3,000	-	-	-	-	3,000
		17902 Troy LVAC Network - William St	CD00628	120,000	-	-	-	-	120,000
		17943 NR-E Watertown 81758-Spring ValleyDr	CD01300	-	33,000	220,000	265,000	-	518,000
		18012 Station 66 (Union Rd) Rebuild - DLine	CD00685	80,000	-	-	-	-	80,000
		18202 CR- Rebuild Midland Ave, Syracuse	CD00770	137,000	-	-	-	-	137,000
		18405 LN403 Youngstown/Sanborn Underbuild transfer	CD00758	89,000	-	-	-	-	89,000
		18416 NR-T.I.81452-County Route 100-Overload	CD01132	121,000	-	-	-	-	121,000
		18568 MV-Poland 62258 Route 8 Reconductor Phase 2	CD00885	50,000	700,000	-	-	-	750,000
		18571 MV-Poland 62258 Route 8 Reconductor Phase 3	C046605	-	1,274,000	-	-	-	1,274,000
		18572 MV- Poland 62258 Route 8 Reconductor Phase 4	C046606	-	-	1,366,000	-	-	1,366,000
		18622 Whitehall 51 Conversion	CD00831	920,000	-	-	-	-	920,000
		18651 NR_Dexter_72661-Canal Street-FdrTie	CD01192	206,000	-	-	-	-	206,000
		18652 NR_Dexter_72661-NYS Route 3-FdrTie	CD01186	31,000	228,000	232,000	-	-	491,000
		18679 Chautauqua South - Feeder 5762 rebuild	CD00849	253,000	-	-	-	-	253,000
		19046 Reservoir Staiton - Bank Replacement	CD01122	58,000	36,000	-	-	-	94,000
		19074 Western New York - Metering Upgrades	C046515	124,000	127,000	130,000	133,000	170,000	684,000
		19094 Buffalo Station 57 - Breaker Replacement	C046513		10,000	429,000	394,000	-	833,000
		19190 MOD Switch "Whip Design" ARP	C046504	20,000	300,000	731,000	826,000	-	1,877,000
		19196 Middleburgh 51 - Route 145 Extend/Convert	CD01010	718,000	-	-	-	-	718,000
		19204 Niagara Falls Network Retirement	C046502	-	-	-	89,000	-	89,000
		19263 Wilton 52 - Route 9 Rebuild/Convert	CD01021	744,000	-	-	-	-	744,000
		19403 Curry Rd 36551 UG Getaway Replacement - 1000CU	CD01069	170,000	-	-	-	-	170,000
		19410 Florida 52 - Bulls Head Rd Rebuild	CD01100	268,000	-	-	-	-	268,000
		19423 Delanson 51 - Route 7 Rebuild/Conversion	C046424	782,000	-	-	-	-	782,000
		19478 Warrensburg 51 - County Home Bridge Rd	CD01133	62,000	-	-	-	-	62,000
		19487 New Harper Substation D Line	C046417	42,000	53,000	108,000	111,000	-	314,000
		19588 Middleburgh 51 - Bear Ladder Rd.	CD01224	165,000	-	-	-	-	165,000
		19589 Middleburgh 51 - West Fulton Rd. Rebuild	C046408	6,000	159,000	-	-	-	165,000
		Syr_Connective Corridor_Ductline	C045334	1,100,000	1,100,000				2,200,000
		09243 Castleton Retirement	C036337	1,000	-	-	-	-	1,000
		11258 Buffalo Station 14 - 25 Cycle Retirement	CD00974	-	-	-	1,000	0	1,000
		18434 Station 01 - Remove 25 Cycle Feeders	C046624	0	1,000	1,000	0	0	2,000
		18444 Station 06 - 25 Cycle Feeder Removals	C046622	0	1,000	1,000	0	0	2,000
		18445 Station 05 - 25 Cycle Feeder 0528 Removal	C046623	0	1,000	1,000	0	0	2,000
		18446 Station 08 - 25 Cycle Feeder Removals	C046625	0	0	1,000	1,000	0	2,000
		18447 Buffalo Station 14 - 25 Cycle Feeder Removals	C046616	0	0	1,000	1,000	0	2,000
		18448 Bufalo Station 17 - 25 Cycle Feeder Removals	C046617	0	0	0	1,000	1,000	2,000
		18449 Buffalo Station 20 - 25 Cycle Feeder Removals	C046618	0	0	0	1,000	1,000	2,000
		18450 Buffalo Station 72 - 25 Cycle Feeder Removals	C046619	0	0	0	1,000	1,000	2,000
	AC Other Total			9,647,000	6,206,000	8,031,000	4,216,000	1,674,000	29,774,000
	Arc Flash Mediation	18023 Arc Flash Mediation - 480V spot networks	CD01278	2,000,000	4,000,000	4,000,000	4,000,000	2,104,000	16,104,000
	Arc Flash Mediation Total			2,000,000	4,000,000	4,000,000	4,000,000	2,104,000	16,104,000
	Blanket	05498 Cent NY-Dist-Asset Replace Blanket	CNC0017	1,647,000	1,698,000	1,757,000	1,815,000	1,875,000	8,792,000
		05809 East NY-Dist-Asset Replace Blanket	CNE0017	1,967,000	2,028,000	2,098,000	2,167,000	2,238,000	10,498,000
		06893 West NY-Dist-Asset Replace Blanket	CNW0017	3,017,000	3,111,000	3,218,000	3,324,000	3,434,000	16,104,000
	Blanket Total			6,631,000	6,837,000	7,073,000	7,306,000	7,547,000	35,394,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
	Buffalo Street Light	18022 Buffalo Street Light Cable Replacement	CD00851	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	12,500,000
	Buffalo Street Light Total			2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	12,500,000
	Cable Replacement	05982 Henry St 36 - River Crossing	C029432	396,000	-	-	-	-	396,000
		06044 Utica UG Cable Replacement	C013822	1,260,000	1,680,000	1,680,000	-	-	4,620,000
		06046 IE-NE Cable Replacements Placeholde	C011099	-	1,725,000	1,725,000	-	-	3,450,000
		09220 Liberty St. UG Cable Replacement	C036469	619,000	500,000	-	-	-	1,119,000
		09224 Riverside 28855 UG Cable Replacement	C036468	1,260,000	2,000,000	-	-	-	3,260,000
		11500 Buffalo Station 22 - Recond 4 kV Getaways	CD00472	420,000	-	-	-	-	420,000
		18758 UG Cable Repl Ash Street Fdr 22347	CD00915	640,000	-	-	-	-	640,000
		18759 UG Cable Repl Temple Street Fdr 24358	CD00914	640,000	-	-	-	-	640,000
		18878 Greenbush 07852 - Huntswood Estates / Bella Vista URD Cable Replacement	CD00913	150,000	-	-	-	-	150,000
	Cable Replacement Total			5,385,000	5,905,000	3,405,000	-	-	14,695,000
	Conductor Replacement	06015 IE - NC Replace open wire primary	C031861	206,000	529,000	538,000	221,000	-	1,494,000
		06027 IE - NE Replace open wire primary	C031860	-	529,000	538,000	221,000	-	1,288,000
		06037 IE - NW Replace open wire primary	C031862	206,000	529,000	538,000	221,000	-	1,494,000
		17851 SW - Replace Steel Conductor on Cuba Lake 3761 - Branch Rd	CD00593	154,000	-	-	-	-	154,000
		17867 SW - Replace Steel Conductor on Cuba Lake 3761 - Jackson Hill Rd	CD00749	360,000	-	-	-	-	360,000
		19624 STA197 - 19752 small wires reconductoring	C046389	2,000	-	-	-	-	2,000
	Conductor Replacement Total			928,000	1,587,000	1,614,000	663,000	-	4,792,000
	ISO Capacitor Banks	06977 NE NYISO 13.2kV Sub Cap Banks	C036827	188,000	-	-	-	-	188,000
		07004 NE NYISO Dist Line Cap Banks	C036831	53,000	-	-	-	-	53,000
	ISO Capacitor Banks Total			241,000	-	-	-	-	241,000
	Substation Battery and Related	04607 Batts/Charg- NY Central	C032013	125,000	125,000	50,000	50,000	200,000	550,000
		04608 Batts/Charg- NY West	C032014	238,000	238,000	238,000	238,000	-	952,000
		04609 Batts/Charg--NY East	C032012	119,000	119,000	200,000	300,000	300,000	1,038,000
	Substation Battery and Related Total			482,000	482,000	488,000	588,000	500,000	2,540,000
	Substation Breaker	04902 NC ARP Breakers & Reclosers	C032253	600,000	600,000	600,000	600,000	600,000	3,000,000
		04905 NYE ARP Breakers & Reclosers	C032252	600,000	600,000	600,000	600,000	600,000	3,000,000
		04947 NYW ARP Breakers & Reclosers	C032261	600,000	600,000	600,000	600,000	600,000	3,000,000
