The Comprehensive Reliability Plan 2008

A Long-Term Reliability Assessment of New York's Bulk Power System

INITIAL DRAFT REPORT

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1 Introduction

When the electric industry restructured in the United States in the 1990s, new market mechanisms approved by FERC stressed competition among suppliers to meet the reliability and economic needs of consumers and the economy. Because strong reliance was placed upon open access to transmission and the markets to send the correct economic signals to add needed resources in response to demand, the NYISO, formed in 1999, undertook two essential functions through its tariffs: (1) the reliable operation of the bulk power system and, (2) the accurate operation of economically competitive markets for capacity, energy and ancillary services. Resource additions and transmission expansions were planned primarily by market participants who were willing to pay for them to support their market-based projects. Bulk power markets for capacity, energy and ancillary services were formed at the same time as state and federal policy makers recognized that the discipline and efficiency of market forces in providing these commodities would promote the public good through cost savings. Under this market-based philosophy, bulk power system needs should be provided for through markets that send economically efficient price signals for investment in needed resources.

Over time, it became increasingly clear that some mechanism was desirable to facilitate the identification by market participants of longer-term bulk power system resource additions beyond the projects identified by individual market participants primarily based on short-term needs. Emphasis remained upon the marketplace, however, to identify and build specific projects to meet transmission security and resource adequacy needs. With these goals in mind, the New York Independent System Operator (NYISO), in conjunction with stakeholders, developed and implemented in 2005 its Comprehensive Reliability Planning Process (CRPP), codified in Attachment Y of the NYISO's Open Access Transmission Tariff (OATT). Upon FERC's acceptance of the CRPP, the NYISO expanded its third essential role; that of bulk power system planner for the New York Control Area. Over 7,000 MW of new power plants and merchant transmission projects with UDRs have come into operation in New York since the formation of competitive wholesale markets—most of these have been located in the downstate region where both the price signals and reliability needs are the greatest. Electric system needs are increasingly provided in response to market forces.

While the NYISO's markets and long-term planning processes have been maturing, the federal and state governments have placed a renewed emphasis on planning for the energy needs of the United States and one of its key economies, New York. At the federal level, the FERC issued its final rule in its OATT reform proceeding. Following on FERC's Orders 888 and 889, which first established transmission open access and competitive market mechanisms for the wholesale electric industry, Order 890 directed improvements to the Open Access Transmission Tariffs of all Transmission Owners and Operators, including the ISOs and RTOs. Among other things, Order 890 listed nine principles that all Transmission Providers should adhere to in conducting their planning processes. In accordance with this Order, the NYISO made a compliance filing at the FERC in December 2007 demonstrating how it plans to comply with these nine principles[1].

The NYISO's expanded planning roles enable it to serve as the authoritative source for bulk power system planning in New York and provide the underpinnings to numerous initiatives being designed and implemented by the State of New York. The New York PSC is continuing to

[1] Reference to the NYISO's FERC Order 890 compliance filing.

implement the Renewable Portfolio Standard (RPS) in New York that calls for 25 percent of all electricity consumption in New York to come from renewable resources, such as wind energy, by 2013. Second, New York PSC is in the midst of a proceeding that is examining how an Energy Efficiency Portfolio Standard (EEPS) can be implemented in New York. The goal of the EEPS is to reduce resource needs and environmental impacts, such as global climate change, from the electric industry by reducing forecasted electric energy consumption levels by 15 percents by 2015 (15 x 15). Third, the PSC has commenced a proceeding to create an Energy Resource Planning Process (ERP) that seeks: (1) to resolve cost allocation and cost recovery issues for generation and demand response projects built to meet bulk power system reliability needs; (2) a process by which the PSC will select the project or projects that should proceed with regulatory approvals to meet reliability needs (transmission, generation and demand response); and (3) to establish an energy resource planning process for the electric and natural gas systems in New York.

Concurrently, the State Department of Environmental Conservation (DEC) is considering several important initiatives of its own that could affect the bulk power system. First, the DEC is implementing the multi-state Regional Greenhouse Gas Initiative (RGGI) to establish a cap and trade system for greenhouse gas emissions, including carbon dioxide, from power plants. Second, the DEC has adjusted its approach for the nitrogen dioxide reductions from the emissions that lead to ozone smog on High Electric Demand Days (HEDD) to broader program that will establish new Reasonably Available Control Technology (RACT) standards. Third, the DEC has ongoing proceedings examining the water withdrawal and discharge permits of power plants that could affect their future operations and viability.

Lastly, but by no means the least of these initiatives, the Governor of New York State issued an Executive Order on April 9, 2008 to form once again a State Energy Planning Board. The SEPB will consist of representatives from state agencies, including the PSC, DEC, Health, Economic Development, NYSERDA, Transportation, Budget and Urban Development. Led by the Governor's Deputy Secretary for Energy, with input from the Deputy Secretary for Environment, the SEPB is to create a State Energy Plan for all energy sectors in New York, including the electric industry. The Executive Order calls upon the SEPB to issue a draft State Energy Plan by March 31, 2009 and to complete a final plan by June 2009. The Executive Order calls upon maximum input from stakeholders including, among others, the NYISO. In fulfilling its mission to serve as the authoritative source on bulk power system operations and reliability planning, the NYISO offers this CRP, built upon the foundation of NYISO's competitive markets, to inform the SEPB as well as the other PSC and DEC initiatives outlined above.

The NYISO is now in the midst of its third cycle of the CRPP, with this 2008 Comprehensive Reliability Plan. Simultaneously, the NYISO is undertaking its fourth Reliability Needs Assessment for 2009. This third CRP contains the supporting documentation for the 2008-2017 reliability plan described herein. Section 2 outlines the CRPP; Section 3 summarizing the 2008 RNA; Section 4 describes the offered solutions to reliability needs; Section 5 discusses the results of the evaluation of solutions; and Section 6 presents the reliability plan itself, along with an analysis of aggravating and mitigating factors that could affect the plan.

2 The Comprehensive Reliability Planning Process

Electric system planning is a continuous process of evaluating, monitoring and updating, which makes the regular publication of the CRPP an invaluable resource. In addition to addressing reliability issues, the CRPP offers valuable information to the state's wholesale electricity marketplace.

As set forth in NYISO OATT, Attachment Y, the objectives of the CRPP are to:

1. Evaluate the reliability needs of the Bulk Power Transmission Facilities (BPTF);
2. Identify factors and issues that could adversely impact the reliability of the BPTF;
3. Provide an opportunity and a process whereby solutions to identified needs are proposed, evaluated, and enacted in a timely manner to maintain the reliability of the system;
4. Provide for the development of market-based solutions, while maintaining the reliability of the BPTF through backstop regulated solutions as needed; and
5. Coordinate the NYISO's reliability assessments with Neighboring Control Areas.

The CRPP is an ongoing process that produces two annual reports. The first is the Reliability Needs Assessment (RNA), which evaluates generation adequacy and transmission reliability over a 10-year span, and identifies future needs for maintaining reliability. Identifying potential and existing reliability issues concerning New York's bulk power system is the first step necessary to maintain the system's integrity for today and the future. The 2008 RNA was issued in December 2008.

The second step is the development of the Comprehensive Reliability Plan (CRP), which identifies and evaluates proposed solutions to maintain power system reliability. Those solutions may include market-based, regulated backstop and/or alternative regulated solutions that may result in new generation additions, transmission upgrades and additions, and/or improved demand response programs.

The following presents an overview and summary of the CRPP, the CRPP stakeholder process, and the reliability policies and criteria that are the foundation of the CRPP. A detailed description of the CRPP is contained in the CRPP Manual, which is posted on the NYISO's website, www.nyiso.com, under "Documents" then "Manuals" and then "Planning".

2.1 Summary of the CRPP

The CRPP is a long-range assessment of both resource adequacy and transmission reliability of the New York bulk power system conducted over a 10-year planning horizon. It is conducted in accordance with the existing reliability criteria of the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council, Inc. (NPCC), and the New

York State Reliability Council (NYSRC). This process is anchored in the NYISO's philosophy that market-based solutions are the first choice to meet identified reliability needs. However, in the event that market-based solutions do not appear to meet a reliability need in a timely manner, the NYISO will designate the Responsible Transmission Owner to proceed with a regulated backstop solution in order to maintain reliability. Under the CRPP, the NYISO also investigates whether market failure is the reason for the lack of a market-based solution, and explores changes in its market rules if that is found to be the case.

As the first step in the CRPP, the NYISO conducts a Reliability Needs Assessment (RNA) to determine whether there are any violations of existing reliability rules governing resource adequacy and transmission security. Following the review of the RNA by the NYISO committees and final approval by the NYISO Board of Directors, the NYISO will request solutions to the identified reliability needs from the marketplace. At the same time, the Responsible Transmission Owners are obligated to prepare regulated backstop solutions for each identified need over the planning horizon, which will serve as the benchmark to establish the time by which a market-based solution must appear. Both market-based and regulated solutions are open to all types of resources: transmission, generation, and demand response. Non-transmission owner developers also have the ability to submit proposals for regulated solutions in the event that no valid market based solution is proposed. The NYISO evaluates all proposed solutions to determine whether they are viable and will meet the identified reliability needs in a timely manner. The NYISO does not conduct an economic evaluation of the proposed solutions under the current tariff[2].

Following its analysis of all proposed solutions, the NYISO prepares the CRP. The CRP identifies all proposed solutions that the NYISO determines are capable of meeting the identified reliability needs. If a viable market-based project or projects can satisfy the identified needs in a timely manner, the CRP will so state. If developers do not present viable market-based proposals and the NYISO determines that a regulated backstop solution must be implemented, the CRP will so state, and the NYISO will request the appropriate Responsible Transmission Owner(s) to proceed with regulatory approval and development of the backstop solution. The NYISO also monitors the continued viability of proposed projects to meet identified needs and reports its findings in subsequent CRPs. The planning process is illustrated in Figure 2.1.

The CRPP also allows the NYISO Board to address the appearance of a reliability need on an emergency basis, whether during or in-between the normal CRPP cycle. In the event that there is an immediate threat to reliability, the NYISO will request the appropriate Transmission Owner(s) to develop a "gap solution" and to pursue its regulatory approval and completion in conjunction with the New York State Public Service Commission (NYSPSC). Gap solutions are intended to be temporary and not to interfere with pending market-based projects.

The Tariff contains a set of principles for cost allocation and cost recovery based upon the principle that beneficiaries should pay. The NYISO continues to be engaged in a stakeholder process to develop procedures for cost allocation. As Attachment Y is currently written, cost recovery for regulated transmission solutions will be addressed through a separate rate schedule

[2] Pursuant to its December 2007 filing in compliance with FERC Order 890 filing the NYISO will perform economic studies to determine the ability and the costs and benefits of projects to alleviate congestion on the bulk power system in New York.

in the NYISO's Services Tariff, while cost recovery for non-transmission solutions will be handled under state law[3].

The CRPP also addresses the respective roles of the NYISO, the FERC and the NYSPSC with regard to the NYISO planning process. In the event of a dispute regarding the NYISO's findings in the RNA or the CRP that cannot be resolved through the normal NYISO governance procedures, the Tariff provides for disputes to be brought to either the FERC or the NYSPSC—depending upon the nature of the dispute. In the event that a Transmission Owner is unable to license or complete a regulated backstop solution that has been found necessary during the course of the CRPP, the NYISO is required to report this to the FERC. Upon request, the NYSPSC will review proposed regulated solutions from either a Transmission Owner or another developer prior to their submission to the NYISO.

A separate, FERC-approved agreement between the NYISO and the New York Transmission Owners addresses the Transmission Owner's rights and obligations for performance under the CRPP. This agreement also envisions the establishment of a separate rate recovery mechanism, to be approved by FERC, for the recovery of costs associated with the development and construction of a regulated transmission backstop solution required by the CRP. The process flow diagram below summarizes the CRPP Stakeholder Process.

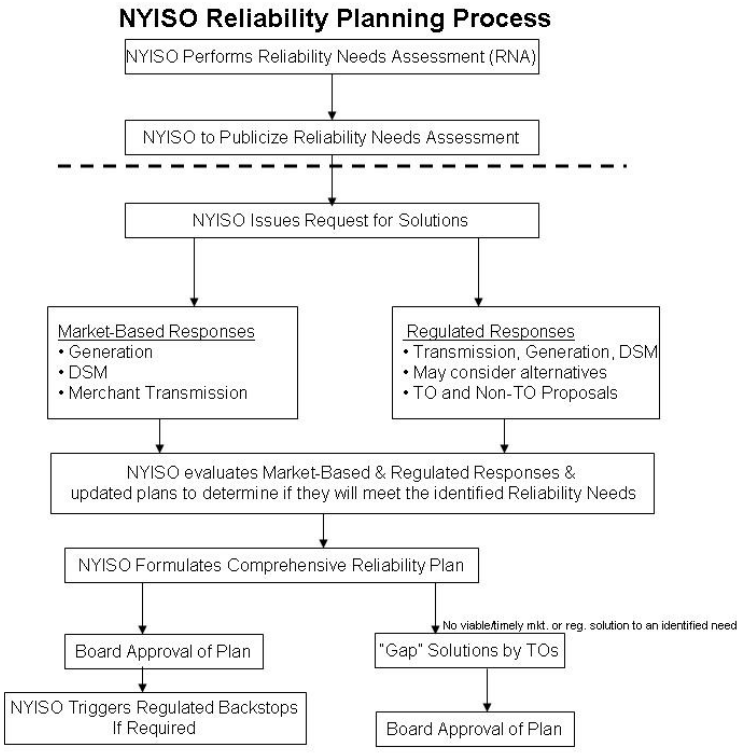

Figure 2.1 CRPP

[3] NYISO's supplemental compliance filing on June 4, 2008, will propose cost allocation and cost recovery mechanisms for reliability solutions.

2.2 Governance Process

Given that the CRPP addresses both reliability and business issues, both the TPAS and the ESPWG participate in the implementation process. This participation consists of parallel input and review stages as shown in Figure 2.2.

