The Comprehensive Reliability Plan 2005: A Long-term Reliability Assessment of New York's Power System

Fifth Draft

August 1, 2006

Table of Contents

Executive Summary

The introduction of competition in the electric industry in New York State, and in many parts of the Northeast separated the costs of utilities' services into distinct producers and marketers, and led to the unbundling of power generation and transmission development. As a result, the State's electric utilities no longer conduct vertically-integrated planning through which generation and transmission plans were tightly coordinated.

In today's world, the future reliability of the bulk power system depends on a combination of additional resources, provided in response to market forces and by electric utility companies, which continue to deliver electricity to customers and have the obligation to provide safe and reliable services. To maintain the system's long-term reliability, those resources must be readily available or in development to meet future needs.

With these goals in mind, the NYISO, in conjunction with stakeholders, developed and implemented its Comprehensive Reliability Planning Process (CRPP), which is contained in Attachment Y of the NYISO's Open Access Transmission Tariff (OATT). The NYISO's Comprehensive Reliability Planning Process (CRPP) is an annual, ongoing process – developed with NYISO stakeholders – to assess and establish the grid's reliability needs and solutions to maintain that New York's lights stay on and continue to shine brightly. This document represents the first in a series of yearly Comprehensive Reliability Plans (CRP) to address the long-term reliability of New York's bulk power system. Electric system planning is a never-ending process of evaluating, monitoring and updating, which makes the annual publication of the CRPP invaluable. In addition to addressing reliability issues, the CRPP offers valuable information to the state's wholesale electricity marketplace.

In December 2005, the New York State Independent System Operator took the first steps toward determining the long-term reliability of New York State's electric grid with the groundbreaking Reliability Needs Assessment (RNA). Now, the NYISO has issued the first Comprehensive Reliability Plan (CRP). The CRP 2005 is a milestone study that identifies, analyzes and outlines solutions to meet the state's power needs and affirm the integrity of New York's bulk power grid over a 10-year span, from 2006 to 2015. Below is a summary of the CRP reliability plan and the reports primary findings and recommendation. Supporting details are contained in the body of the report.

The Reliability Plan – A Summary

The Reliability Needs Assessment (RNA) determined that additional resources would be needed over the 10-year study period in order for the New York Control Area (NYCA) to comply with all applicable reliability criteria. As a result, the NYISO initiated a request for solutions. The Market Participants responded with a broad range of solutions including the Transmission Owners' (TO) Updated Plans, Market Proposals and Alternative Regulated Responses. Based on the evaluations of the Market Proposals, Responsible TO Updated Plans, modeling refinements, and continued operation of the Poletti unit, the NYISO has determined sufficient resource additions to the NYCA are planned or under development such that the NYCA can meet reliability criteria for the first five years and through four of the second five years of the Study Period. In order to meet criteria for the last year of the study period, additional Market Proposal or Regulated Solutions will be needed. Given that this need is sufficiently far in the future and

the next round of CRPP has already begun, the NYISO has determined that no action needs to be taken at this time to implement a regulated backstop solution or alternative regulated solution to address this reliability need.

The plan consists of the following actions:

1. The deferred retirement of the New York Power Authority's Charles A Poletti generating unit in New York City from 2008 until 2009.
2. The implementation of the Responsible Transmission Owner plans, which include transmission additions and upgrades, reactive resource additions, capacity additions totaling 466 Megawatts (MW), capacity equivalent Unforced Deliverability Rights (UDRs) totaling 990 MW supported by generation in neighboring control areas, and demand-side management (DSM) programs totaling 449 MW. These solutions result in total resource additions of 1,905 MW through 2010.
3. The development of 1,200 MW of merchant generation projects in New York City and Long Island, in particular, the 950 MW proposed for New York City. It is important that this generation be in service as scheduled but no later than the summer of 2011.
4. Planned resource additions as noted in 2 and 3 above, total 3,105 MW by 2015.