		11619 NY Circuit Breaker Replacement	C037883	750,000	750,000	750,000	250,000	-	2,500,000
	Substation Breaker Total			2,550,000	2,550,000	2,550,000	2,050,000	1,800,000	11,500,000
	Substation Circuit Switcher	04703 Circuit Switcher Strategy Co:36 DxT	C018850	1,000,000	1,000,000	1,000,000	2,500,000	2,500,000	8,000,000
	Substation Circuit Switcher Total			1,000,000	1,000,000	1,000,000	2,500,000	2,500,000	8,000,000
	Substation Indoor	04635 Buffalo Indoor Sub. #29 Refurb.	C006722	2,278,000	1,257,000	-	-	-	3,535,000
		04654 Buffalo Station 27 Rebuild - Sta	C033473	3,205,000	1,587,000	-	-	-	4,792,000
		04657 Buffalo Station 31 Rebuild - Sub	C046952		-	-	1,614,000	4,250,000	5,864,000
		04663 Buffalo Station 37 Rebuild - Sub	C033474		1,008,000	4,017,000	535,000	-	5,560,000
		04665 Buffalo Station 41 Rebuild - Sub	C046956	-	-	-	776,000	1,125,000	1,901,000
		04670 Buffalo Station 59 Rebuild - Sub	C033475		50,000	1,225,000	3,650,000	50,000	4,975,000
		05411 Buffalo Station 27 Rebuild - Line	C033476	638,000	77,000	-	-	-	715,000
		05413 Buffalo Station 29 Rebuild - Fdrs	C006723	107,000	-	-	-	-	107,000
		05419 Buffalo Station 31 Rebuild - Line	C046943	-	53,000	1,614,000	276,000	57,000	2,000,000
		05430 Buffalo Station 37 Rebuild - Line	C033477	638,000	425,000	85,000	-	-	1,148,000
		05434 Buffalo Station 41 Rebuild - Line	C046938	-	-	-	-	109,000	109,000
		05447 Buffalo Station 52 Rebuild - Fdrs	C027949	27,000	-	-	-	-	27,000
		05451 Buffalo Station 59 Rebuild - Line	C033478	-	126,000	420,000	42,000	-	588,000
		11877 Rock Cut #286 2nd Tranf and Metalclad	CD00882	450,000	2,350,000	661,000		-	3,461,000
		17328 Removal of Brighton Ave 4 kV Sub	CD00886	10,000	10,000	560,000	-	-	580,000
		18783 Welch 83 Indoor Substation Refurbishment - DSub	C046583	-	48,000	1,399,000	561,000	-	2,008,000
		18784 Welch 83 - Indoor Substation Refurbishment - DLine	C046584	-	85,000	538,000	243,000	-	866,000
		18786 Eighth St 80 - Indoor Substation Refurbishment - DSub	C046585		47,000	930,000	81,000	26,000	1,084,000
		18787 Eighth St 80 - Indoor Substation Refurbishment - DLine	C046586	134,000	529,000	431,000	299,000	-	1,393,000
		18789 Stephenson 85 - Indoor Substation Refurbishment - DSub	C046581		-	48,000	1,399,000	773,000	2,220,000
		18790 Stephenson 85 - Indoor Substation Refurbishment - DLine	C046580	-	-	173,000	884,000	725,000	1,782,000
		18794 Eleventh St 82 - Indoor Substation Refurbishment - DSub	C046582		-	-	70,000	1,877,000	1,947,000
		18795 Eleventh St 82 - Indoor Substation Refurbishment - DLine	C046576	-	-	54,000	552,000	-	606,000
		18797 Beech St 81 - Indoor Substation Refurbishment - DSub	C046577		-	-	70,000	1,877,000	1,947,000
		18798 Beech St 81 - Indoor Substation Refurbishment - DLine	C046578	-	-	-	56,000	623,000	679,000
		19066 Buffalo Station 30 Rebuild - Sta	C046519	-	-	-	-	795,000	795,000
	Substation Indoor Total			7,487,000	7,652,000	12,155,000	11,108,000	12,287,000	50,689,000
	Substation Metal-Clad Switchgear	05024 Rebuild Saratoga Substation	C029436		-	356,000	1,327,000	619,000	2,302,000
		05846 Emmet St - Repl TB1 and mclad	C017952		10,000	336,000	1,304,000	603,000	2,253,000
		13341 Union St 376 - Replace Metalclad Gear	C046745		-	377,000	1,327,000	619,000	2,323,000
		13342 Johnson Rd - Replace Metalclad Gear	C046747		-	377,000	1,458,000	675,000	2,510,000
		13343 Pinebush - Replace Metalclad Gear	C046744		-	-	362,000	1,362,000	1,724,000
		13345 Hopkins 253 - Replace Metalclad Gear	C046741		1,000	2,800,000	1,316,000	248,000	4,365,000
		13346 Whitesboro 632 - Replace Metalclad Gear	C046742		-	-	362,000	1,362,000	1,724,000
		13348 Conkling 652 - Replace Metalclad Gear	C046743	-	-	-	394,000	1,397,000	1,791,000
		17183 Oneida SG replacement- feeder getaways	CD00504	220,000	-	-	-	-	220,000
	Substation Metal-Clad Switchgear Total			220,000	11,000	4,246,000	7,850,000	6,885,000	19,212,000
	Substation Mobile	17809 Mobile Substation 7C - Refurbish and Upgrade	C046673	560,000	-	-	-	-	560,000
		17811 Mobile Substation 2E - Replacement	C046666	-	-	549,000	394,000	-	943,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		17812 Mobile Substation 4E - Refurbish and Upgrade	C046667	-	-	527,000	-	-	527,000
		17821 Mobile Substation 6E - Rewind	C046668	-	-	658,000	-	-	658,000
	Substation Mobile Total			560,000	-	1,734,000	394,000	-	2,688,000
	Substation Power Transformer	04824 IE - NY ARP Transformers	C025801	-	377,000	384,000	394,000	404,000	1,559,000
		04962 NY ARP Spare Substation Transformer	C026055	629,000	647,000	658,000	675,000	693,000	3,302,000
		04979 NY Trf Replacement DxT	C034585	412,000	412,000	438,000	2,383,000	2,432,000	6,077,000
		09251 Fisher Ave Replace 34/13kV Trans	C036101	850,000	605,000	-	-	-	1,455,000
		17795 French Creek Station 56 - Transformer Replacement	CD00862	429,000	250,000	-	-	-	679,000
		17805 Station 124 - Almeda Ave Transformer Replacement	C046670		10,000	242,000	2,585,000	384,000	3,221,000
		17806 Rock City Station 623 - Transformer Replacement	C046671		-	377,000	412,000	-	789,000
		17807 Indian Lake - Replace Transformers	C046672	30,000	350,000	-	-	-	380,000
		18471 NYE Spare Transformer 69 kV - 13.8 kV	CD00783	541,000	-	-	-	-	541,000
		18581 Collins Station - Replace Transformer	C046602	50,000	722,000	-	-		772,000
	Substation Power Transformer Total			2,941,000	3,373,000	2,099,000	6,449,000	3,913,000	18,775,000
	Substation RTU	04969 NY RTU Program - DxT Subs	C022151	504,000	504,000	600,000	1,008,000	-	2,616,000
	Substation RTU Total			504,000	504,000	600,000	1,008,000	-	2,616,000
	TBD	05061 Reserve for Asset Replacement Unidentified Specifics & Schedule Changes (substation)	C046947	(3,424,000)	(3,274,000)	(13,238,000)	(10,376,000)	(5,935,000)	(36,247,000)
		06508 Reserve for Asset Replacement Unidentified Specifics & Schedule Changes	C046917	(9,652,000)	(7,833,000)	(5,257,000)	1,244,000	6,225,000	(15,273,000)
	TBD Total			(13,076,000)	(11,107,000)	(18,495,000)	(9,132,000)	290,000	(51,520,000)
Asset Condition Total				30,000,000	31,500,000	33,000,000	41,500,000	42,000,000	178,000,000
Damage/Failure	Blanket	04693 Cent NY-Dist-Subs Blanket	CNC0002	310,000	321,000	333,000	344,000	356,000	1,664,000
		04762 East NY-Dist-Subs Blanket	CNE0002	919,000	951,000	985,000	1,019,000	1,054,000	4,928,000
		05206 West NY-Dist-Subs Blanket	CNW0002	713,000	738,000	765,000	791,000	818,000	3,825,000
		05499 Cent NY-Dist-Damage/Failure Blanket	CNC0014	4,627,000	4,788,000	4,962,000	5,131,000	5,306,000	24,814,000