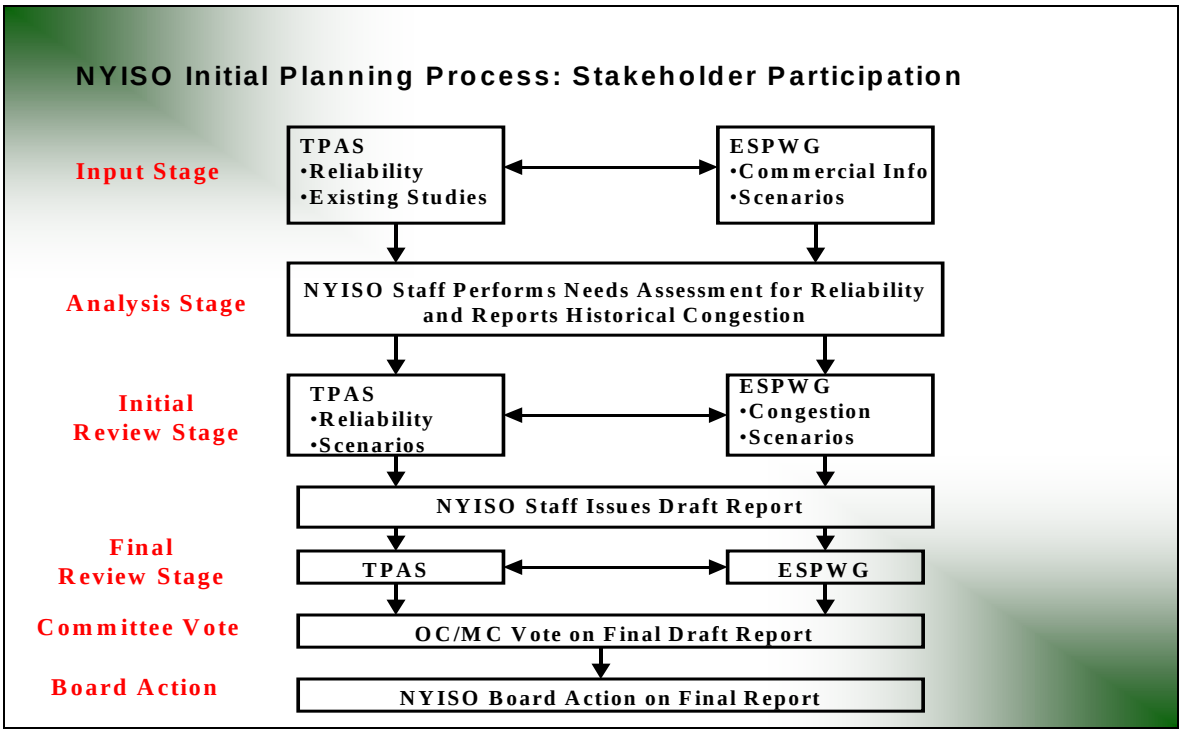

Figure 2.2 NYISO Governance Process

TPAS has primary responsibility for the reliability analyses, while the ESPWG has primary responsibility for providing commercial input and assumptions utilized in the development of reliability assessment scenarios and the reporting and analysis of historic congestion costs. Coordination between these two groups and NYISO Staff was established during each stage of the initial planning process.

The intent of this process is to achieve consensus at both TPAS and the ESPWG. While no formal voting process is established at this level, which is typical for NYISO working groups, an opportunity for reporting majority and minority views to the NYISO's governance committees is provided in the absence of a consensus.

Following TPAS and ESPWG review, the draft RNA and CRP reports are forwarded to the Operating Committee for discussion and action, and subsequently to the Management Committee for discussion and action. Finally, the NYISO's Board of Directors reviews and approves the RNA and the CRP.

2.3 Summary of Reliability Policies and Criteria Applicable to the NYISO

The foundation of the CRPP is the reliability policies and criteria applicable to the NYISO. The phrase "reliability policy and criteria" is used broadly to include standards, requirements,

guidelines, practices, and compliance. The following presents an overview of these policies and criteria in the context of basic reliability concepts and the organizations that develop, promulgate, implement, and enforce the related policies and criteria.

2.3.1 Basic Reliability Concepts

The standard industry definition of bulk power system reliability is the degree to which the performance of the elements of that system (*i.e.*, generation and transmission) results in power being delivered to consumers within accepted standards and in the amount desired. It may be measured by the frequency, duration, and magnitude of adverse effects on consumer service.

Reliability consists of adequacy and security. Adequacy, which encompasses both generation and transmission adequacy, refers to the ability of the bulk power system to supply the aggregate requirements of consumers at all times, accounting for scheduled and unscheduled outages of system components. Security refers to the ability of the bulk power system to withstand disturbances such as electric short circuits or unanticipated loss of system components.

There are two different approaches to analyzing a bulk power system's security and adequacy. Adequacy is a planning and probability concept. A system is adequate if the probability of not having sufficient transmission and generation to meet expected demand is equal to or less than the system's standard, which is expressed as a loss of load expectation (LOLE). The New York State Power System is planned to meet a LOLE representative of an involuntary load disconnection event not more than once in every 10 years, or 0.1 days per year. This requirement forms the basis of New York's resource adequacy and installed capacity requirements.

Security is an operating and deterministic concept. This means that possible events are identified as having significant adverse reliability consequences and the bulk power system is planned and operated so that the system can continue to serve load even if these events occur. Security requirements are sometimes referred to as "N minus 1" (N-1), "N minus 1 and minus 1" (N-1-1), or "N minus 2" (N-2). In this definition, "N" is the number of system components. An N-1 requirement means that the system can withstand the loss of any one component without affecting service to consumers. N-1-1 means that the reliability criteria apply after any critical element such as a generator, transmission circuit, transformer, series or shunt compensating device, or high voltage direct current (HVDC) pole has already been lost, and after generation and power flows have been adjusted between outages by the use of 10-minute operating reserve and, where available, phase angle regulator control and HVDC control. Each control area usually maintains a list of critical elements and most severe contingencies that need to be assessed.

2.3.2 Organizational Structure

Reliability policies are developed, promulgated, implemented, and enforced by various organizations at different levels. These include federal and state regulators, industry-created organizations such as the North American Electric Reliability Corporation, Inc. (NERC) and its member organizations, transmission owners, and energy market participants.

NERC was formed as a voluntary, not-for-profit organization in 1968 in response to the blackout of 1965. A ten-member Board of Trustees governs NERC with input from an industry

Stakeholder Committee. NERC has formulated planning standards and operating policies. Pursuant to the Energy Policy Act of 2005, the Federal Energy Regulatory Commission approved NERC as the Electric Reliability Organization for North America in 2006. FERC has approved many NERC standards as enforceable as of June 18, 2007, and NERC and FERC are in the process of approving additional standards that carry the weight of federal law.

Ten Regional Reliability Councils currently comprise NERC's membership; and members of these councils come from all segments of the industry. New York State is an Area within the Northeast Power Coordinating Council (NPCC), which includes New England and northeastern Canada. NPCC implements broad-based, industry-wide reliability standards tailored to its region. NERC and NPCC have requested FERC's approval of a delegation agreement by which NPCC will oversee and enforce compliance with NERC and NPCC standards in the northeastern regions of the United States and Canada.

New York State also has its own electric reliability organization, which is the New York State Reliability Council (NYSRC). The NYSRC is a not-for-profit organization that promulgates reliability rules and monitors compliance on the New York State Power System. The NYISO, and all organizations engaging in electric transactions on the state's power system must comply with these rules. Thirteen members from different segments of the electric power industry govern the NYSRC. New York-specific reliability rules may be more detailed or stringent than NERC Standards and Policies and NPCC Criteria. Local reliability rules that apply to certain zones within New York may be even more stringent than statewide reliability rules.

2.3.3 Reliability Policies and Criteria

Similar to the national, regional and state levels of reliability organizations, there are national, regional and state levels of documents comprising the reliability standards, policies and criteria that govern the New York bulk power system. Presently, NERC has two major types of such documents: Operating and Planning Standards.

Planning Standards documents provide the fundamental planning requirements. The interconnected bulk electric system must be planned so that the aggregate electrical demand and energy requirements of customers are satisfied, taking into account scheduled and reasonably expected unscheduled outages of system elements, and capable of withstanding sudden disturbances. Regional Councils may develop planning criteria that are consistent with those of NERC.

NERC's Operating Standards provide the fundamental operating requirements. The interconnected bulk electric system must be operated in secure state such that the aggregate electrical demand and energy requirements of customers are satisfied in real time. Primary responsibility for reliable operation is vested with transmission operators, which are the New York TOs, and reliability coordinators and balancing authorities, which, in New York State, is the NYISO. The thrust of these Operating Standards is to promote reliable interconnection operations within each of the three interconnections in North America without burdening other entities within the interconnection. The NYISO is within the Eastern Interconnection.

NPCC has three basic categories of documents: Criteria, Guidelines, and Procedures, respectively referred to as Type A, B, and C documents. The foundational NPCC document is A-

2, Basic Criteria for Design and Operation of Interconnected Power Systems, which establishes the principles of interconnected planning and operations.

The NYSRC Reliability Rules for Planning and Operating the New York State Power System includes the required rules and defines the performance that constitutes compliance. These rules include NERC Planning Standards and Operating Policies; NPCC Criteria, Guidelines and Procedures; New York-specific reliability rules; and local transmission owner reliability rules. The NYISO's implementation and compliance with NYSRC Reliability Rules are codified in its Operations, Planning, and Administrative manuals and other written procedures.

The NYSRC establishes the annual statewide installed capacity requirement (ICR) to maintain resource adequacy. The ICR is expressed as an Installed Reserve Margin, which is the percentage of capacity above 100 percent that is required. Factors that are considered in establishing the ICR include the characteristics of loads, uncertainty in load forecast, outages and deratings of generation units, the effects of interconnections on other control areas, and transfer capabilities of the state's transmission system. The NYISO determines installed capacity (ICAP) requirements for load serving entities (LSEs), including locational ICAP requirements for New York City and Long Island.

3 Reliability Needs Assessment Summary

The 2008 RNA indicated that the forecasted system first exceeds the Loss of Load Expectation (LOLE) criterion in the year 2012. With the Neptune project modeled as firm capacity available at Zone K, the first year of need is 2013. The need in 2012 results from a statewide capacity deficiency as well as zonal deficiency resulting from transmission constraints. Therefore the need could be resolved by adding capacity resources down stream of the transmission constraints or by adding resources upstream of transmission constraints in conjunction with transmission reinforcement. Accordingly, the RNA designated all Transmission Owners (TOs), except for the NYPA, as the Responsible TOs required to identify a regulatory backstop solution to the reliability need, which may be called upon by the NYISO should no timely market-based solution be available. The NYISO expects that NYPA will work with the other TOs on the development of regulated backstop solutions to the statewide needs on a voluntary basis.

Based upon continuing load growth throughout the New York Control Area from 2013 to 2017, the RNA determined that the LOLE criterion will be violated in these years as well. The RNA characterized the reliability needs for 2013-2017 as statewide resource adequacy needs. That is, there are multiple combinations of generation, transmission and demand-side resources that could satisfy those needs during this period. Consequently, the RNA identified all of the TOs, except for the New York Power Authority (NYPA), as Responsible TOs to identify regulatory backstop solutions for the reliability needs in 2013 to 2017. NYPA was not identified as a Responsible TO because it serves its government, authority and private sector customers by contractual agreement rather than as the utility provider of last resort, which would be required to service those customers should they refuse service from NYPA. Nevertheless, the RNA stated the NYISO's expectation that NYPA will work cooperatively with the Responsible TOs to identify regulated backstop solutions to the reliability needs identified in the RNA.

The RNA reported the results of two sensitivity analyses, with the following results:

- The reliability need in 2012 could be deferred to 2013 if the Neptune project was modeled as firm capacity in Zone K;
- Assuming unlimited transmission system capability would also defer the first year of reliability need from 2012 to 2013;

The RNA also examined the reliability needs under a number of alternative scenarios, with the following results:

- If the high load forecast were to occur, the reliability need in 2012 would advance to 2010, and local needs would emerge in Western New York;
- If increasingly stringent environmental controls were to force the retirement of all of the coal-based generation in New York except for the two most modern units, the reliability needs in some zones in New York would advance to 2009 or 2010;
- If the retirement of the older NYPA Charles Poletti unit was deferred until the end of 2009, both statewide and downstate reliability would improve;

- If NYPA proceeds with its agreement to purchase 500 MW from New Jersey to serve its customers in New York City via a new direct current transmission tie, the first year of need would be 2014;

Finally, the RNA conducted a short-circuit analysis and informed the market about historic congestion costs.

The reliability needs can be satisfied through the addition of compensatory MWs statewide as well as Zones G through K below the UPNY/SENY interface. Because there is a statewide resource adequacy need, all TOs, except for the NYPA, are designated as the Responsible TOs for purposes of identifying regulated backstop solutions. The NYISO expects that NYPA will work with the other TOs on the development of regulated backstop solutions to the statewide needs on a voluntary basis.

Dr. David Patton, the NYISO's Independent Market Advisor, reviewed the RNA. With regard to the locational needs identified in the RNA, Dr. Patton indicated that the ongoing work of the NYISO and its Market Participants to identify when new capacity zones and associated local capacity requirements are appropriate should improve the economic signals needed to allow the market to resolve these needs.

On December 10, 2007, the NYISO Board of Directors approved the draft Reliability Needs Assessment submitted to it by the NYISO Management Committee. Because the tariff calls for the NYISO to encourage market-based solutions to RNA reliability needs, the NYISO issued its initial request for those solutions on December 12, 2007. The NYISO requested that developers submit market-based solutions and that the Responsible TOs submit regulated backstop solutions to the identified Reliability Needs by March 1, 2008. The NYISO also stated that developers could submit alternative regulated solutions if they chose to. Due to uncertainty as to the viability of generation solutions as of April 4, the NYISO issued a letter that day soliciting any remaining alternative regulated solutions to be submitted by April 21, 2008. Like market-based solutions and regulated backstop solutions, these proposals may consist of transmission, generation or DSM projects.

Two significant changes since the approval of the 2008 RNA are a reduced load forecast and the change in status of a proposed Market Solution to "under construction." Electric system planning continuously evaluates changing system conditions, monitors factors that impact the forecasts used in the assessments, and updates the assumptions and results of the assessments. Changes to these parameters will be incorporated in the next cycle of CRPP. Accordingly, the Solutions received in response to the NYISO's solicitations are evaluated to determine if they meet the identified Reliability Needs in the 2008 RNA.