Findings, Conclusion and Recommendation

Finding Number One – Transmission Security and Adequacy:

The criteria used to establish the baseline for the 10-year Study Period resulted in a significant reduction in transfer limits in order to maintain the security of the transmission system. The lower transfer limits reduced the ability of the transmission system to deliver capacity downstream of the constraints. The result was an increase in the Loss of Load Expectation (LOLE) that translated 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 impacted by load growth and generator retirements.

Action Required: The primary lesson learned from this finding is that the criteria and process for establishing the baseline for the first five years of the study period need to be reviewed. In particular, analysis is needed of how reductions in the baseline system transfer limits that result from more limiting transmission security constraints are going to be addressed in determining reliability needs.

A secondary action item is to re-emphasize the importance of 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 and the non-bulk system to the extent that it affects the bulk power system. They include:

1. Continuation of the initiative to complete a comprehensive reliability analysis of reactive power demand and resources in the NYCA.
2. Development of a work plan and time table for the Reactive Power Working Group to complete its initiative to improve modeling of reactive power sinks and sources in the NYCA power system model.
3. 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 factors that could enhance or improve the voltage performance of the New York's transmission system, from the reliability perspective.

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 is that the construction of the planned resources and transmission upgrades moves forward on the schedules provided. The NYISO, with its stakeholders, is developing criteria and procedures to monitor the ongoing viability of solutions and the need to determine when solutions need to be "triggered". If solutions were 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.

   Action required: The monitoring processes for tracking all planned system additions that are identified as necessary to maintain reliability are currently under development by the Electric System Planning Working Group (ESPWG) must be finalized, approved and implemented by September 2006. The New York State Legislature should reenact Article X of the Public Service Law.

2. Except for the 140 MW of off-shore wind[1] off Long Island all the planned generator additions in this plan will be natural gas fired units with Number 2 fuel oil or kerosene as the back up.

   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.

3. The plan depends increasingly on the availability of capacity resources in neighboring control areas in order 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.

4. No transmission solutions were submitted as market solutions. The proponents of market-based generation solutions also stated that their

[1] While not part of this plan, New York State has a significant initiative to site additional renewable resources. See New York Public Service Commission Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retain Renewable Portfolio Standard, Order Regarding Retain Renewable Portfolio Standard (September 24, 2004).

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 states that, concurrently with submission for Board Review, "the draft CRP will also be provided to the Independent Market Adviser for his review." The Independent Market Advisor should review if market rule changes are necessary to address and identify failure, if any, in one of the NYISO competitive markets. (NYISO OATT, Attachment Y, Section 5.2).

5. Increased load growth[2] or retirement of additional generating units beyond those already included in the plan for either economic and/or environmental factors, as well as continued degradation of the voltage performance of the New York System, would adversely affect reliability.

   Action Required: The next round of the CRPP process needs to progress on schedule. 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.

Recommendation

This CRP has determined that under the conditions studied, the solutions submitted and the Responsible TO Updated Plans, the proposed system upgrades will maintain the reliability of the New York power system without the need for regulated backstop or alternative regulated solutions at this time. Therefore, the NYISO Staff recommends that the CRP 2005 be approved.

[2] For instance, the 2005 CRP resource and transmission additions will maintain criteria under an expected NYCA peak load forecast of 34,200 MW for 2010 while the 2006 CRP resources will need to meet an expected peak load 35,042 MW or approximately 840 MW of additional load.

I. Introduction

The introduction of competition in the electric industry in New York State, and in many parts of the Northeast separated the costs of utilities' services into distinct products and markets, and led to the unbundling of power generation and transmission development. As a result, the State's electric utilities no longer conduct vertically-integrated planning through which generation and transmission plans were tightly coordinated.

In today's world, the future reliability of the bulk power system depends on a combination of additional resources, provided in response to market forces and by regulated electric utility companies, which continue to deliver electricity to customers and have the obligation to provide safe and reliable services. To maintain the system's long-term reliability, those resources must be readily available or in development to meet future needs.