		05810 East NY-Dist-Damage/Failure Blanket	CNE0014	6,620,000	6,850,000	7,098,000	7,340,000	7,591,000	35,499,000
		06894 West NY-Dist-Damage/Failure Blanket	CNW0014	5,205,000	5,386,000	5,581,000	5,772,000	5,969,000	27,913,000
	Blanket Total			18,394,000	19,034,000	19,724,000	20,397,000	21,094,000	98,643,000
	D/F Other	04753 DxT Substation Dmg/Fail Reserve C36	C018595	241,000	249,000	262,000	272,000	272,000	1,296,000
		17430 New Florida Substation	CD01168	1,000,000	1,000,000	-	-	-	2,000,000
		17432 Florida Substation Distribution Feeders	CD01172	800,000	300,000	-	-	-	1,100,000
		17512 Selkirk 14952 - Rebuild Getaway	CD00858	320,000	-	-	-	-	320,000
		19404 Station 82 (11th St) - Transformer Replacement	CD01112	165,000	-	-	-	-	165,000
		19695 Ridge Station 142 – Replace 115kV-4.16kV Transformer	C046362	488,000	-	-	-	-	488,000
	D/F Other Total			3,014,000	1,549,000	262,000	272,000	272,000	5,369,000
	Major Storms	06688 Storm Damage - Dist - Western Div	C000056	150,000	150,000	150,000	150,000	150,000	750,000
		06689 Storm Damage Distribution East Div.	C000328	500,000	500,000	500,000	500,000	500,000	2,500,000
		06690 Storm Damage-Dist-Cent Div	C012965	50,000	50,000	50,000	50,000	50,000	250,000
	Major Storms Total			700,000	700,000	700,000	700,000	700,000	3,500,000
	TBD	05062 Reserve for Damage/Failure Unidentified Specifics & Schedule Changes (substation)	C046948	174,000	771,000	1,725,000	1,694,000	1,750,000	6,114,000
		06509 Reserve for Damage/Failure Unidentified Specifics & Schedule Changes	C046918	158,000	496,000	359,000	(93,000)	(466,000)	454,000
	TBD Total			332,000	1,267,000	2,084,000	1,601,000	1,284,000	6,568,000
Damage/Failure Total				22,440,000	22,550,000	22,770,000	22,970,000	23,350,000	114,080,000
Non-Infrastructure	Blanket	04508 Cent NY-General-Genl Equip Blanket	CNC0070	1,139,000	1,185,000	1,239,000	1,289,000	1,341,000	6,193,000
		04525 East NY-Genl Equip Budgetary Reserv	CNE0070	859,000	894,000	935,000	973,000	1,012,000	4,673,000
		04559 Telecom and Radio Equipment	C004157	1,040,000	1,005,000	1,015,000	1,015,000	1,015,000	5,090,000
		04563 West NY-General-Genl Equip Blanket	CNW0070	870,000	905,000	946,000	984,000	1,024,000	4,729,000
		05509 Cent NY-Dist-Telecomm Blanket	CNC0021	1,000	1,000	1,000	1,000	1,000	5,000
		05821 East NY-Dist-Telecomm Blanket	CNE0021	1,000	1,000	1,000	1,000	1,000	5,000
		06905 West NY-Dist-Telecomm Blanket	CNW0021	1,000	1,000	1,000	1,000	1,000	5,000
	Blanket Total			3,911,000	3,992,000	4,138,000	4,264,000	4,395,000	20,700,000
	TBD	04546 Reserve for General Equipment Specifics & Schedule Changes	C046963	249,000	248,000	252,000	246,000	255,000	1,250,000
	TBD Total			249,000	248,000	252,000	246,000	255,000	1,250,000
Non-Infrastructure Total				4,160,000	4,240,000	4,390,000	4,510,000	4,650,000	21,950,000
Statutory/Regulatory	Asset Condition I&M	06045 IE-NC Duct Replac Placeholder	C032091	85,000	85,000	85,000	-	-	255,000
		06047 IE-NE_-Duct Replace Placeholder	C032093	-	85,000	85,000	-	-	170,000
		06048 IE-NE-MH-Program-Placeholder	C032103	-	168,000	168,000	-	-	336,000
	Asset Condition I&M Total			85,000	338,000	338,000	-	-	761,000
	Blanket	05497 Cent NY-Dist-3rd Party Attch Blankt	CNC0022	205,000	211,000	218,000	225,000	232,000	1,091,000
		05501 Cent NY-Dist-Land/Rights Blanket	CNC0009	1,501,000	1,587,000	1,682,000	1,783,000	1,890,000	8,443,000
		05503 Cent NY-Dist-Meter Blanket	CNC0004	843,000	904,000	971,000	1,038,000	1,110,000	4,866,000
		05504 Cent NY-Dist-New Bus-Comm Blanket	CNC0011	3,847,000	4,096,000	4,366,000	4,645,000	4,942,000	21,896,000
		05505 Cent NY-Dist-New Bus-Resid Blanket	CNC0010	8,135,000	8,568,000	9,122,000	9,698,000	10,310,000	45,833,000
		05506 Cent NY-Dist-Public Require Blanket	CNC0013	839,000	893,000	951,000	1,012,000	1,078,000	4,773,000
		05508 Cent NY-Dist-St Light Blanket	CNC0012	2,888,000	2,987,000	3,100,000	3,209,000	3,322,000	15,506,000
		05808 East NY-Dist-3rd Party Attch Blankt	CNE0022	31,000	32,000	33,000	34,000	35,000	165,000
		05813 East NY-Dist-Land/Rights Blanket	CNE0009	11,000	12,000	13,000	14,000	15,000	65,000
		05815 East NY-Dist-Meter Blanket	CNE0004	459,000	492,000	528,000	565,000	604,000	2,648,000
		05816 East NY-Dist-New Bus-Comm Blanket	CNE0011	2,944,000	3,135,000	3,342,000	3,556,000	3,784,000	16,761,000
		05817 East NY-Dist-New Bus-Resid Blanket	CNE0010	7,344,000	7,735,000	8,236,000	8,756,000	9,309,000	41,380,000
		05818 East NY-Dist-Public Require Blanket	CNE0013	1,105,000	1,176,000	1,253,000	1,333,000	1,418,000	6,285,000
		05820 East NY-Dist-St Light Blanket	CNE0012	1,362,000	1,409,000	1,462,000	1,514,000	1,567,000	7,314,000
		06282 NiMo Meter Purchases	CN03604	2,870,000	2,990,000	3,105,000	3,030,000	3,120,000	15,115,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		06283 NiMo Transformer Purchases	CN03620	25,287,000	26,046,000	26,827,000	27,632,000	28,461,000	134,253,000
		06892 West NY-Dist-3rd Party Attch Blankt	CNW0022	178,000	183,000	189,000	195,000	201,000	946,000
		06897 West NY-Dist-Land/Rights Blanket	CNW0009	647,000	684,000	725,000	769,000	815,000	3,640,000
		06899 West NY-Dist-Meter Blanket	CNW0004	811,000	870,000	934,000	999,000	1,068,000	4,682,000
		06900 West NY-Dist-New Bus-Comm Blanket	CNW0011	3,975,000	4,233,000	4,512,000	4,801,000	5,108,000	22,629,000
		06901 West NY-Dist-New Bus-Resid Blanket	CNW0010	5,414,000	5,756,000	6,128,000	6,515,000	6,926,000	30,739,000
		06902 West NY-Dist-Public Require Blanket	CNW0013	1,105,000	1,176,000	1,253,000	1,333,000	1,418,000	6,285,000
		06904 West NY-Dist-St Light Blanket	CNW0012	3,517,000	3,637,000	3,775,000	3,908,000	4,046,000	18,883,000
	Blanket Total			75,318,000	78,812,000	82,725,000	86,564,000	90,779,000	414,198,000
	Inspection & Maintenance	05999 I&M - NC D-Line OH Work From Insp	C026160	5,848,000	5,848,000	5,848,000	5,848,000	5,848,000	29,240,000
		06000 I&M - NC D-Line UG Work From Insp	C026163	833,000	833,000	833,000	833,000	833,000	4,165,000
		06002 I&M - NE D-Line OH Work From Insp	C026159	13,005,000	5,848,000	5,848,000	5,848,000	5,848,000	36,397,000
		06003 I&M - NE D-Line UG Work From Insp	C026162	953,000	833,000	833,000	833,000	833,000	4,285,000
		06005 I&M - NW D-Line OH Work From Insp	C026161	6,480,000	5,848,000	5,848,000	5,848,000	5,848,000	29,872,000
		06006 I&M - NW D-Line UG Work From Insp	C026164	1,434,000	1,434,000	1,434,000	1,434,000	1,434,000	7,170,000
	Inspection & Maintenance Total			28,553,000	20,644,000	20,644,000	20,644,000	20,644,000	111,129,000
	New Business	05392 Buffalo Spot Network - Canal Side	C035514	105,000	-	-	-	-	105,000