4 The Development of Solutions to Reliability Needs

Following the issuance of an RNA, the Comprehensive Reliability Planning Process (CRPP) enters a Solutions Phase, in which the NYISO requests and evaluates solutions to the Reliability Needs, and then prepares its Comprehensive Reliability Plan(CRP). Updated TO plans may also be submitted by the TOs for evaluation by the NYISO. This section summarizes the responses and updated TO plans received by the NYSIO.

The NYISO received market-based solutions totaling a potential of 3,380 MW of resources, and received 2,100 MW of resources as backstop regulatory solutions from the Responsible TOs. Three alternative regulatory solutions were received totaling approximately 344 MW of generation and demand response resources, as well as a 1,200 MW HVDC transmission proposal. The NYISO evaluated the various solutions and updated plans it received according to the CRPP Manual.[4] The NYISO conducted an iterative process with the project proponents, and is reporting the results of its evaluation in this CRP.

4.1 **Responsible Transmission Owner Solutions**

The Responsible Transmission Owners jointly submitted both proposed Regulated Backstop Solutions and Updated TO Plans. Individual TOs also submitted potential options for regulated backstop solutions in their own proposals.

4.1.1 Joint Responsible TO Submittal

- Neptune Project HVDC Tie PJM to Long Island exercising UDR rights as firm capacity. This RNA scenario indicated there would not be additional needs in the first five years. This is confirmed in the evaluation phase.

The Responsible Transmission Owners (TOs) identified to provide solutions to meet the needs for the second five year period of the 2008 Reliability Needs Assessment (RNA) are:

- Central Hudson Gas and Electric Company (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Long Island Power Authority (LIPA)
- New York State Electric & Gas Corporation (NYSEG)
- Niagara Mohawk Power Corporation d/b/a National Grid (National Grid)
- Orange & Rockland Utilities, Inc. (O&R), and
- Rochester Gas and Electric Corporation (RG&E).

[4] The NYISO's determination that a solution is viable under the approved criteria does not predict the outcome of regulatory approval processes, or the application of governmental policies. The NYISO does not itself select specific projects to meet reliability needs, nor does it construct any projects.

The response includes detailed solutions developed to meet the reliability needs identified in 2013 – 2017 time period. The NYISO may trigger reliability backstop solutions if it determines that the market-based solutions are not likely to be available to meet the reliability needs in a timely manner. The proposed solutions are comprised of the following:

- 500 MW of DSM in Zone J phased in by 2017. This represents demand reduction commitments made by Con Edison and is included in its most recent load forecast. This resource was submitted as an Updated TO plan. Pursuant to Section 4.4(b) of Attachment Y, the NYISO is not in agreement with this resource as a TO plan to meet bulk power system reliability needs at this time. There is some uncertainty regarding Con Edison's proposed plan because the New York State Public Service Commission (PSC) has not yet acted on Con Edison's filing to implement 500 MW of DSM as part of the Energy Efficiency Portfolio Standard (EEPS) proceeding. The uncertainty simply may be a question of timing. There is some evidence that the PSC will approve some level of DSM programs for Con Edison as the PSC authorized some ratepayer funds for Con Edison to hire additional staff for this purpose. Moreover, Con Edison has publicly announced a 500 MW DSM program and indicated its commitment as a company to carrying out the program. At this time, the NYISO cannot reasonably determine the size and scope of the Con Edison DSM program. Given that: (i) the absence of the 500 MW DSM resource would leave a resource adequacy need unfulfilled only in 2017, (ii) the PSC is expected to rule on additional DSM programs in the EEPS proceeding this year; and (iii) there is plenty of time to implement DSM or other resources for 2017 following a PSC decision, the NYISO does not need to make a determination of necessity for a regulated backstop solution at this time. The NYISO will continue to work with Con Edison and the PSC staff on this issue, particularly in the context of establishing whether the resource can be included in the base case for the NYISO's 2009 RNA. The NYISO will also monitor the Con Edison proposed plan in its quarterly monitoring program.
- 500 MW of new clean efficient generation/DSM in Zone J phased in during the 2013-2017 period as the CRP indicates this capacity would be needed. This assumes a start date 3-4 years prior to the date when the CRP indicates this capacity would be needed.
- 300 MW of new generation/DSM in Zone K to be phased in during the 2013-2017 period with a start date 3-4 years prior to the date when the NYISO would expect the resource to be in service.
- 300 MW of new generation/DSM in Zone B phased in during the 2013-2017 period as the CRP indicates this capacity would be needed. This assumes a start date 3-4 years prior to the date when the CRP indicates this capacity would be needed.

- 500 MW of new generation/DSM in Zone G phased in during the 2016-2017 period as the CRP indicates this capacity would be needed. This assumes a start date 3-4 years prior to the date when the CRP indicates this capacity would be needed.
- A 345 kV line between Zones F and G that would permit the location of generation and DSM in upstate zones, rather than Zone G as indicated above. Implementation will take between 5 and 7 years.[5] The 345 kV transmission line between Zones F and G was developed by National Grid and consisted of two alternative proposals. The first proposal (A1) consisted of a new 44-mile 345 kV transmission line between Leeds and Pleasant Valley. The second proposal (A2) consisted of a 64 mile 345 kV transmission line between Schodack and Pleasant Valley. Schodack is near Alps and the intersection of the existing 115 kV line, which runs south towards Pleasant Valley and the existing 345 kV New Scotland line.

The evaluation of Regulated Backstop solutions was performed with both plans included. The evaluation of Market Based Solutions was performed two ways, one with both of the plans included and one with just the second plan included.

4.1.2 Individual TO Submittals

In addition to the response provided by the Responsible Transmission Owners as a group for the second five years, the following individual TO plans were submitted:

- Rochester Gas and Electric (RG&E) submitted separately supporting documentation for a specific 300 MW generation proposal in Zone B. Their submittal included conceptual design information, licensing, and a construction schedule for a 300 MW natural gas combined cycle plant. RG&E stated that completion of this project would take 5 – 7 years.[6]
- National Grid proposed a transmission project consisting of transmission reinforcements to the underlying 115 kV system between Packard and Gardenville by creating a new 115 kV line. The proposal also adds three 75 Mvar 115 kV capacitor banks at Gardenville. This was submitted in response to potential (N-1)-1 issues in Zone A under a high load forecast scenario in the RNA and to determine its impact on transfer capability in Zone A.

4.2 **Market Solutions**

The NYISO reviewed solutions that were submitted in response to its request and concluded that the following are viable market solutions based upon the information

[5] Although the trigger date for this solution is 2008, the NYISO has determined that, based upon the 3,380 MW of market solutions it received in response to the 2008 RNA, it is likely that sufficient market solutions will be present to fulfill the needs identified in the 2008 RNA. Accordingly, the NYISO does not need to trigger a reliability backstop solution at this time.

[6] As stated previously, the NYISO does not need to trigger a reliability backstop solution at this time.

received to date. Five of the solutions were included in the 2007 CRP and were re-submitted for the 2008 CRP. Four of the solutions are new. The market solutions include:

1. 520 MWs of generation in Zone J (New York City) approximately 420 MWs net when accounting for associated retirements,
2. 500 MWs of identified generation in PJM to be delivered via a 660 MW back-to-back HVDC transmission project,
3. 550 MWs of identified generation in PJM to be delivered via a radial AC transmission project into J.
4. 550 MWs of identified capacity associated with two controllable transmission projects into Zone J with potential UDRs totaling 850 MW,
5. 300 MWs of generation addition in Zone H ,
6. 425 MWs in two DSM SCR projects into Zones F, G, H, I, and J as required to meet needs,
7. 635 MWs of Generation addition in Zone F under construction. .

In total, the NYISO received market-based solutions with an equivalent capacity of 3,380 MWs.

Table 4.2.1 below is a summary of the solutions that have been submitted. Figure 4.2.1 presents the cumulative MW by in-service dates for the market solutions versus the cumulative MW need by year of need:

Table 4.2.1: Summary of Proposed Market Solutions

Project Type	Size of Resource(MW)	Zone	In-service Date
Generation Proposals			
Gas Turbine NRG Astoria Re-powering	520-100 MW (420MW Net)	J	1/2011
Simple Cycle GT Indian Point	300	H	5/2011
Combined Cycle Bergen	550	J	6/2010
DSM SCR	125	G,H, and J	2012-2017
DSM SCR	300	F,G,H,I, and J	2008 thru 2012
Besicorp	635	F	Q1/2010
Transmission Proposals			
Controllable AC Transmission –VFT Linden VFT	300 (No specific CAP identified)	PJM-J	4th quarter 2009 PJM Queue G22
Back-to-Back HVDC, AC Line HTS/FPL	660 (500MW specific CAP identified)	PJM-J	Late 2010 PJM Queue O66
Back-to-Back HVDC, AC Line Harbor Cable	550 (550MW specific CAP identified)	PJM-J	6/2011

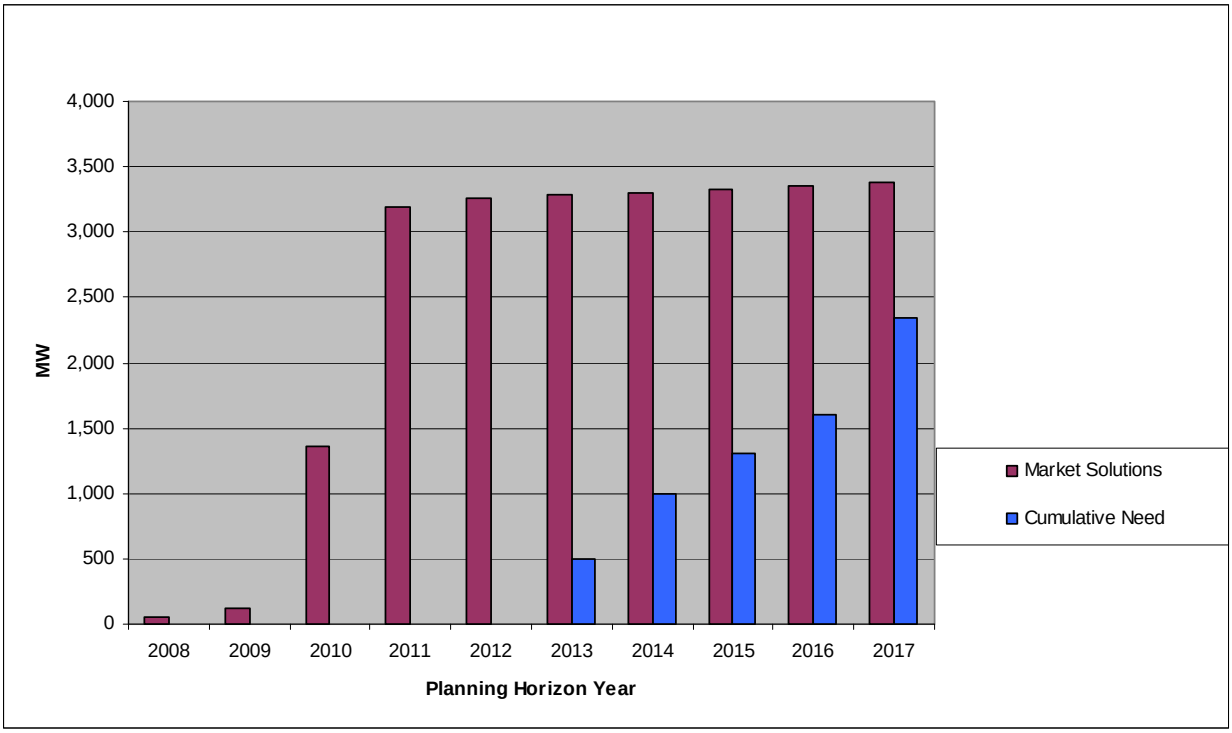

Figure 4.2.1: Cumulative Needs Compared to Market Solutions in MW

More specifically, the NYISO received the following projects:

The NRG 520 MW Astoria Repowering Project [420 MW Net]

NRG has proposed the construction of two Siemens fast-start combined cycle units totaling 520 MW installed capacity at its Astoria facility in Queens to be connected to the 138kV Astoria West Substation.

In addition, NRG has proposed the construction of three Siemens fast-start combined cycle units totaling 789 MW installed capacity at its Astoria facility in Queens to be connected to the Astoria 345kV transmission. Either project would replace approximately 100 MW of oil fired generation from existing Westinghouse units.

NRG also proposed the construction of a three-on-one combined cycle plant at their Arthur Kill facility. The proposed facility would have a radial interconnection into the Gowanus 345kV substation in Brooklyn.

For purposes of the evaluation of this proposal, the lowest MW contribution to potentially satisfying needs was included in the evaluation of market solutions.

The 660 MW Hudson Transmission Project (HTP)

This solution has been submitted by Hudson Transmission Partners ("Hudson"). The HTP is a high-voltage direct current (HVDC) project that will provide a new controllable transmission line into Zone J that is rated at 660 MW. This is Project

No. 206 in the NYISO interconnection queue. The HTP consist of back-to-back HVDC system ("converter-circuit-converter") in a single building (the Converter Station) located in Ridgefield, New Jersey near PSE&G Bergen substation, which is part of the PJM transmission system. A high-voltage 345kV alternating-current (AC) transmission line will connect the Converter Station to Con Edison's transmission system at the West 49th St. substation. The HTP is being developed in response to the Request for Proposals, "Long-Term Supply of In-City Unforced Capacity and Optional Energy" issued by NYPA dated March 11, 2005 (the "NYPA RFP"). The project was selected by NYPA's Board of Trustees for further negotiation and review. The project has a proposed in-service date of late 2010. The System Impact Study in the PJM interconnection process has been posted.

The Red Oak, NJ Combined Cycle Generating Unit (500 MW)

This solution was submitted by FPL Energy. The Red Oak project is an existing 817 MW three on one (3x1) combined cycle, natural gas fired power generation project, located in Sayreville, New Jersey. Red Oak began commercial operation in 2002. Red Oak's major equipment includes three Westinghouse 501F combustion turbines ("CTs"), one Toshiba Steam Turbine ("ST"), and three Foster Wheeler heat recovery steam generators ("HRSGs"), each with selective catalyst reduction. FPL Energy proposed the Red Oak project to NYPA as a supplement to Hudson's response to the NYPA RFP. The Red Oak project would provide reliable capacity to NYPA's New York City customers via the HTP. The project was selected by NYPA's Board of Trustees for further negotiation and review of a 500MW capacity contract.