With these goals in mind, the NYISO, in conjunction with stakeholders, developed and implemented its Comprehensive Reliability Planning Process (CRPP), which was approved by the Federal Energy Regulatory Commission (FERC) in December 2004 and is contained in Attachment Y of the NYISO's OATT. This document represents the first in a series of yearly CRPP studies to address the long-term reliability of New York's bulk power system.

Electric system planning is a never-ending process of evaluating, monitoring and updating, which makes the annual publication of the CRPP invaluable. In addition to addressing reliability issues, the CRPP offers valuable information to the state's wholesale electricity marketplace.

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 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 RNA was issued in December 2005.

The second step is the development of the Comprehensive Reliability Plan (CRP), which identifies and evaluates 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 improved demand response programs.

This is the first CRP study produced by the NYISO and its stakeholders. The primary objective of the CRP is to present the results of the planning process. As this is the first time through the process and many of the CRPP criteria and procedure documents are still under development, a secondary objective was to identify issues that resulted from implementing the process.

This report begins with an overview of the CRPP followed by a summary of the RNA report. The balance of the document describes the request for solutions, assesses transmission system security and adequacy, and evaluates the proposed solutions. The CRP concludes with a summary of the reliability plan including findings, actions required, and a recommendation that this report be approved by the NYISO's Governance Committees and Board of Directors.

II. The Comprehensive Reliability Planning Process[3]

The following presents an overview of the CRPP, the reliability policies and criteria which are the foundation of the CRPP, and the analysis methodology used.

Overview 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 five-year and 10-year planning horizons. The reliability of the bulk power system is assessed and solutions to reliability needs evaluated in accordance with existing reliability criteria of the NERC, NPCC, and NYSRC as they may change from time to time. This process is anchored in the NYISO's market-based philosophy, which posits that market solutions should be 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 TO[4] to proceed with a regulated backstop solution in order to maintain reliability. Market participants can offer and promote alternative regulated solutions which, if determined by NYISO to help satisfy the identified reliability needs and by regulators to be more desirable, may displace some or all of the Transmission Owner's regulated backstop solutions. Under the CRPP, the NYISO also has an affirmative obligation to report historic congestion on the transmission system and whether the marketplace is responding appropriately to the reliability needs of the bulk power system. If market failure is identified as the reason for the lack of market-based solutions, the NYISO will explore appropriate changes in its market rules with its stakeholders. The CRPP does not substitute for the planning that each Transmission Owner conducts to maintain the reliability of its own bulk and non-bulk power systems.

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 with respect to either resource adequacy or transmission system reliability. A base case model of the electric system is assembled with inputs from stakeholders to determine the reliability needs of the electric system for a five-year period and for a 10-year period. This base case model includes plans that transmission owners have made to address the reliability needs of their own bulk and non-bulk power systems. Following the review of the RNA by the NYISO committees and final approval by the NYISO Board, the NYISO requests solutions from the marketplace to the reliability needs identified in the RNA. The RNA also identifies the Responsible TO or TOs that are obligated to prepare regulated backstop solutions for each identified need. The regulated backstop solutions also will serve as the benchmark to establish the timeframes for a market-based solution to appear. Both market-based and regulated solutions are open to all resources: transmission, generation, and demand response. Non-transmission owner developers, as well as TOs who have not been designated as a Responsible TO, also have the ability to submit proposals for regulated solutions to serve as an alternative to the regulated backstop solutions provided by the

[3] A more detailed review of the CRPP is provided in the report entitled: "Comprehensive Reliability Planning Process Supporting Document and Appendices for the Draft Reliability Needs Assessment" dated December 21, 2005 and available on the NYISO web site home page.

[4] Responsible TO: The Transmission Owner or Transmission Owners designated by the NYISO, pursuant to the NYISO Planning Process, to prepare a proposal for a regulated solution to a Reliability Need or to proceed with a regulated solution to a Reliability Need. The Responsible TO will normally be the Transmission Owner in whose Transmission District the NYISO identifies a Reliability Need.

responsible transmission owners. The NYISO has the responsibility to evaluate 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.