		06511 Reserve for New Business Commercial Unidentified Specifics & Schedule Changes	C046920	4,523,000	5,458,000	5,536,000	5,289,000	5,006,000	25,812,000
		06512 Reserve for New Business Residential Unidentified Specifics & Schedule Changes	C046921	88,000	3,331,000	2,664,000	1,971,000	1,205,000	9,259,000
		17241 Crown Point URD Phase 2 and 3	CD00438	64,000	-	-	-	-	64,000
		17422 102 Dickerson, Temp Service	CD00484	104,000	-	-	-	-	104,000
		17478 Carriage Hills URD	CD00589	84,000	-	-	-	-	84,000
		17775 Westbrook Estates URD - Lake George, NY	CD00550	60,000	-	-	-	-	60,000
		17777 Ellis Hospital Dual Feed - Rosa Rd 13756 Rebuild & Conversion	CD00566	78,000	-	-	-	-	78,000
		17896 The Moorings at Half Moon URD	CD00603	80,000	-	-	-	-	80,000
		18025 Oot Brother Inc. URD Sullivan, NY	CD00666	96,000	-	-	-	-	96,000
		18113 Middleburgh 52 - Rebuild Route 145	CD00753	100,000	-	-	-	-	100,000
		18338 North Ridge Hollow Ph 1 Colonie, NY	CD00716	84,000	-	-	-	-	84,000
		18453 1001 Main St. - Ciminelli Medical Office Bldg.	CD00814	250,000	-	-	-	-	250,000
		18615 Oswego - Trolley Light Pole Replacement	CD00810	96,000	-	-	-	-	96,000
		18621 Lakeview Village Mayfield, NY	CD00838	96,000	-	-	-	-	96,000
		18648 Trackside Crossing Marcy, NY	CD00839	133,000	-	-	-	-	133,000
		18836 Van Dyke Spinney, Delmar, NY	CD00890	100,000	-	-	-	-	100,000
		18866 Kensington Woods Ph1, New Scotland, NY	CD00892	312,000	-	-	-	-	312,000
		19080 CR-Ash Street-13.2kV Feeder 22352	CD01217	304,000	312,000	-	-	-	616,000
		19123 Lakeview Est. at Madison Barracks, Hounsfield, NY	CD00958	88,000	-	-	-	-	88,000
		19126 Austin Meadows North Ph1, Manlius, NY	CD00957	144,000	-	-	-	-	144,000
		19250 Mohawk Hills Ph 2. Amsterdam, NY	CD01008	106,000	-	-	-	-	106,000
		19474 Rolling Hills Farm, Westport, NY	CD01119	179,000	-	-	-	-	179,000
		19491 NO - SUNY Potsdam 2.8MW CHP - Lawrence Ave DTT	CD01147	136,000	-	-	-	-	136,000
		19517 Travers Meadows Ph 3. Malta, NY	CD01150	255,000	-	-	-	-	255,000
		19572 New feed to Lockheeds Cazanovia site	CD01184	232,000	-	-	-	-	232,000
		19577 Pierce Rd. Medical. Clifton Park, NY	CD01178	64,000	-	-	-	-	64,000
		19580 North Terrace, Gloversville, NY	CD01171	64,000	-	-	-	-	64,000
		19587 Park Place at Saratoga Polo, Saratoga Springs, NY	CD01169	64,000	-	-	-	-	64,000
		19694 SUNY College of Nano Eng. Clifton Park, NY	CD01209	43,000	-	-	-	-	43,000
		19707 Patriot Sq Ph1. Glennville, NY	CD01222	85,000	-	-	-	-	85,000
		19708 Locus View Aprt. Selkirk, NY	CD01221	85,000	-	-	-	-	85,000
		19719 Condos at Helderberg URD, Rotterdam, NY	CD01238	85,000	-	-	-	-	85,000
		19725 Olson Farms Phase 2 URD - Gansevoort, NY	CD01235	85,000	-	-	-	-	85,000
		19731 Stoneledge Terrace URD - Troy, NY	CD01249	85,000	-	-	-	-	85,000
		19732 Kaydeross Village Phase 3 URD - Ballston Spa, NY	CD01251	85,000	-	-	-	-	85,000
		19753 Twenty West URD Phase 3, Altamont, NY	CD01256	106,000	-	-	-	-	106,000
		19754 Timbercreek Preserve URD Phase 2 - Ballston Lake, NY	CD01265	531,000	-	-	-	-	531,000
		19757 Bluebird Village URD Phase 3 - S. Glens Falls, NY	CD01254	85,000	-	-	-	-	85,000
		19759 Carriage Hill Court	CD01248	82,000	-	-	-	-	82,000
		19760 Witbeck URD Phase 1 - East Greenbush, NY	CD01250	206,000	-	-	-	-	206,000
	New Business Total			9,652,000	9,101,000	8,200,000	7,260,000	6,211,000	40,424,000
	Public Requirements	05779 DOTR RT28 White Lk - McKeever Dist	C035027	4,000	32,000	196,000	-	-	232,000
		06514 Reserve for Public Requirements Unidentified Specifics & Schedule Changes	C046922	3,529,000	7,833,000	8,937,000	9,292,000	9,446,000	39,037,000
		07002 MV-Frankfort Municipal Route 5	C036848	21,000	-	-	-	-	21,000
		11884 DOT Rt 11/Main St., Gouverneur	CD00282	272,000	-	-	-	-	272,000
		17977 Old Route 5 Paving Project	CD00663	104,000	-	-	-	-	104,000
		18336 NYSDOT Pin #1089.1	CD00815	120,000	-	-	-	-	120,000
		18479 OH Relocation 2452 Rte 9, Malta	CD00789	64,000	-	-	-	-	64,000
		18668 DOT PIN 1098.61 Route 4 Hudson Falls -Phase 2	CD00921	650,000	-	-	-	-	650,000
		19236 DOT PIN 2134.50 Utica Arterial	CD01009	1,700,000	-	-	-	-	1,700,000
		19401 PIN 1043.38 DOT South Glens Falls	CD01077	149,000	-	-	-	-	149,000
		19573 DOT PIN 3754.56 Connective Corridor Phase 2/3	CD01183	1,080,000	1,110,000	-	-	-	2,190,000
	Public Requirements Total			7,693,000	8,975,000	9,133,000	9,292,000	9,446,000	44,539,000
	S or R Other	17520 East Batavia Substation - DLine Upgrades PH2	CD00587	165,000	-	-	-	-	165,000
		18841 296 Judson Rd Big Moose, NY	CD00923	140,000	-	-	-	-	140,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		18884 Rotterdam 13851 / Weaver 24552 Relocation	CD00960	298,000	-	-	-	-	298,000
		19419 Rotterdam 13852 & 13853 Relocation - Lock 8 - Erie Canal	C046422	864,000	-	-	-	-	864,000
		19699 PIN 5755.43 - E. Robinson/N. French Relocations	CD01228	288,000	-	-	-	-	288,000
	S or R Other Total			1,755,000	-	-	-	-	1,755,000
Statutory/Regulatory Total				123,056,000	117,870,000	121,040,000	123,760,000	127,080,000	612,806,000
System Capacity & Performance	AC Other	05399 Buffalo Station 03 - 25 Cycle Feeder Removals	C036207	1,000	1,000	0	0	0	2,000
		06755 Tonawanda - F7128 Removal	C036206	0	0	1,000	1,000	1,000	3,000
	AC Other Total			1,000	1,000	1,000	1,000	1,000	5,000
	Blanket	05502 Cent NY-Dist-Load Relief Blanket	CNC0016	530,000	563,000	600,000	638,000	679,000	3,010,000
		05507 Cent NY-Dist-Reliability Blanket	CNC0015	856,000	885,000	917,000	948,000	980,000	4,586,000
		05814 East NY-Dist-Load Relief Blanket	CNE0016	573,000	609,000	649,000	690,000	734,000	3,255,000
		05819 East NY-Dist-Reliability Blanket	CNE0015	1,042,000	1,077,000	1,116,000	1,154,000	1,193,000	5,582,000
		06898 West NY-Dist-Load Relief Blanket	CNW0016	891,000	947,000	1,009,000	1,073,000	1,141,000	5,061,000
		06903 West NY-Dist-Reliability Blanket	CNW0015	2,073,000	2,143,000	2,221,000	2,297,000	2,375,000	11,109,000
	Blanket Total			5,965,000	6,224,000	6,512,000	6,800,000	7,102,000	32,603,000
	Capacity Planning	04812 Harris Road Second Transformer	C032496	400,000	501,000	107,000	-	-	1,008,000
		04895 N Syracuse Capacity Inc	C028831	3,364,000	420,000	-	-	-	3,784,000
		04903 Starr Road 13kV Bus Extension	C032368	235,000	90,000	-	-	-	325,000
		04950 N Collins Repl T1 Xfrm	C032313	-	-	70,000	134,000	1,021,000	1,225,000
		04989 Ogden Brook- install 13.2 kV s/gear	C032597	650,000	-	-	-	-	650,000
		04990 Ogdenbrook Sta - Add Ckt Sw & TB2	C034783	250,000	-	-	-	-	250,000
		04994 Paloma Second Transformer	C032495	58,000	345,000	633,000	115,000		1,151,000