The 550 MW Harbor Cable Project (HCP) and Generating Portfolio

This solution was submitted by Brookfield Energy Marketing. The HCP will provide a 550 MW fully controllable electric transmission pathway from generation sources located in New Jersey to New York City (Zone J). The HCP will consist of a back-to-back HVDC converter station located in Linden, New Jersey with 200 MW going to the Goethals substation on Staten Island via a single circuit 345 kV AC transmission cable and 350 MW going to Manhattan near the new World Trade Center substation via double-circuit 138 kV AC transmission cables. This is Project No.195 in the NYISO interconnection queue. The developer proposes to bundle the transmission project with up to 550 MW of capacity and energy from existing and/or new capacity located in New Jersey to be available in June 2011. To date, the developer has not applied for interconnection in PJM.

The 300 MW Linden Variable Frequency Transformers (VFT)

This solution was submitted by GE Energy Financial Services. The Project is a 300 MW bi-directional controllable AC transmission tie between the PJM and NYISO systems. It will be physically located adjacent to Linden Cogen plant. Three (3) 100 MW Variable Frequency Transformer (VFT) "channels" will tie an existing PJM 230 kV transmission line to existing 345 kV cables connecting

Linden Cogen into Con Edison's Goethals substation. This will result in a continuously variable 300 MW tie between the northern New Jersey PJM system and New York City (Zone J). This proposal does not contain any associated capacity but would rely on existing resources in PJM. This project is # 125 on the NYISO's interconnection queue and is scheduled to be in-service in late 2009. The developer has entered into an Interconnection Services Agreement and a Construction Services Agreement in PJM, and is under construction. It is expected that UDRs will be awarded for the full capacity of this project.

The 300 MW Indian Point Peaking Facility

This solution was submitted by Entergy Nuclear Power Marketing. The Entergy Buchanan Generation Project will consist of 300 to 330 MWs of simple cycle gas turbine peaking capacity to be located on the site of the Indian Point Generating Facility in Zone H. The facility will be interconnected to Consolidated Edison Company's existing Buchanan substation at 138 kV. This project is scheduled to be in-service in mid-2011. This project has not yet submitted a request for interconnection to the NYISO.

The 635 MW Empire Generating Project

This solution was submitted by Empire Generating Co LLC for a 635 MW combined cycle plant that is presently under construction in Zone F. The anticipated in service date is on or before the first quarter of 2010.

EnerNOC Demand Response

EnerNOC, Inc. EnerNOC offers 125 MW of additional demand response resources to the NYISO for Zones G, H, and J specifically and/or any other zones as needed to meet identified reliability needs.

Energy Curtailment Specialists, Inc. Demand Response

Energy Curtailment Specialists(ECS) offers up to 300 MW of additional demand response by 2012 to the NYISO for Zones F, G, and H of 25 MW each, 75 MW in Zone I, and 150 MW in Zone J.

4.3 Alternative Regulated Solutions

Three alternative regulated solutions were submitted. One consists of existing generation projects currently retired or scheduled to be retired, the second proposes a new transmission facility located wholly within New York, and the third constitutes a demand response proposal. Developers proposed the following alternative regulated responses:

Mirant Lovett

This alternative regulated solution was submitted by Mirant New York. Mirant is proposing to construct a new 540 MW combined cycle facility located at the Lovett site by the year 2012.

New York Regional Interconnect

This alternative regulated solution was previously submitted by the New York Regional Interconnect (NYRI) in response to the NYISO's 2005 and 2007 RNAs. The NYRI transmission proposal is to construct a new high voltage direct current ("HVDC") transmission line between the Edic Substation in the Town of Marcy, Oneida County, to the Rock Tavern Substation in the Town of New Windsor, Orange County. It is Project No. 96 in the NYISO interconnection queue. The HVDC transmission system would function as a bipolar, bi-directional facility operated at a rated power flow of 1,200 MW at a nominal voltage of ± 400 kV DC. The developer has filed at petition at FERC seeking incentive rate treatment for the facility. The developer plans to place the project in commercial operation for the summer of 2011.

Packard-Gardenville

National Grid proposed to add transmission reinforcements to the underlying 115 kV system between Packard and Gardenville by constructing a new 115 kV line and reconductoring an existing line. The proposal also adds three 75 Mvar 115 kV capacitor banks at Gardenville.

5 Evaluation of Solutions

Evaluation of solutions is covered by Section 7 of the NYISO Comprehensive Reliability Planning Process Manual. Section 7.1 describes the process for the evaluation of the regulated backstop solutions submitted by the Responsible Transmission Owners. Section 7.2 states how market-based solutions are evaluated. Section 7.3 lays out the process for the evaluation of alternative regulated solutions.

5.1 Adequacy and Transmission Security

Figure 4.1 below displays the bulk power transmission system for the NYCA, which is generally facilities 230 kV and above, but does include certain 138 kV facilities and a very small number of 115 kV facilities. The balance of the facilities 138 kV and lower are considered non-bulk or sub-transmission facilities. The figure also displays key transmission interfaces for New York.

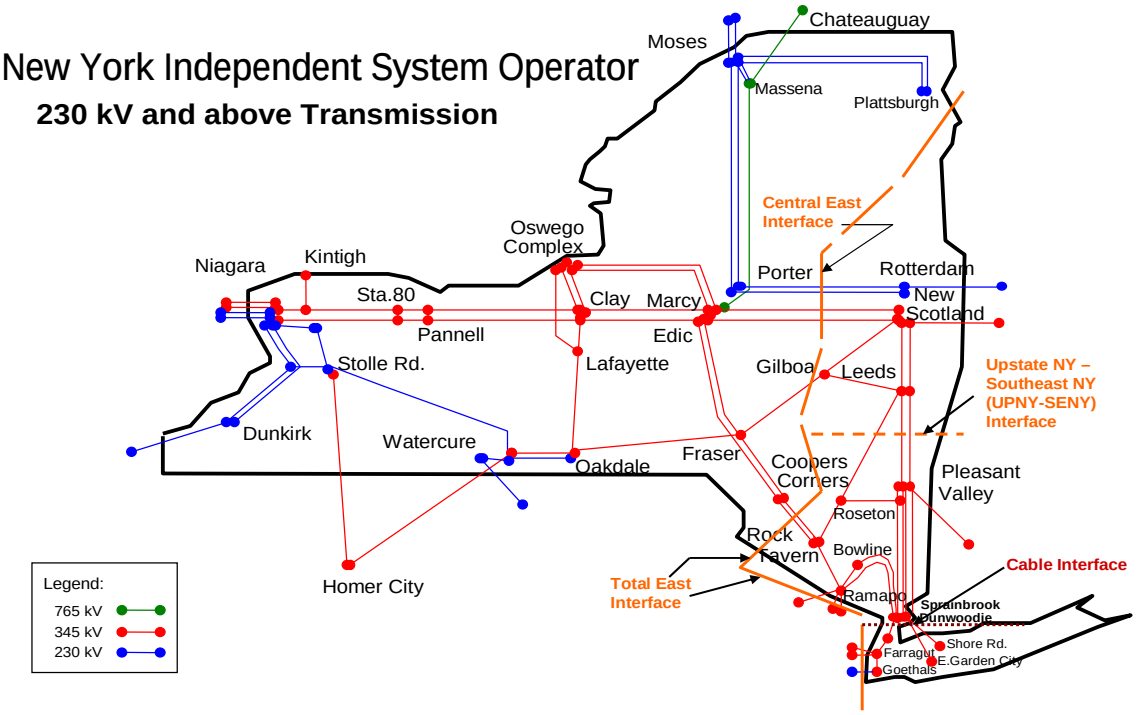

Figure 5.1: NYISO 230 kV and above Transmission Map

Reliability is defined and measured through the use of the concepts of adequacy and security. Adequacy is the ability of the electric systems to supply and deliver the total quantity of electricity demanded at any given time taking into account scheduled and unscheduled outages of system elements. The New York State bulk electricity system is planned to meet a loss of load expectation (LOLE) that, at any given point in time, is less than or equal to an involuntary load disconnection that is not more frequent than once in every 10 years, or 0.1 days per year. Compliance with this criterion is assessed probabilistically. Security is the ability of the power system to withstand disturbances that are sudden and/or the unanticipated loss of system elements and continue to supply and deliver electricity. Compliance with security criteria is assessed deterministically.

The NYISO's existing Planning Process includes both adequacy and security assessments.

In the RNA, transfer limits were assumed to be constant from the end of the First Five Years throughout the second five year period to conduct the resource and transmission adequacy assessment to minimize local needs manifesting themselves on the Bulk Power System unnecessarily. This assumption is confirmed during the evaluation of the solutions. The staging of the proposed regulated backstop solutions throughout the second five year period would maintain or significantly improve on this constant level assumption given the locations of these solutions. The solutions in Zone G were assessed on the 138 kV system and the solutions in Zone J were concentrated on the 345 kV system.

5.2 Responsible Transmission Owners Submitted Plans and Regulated Backstop Solutions

From the joint Responsible TO submittal, the Neptune HVDC project exercising it UDR rights with some level of firm capacity was included in the evaluation of the First Five Year Base Case. For the Second Five Year period, the joint submittal by the responsible TOs was evaluated. Individually submitted TO regulated backstop solutions were also evaluated. The evaluation of the Responsible TO Solutions is divided into two separate five year periods.

5.2.1 First Five-Year Base Case:

As identified in the 2008 RNA and discussed in the transmission security and adequacy section, load growth in SENY, planned generator retirements, and changes to neighboring systems, and the resulting impacts on the voltage performance of the transmission system, resulted in a significant reduction in the transfer capability of the bulk power transmission system to reliably deliver power into and through the Lower Hudson Valley. This impact manifested itself as increased needs in Zones G through J.

The submittal by the Responsible TOs included a level of firm capacity treatment in Zone K associated with the Zone K UDRs. Incorporating this change into the Five Year Base Case period did not change the transmission interface limits but deferred the first year of reliability need from 2012 to 2013 because of the change from emergency assistance treatment to a level of firm capacity. Table 5.2.1-a below presents the key transmission interface transfer limits based on thermal limits, 5.2.1-b below presents the key transmission interface transfer limits based on voltage limits while 5.2.1-c presents the transfer limits employed in the MARS analysis.

Table 5.2.1-a: Transmission System Thermal Transfer Limits for Key Interfaces in MW

Interface	Year				
	2008	2009	2010	2011	2012
Central East + FG*	3375	3350	3175	3250	3100
F-G	3475	3475	3475	3475	3475
UPNY/SENY	5150	5150	5150	5150	5150
I-J	3925	4000	4400	4400	4400
I-K	1290	1290	1290	1290	1290

* F-G – Fraser-Gilboa circuit

Table 5.2.1-b: Transmission System Voltage Transfer Limits for Key Interfaces in MW

Interface	Year				
	2008	2009	2010	2011	2012
Central East + FG	3,150	3,150	3,150	3,150	3,150
F-G					
UPNY/SENY					
I-J			4,225	4,175	4,150
I-K					

Note: Blank entries indicate that the voltage limits are more than 5% above the thermal limits.

Table 5.2.1-c: Transmission System Transfer Limits for Key Interfaces in MW

Interface	Year				
	2008	2009	2010	2011	2012
Central East + FG	3,150 V	3,150 V	3,150 V	3,150 V	3,100 T
F-G	3,475 T	3,475 T	3,475 T	3,475 T	3,475 T
UPNY/SENY	5,150 T	5,150 T	5,150 T	5,150 T	5,150 T
I-J	3,925 T	4,000 T	4,400 C	4,400 C	4,400 C
I-K	1,290 T	1,290 T	1,290 C	1,290 C	1,290 C
I-J&K	5,215 T	5,290 T	5,515 V	5,465 V	5,440 V

Note: T = Thermal; V = Voltage, C = Combined

These transfer limits were incorporated into the MARS model along with the proposed additions. The LOLE results are presented in the Table 5.2.1-d entitled: "RNA Study Case Load and Resource Table with TO Submitted Plans". The table shows that the with the TO Updated Plan, the NYCA system meets resource adequacy requirement through 2012 and that the first year of need is 2013. Table 5.2.1-e presents the LOLE results by zone and for the NYCA.

Table 5.2.1-d: RNA Study Case Load and Resource Table with TO Submittal (First Five Year Base Case)

Year	2008	2009	2010	2011	2012
Peak Load					
NYCA	33,871	34,300	34,734	35,141	35,566
Zone J	11,975	12,150	12,325	12,480	12,645
Zone K	5,485	5,541	5,607	5,664	5,730
Resources					
NYCA					
"-Capacity"	39,247	39,247	39,987	39,987	39,987
"-SCR"	1323	1323	1323	1323	1323
Total	40,570	40,570	41,310	41,310	41,310
Zone J					
"-Capacity"	10,019	10,019	9,128	9,128	9,128
"-SCR"	468.7	468.7	468.7	468.7	468.7
Total	10,487	10,487	9,596	9,596	9,596
Zone K					
"-Capacity"	5,612	5,612	6,352	6,352	6,352
"-SCR"	159.5	159.5	159.5	159.5	159.5
Total	5,772	5,772	6,512	6,512	6,512
NYCA Resource to Load Ratio[1]	119.78%	118.28%	118.93%	117.55%	116.15%
Zone J Res./Load Ratio[2]	87.57%	86.31%	77.86%	76.89%	75.89%
Zone K Res./Load Ratio	105.22%	104.16%	116.13%	114.96%	113.64%
NYCA LOLE (day/year)	0.00	0.00	0.03	0.05	0.10

[1] The statewide and local resource to load ratios result from the existing system under the conditions studied and should not be interpreted as the IRM or LCR that would be established for the NYCA capacity markets.

[2] A ratio less than the current location capacity requirement is the result of the "as found system" being at a point on the LCR/IRM curve that meets reliability criteria with LCRs different from current requirements.

Table 5.2.1-e: NYCA LOLE Table for the First Five-Year Base Case with TO Submittal (First Five Year Base Case)[7]

AREA	2008	2009	2010	2011	2012
Zone B (Upstate NY)	0	0	0.02	0.03	0.06
Zone E (Upstate NY)	0	0	0.01	0.01	0.02
Zone G (Hudson Valley or SENY)			0	0	0
Zone I (Hudson Valley or SENY)	0	0	0.02	0.04	0.09
Zone J (Hudson Valley or SENY)	0	0	0.03	0.04	0.10
Zone K (Long Island or SENY)		0	0	0	0
NYCA	0	0	0.03	0.05	0.10

5.2.2 Second five years

As previously discussed in Section IV, the Responsible TOs offered a joint submittal with proposals to satisfy the Reliability Needs. They consisted of 2,100 MW of new resources by 2017. These include 300 MW of new generation or DSM in Zone B, a commitment to 500 MW of DSM in addition to another 500 MW of DSM or clean generation in Zone J, 300 MW of new generation or DSM in Zone K, as well as another 500 MW in Zone G. Also included was a proposal to add new transmission between Zones F and Zone G, which would increase the transfer capability of the UPNY-SENY interface. This transmission line increases the transfer limits to allow for better utilization of upstate resources. If the transmission line was not available, the reliability need would increase by 250 MW to 2,350 MW, given the same locations of the resource additions with the transmission line. Additionally, RG&E has proposed a generation option consisting of the repowering of the Russell plant that could serve as the solution for the needs identified in Zone B. National Grid has proposed adding a third transmission line from Leeds to Pleasant Valley to enable more generation upstate to be effective in satisfying needs in the Lower Hudson Valley, as well as to improve the operational reliability of the transmission grid.

Table 5.2.2-a presents the phase in of the joint Transmission Owners' submittal by year and zone with and without the new transmission line in-service by 2017.

[7] Probability of occurrences in days per year.

Table 5.2.2-a: Joint Transmission Owner Submittal of Resource Additions by Year and Zone

MW level	2,100 with Transmission		2,350 without transmission	
Year	**MW**	**Zone**	**MW**	**Zone**
2013	300	B	300	B
	190	J	190	J
	121	K	121	K
2014	315	J	315	J
	40	K	40	K
2015	270	J	270	J
	44	K	44	K
2016	250	G	250	G
	40	J	40	J
	44	K	44	K
2017	250	G	250	G
	185	J	435	J
	47	K	47	K
Total	2096		2346	

In the RNA, transfer limits were assumed to be constant from the end of the First Five Years throughout the second five year period to conduct the resource and transmission adequacy assessment to minimize the effect of local needs manifesting themselves on the Bulk Power System unnecessarily. This assumption was confirmed during the evaluation of the solutions. The staging of the proposed regulated backstop solutions throughout the second five year period maintains and even improves the constant transfer levels given the locations of these solutions. The solutions in Zone G were assessed on the 138 kV system and the solutions in Zone J were concentrated on the 345 kV system.

The impacts of the Leeds to Pleasant Valley alternatives were evaluated by conducting power flow analysis to determine their impacts on thermal and voltage limits. Both alternatives result in approximately the same increase in the UPNY/SENY interface of approximately 875 MW. However, the New Scotland to Leeds circuit becomes more limiting for the third Leeds to Pleasant Valley circuit alternative. This impact is reflected on the transfer limit for the Zone F to Zone G interface. In other words, the Schodak to Pleasant Valley alternative mitigates the New Scotland to Leeds transfer limit regardless of dispatch. More generation upstream of these interfaces would be able to supply downstream areas, subject to the Central East Interface limit. Voltage limit impacts in the Hudson Valley were approximately the same for both alternatives, but to achieve the same level increase as the thermal limit, additional reactive compensation in the Hudson Valley would be required. Such enhancement could take the form of

transmission improvements (capacitor banks, static VAR compensators, etc.) or generation solutions, such as a 500 MW generator solution proposed by Mirant in Zone G. Table 5.2.2-b summarizes the transfer limits used in the LOLE analysis for the transmission alternatives. Individual assessments were performed for the generation/DSM addition in Zone B, one with all generation and one with all DSM. While both were effective in satisfying the identified Reliability Needs, overall system performance and transfer limits were better for the generation alternative.

Table 5.2.2-b: Transfer Limits for Transmission Alternatives (in MW)

Interface	Existing System	Leeds-PV	Schodack-PV
F-G	3,475	3,475	4,350
UPNY-SENY	5,150	6,025	6,025

Table 5.2.2-c below presents the total level of MW needed to maintain compliance with the resource adequacy criterion for the all-resource approach. Table 5.2.2-d presents the results with the transmission upgrades. The LOLE results by zone are presented in Tables 5.2.2-e and 5.2.2-f, respectively. Resource additions would need to be located primarily in load Zones G through J in order to fulfill the Reliability Needs. Although these results indicate the MW level of solutions that would be required, these amounts could change depending on the specific solutions that are proposed. Tables 5.2.2-e and 5.2.2-f indicate LOLEs of 0.01 for NYCA in 2013 and 2017. These results show that the NYCA will just achieve, but will not violate, the resource adequacy criterion in these years.

Table 5.2.2-c: RNA Study Case Load and Resource Table
(TO Submittal with 2,100 MW of Resources and Transmission Upgrade, Second Five Years)

Year	2013	2014	2015	2016	2017
Peak Load					
NYCA	35,651	35,950	36,269	36,577	36,930
Zone J	12,590	12,660	12,755	12,825	12,965
Zone K	5,670	5,694	5,714	5,753	5,780
Resources					
NYCA					
"-Capacity"	39,126	39,376	39,626	39,876	40,126
"-SCR"	1323	1323	1323	1323	1323
Total	40,459	40,709	40,959	41,209	41,459
Zone J					
"-Capacity"	9,015	9,265	9,515	9,515	9,515
"-SCR"	468.7	468.7	468.7	468.7	468.7
Total	9,483	9,733	9,983	9,983	9,983
Zone K					
"-Capacity"	6,352	6,352	6,352	6,352	6,352
"-SCR"	159.5	159.5	159.5	159.5	159.5
Total	6,522	6,522	6,522	6,522	6,522
NYCA Resource to Load Ratio[1]	113.5%	113.2%	112.9%	112.7%	112.3%
Zone J Res./Load Ratio[2]	75.3%	76.9%	78.3%	77.8%	77.0%
Zone K Res./Load Ratio	115.0%	114.5%	114.1%	113.4%	112.8%
NYCA LOLE (day/year)	0.10	0.08	0.08	0.09	0.1

Table 5.2.2-d: RNA Study Case Load and Resource Table
(TO Submittal with 2,350 MW of Resources without Transmission Upgrade Second Five Years)

Year	2013	2014	2015	2016	2017
Peak Load					
NYCA	35,651	35,950	36,269	36,577	36,930
Zone J	12,590	12,660	12,755	12,825	12,965
Zone K	5,670	5,694	5,714	5,753	5,780
Resources					
NYCA					
"-Capacity"	39,136	39,386	39,636	39,886	40,386
"-SCR"	1323	1323	1323	1323	1323
Total	40,459	40,709	40,959	41,209	41,709
Zone J					
"-Capacity"	9,015	9,265	9,515	9,515	9,765
"-SCR"	468.7	468.7	468.7	468.7	468.7
Total	9,483	9,733	9,983	9,983	10,233
Zone K					
"-Capacity"	6,362	6,362	6,362	6,362	6,362
"-SCR"	159.5	159.5	159.5	159.5	159.5
Total	6,522	6,522	6,522	6,522	6,522
NYCA Resource to Load Ratio[1]	113.5%	113.2%	112.9%	112.7%	112.9%
Zone J Res./Load Ratio[2]	75.3%	76.9%	78.3%	77.8%	78.9%
Zone K Res./Load Ratio	115.0%	114.5%	114.1%	113.4%	112.8%
NYCA LOLE (day/year)	0.10	0.08	0.08	0.09	0.09

Table 5.2.2-e: NYCA LOLE Table for the Second Five Years with TO Submittal of 2,100 MW of Resources with Transmission Upgrades

AREA	2013	2014	2015	2016	2017
Zone B (Upstate NY)	0.04	0.05	0.06	0.07	0.08
Zone E (Upstate NY)	0.02	0.02	0.02	0.03	0.03
Zone G (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone I (Hudson Valley or SENY)	0.08	0.07	0.07	0.08	0.09
Zone J (NYC or SENY)	0.08	0.08	0.08	0.09	0.09
Zone K (Long Island or SENY)	0.00	0.00	0.00	0.00	0.00
NYCA	0.10	0.08	0.08	0.09	0.10

Table 5.2.2-f: NYCA LOLE Table for the Second Five Years with TO Submittal Totaling 2,350 MW of Resources without Transmission Upgrades

AREA	2013	2014	2015	2016	2017
Zone B (Upstate NY)	0.04	0.05	0.06	0.07	0.08
Zone E (Upstate NY)	0.02	0.02	0.02	0.03	0.03
Zone G (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone I (Hudson Valley or SENY)	0.08	0.07	0.07	0.08	0.09
Zone J (NYC or SENY)	0.08	0.08	0.08	0.09	0.09
Zone K (Long Island or SENY)	0.00	0.00	0.00	0.00	0.00
NYCA	0.10	0.08	0.08	0.09	0.09

5.2.3 Assessment of Responsible TO Updated Plans and Regulated Backstop Solutions

The evaluation of the joint Responsible TO submittal solutions indicates that the system as modeled will meet the needs through 2017. Figures 5.5-1 and 5.5-2 below present the resource mix that results from the TOs' submittal for both the all-resource proposal of 2,350 MW and the 2,100 MW resource proposal that includes the Leeds-PV transmission upgrade. The transmission upgrade reduces the NYCA resources that are needed to meet criteria because it allows for better utilization of resources within NYCA and neighboring control areas.

NYCA resources are presented as the percentage of the forecasted annual peak load. The sum of the resources stated as a percentage of the forecasted peak load equals the installed reserve margin, which is a generally accepted measure of the level of resources needed to maintain reliability. Expressed as the percentage of annual peak load, the resources are divided into five categories:

- in-NYCA generating capacity,
- unforced capacity deliverability rights (UDRs), which are supported by external capacity,
- special case resources/demand response,

- regulated backstop resources needed to maintain the 0.1 days per year criterion, and;
- external capacity of 3,280 MW currently eligible to participate in the NYISO markets. The amount of eligible capacity can change annually and is used in the chart for illustrative purposes only.

For reference, the statewide installed capacity requirement is currently 115 percent, which is updated annually.