		05011 PS&I Activity - New York	C008153	50,000	50,000	50,000	50,000	-	200,000
		05063 Reserve for Load Relief Unidentified Specifics & Schedule Changes (substation)	C046949	(2,056,000)	(8,198,000)	(11,619,000)	(15,901,000)	7,622,000	(30,152,000)
		05139 Station 214 - Install TB2 (DxD Sub)	C029186		10,000	190,000	1,200,000	-	1,400,000
		05462 Butler - Construct Feeder 36253	C028878	595,000	-	-	-	-	595,000
		05480 Capron Rd. Rebuild	C015901	93,000	-	-	-	-	93,000
		05637 Whitaker Dline work	C006848	-	258,000	629,000	162,000	-	1,049,000
		05973 Harris Road DLine	C032446	200,000	740,000	1,608,000	464,000	-	3,012,000
		05978 Hawthorne Rd Reconductor	C016333	-	555,000	-	-	-	555,000
		06127 Liberty 9490 - replace getaway	C028786	50,000	900,000	-	-		950,000
		06243 N Syracuse Sub Getaways	C030506	1,454,000	580,000	-	-	-	2,034,000
		06393 Ogden Brook - Install new feeders	C032598	129,000	-	-	-	-	129,000
		06410 Paloma Feeder Getaway	C032498	44,000	264,000	484,000	88,000		880,000
		06510 Reserve for Load Relief Unidentified Specifics & Schedule Changes	C046919	(4,804,000)	(9,126,000)	(7,973,000)	9,573,000	17,555,000	5,225,000
		06573 Saratoga 4.16 kV Conversion	C029437	-	356,000	1,327,000	619,000	127,000	2,429,000
		06630 Shelby 7657 Reconductoring	C032344	-	106,000	350,000	-	-	456,000
		06675 Station 214 - Install TB2 (DxD Line)	C029187	50,000	1,572,000	-	-	-	1,622,000
		06681 Station 81 - Relieve F8164	C034526	-	53,000	162,000	-	-	215,000
		06855 Van Dyke Subst- New 51 Dist Feeder	C016087	40,000	654,000	713,000	-	-	1,407,000
		06978 North Syracuse Substation DxT	C036985	2,810,000	520,000	-	-	-	3,330,000
		09234 Bflo Sta 139 - Replace Transformers	C036639		-	53,000	1,291,000	552,000	1,896,000
		09236 Bridge St. Second Transformer	C036185		-	-	1,031,000	2,538,000	3,569,000
		09239 Buffalo Station 56 Transformer Replacement	C036502		-	1,500,000	2,397,000	294,000	4,191,000
		09250 East Malloy-low side sub equipment	C036188		10,000	514,000	1,292,000	329,000	2,145,000
		09252 Fly Rd. Transformer Addition	C036189	10,000	180,000	469,000	120,000	-	779,000
		09258 Lockport Road 216 - Install TB#2	C036057		20,000	150,000	150,000	430,000	750,000
		09263 Military Road 210 - Install TB#2	C036056	36,000	514,000	421,000	-	-	971,000
		09273 Shawnee Road 76 (DSub)	C036059	51,000	945,000	1,433,000	373,000		2,802,000
		09279 Wilson 93 Load Relief - Replace TB1	C035743	170,000	1,471,000	204,000	-	-	1,845,000
		11086 Ash St 12 kV Metalclad Replacement getaway cable	CD00134	264,000	-	-	-	-	264,000
		11147 Bethlehem 02158 - Juniper 44651 TIE (02158 Conversion)	CD01067	380,000	-	-	-	-	380,000
		11358 Beech Ave Conversion Niagara Falls	C032751	214,000	209,000	-	-	-	423,000
		11361 8th St Conversion Niagara Falls	C046841	27,000	28,000	-	-	-	55,000
		11380 Welch Ave Conversion Load Relief	C046842	107,000	467,000	135,000	-	-	709,000
		11384 S.Philadelphia Transformer Upgrade	CD01293	10,000	457,000	269,000	-	-	736,000
		11541 E Malloy 15153 Aerial cable to open wire project	C046840	43,000	-	-	-	-	43,000
		11744 Buffalo Station 40 - F4067 Relief	C046822	-	-	99,000	-	-	99,000
		11886 Randall Rd - New station - M/C S/G & Cap Bank	CD00896	30,000	640,000	1,660,000	1,660,000	-	3,990,000
		11887 Randall Rd - New station - Dist getaways, etc	CD00897	25,000	440,000	380,000	440,000	-	1,285,000
		11933 Sodeman Rd Station - new station - M/C & cap bank	C046798	30,000	1,285,000	-	-		1,315,000
		11956 Queensbury Station - Reroute getaways to new M/C S/G units.	CD00895	60,000	-	-	-	-	60,000
		11958 McCrea Station - New station - Install M/C & cap bank	C046790		50,000	410,000	1,390,000	1,030,000	2,880,000
		11959 McCrea Station - New station - Getaways, etc.	C046791		50,000	220,000	390,000	60,000	720,000
		13238 Albion 8064 Getaway Reconductor	C046762	-	-	47,000	-	-	47,000
		13373 East Malloy transformer addition	C046732		10,000	180,000	469,000	120,000	779,000
		13866 East Malloy- feeders and getaways	CD01279	-	15,000	263,000	-	-	278,000
		13999 Fly Rd Low side substation equipment	C046722	10,000	340,000	700,000	700,000	-	1,750,000
		15746 Genesee North 34.5kV Relief	C046708		-	65,000	242,000	113,000	420,000
		15749 DeLaet's Landing - Land and Civil Portion	CD00901	15,000	950,000	1,500,000	-	-	2,465,000
		15754 DeLaet's Landing DxD	CD00893	60,000	360,000	1,000,000	-		1,420,000
		16282 Shawnee Road 76 (DLine)	CD00967	40,000	134,000	58,000	8,000		240,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		17315 CR-Build tie between Duguid 54 & 55	CD00710	30,000	-	-	-	-	30,000
		17471 Chautauqua South: Stedman Rd substation Dline work	C046690	31,000	143,000	870,000	1,091,000	1,053,000	3,188,000
		17515 Karner 31716 Conversion - New 13.2kV Tie	C046682	164,000	-	-	-	-	164,000
		17731 Hoags Corner 22145 - Conversion (4.8/13.2kV)	CD00532	60,000	-	-	-	-	60,000
		17802 CR- Convert Peat St 52 Along Burnet Ave	CD00555	440,000	-	-	-	-	440,000
		17853 CR- Pine Grove 56 NYS Hwy 31 conversion	CD00608	160,000	-	-	-	-	160,000
		17870 SW - Reconductor #6 Wire on Machias 1362 on State Hwy 16	CD00754	240,000	-	-	-	-	240,000
		17871 CR- Starr Rd 51 Hwy 222 Conversion	CD00605	120,000	-	-	-	-	120,000
		17969 Grooms Road 34556 - Getaway Replacement	CD01129	108,000	-	-	-	-	108,000
		18370 Milton Ave second transformer	C046642		10,000	250,000	1,734,000	679,000	2,673,000
		18371 Milton Ave DLine	C046643	-	471,000	1,150,000	296,000	-	1,917,000
		18377 Gilbert Mills xfmr upgrade-buswork	C046639	10,000	167,000	435,000	111,000	-	723,000
		18393 Fairdale Dsub	C046640		-	333,000	813,000	209,000	1,355,000
		18394 Fairdale DLine	C046633	-	159,000	388,000	100,000	-	647,000
		18395 New Haven xfmr upgrade-Buswork	C046634	-	52,000	596,000	294,000	-	942,000
		18396 New Haven xfmr upgrade-Dline	C046635	312,000	1,665,000	652,000	-	-	2,629,000
		18397 Whitaker Dsub	C046636		-	451,000	1,100,000	249,000	1,800,000
		18406 Malone new feeder 89554 (Station work)	C046631	21,000	317,000	-	-	-	338,000
		18420 Malone new 89554 feeder (Line work)	C046626	-	633,000	-	-	-	633,000
		18429 Watertown New 115/13.2 kV Substation (D-Sub)	C046627	10,000	95,000	2,047,000	1,645,000	-	3,797,000
		18472 Terminal Station: Install Reactors for TB2 and TB3	C046613		-	647,000	-	-	647,000
		18484 Long Road 209 - Install TB2	CD00977		30,000	20,000	368,000	301,000	719,000
		18497 Harris Road Second SWGR	CD01088	600,000	1,111,000	194,000	-	-	1,905,000
		18516 Milton Ave 2nd Switchgear	C046609		10,000	113,000	816,000	291,000	1,230,000