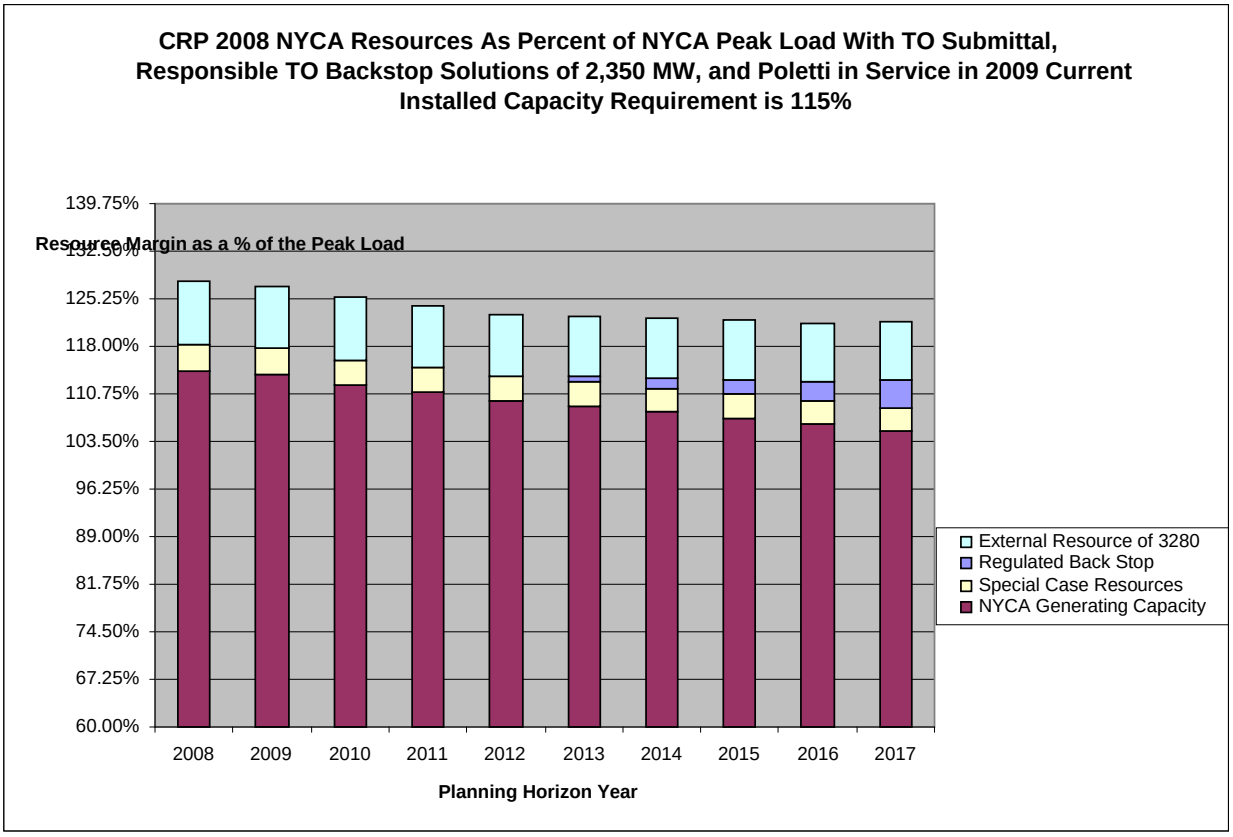

Figure 5.2.3-1: TO Regulated Backstop Solutions – 2,350 MW

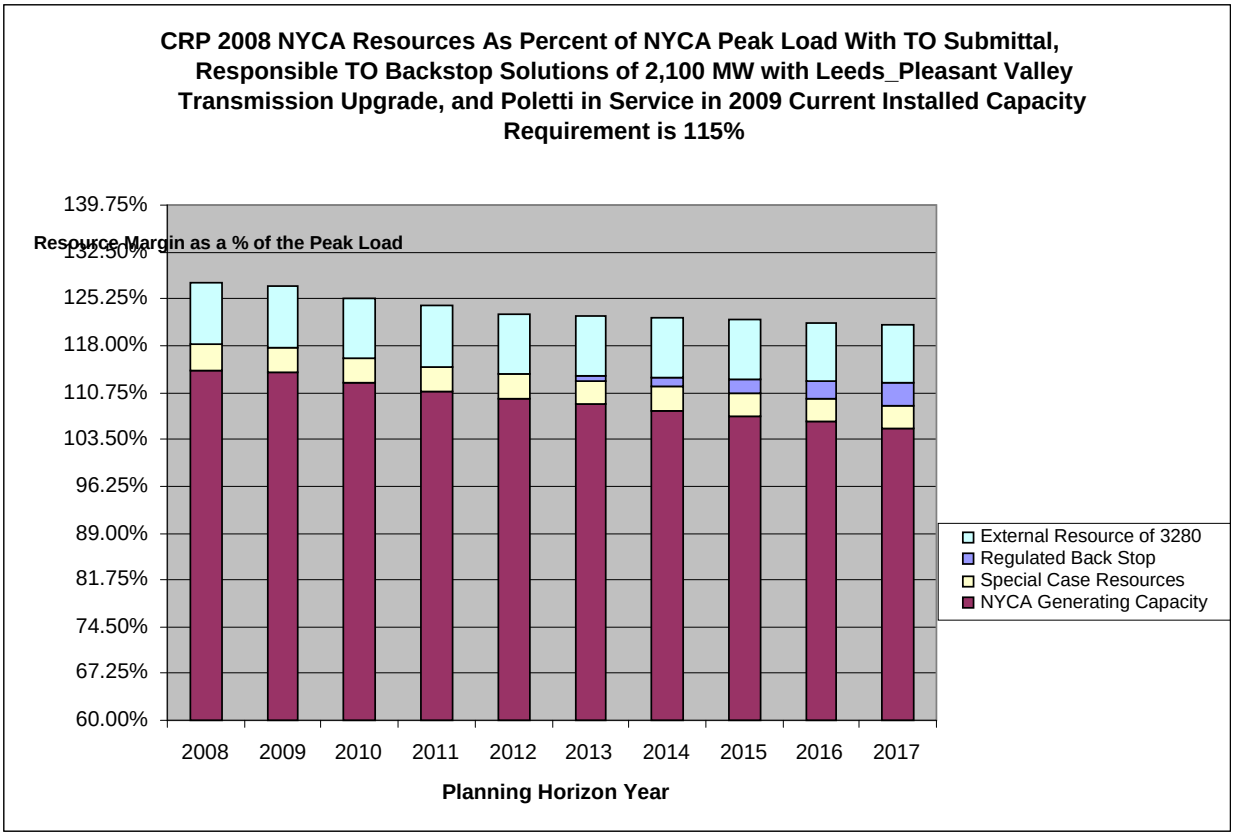

Figure 5.2.3-2: TO Regulated Backstop Solutions – 2,100 MW

5.3 **Market-based Solutions**

As previously discussed, the NYISO received nine market-based proposals in response to its request for market solutions. Because the HVDC proposals provided evidence of the availability or potential availability of capacity and energy, the HVDC projects from PJM to Zone J were modeled as unforced capacity delivery rights (UDR) or equivalent to generators located in Zone J. The transfer limits utilized to evaluate the Market Proposals are the same as those used to evaluate the TO Updated Plans from the First Five Years. Since the proposed market solutions provide for generation additions in excess of the TO backstop solutions, as well as additional transmission capability, for the second five years, it was assumed that at least the same level of reactive support would be available as the assumed backstop solutions. Therefore, the transfer limits would be at least those used for the evaluation of the backstop solutions. Recognizing that many of the proposed market solutions were DC and AC ties from PJM, additional zones and interfaces were added to the transmission topology utilized for the MARS Resource Adequacy Analysis. This topology change was employed to capture potential internal PJM or Zone J constraints not otherwise specifically modeled when there is only one transmission interface modeled for the PJM to Zone J interface[8].

5.3.1 First Five Year Base Case

Table 5.3.1-a below presents the Load and Resource table with the Five Year Base Case with the update to the Neptune project, and the market proposals for the First Five Year Base Case. The market solutions improve the LOLE results for 2009 through 2010 when compared to the first Five Year Base Case. Table 5.3.1-b presents the zonal and NYCA LOLE results with the market proposals in-service.

[8] Of the three proposed transmission solutions, one has not initiated the Interconnection Process with PJM, one has completed its impact study, and one has proceeded to construction with an Interconnection Service Agreement and Construction Service Agreement. Since these projects would have significant impacts on both the PJM and New York systems, their status will be closely monitored in Interconnection Processes, the CRPP and the Regional Planning Process through the Northeast Coordinated System Plan.

Table 5.3.1-a: Base Case Load and Resource Table With Updated Neptune and Market Solutions

Year	2008	2009	2010	2011	2012
Peak Load					
NYCA	33,871	34,300	34,734	35,141	35,566
Zone J	11,975	12,150	12,325	12,480	12,645
Zone K	5,485	5,541	5,607	5,664	5,730
Resources					
NYCA					
"-Capacity"	38,697	39,037	40,021	41,871	41,871
"-SCR"	1323	1323	1323	1323	1323
Total	40,020	40,360	41,344	43,194	43,194
Zone J					
"-Capacity"	10,019	10,019	9,678	11,228	11,228
"-SCR"	468.7	468.7	468.7	468.7	468.7
Total	10,487	10,487	10,146	11,696	11,696
Zone K					
"-Capacity"	5,392	5,702	6,362	6,362	6,362
"-SCR"	159.5	159.5	159.5	159.5	159.5
Total	5,552	5,862	6,522	6,522	6,522
NYCA Resource to Load Ratio[1]	118.15%	117.67%	119.03%	122.92%	121.45%
Zone J Res./Load Ratio[2]	87.57%	86.31%	82.32%	93.72%	92.49%
Zone K Res./Load Ratio	101.21%	105.78%	116.31%	115.14%	113.81%
NYCA LOLE (day/year)	0.00	0.00	0.00	0.00	0.00

Table 5.3.1-b: NYCA LOLE Table for the First Five-Year Base Case with Updated Neptune and Market Solutions LOLE (probability of occurrences in days per year)

AREA	2008	2009	2010	2011	2012
Zone B (Upstate NY)	0.00	0.00	0.00	0.00	0.00
Zone E (Upstate NY)	0.00	0.00	0.00	0.00	0.00
Zone G (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone I (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone J (NYC or SENY)	0.00	0.00	0.00	0.00	0.00
Zone K (Long Island or SENY)	0.00	0.00	0.00	0.00	0.00
NYCA	0.00	0.00	0.00	0.00	0.00

5.3.2 Second Five Years

Table 5.3.2-a presents the Load and Resource table that incorporates the updated Neptune and market proposals for the second five years. Table 5.3.2-b presents the zonal and LOLE results for the second five years with the market proposals in-service. Zonal LOLE results are presented for both treatments of the updated TO plans. That is, the results are modeled with only the Neptune Cable with UDRs and firm capacity in service starting in 2010, and also with that facility and Con Edison's additional 500 MWs of DSM for Zone J in service by 2017.

Table 5.3.2-a: Base Case Load and Resource Table with TO Updated Plans and Market Solutions Second Five Years

Year	2013	2014	2015	2016	2017
Peak Load					
NYCA	35,962	36,366	36,749	37,141	37,631
Zone J	12,780	12,915	13,030	13,140	13,360
Zone K	5,791	5,855	5,919	6,002	6,076
Resources					
NYCA					
"-Capacity"	42,506	42,506	42,506	42,506	42,506
"-SCR"	1323	1323	1323	1323	1323
Total	43,829	43,829	43,829	43,829	43,829
Zone J					
"-Capacity"	11,228	11,228	11,228	11,228	11,228
"-SCR"	468.7	468.7	468.7	468.7	468.7
Total	11,696	11,696	11,696	11,696	11,696
Zone K					
"-Capacity"	6,362	6,362	6,362	6,362	6,362
"-SCR"	159.5	159.5	159.5	159.5	159.5
Total	6,522	6,522	6,522	6,522	6,522
NYCA Resource to Load Ratio[1]	121.9%	120.5%	119.3%	118.0%	116.5%
Zone J Res./Load Ratio[2]	91.5%	90.6%	89.8%	89.0%	87.5%
Zone K Res./Load Ratio	112.6%	111.4%	110.2%	108.7%	107.3%
NYCA LOLE (day/year)	0.00	0.00	0.01	0.02	0.04

Table 5.3.2-b: NYCA LOLE Table for the Second Five Years with Both Submittals and Market Solutions LOLE (probability of occurrences in days per year)

AREA	2013	2014	2015	2016	2017
Zone B (Upstate NY)	0.00	0.00	0.00	0.00	0.01
Zone E (Upstate NY)	0.00	0.00	0.00	0.00	0.00
Zone G (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone I (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.01
Zone J (NYC or SENY)	0.00	0.00	0.00	0.00	0.01
Zone K (Long Island or SENY)	0.00	0.00	0.00	0.00	0.00
NYCA	0.00	0.00	0.00	0.00	0.01

As can be seen from these LOLE results, the impact of including both submitted updates is to improve adequacy from the RNA to a reliable LOLE of 0.01 days per year. With or without the 500 MW of additional DSM in Zone J, resource adequacy will meet criteria.

5.3.3 Assessment of the Market Proposals

With the updated Neptune HVDC project, the market proposals are not needed to meet the identified Reliability Needs for the First Five Year Base Case. Moreover, if they are constructed, the market proposals are sufficient to maintain the LOLE criteria for the second five year period. Because of planning uncertainties and the identified needs in the second five years, sufficient projects should proceed to meet resource adequacy requirements. At least 500 MW of resources should be added by 2013. A total of at least 2,350 MW of resources should be added statewide by 2017. Projects in the quantities and locations noted in the table of Market Solutions will need to maintain their schedules for permitting, construction, and entering into service.

In evaluating the viability of the market proposals, the NYISO has identified a concern with respect to these projects going forward and their potential overall reliability benefits being realized. Although each of these developers have significant financial resources available to them, the proponents of market-based generation and transmission solutions stated that their viability may depend upon entry into long-term contracts for the sale of at least a portion of their output or use of their transmission facility. The developers indicated that the NYISO administered markets do not provide sufficient certainty with respect to revenue streams to fully support the significant investment these products will require. Accordingly, while the NYISO has determined that these projects appear viable at this time to meet their projected in-service dates, there is at least some level of uncertainty as to whether these projects will proceed.

Figure 5.3.3-1 below presents the installed reserve margin that results from the TO submittal for the First Five Year Base Case and the market proposals for the full 10-year Study Period. The resources are presented as a percentage of the annual peak load. The sum of the resources equal the NYCA Installed Reserve Margin (IRM), which is a generally accepted measure of the level of resources needed to maintain reliability. While updated annually, the statewide IRM is currently 15 percent.

Expressed as a percentage of the annual peak, the resources are divided into six categories: (1) in-NYCA existing generating capacity, (2) special case resources/demand response, (3) market proposals that are additions to NYCA generating capacity, and (4) external capacity of 3,280 MW currently eligible to participate in the NYISO markets. Figures 5.3.3-2 and 5.3.3-3 below present the resources for New York City and Long Island as a percentage of their respective peak loads. The sum of the resources is equal to the amount of installed zonal resources expressed as a percentage of the forecasted zonal peak load. Because New York City and Long Island are defined as localities in the NYISO Tariff, they have minimum installed Locational Capacity Requirements. The current minimum Locational Capacity Requirements are 80 percent for New York City and 94 percent for Long Island, respectively.

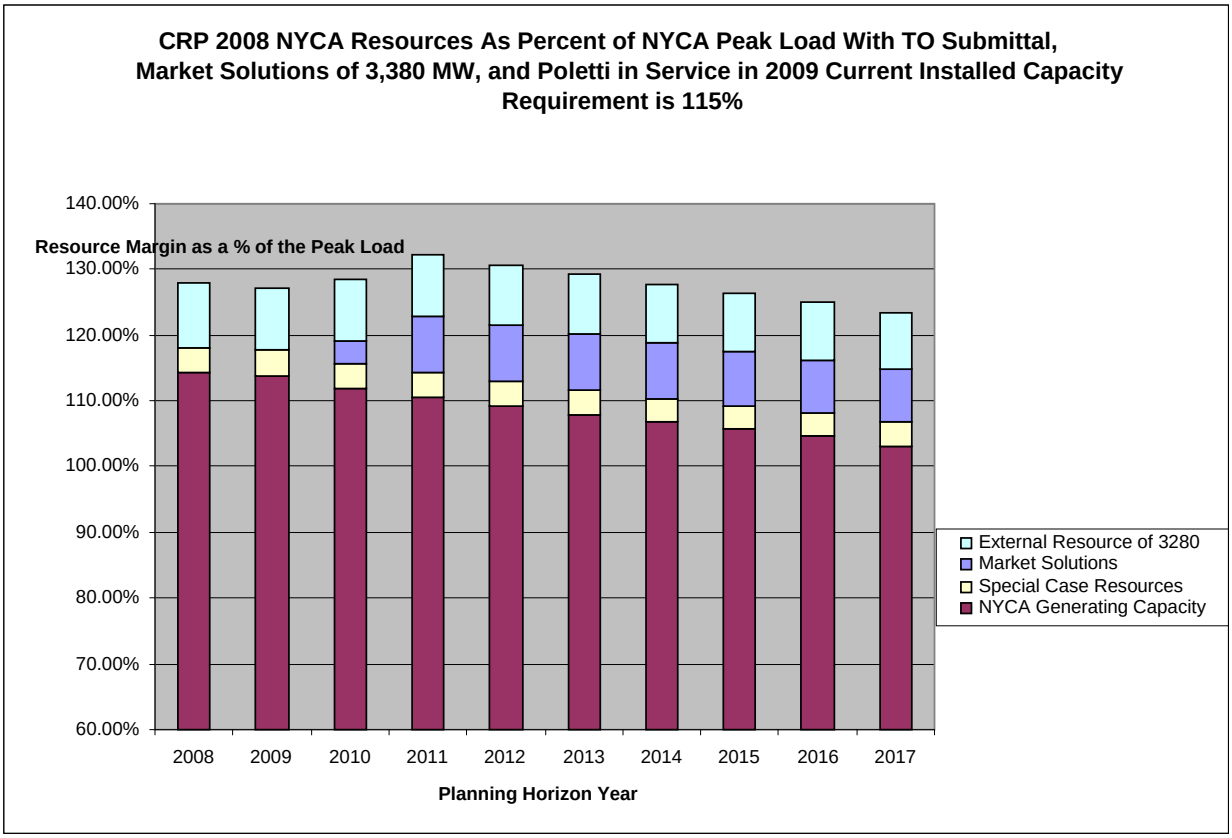

Figure 5.3.3-1: CRP 2007 NYCA Resources As Percent of NYCA Peak Load With TO Submittal, Poletti In-service in 2009 and Market Solutions

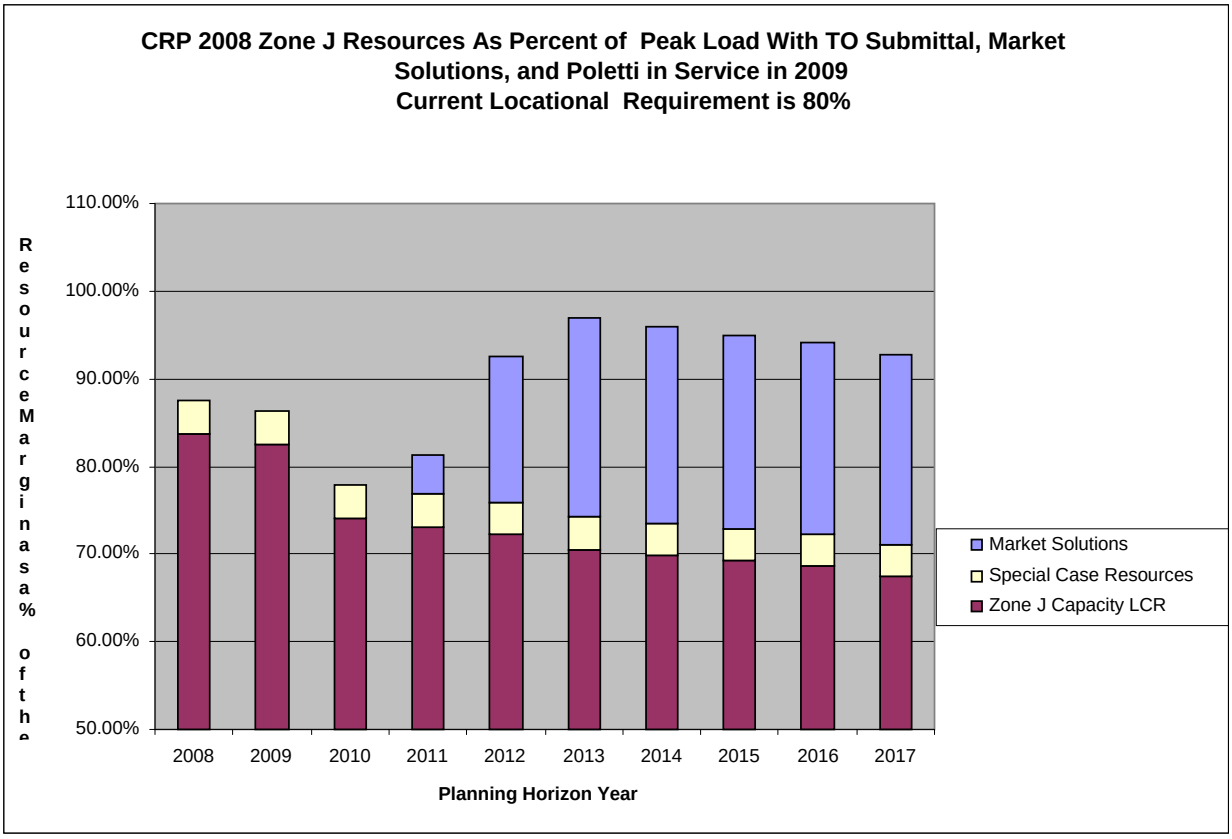

Figure 5.3.3-2: CRP 2007 Zone J Resources As Percent of Zone J Peak Load With TO Submittal, Poletti In-service In 2009 and Market Solutions

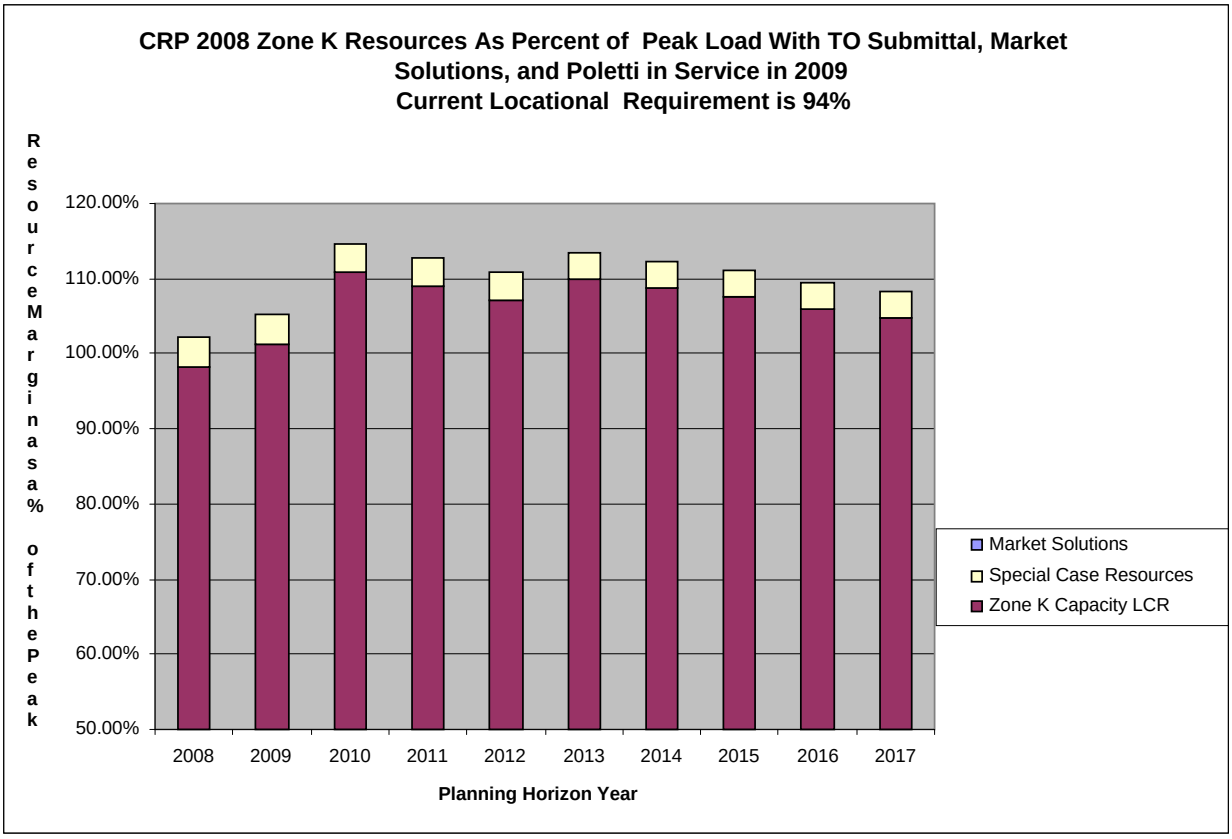

Figure 5.3.3-3: CRP 2007 Zone K Resources As Percent of Zone K Peak Load With TO Submittal, and Market Solutions

5.4 **Alternative Regulated Responses**

The NYISO solicited request for alternative regulated responses to meet the Reliability Needs. As discussed previously, three alternative regulated responses were submitted. The responses consisted of one generation proposal, and two transmission proposals. An in-depth review of each of the proposals was not undertaken at this time because, as noted above, the NYISO determined that none of these alternatives are required as there are sufficient Market Solutions.

5.4.1 Regulated Generation Alternative

This alternative regulated solution was submitted by Mirant New York. Mirant is proposing to construct a new 540 MW combined cycle facility located at the Lovett site by the year 2012.

Table 5.4.1-a: Impact of New Lovett 540 MW Combined Cycle on NYCA LOLE[9]

	2013	2014	2015	2016	2017
Zone B (Upstate NY)	0.06	0.09	0.15	0.22	0.31
Zone E (Upstate NY)	0.02	0.03	0.06	0.10	0.15
Zone G (Hudson Valley or SENY)	0.00	0.00	0.00	0.00	0.00
Zone I (Hudson Valley or SENY)	0.08	0.12	0.20	0.31	0.41
Zone J (Hudson Valley or SENY)	0.09	0.14	0.22	0.34	0.44
Zone K (Long Island or SENY)	0.00	0.00	0.01	0.02	0.04
NYCA	0.10	0.14	0.23	0.36	0.46
NYCA Differences (W and W/O ARR)[2]	-0.07	-0.13	-0.19	-0.24	-0.26

5.4.2 Alternative Transmission Response

The alternative regulated solution was submitted by the New York Regional Interconnect (NYRI). The NYRI transmission proposal is to construct a new high voltage direct current ("HVDC") transmission line between the Edic Substation in the Town of Marcy, Oneida County, to the Rock Tavern Substation in the Town of New Windsor, Orange County. It is Project No. 96 in the NYISO interconnection queue.

Based on updated information and modeling, the NYISO had determined that there is no need to require a regulated backstop solution at this time. As a result, the alternative regulated transmission proposal was not evaluated as a specific alternative to regulated backstop solutions. Rather, this proposal was evaluated as a generic increase to transfer capability.

To evaluate the benefits of increased transfer capability associated with this transmission proposal, selected interfaces in the MARS model were increased to simulate the potential benefits of additional transmission capability.

Although this proposal would potentially increase the Zones E to G interface by 1,200 MW, there are simultaneous constraints that need to be recognized. To capture these simultaneous constraints, this project was evaluated using a reduced increase of only 1,000 MW for UPNY/SENY. The impact of this proposal on LOLE is presented in Table 5.4.2-a.

[9] Includes updated TO plans

Table 5.4.2-a: Impact NYRI Transmission Proposal on NYCA LOLE[10]

	2013	2014	2015	2016	2017
Zone B (Upstate NY)	0.11	0.17	0.27	0.40	0.49
Zone E (Upstate NY)	0.04	0.07	0.12	0.20	0.24
Zone G (Hudson Valley or SENY)	0.01	0.01	0.01	0.02	0.02
Zone I (Hudson Valley or SENY)	0.12	0.18	0.29	0.42	0.53
Zone J (Hudson Valley or SENY)	0.13	0.21	0.33	0.48	0.58
Zone K (Long Island or SENY)	0.00	0.01	0.01	0.03	0.05
NYCA	0.13	0.21	0.34	0.49	0.61
NYCA Differences (W and W/O ARR)	-0.04	-0.06	-0.08	-0.10	-0.12

5.4.3 National Grid Alternative Regulated Backstop Proposal

National Grid proposed to add transmission reinforcements to reinforce the underlying 115 kV system between Packard and Gardenville by creating a new 115 kV line. The proposal also adds three 75 Mvar 115 kV capacitor banks at Gardenville. This proposal was evaluated with the jointly submitted TO regulated backstop solution. This proposal greatly improves the performance of the local system in Zone A around the Gardenville substation but does not appreciably increase the transfer limits of the Dysinger East and West Central interfaces after the addition of the Zone B regulated backstop solution.

5.4.4 Assessment of the Alternative Regulated Responses

The above analysis indicates that all of the alternative regulated responses would improve reliability and satisfy some portion of the need.

The transmission alternative regulated solution would benefit resource adequacy only if there is additional capacity available to be delivered. Transmission projects also provide the flexibility to site additional resources in upstate New York, and can provide other benefits. For instance, the NYRI has included reactive power capability for the Rock Tavern terminal, which could provide additional reactive capability for the Lower Hudson Valley. The full impact of this transmission project was studied in the System Reliability Impact Study (SRIS), which is under review by the NYISO.

5.5 **Summary of Evaluation of Proposed Solutions**

In summary, the TO submittal will satisfy New York's reliability needs for the first five years of the Study Period. If the market responses remain on schedule as proposed, the NYCA would more than comply with the LOLE criterion throughout the 10-year Study Period. Given that the total capacity of the market solutions are nearly 1000 MW in excess of resource requirements, and the planned in-service dates are well in advance of

[10] ibid

need, reliability needs will still be met if a portion of the market solutions come into service later than presently planned. Consequently, neither a regulated backstop solution nor an alternative regulated response needs to be implemented at this time. Going forward, the NYISO will monitor the progress of proposed solutions in the next cycle of CRPP to determine that these planned resources will be available in a timely manner.

5.6 **Transmission System Short Circuit Assessment**

The NYISO updated the short circuit assessment in the 2008 RNA to include the TO solutions that were evaluated for this CRP. The methodology employed was the same as used for the RNA. It is described in the "NYISO Guideline for Fault Current Assessment," contained in Appendix B of the RNA supporting document. The fault current levels arising from the implementation of the updated TO plans were assessed and compared against the most recent Annual Transmission Reliability Assessment 2007 (ATRA) fault levels to determine if breakers would become over-dutied. The market solutions were evaluated in aggregate. Assumptions were made as to the exact locations for the solutions in the second five years of the Study Period. The exact location of solutions can greatly impact the fault levels calculated. Based on the locations assumed for the solutions, fault duties did not indicate over-dutied breakers in addition to those identified in the 2007 ATRA.

6 The 2008 Reliability Plan[11]

The NYISO OATT Attachment Y in Section 8 states that:

> Following the NYISO's evaluation of the proposed market-based and regulated solutions to Reliability Needs, the NYISO will prepare a draft Comprehensive Reliability Plan ("CRP"). The draft CRP shall set forth the NYISO's findings and recommendations; including any determination, that implementation of a regulated solution (which may be a Gap Solution) is necessary to maintain system reliability.

After Committee review and vote as described in Attachment Y of the OATT, the draft CRP will become final once approved by the NYISO Board of Directors.

The 2008 RNA determined that additional resources would be needed over the 10-year study period in order for the NYCA to comply with applicable reliability criteria[12]. As a result, the NYISO requested market-based, regulated backstop, and alternative regulated solutions to the reliability needs. The preference is to provide an opportunity for market solutions to meet the future needs with regulated backstops and alternative regulated solutions available, if needed.

The NYISO designated the Transmission Owners(TOs) responsible for developing regulated backstop solutions to address the reliability needs identified in the RNA. The Responsible Transmission Owners submitted two updated TO plans, one of which had the effect of meeting needs in the First Five Year Period. They also submitted regulated backstop solutions, which were sufficient to meet the identified reliability needs over the second five-year period in conjunction with the updated TO plans. In addition, a broad range of solutions, including market proposals, and alternative regulated responses were submitted. Based upon its evaluation of the Market Proposals and updated TO Plans, the NYISO has concluded that there are sufficient resource additions to the NYCA planned or under development to meet the identified Reliability Needs for the next 10 years. Accordingly, the NYISO has determined that no action needs to be taken at this time to implement any proposed regulated backstop solution or an alternative regulated solution to address the reliability needs identified in the 2008 RNA.