		18522 Watertown New 115/13.2 kV Substation(D-Line)	C046610	315,000	1,077,000	1,864,000	-	-	3,256,000
		18544 Attica Station transformer upgrade	C046611	134,000	1,057,000	97,000	-	-	1,288,000
		18570 Long Rd 209 - New F20955	CD00964	50,000	49,000	721,000	590,000	-	1,410,000
		18626 CR- Ash Street 26 State St Reconductoring	CD00866	82,000	-	-	-	-	82,000
		18666 Lockport Road 216 - Install TB#2 - D Line Project	CD01252		80,000	30,000	50,000	200,000	360,000
		18709 West Hamlin #82 - Install Transformer #2	CD01089	44,000	662,000	662,000	331,000	-	1,699,000
		18710 West Hamlin #82 - New TB2 - Install new feeders	CD01090	240,000	2,066,000	886,000	8,000	-	3,200,000
		18719 Fly Rd Feeder Work	C046594	570,000	1,140,000	1,110,000	-	-	2,820,000
		18720 Paloma new switchgear	CD01190	123,000	735,000	1,348,000	245,000		2,451,000
		18761 West Sweden - Install New Station	C046593		-	40,000	103,000	2,288,000	2,431,000
		18763 West Sweden - New Station - Install new feeders	C046591		-	25,000	1,543,000	1,559,000	3,127,000
		18764 Whitaker 2nd Transformer	C046592		-	326,000	797,000	205,000	1,328,000
		18765 Mumford #50 - Install Transformer #2	C046590		20,000	300,000	1,000,000	200,000	1,520,000
		18766 Mumford #50 - New TB2 - Install new feeder	C046589		-	420,000	220,000	160,000	800,000
		18774 Carthage 71761, 71763 and 71764 feeder tie	CD00944	188,000	-	-	-	-	188,000
		18823 New Haven Xfmr Upgrade-Xmfr	C046562	-	44,000	823,000	432,000	-	1,299,000
		18826 Gilbert Mills Xfmr Upgrade-Xfmr	C046563	10,000	232,000	597,000	152,000	-	991,000
		18849 Buffalo Station 57 - F5768 Reconductoring	C046557	155,000	212,000	-	-	-	367,000
		18850 Buffalo Station 129 - F12974 Reconductoring	C046558	103,000	370,000	-	-	-	473,000
		18864 Baker St - Install 2nd xfmr	C046553		-	127,000	549,000	3,974,000	4,650,000
		19026 Wellsville Relief D-Line work	C046540	-	-	220,000	190,000	195,000	605,000
		19028 Wellsville Relief substation work	C046535		-	-	280,000	242,000	522,000
		19029 Delameter Install two 20/26/33MVA xfmrs	C046536		31,000	634,000	3,872,000	78,000	4,615,000
		19030 Delameter New Feeders	C046537	103,000	793,000	1,883,000	552,000	-	3,331,000
		19032 Eden switch structure -install 2-10/12.5MVA XFMRS	C046538	-	199,000	424,000	3,926,000	1,416,000	5,965,000
		19033 Eden Switch Structure - New Feeders	C046532	-	32,000	646,000	663,000	680,000	2,021,000
		19050 New Tonawanda Substation - DxD Line	C046534	78,000	1,585,000	2,582,000	28,000	-	4,273,000
		19051 New Tonawanda Substation - DxD Sub	C046528	67,000	159,000	2,689,000	2,760,000	-	5,675,000
		19053 Buffalo Station 56 - New F5664	C046530	-	-	54,000	773,000	-	827,000
		19054 Buffalo Station 77 - Add TB3 (DxD Sub)	C046531		38,000	106,000	1,317,000	552,000	2,013,000
		19055 Buffalo Station 77 - Add TB3 (DxD Line)	C046524	52,000	212,000	323,000	56,000	-	643,000
		19064 Cortland Area Study	C046526	-	-	861,000	2,120,000	544,000	3,525,000
		19065 Syracuse UG Study	C046527	-	846,000	2,065,000	530,000	-	3,441,000
		19072 Sawyer - two new additional 23kV Cables on Kenmore Ave	C046523	-	-	-	637,000	731,000	1,368,000
		19082 Chautauqua South: new Stedman 115 - 13.2kV substation DxD	C046518		10,000	229,000	601,000	678,000	1,518,000
		19109 Raquette Lake Transformer Upgrade	CD01139		10,000	435,000	72,000	-	517,000
		19150 Teal Substation Rebuild-Swgr	C046511	-	-	223,000	2,507,000	1,403,000	4,133,000
		19151 Teal Substation Rebuild-Feeders	C046505	-	-	65,000	583,000	327,000	975,000
		19205 New Abby Street Substation - DxD Sub	C046496	-	133,000	269,000	6,071,000	114,000	6,587,000
		19206 New Abby Street Substation - DxD Line	C046497	-	80,000	807,000	552,000	-	1,439,000
		19214 Van Dyke Station - New 53 Dist Feeder	C046493	40,000	-	750,000	-	-	790,000
		19216 Van Dyke Station - New 54 Dist Feeder	C046495	40,000	-	255,000	224,000	-	519,000
		19217 Van Dyke Station - New 55 Dist Feeder	C046489	40,000	-	330,000	-	-	370,000
		19218 Van Dyke Station - New 56 Dist Feeder	C046487	40,000	897,000	799,000	-	-	1,736,000
		19219 Van Dyke Subst- New 57 Dist Feeder	C046488	40,000	481,000	527,000	-	-	1,048,000
		19220 Van Dyke Station - New 115/13.2kV station	C046490	400,000	2,727,000	1,927,000	-	-	5,054,000
		19232 New Cicero Substation DxT	C046480	295,000	1,473,000	884,000	295,000		2,947,000
		19233 New Cicero Substation DSub	C046475	467,000	2,345,000	1,407,000	469,000		4,688,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		19234 New Cicero Substation Dline	C046476	258,000	1,288,000	773,000	258,000	-	2,577,000
		19422 North Bangor new 34.5/13.2kV Station (D-Sub)	C046423				10,000	751,000	761,000
		19450 North Bangor Conversion (D-Line)	C046418	48,000	740,000	-	-	-	788,000
		19453 Lords Hill 67 Voltage violation corrections	CD01131	206,000	-	-	-	-	206,000
		18777 Lakeville substation retirement	C046588	-	-	-	1,000	-	1,000
		19070 Stow Retirement	C046521	-	-	-	1,000	-	1,000
		19071 Chautauqua substation retirement	C046522	0	0	0	1,000	0	1,000
		19149 Panama Retirement	C046509	-	-	-	1,000	-	1,000
	Capacity Planning Total			11,688,000	25,911,000	38,150,000	52,195,000	50,870,000	178,814,000
	ERR	05273 Amsterdam 51/53 - Widow Susan Rd Area	C028835	72,000	-	-	-	-	72,000
		06341 NR-North Carthage 81652-53 Fdr Tie	C010693	-	-	39,000	338,000	231,000	608,000
		06347 NR-T.I.81452-Cross Island Rd	C022912	-	-	-	238,000	244,000	482,000
		06657 St Johnsville - Sanders Road	C029439	123,000	-	-	-	-	123,000
		11101 NR-Lowville 77354-Pine Grove Road-FdrTie	C046866	-	-	84,000	253,000	259,000	596,000
		11102 NR-Lowville 77354-Otter Creek Road-FdrTie	CD01223	-	-	-	26,000	353,000	379,000
		11103 NR-Lowville-77354-Burdick Crossing Road-FdrTie	CD01074	-	39,000	336,000	-	-	375,000
		11145 NR-Brady 95757-Riverside Dr-FdrTie	CD01191	-	253,000	258,000	-	-	511,000
		11146 NR-Brady 95757-CoRt27-FdrTie	C046861	-	-	-	241,000	248,000	489,000
		11597 NR_N Carthage_81652_NYSHwy3_InternalFdrTie	C046835	-	66,000	224,000	230,000	236,000	756,000
		12773 Port Henry 51 - Rebuild Route 9N from P195-205	CD00326	117,000	-	-	-	-	117,000
		12832 Center St 54 - Hyney Hill Road Rebuild	CD00357	134,000	-	-	-	-	134,000
		12834 Center St. 54 - Extend 3Ø on State Route 30A	CD00329	420,000	-	-	-	-	420,000
		12875 NR_Lyme 73351_T.I. 81455-NYSHwy12E_FdrTie	CD01295	-	212,000	264,000	-	-	476,000
		17247 Schoharie 52 - State Route 443 Rebuild	CD00424	372,000	-	-	-	-	372,000
		17610 ERR Program Placeholder	C046684	1,779,000	2,694,000	2,333,000	2,372,000	2,392,000	11,570,000
		17793 NR-Coffeen 76051_Gaffney St_Reconductor	CD01030	144,000	-	-	-	-	144,000