The plan consists of the following actions:

1. Deferring retirement of the New York Power Authority's Charles A. Poletti generating unit in New York City from 2009 until 2010. It is particularly important that the existing Poletti unit stay in-service until 2010 because the Consolidated Edison M29 transmission project will not be in-service until late 2010.

2. Implementing certain Responsible TO plans, which include transmission upgrades, such as the addition of capacitor banks at the Millwood Substation, firm capacity in

[11] All supporting databases and analysis utilized in developing this plan are available for inspection subject to confidentiality and critical energy infrastructure information requirements (CEII).

[12] Reliability needs are identified with respect to approved reliability criteria, including through MARS LOLE studies. These studies reflect capabilities of the NYCA transmission system with appropriate interface limits in the presence of thermal, voltage or stability constraints.

conjunction with granted UDRs, and the implementation of any planned non Bulk Power System plans.

3. Developing at least 2,350 MW of market-based resources from the 3,380 MW of the merchant generation, transmission and demand response projects that have been proposed for New York. Approximately 1,000 MW of these resources should be located in New York City or have unforced capacity delivery rights (UDRs) into New York City; 1,050 MW of resources in the Lower Hudson Valley; and the remaining 300 MW of additional resources in New York State as a whole, including Upstate New York. The NYISO has received market-based proposals for more than the minimum resources needed to meet resource adequacy criteria and transmission security criteria. The NYISO does not choose which of the market-based projects submitted to it will be built. Rather, it is up to the proponents to proceed with, and the relevant state siting and permitting agencies to approve, the specific resources that will be added in New York. The NYISO will continue to monitor and track on a quarterly basis the viability of these projects in accordance with established procedures and will report on its evaluation in the next CRP. As identified in section 5.3 of the 2008 RNA, there are other combinations of resources that would meet resource adequacy criteria on a statewide basis. The NYISO has instituted a tracking process for projects submitted in the CRP[13].

4. NERC Blackout Recommendation 7a, to the extent applicable, including a review of NERC's other blackout recommendations related to voltage, such as load modeling and generator performance, should be reviewed to identify additional factors not already implemented that could enhance or improve reliability through managing the voltage performance of New York's bulk power system – see 7.1.2 item 2 below.

5. In summary, based upon the solutions submitted to the NYISO, the resource additions required for the next 10 years total approximately 2,350 MW by year 2017, with phase in beginning in 2013, counting the updated TO plan submitted for the First Five Year Period.

[13] See NYISO Technical Bulletin 171, Subject: Monitoring Viability of Solutions to Meet Reliability Needs – NYISO Process

7 Findings, Actions, and Recommendation

This section will present the findings and recommendations of the NYISO in conducting the 2008 Reliability Needs Assessment an the preparation or the Comprehensive Reliability Plan.

7.1 **Findings, Actions Taken and Actions Required**

7.1.1 Finding Number One – Transmission Security and Adequacy

As in the two prior CRPs approved by the NYISO Board of Directors, it was necessary to reduce transfer limits for key NYCA transmission interfaces during the 10-year Study Period in order to maintain the security of the transmission system. The lower transfer limits were largely located in SENY and Western New York, and reduced the ability of the transmission system to deliver capacity downstream of the constraints as well as into the local area of the interfaces between the NYCA Zones. The result was an increase in the LOLE, which translates into increased resource requirements. The major factor driving the reduction in transfer limits was the voltage performance of the New York Transmission System, which is being adversely impacted by load growth and generator retirements.

However, the required transfer limit reductions identified in the 2008 CRPP were not as severe as in the prior studies because of system improvements incorporated into the baseline from the first and second CRP and updated TO plans, designed to improve the voltage performance of the system. The prior CRPs identified actions required to address transmission security and adequacy concerns. These concerns are still relevant to the 2008 CRP, and are reiterated herein along with a summary of the steps that have already been taken to address the required actions.

7.1.2 Prior CRP Recommended Actions

The prior CRPs identified and recommended actions that would be needed to undertaken in order to mitigate the impact of the expected degradation in the voltage performance of the New York transmission system. They were:

1. The determination of Reliability Needs for resource adequacy deficiencies should differentiate between the needs that are solely attributable to transmission system performance in the form of thermal, voltage, or stability constraints versus those that are attributable to an overall NYCA system-wide resource adequacy deficiency.
2. Continued progress on the part of a number of NYISO-related initiatives to address issues and concerns with the voltage performance of the bulk power system. They include:
   - Continuation of the initiative to complete a comprehensive reliability analysis of reactive power demand and resources in the NYCA.
   - Development of a work plan and time table for the Reactive Power Working Group (RPWG) to complete its initiative to improve

modeling of reactive power sinks and sources in the NYCA power system model.

- A benchmarking of New York's reactive power planning and voltage control practices to the "best practices" identified in NERC Blackout Recommendation 7a, to the extent applicable. A review of NERC's other blackout recommendations related to voltage, such as load modeling and generator performance, is recommended to identify additional factors that could enhance or improve reliability through managing the voltage performance of New York's bulk power system.

Actions Taken

Since the approval of the first CRP, the NYISO has taken the following actions:

1. To address the 2005 CRP recommended action 1 above, the resource adequacy needs for the 2007 RNA were evaluated to determine if they were solely attributable to transmission constraint(s) and/or attributable to an overall NYCA system wide resource adequacy deficiency. Based on this evaluation, the Responsible TOs were identified.

2. To address the initial CRP recommended action 2 above, the NYISO RPWG has continued to make progress on several initiatives it has underway. They include, but are not limited to the following:

   - A review of the NYISO Voltage Guidelines such as the adequacy of the five percent margin used to determine interface transfer limits above which voltage collapse potentially would occur.

   - A review of a number of the factors that impact the voltage performance of the power system. They include the load forecast, the modeling of system loads, and the testing of generator reactive capability, metering, load power factor, and a review of the tools that are used for power system simulation.

   These efforts are ongoing and the RPWG has been providing monthly reports to the Operating Committee regarding their progress. The reports have covered such topics as complex load modeling, survey of reactive power resources, metering needs, and power factor sensitivity testing. The NYISO supports and endorses the work of the RPWG.

7.1.3 Finding Number Two – Plan Risk Factors

Although the planned system meets reliability criteria based on the conditions studied, the NYISO has identified a number of risk factors that could adversely affect the plan. These factors will require ongoing review and assessment.

They are:

1. First and foremost, construction of planned resources and transmission upgrades should move forward on the schedules provided so that at least 2,350 MW of market-based resources from the 3,380 MW of the merchant generation,

transmission and DSM projects that have been proposed for New York are in service when needed. Approximately 1,000 MW of these resources should be located in New York City or have unforced capacity delivery rights (UDRs) into New York City; 1050 MW of resources in the Lower Hudson Valley; and the remaining 300 MW of additional resources in New York State as a whole, including Upstate New York. In accordance with criteria adopted by the NYISO Operating Committee, the NYISO will continue to monitor the progress of market-based transmission, capacity and DSM resource additions to determine their ongoing viability, and to determine whether regulated backstop solutions need to be "triggered." If solutions are not implemented on a timely basis, electric system reliability could be put at risk. Also, the absence of a "one-stop" siting process could impede the construction and operation of new generating facilities to meet Reliability Needs. New York State once had a streamlined siting process for large power plants, but that law (Article X of the New York Public Service Law) expired at the end of 2002. The NYISO should reflect the absence of an Article X process when evaluating the viability of project timelines.

Action Required

The Operating Committee has approved the criteria and process for monitoring all planned system additions that are identified as necessary to maintain reliability. The NYISO, as the responsible party for assessing the continued viability of solutions to meet the Reliability Needs in a timely manner, has established a comprehensive solution monitoring process. Technical Bulletin 171 augments the monitoring criteria in the CRPP Manual to include a more complete representative list of tracking metrics, to require solution updates on a quarterly basis, to modify the allowed grace period for overdue update responses from proposers of solutions, and to include independent status verifications on critical path activities by the NYISO through office and site visits. In accordance with the provisions of Attachment Y and the CRPP Manual, the NYISO process also includes an independent analysis of project schedules submitted by the Transmission Owners in determination of the Benchmark trigger dates associated with their proposed regulated backstop

Finally, The New York State Legislature should reenact a comprehensive siting process for major electric generating facilities in Article X of the Public Service Law.

2. Further delay in the implementation of the Con Edison M29 facility beyond summer 2011 could cause resource adequacy problems in New York City for 2011 when combined with the retirement of the existing Poletti unit on January 31, 2010. The M29 facility will be needed to meet bulk power system reliability criteria beyond the retirement of the existing Poletti unit, absent other system improvements or additions.

Action Required

Con Edison should continue with the development of the M29 facility on schedule and immediately inform the NYISO of any further delays. The NYISO will continue to monitor the progress of the M29 facility in its quarterly monitoring of the progress of TO plans.

3. The planned generator additions in this plan will be natural gas fired units with Number 2 fuel oil or kerosene as the back up fuel.

Action Required

The fuel diversity of the power supply system and its overall impact on fuel availability, reliability and prices needs to be monitored on a continuous basis. The NYISO will also monitor changes to the fuel supply infrastructure, such as new fuel gas pipelines and liquefied natural gas facilities.

4. The plan depends increasingly on the availability of capacity resources in neighboring control areas delivered as UDRs for New York to maintain its compliance with reliability criteria.

Action Required

The Northeast Coordinated System Plan, which is specified in the Northeast Planning Protocol, will need to assess whether sufficient resources are being developed on a regional basis to maintain resource adequacy in all areas. As capacity markets become increasingly more regional in nature, New York will need to monitor its capacity markets to determine that they remain competitive and attract sufficient investment to maintain reliability. The NYISO's neighboring control areas, ISO-New England and PJM, have implemented multi-year forward capacity markets. The NYISO will also review its capacity market structures to determine whether forward capacity markets longer than one year should be implemented to encourage resource additions in New York. This examination is already proceeding in the NYISO's Installed Capacity Working Group (ICAPWG), and should continue.

5. The proponents of market-based generation and transmission solutions stated that their viability may depend upon entry into long-term contracts for the sale of their output in combination with spot market sales.

Action Required

Section 8.2 of Attachment Y of the OATT states that, concurrently with submission for Board Review, "the draft CRP will also be provided to the Independent Market Advisor for his review." The Independent Market Advisor will review whether market rule changes are necessary to address and identify failure in one or more of the NYISO competitive markets. (OATT Attachment Y, Section 5.2). As stated in Item 3 above, the NYISO should continue examining

whether forward capacity markets longer than one year should be implemented in New York to encourage investment in new infrastructure resources. In addition, the NYISO will continue monitoring and participate in the PSC's Energy Resource Planning (ERP) proceeding.

6. Retirement of additional generating units beyond those already included in the plan for either economic and/or environmental factors, or continued degradation of the voltage performance of the New York bulk power system would adversely affect the reliability of the NYCA beyond what has been identified in CRP2008.

Action Required

The next round of the CRPP should progress on schedule. A draft 2009 RNA Assessment is due to be completed in September 2008. Just as important as the plan itself is the process of planning and the ongoing monitoring it provides. Emphasis should be placed on thoroughly identifying and addressing environmental factors that may lead to additional generating unit retirements.

The two environmental initiatives, one of which is designed to reduce ozone precursor emissions of NOx and the other designed to reduce CO2 emissions, are currently being considered by environmental regulators in New York and the Northeast. Both of these initiatives have been planned to be implemented in 2009. The NYISO analysis of impacts of NYSDEC's initial proposal to regulate NOx emissions from low capacity factor units, known as HEDD units, shows that reliability criteria would be violated in 2009. There are indications that the DEC will not seek targeted reductions from specified HEDD units, but will seek to promulgate additional NOx Reasonably Available Control Technology (RACT) requirements. The NYISO will evaluate the proposal, when made, to determine its impact on this plan and bulk power system reliability generally. Additional time and broader range of approaches will be required to develop a regulatory strategy that simultaneously achieves the necessary NOx reductions while satisfying reliability criteria. The NYISO analysis of the implementation of RGGI identified the need for a minimum number of CO2 Allowances to be available to New York generators in order to satisfy reliability criteria. In the event that either regulatory actions or allowance market activity restrict the liquid supply of allowances to less than the identified minimum, then reliability criteria may be violated.

In addition to continue to analyze the reliability impacts of these regulatory initiatives, the NYISO will undertake the following actions as well:

- To achieve compliance with the ozone standard through the reduction of NOx emissions from power plants, the NYISO will support the development of a broader range of regulatory initiatives to achieve these reductions. The USEPA recently established a new standard for ozone at 75 ppb which will significantly increase the magnitude of the challenge ahead.

- The NYISO will continue to monitor the development of the RGGI program with particular focus on allowance auction design and implementation and development of an effective allowance market monitoring program. The NYISO will also need to incorporate allowance prices in its planning and market monitoring processes.

7. New York's initiative to reduce demand. New York's Governor announced a goal to reduce New York's energy consumption by 15% of forecasted levels by 2015. The PSC has commenced a proceeding to examine implementation an Energy Efficiency Portfolio Standards (EEPS) to achieve these reductions in energy usage. Implementation of this initiative would also affect the State's future capacity needs. Also, the impact of NYSERDA sponsored programs on load demand and resource additions need to be monitored and factored into the reliability assessments.

   Action Required

   The PSC proceeding should continue to be undertaken in coordination with the NYISO's planning processes and be based upon consistent data inputs and analytical models and methodologies. The NYISO has and will continue to actively participate in the PSC's EEPS proceeding by providing technical expertise on load forecasting, establishing energy savings goals, and measurement and verification of energy and related demand savings.

7.2 Recommendation

This 2008 CRP has determined that under the conditions studied, the market-based solutions submitted and the Responsible TO Updated Plans, the proposed system upgrades will maintain the reliability of the New York bulk power system without the need for regulated backstop or alternative regulated solutions at this time. Therefore, the NYISO Staff recommends that the Operating Committee and the Management Committee recommend that the Board of Directors approve the 2008 CRP.

Appendix A

Appendix B

Appendix C