		18071 NR-T.I.81456_NYS Route 180_Relocation	CD00865	103,000	-	-	-	-	103,000
		19459 NR-T.I.81452-Grandview Park Rd-Rebuild	CD01188	103,000	170,000	-	-	-	273,000
		19460 NR-T.I.81458-County Route 1-FdrTie	CD01187	-	-	162,000	166,000	-	328,000
		19461 NR_T.I. 81455-Mils Road-Overloaded Step-down	CD01135	21,000	106,000	-	-	-	127,000
		19462 NR_T.I. 81455-Breezey Pines Rd-Overloaded Step-down	CD01137	-	53,000	65,000	-	-	118,000
		19468 NR_Lyme 73351-Breezy Point Rd-Overload	CD01142	21,000	106,000	-	-	-	127,000
	ERR Total			3,409,000	3,699,000	3,765,000	3,864,000	3,963,000	18,700,000
	Heavily Loaded Transformer	06011 IE - NC Dist Transformer Upgrades	C014846	1,029,000	1,057,000	1,076,000	1,104,000	1,133,000	5,399,000
		06023 IE - NE Dist Transformer Upgrades - C15828	C015828	1,029,000	1,057,000	1,076,000	1,104,000	1,133,000	5,399,000
		06033 IE - NW Dist Transformer Upgrades	C010967	1,029,000	1,057,000	1,076,000	1,104,000	1,133,000	5,399,000
	Heavily Loaded Transformer Total			3,087,000	3,171,000	3,228,000	3,312,000	3,399,000	16,197,000
	Overhead Distribution Fusing	06016 IE - NC Side Tap Fusing	C015511	617,000	636,000	655,000	675,000	-	2,583,000
		06028 IE - NE Side Tap Fusing	C015510	617,000	636,000	655,000	675,000	-	2,583,000
		06038 IE - NW Side Tap Fusing	C015509	617,000	636,000	655,000	675,000	-	2,583,000
	Overhead Distribution Fusing Total			1,851,000	1,908,000	1,965,000	2,025,000	-	7,749,000
	SC&P Other	04674 BuffaloAlbanyFlyingGroundsSwitchRpl	C033636	1,045,000	1,030,000	-	-	-	2,075,000
		04758 East Golah 51 - Second Bank	C006533	100,000	-	-	-	-	100,000
		04792 Frankhauser New Station - T Sub Work	C036520	621,000	930,000	-	-	-	1,551,000
		04793 Frankhauser-115-13.2KV- Bus & Bkrs	C028931	689,000	1,034,000	23,000	-	-	1,746,000
		04953 NW Panama Retirement	C032306	-	-	-	12,000	-	12,000
		05095 Schuylerville Station - Bus Changes	C035226	350,000	75,000	-	-	-	425,000
		05367 Brook Road 55/57 - Daniels Rd	C029425	206,000	-	-	-	-	206,000
		05400 Buffalo Station 12 - Fdr Rem & Ties	C036208	49,000	80,000	-	-	-	129,000
		05867 F13862 Extend & transfer to F23255	C026558	428,000	-	-	-	-	428,000
		05920 Frankhauser New Station - Line Work	C028929	2,176,000	3,263,000	-	-	-	5,439,000
		06351 NR-W.Adams87554-Church St	C022959	400,000	-	-	-	-	400,000
		06444 Port Henry 52 - Moriah Road Rebuild/Convert	C019070	515,000	-	-	-	-	515,000
		06583 Schodack fdr rbld -retire castleton	C017957	404,000	-	-	-	-	404,000
		06731 Swann Rd F10552 tie with F10557	C028106	50,000	-	-	-	-	50,000
		09227 Walmore 217 Contingency Load Relief - New F21055	C036566	218,000	94,000	8,000	-	-	320,000
		11486 Starr Rd 33453/Tuller Hill 24651	CD00861	935,000	-	-	-	-	935,000
		11582 Buffalo Station #51 - 4 Bay Louver Install	C046834	5,000	5,000	-	-	-	10,000
		11838 2163 Load Relief	CD00543	124,000	-	-	-	-	124,000
		11914 UG Cable Replacements - NYS Lake Ontario State Parkway	CD00292	236,000	-	-	-	-	236,000
		11943 Sodeman Rd - New station - dist getaways, reconductoring, etc.	C046796	80,000	2,900,000	2,400,000	-	-	5,380,000
		13246 South Livingston relief - DLine Fdr 2 & Fdr 3	C046759	100,000	290,000	880,000	1,050,000	1,000,000	3,320,000
		13277 Hudson 08753 - Buckley Corners 45451 TIE Creation	CD01280	383,000	-	-	-	-	383,000
		13280 Grooms Rd 34557 - Saratoga Rd Conversion (4.8 to 13.2kV)	C046761	200,000	-	-	-	-	200,000
		15685 Orangeville Substation - Modify Regulator Bank	CD00833	16,000	-	-	-	-	16,000
		16879 Hudson 08753 - Route 9G - Reconductor - Tree Wire	CD00805	252,000	-	-	-	-	252,000
		17062 Midler Station Retirement	C046702	-	-	-	-	244,000	244,000
		17074 Cedar 51 - Tripoli Road Gap Closing	CD00683	90,000	-	-	-	-	90,000
		17123 Ashley 51 - Baldwin Corners Road Phase 3	CD01117	200,000	-	-	-	-	200,000
		17185 DLine -To expand Rock Cut Sub Retire Brighton 4kV	CD00881	1,288,000	400,000	-	-	-	1,688,000
		17511 - Buffalo Station 64 - New F6453	CD00970	1,380,000	477,000	-	-	-	1,857,000
		17516 Reynolds Rd 33455 Line Extension (34.5kV to 13.2kV Conversion - Defreesville #7 line OOS)	C046683	132,000	-	-	-	-	132,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		17738 Curry Rd 36556 / Lynn St 32052 - Helderberg Ave Conversion (4.16/13.2kV)	CD01218	412,000	1,000	-	-	-	413,000
		17837 Buffalo Station 49 - UG Upgrades	CD01128	2,262,000	1,206,000	-	-	-	3,468,000
		17850 CR- Peat St 53 Mooney Ave Conversion	CD00613	120,000	-	-	-	-	120,000
		17860 West Valley 25 Relief	CD00616	286,000	-	-	-	-	286,000
		17861 Bemus Point 159 Relief	CD00840	170,000	-	-	-	-	170,000
		17862 Cassadaga 61 Relief	CD00842	108,000	-	-	-	-	108,000
		17887 Bolton 51/Warrensburg 51 Feeder Tie	CD00606	1,052,000	-	-	-	-	1,052,000
		17922 Install EMS at West Valley Substation	CD00640	228,000	-	-	-	-	228,000
		17934 Steamburg Station Retirement	CD01123	10,000	204,000	-	-	-	214,000
		17938 Price Corners Rebuild - Upgrade transformer	CD01124	680,000	657,000	-	-	-	1,337,000
		17939 Price Corners Rebuild - New Feeder	CD01120	598,000	571,000	-	-	-	1,169,000
		17940 Reservoir Station - Dline work	CD01200	6,000	55,000	-	-	-	61,000
		18212 East Batavia Sta. Install Feeder Position	CD01310	210,000	33,000	-	-	-	243,000
		18375 CR_Temple St_LVAC_Network-2012 Cutovers	CD00911	234,000	-	-	-	-	234,000
		18403 Buffalo 47 - New F4762	CD01154	689,000	577,000	242,000	-	-	1,508,000
		18413 CR- Nile 51 Glen Cove reconductoring (PPP)	CD00917	622,000	-	-	-	-	622,000
		18417 Burdeck 26552 - Burnett St Conversion (4.16 / 13.2kV)	C046632	277,000	-	-	-	-	277,000
		18418 Burdeck 26552 - Westcott / Curry Rd Conversion (4.16 / 13.2kV)	CD01226	298,000	-	-	-	-	298,000
		18584 Ash St_LVAC Network-Armory Square Area-Upgrades	CD00820	360,000	-	-	-	-	360,000
		18851 South Livingston relief - DLine Fdr 1 & Fdr 4	C046552	100,000	300,000	1,040,000	1,024,000	1,024,000	3,488,000
		19031 CR- LHH 44 2012 NYS PSC action item - Noble Shores Rd	CD00987	164,000	-	-	-	-	164,000
		19063 Park St Study	C046525	-	159,000	388,000	100,000	-	647,000
		19077 CR- LHH 44 2012 NYS PSC Action item - CR47	CD00953	568,000	-	-	-	-	568,000
		19345 North Collins New Feeder	C046433	-	-	106,000	431,000	552,000	1,089,000
		19349 Oneida 50153-Arquint Rd-VC	CD01068	52,000	-	-	-	-	52,000
		19394 Buffalo Station 49 - UG Upgrades (D Sub)	CD01125	52,000	-	-	-	-	52,000
		19411 Sycaway 37253 - Brunswick Rd (Rte 2) Conversion (4.16/ 13.2kV)	C046431	272,000	-	-	-	-	272,000
		19412 Tibbits 29254 - 15th Ave Conversion (4.16 / 13.2kV) - Load Reallocation to Sycaway 37251	C046425	149,000	-	-	-	-	149,000
		19413 Sand Creek 45253 - Bridle Path Reconductor & Convert single phase (2.4 / 7.62kV)	CD01225	116,000	-	-	-	-	116,000
		19414 Rosa Rd 13757 - Grand Blvd - Conversion (4.16/13.2kV)	C046426	231,000	-	-	-	-	231,000
		19415 Trinity 16452 - Myrtle Ave Conversion (4.16 / 13.2kV)	C046427	231,000	-	-	-	-	231,000
		19416 Greenbush 07856 - Getaway Replacement	C046428	274,000	-	-	-	-	274,000
		19451 Sheppard Rd replace regulators	C046419	129,000	238,000	-	-	-	367,000
		19479 NR_Port Leyden 75563-E Main St - Re-conductor	CD01193	6,000	142,000	-	-	-	148,000
		19480 NR_Port Lyden 75563-Moose River Rd 1-phase Re-conductor	CD01197	-	-	11,000	249,000	255,000	515,000
		19493 Chestertown 52 - Short St. Tie	CD01157	62,000	-	-	-	-	62,000
		19503 Long Road #209 new TB#2 - DxT Sub - C43594	C046411		50,000	34,000	614,000	502,000	1,200,000
		19504 Military Road #210 - DxT Substation - C43612	C046412	33,000	463,000	378,000	-	-	874,000
		19519 Whitehall 51 - County Route 10 Rebuild	CD01211	98,000	-	-	-	-	98,000
		19639 5762 manline tie to 7861 partial reconductoring	C046377	76,000	-	-	-	-	76,000
		19643 5762 reconductoring - allow balancing accross manlines	C046380	76,000	-	-	-	-	76,000
		19679 West Hamlin 82 (DxT Sub) C44339	C044339	325,000	370,000	170,000	85,000	-	950,000
		19680 Front St 36052_Scotia 25572- Mohawk Ave Conversion (4.16 / 13.2kV)	CD01219	387,000	-	-	-	-	387,000
		19773 Lockport Rd#216 Install 2nd Tr DxT - C44925	C044925		80,000	100,000	100,000	270,000	550,000
		Mumford DxT (need real name)	C044623		10,000	350,000	520,000	220,000	1,100,000
		Shawnee DxT (no PPM)	C043615	17,000	248,000	478,000	191,000		934,000
		Utica_Varick St_600 Block_LVAC	C045333	350,000					350,000
		04904 Starr Road 2nd Transformer	C032503	555,000	214,000	-	-	-	769,000
		19702 Starr Road Feeder Work	C046363	-	100,000	-	-	-	100,000
		13318 Underfrequency Load Shed Implementation Plan - NY	C046754	1,000	1,000	-	-	-	2,000
		13322 Underfrequency Load Shed Implementation Plan - NY TxD	C046751	1,000	1,000	-	-	-	2,000
	SC&P Other Total			25,619,000	16,258,000	6,608,000	4,376,000	4,067,000	56,928,000
	Substation Mobile	11331 New NY Mobile Substation 69x34.5kV -13.2x4.4kV	CD01182	942,000	-	-	-	-	942,000
		19590 NY New Mobile 115 kV - 13.2x4.4 kV	C046409	1,535,000	1,578,000	-	-	-	3,113,000
		19593 NY New Mobile Substation 23 kV - 13.2x4.4 kV, 12/14 MVA	C046402	10,000	719,000	823,000	-	-	1,552,000
	Substation Mobile Total			2,487,000	2,297,000	823,000	-	-	5,607,000
	Substation Relay/Protection	04877 MikeCooperTASRelayReplacemntCo36DxT	C034691	388,000	-	-	-	-	388,000
		11413 Station 63 TB1 Neutral Protection	CD00665	36,000	-	-	-	-	36,000
	Substation Relay/Protection Total			424,000	-	-	-	-	424,000
	Substation RTU	05028 REP - Dist Subs Without RTUs	C019851	2,571,000	2,642,000	2,689,000	2,760,000	2,831,000	13,493,000
	Substation RTU Total			2,571,000	2,642,000	2,689,000	2,760,000	2,831,000	13,493,000
	Substation Spare	18713 Spare Transformer 3.5 MVA - NYW	CD00906	165,000	-	-	-	-	165,000
		19471 NY Spare Circuit Breakers - 115 kV	CD01115	272,000	-	-	-	-	272,000
		19476 NY Sub T System Spares - Circuit Breakers	CD01114	278,000	-	-	-	-	278,000
	Substation Spare Total			715,000	-	-	-	-	715,000
	TBD	04752 DxT Study Budgetary Reserve - NIMO - C31550	C031550	49,000	49,000	49,000	49,000	-	196,000
		05065 Reserve for Reliability Unidentified Specifics & Schedule Changes (substation)	C046950	(2,753,000)	(940,000)	(332,000)	(3,380,000)	(1,426,000)	(8,831,000)
		06515 Reserve for Reliability Unidentified Specifics & Schedule Changes	C046923	(4,449,000)	1,449,000	(886,000)	3,946,000	8,714,000	8,774,000
	TBD Total			(7,153,000)	558,000	(1,169,000)	615,000	7,288,000	139,000
	Storm Hardening	19606 Storm Hardening - Hague Rd 41853 feeder	C046394	860,000	-	-	-	-	860,000
		19607 Storm Hardening - Berry Rd 15351 feeder	C046395	860,000	-	-	-	-	860,000
		19608 Storm Hardening - Lowville 77354 feeder	C046396	960,000	-	-	-	-	960,000

Spending Rationale	Program	Project Name	Project #	FY14	FY15	FY16	FY17	FY18	Total
		19609 Storm Hardening - Placeholder for NY East	C046390		1,057,000	1,076,000	1,104,000	1,133,000	4,370,000
		19611 Storm Hardening - Placeholder for NY Central	C046391		1,057,000	1,076,000	1,104,000	1,133,000	4,370,000
		19612 Storm Hardening - Placeholder for NY West	C046392		1,057,000	1,076,000	1,104,000	1,133,000	4,370,000
	Storm Hardening Total			2,680,000	3,171,000	3,228,000	3,312,000	3,399,000	15,790,000
System Capacity & Performance Total				53,344,000	65,840,000	65,800,000	79,260,000	82,920,000	347,164,000
Grand Total				233,000,000	242,000,000	247,000,000	272,000,000	280,000,000	1,274,000,000

Exhibit 4

NIAGARA MOHAWK POWER CORPORATION
Summary of Bill Impact Associated with FY14 - FY18 T & D Capex Only
For Fiscal Years 2014, 2015 & 2016
($000's)

	FY 2014	FY 2015	FY 2016
Depreciation Expense	8,064	14,861	22,798
Rate Base:			
Net Utility Plant	558,420	995,444	1,467,860
Accumulated Deferred Taxes	-65,775	-98,330	-139,076
Total Rate Base	492,645	897,114	1,328,784
ROR	9.44%	9.44%	9.44%
Return on Rate Base	46,501	84,679	125,425
Total Revenue Requirement Impact of FY14 - FY16 Capex Only	54,565	99,540	148,223
Rate Base Impact of Depreciation on 3/31/12 Embedded Plant	-77,458	-232,375	-387,292
ROR	9.44%	9.44%	9.44%
Total Revenue Requirement Impact of 3/31/12 Embedded Plant	-7,311	-21,934	-36,557
Total Revenue Requirement Impact of Capex less impact of Embedded Plant	**$47,254**	**$77,606**	**$111,666**
Allocation of Revenue Requirement to SC1 Residential Customers	28,169	46,106	66,107
SC1 Residential Customers Cumulative Bill Impact per kWh	**$0.00253**	**$0.00414**	**$0.00593**

Assumptions:

1) FY14 - FY18 capex per the 1/31/2013 CIP filing (Transmission, Distribution & Sub-Transmission only)
2) Depreciation Rates per filed Joint Proposal in Case 12-E-0201
3) ROR based on 9.3% ROE per filed Joint Proposal in 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, 2012 Electric Depreciable Plant	7,047,642
Composite Electric Depreciation Rate	2.20%
Total Annual Electric Depreciation based on embedded plant	154,917

   Ratebase impact determined by using a half year average of annual depreciation per year
5) Allocated revenue requirement to SC1 customers based on 2014-2016 T&D Revenue at Proposed Rates per Appendix 2, Schedule 3, pages 1-3 filed in the Joint Proposal in Case No. 12-E-0201.
6) SC1 bill impact utilized SC1 kWh per Appendix 2, Schedule 4-6, Page 1 filed in the Joint Proposal in Case No. 12-E-0201.