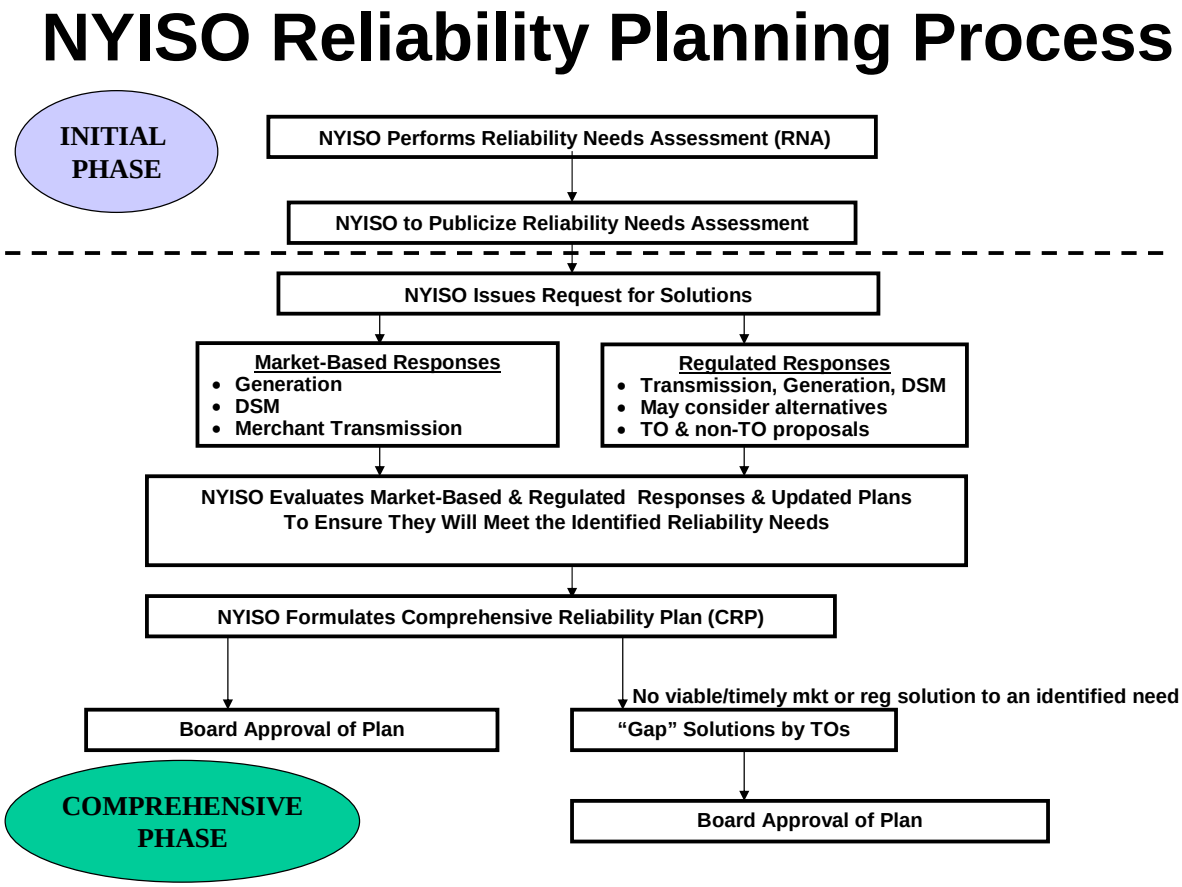
Following its evaluation of all proposed solutions (including alternative regulated solutions), the NYISO prepares its Comprehensive Reliability Plan. The CRP identifies all proposed solutions that the NYISO has found will meet part or all of the identified reliability needs. If there is a viable market-based project that will meet the identified need in a timely manner, the CRP will so state. If there is no viable market-based proposal and the NYISO determines that a regulated backstop solution must be implemented to maintain bulk power system reliability, the CRP will so state. If a regulated backstop project must proceed, the NYISO will request the Responsible TO or TOs to proceed with regulatory approval and development of its regulated backstop solution.

There is also a provision that will allow the NYISO Board to deal with the sudden 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 to develop a "gap solution" and to pursue its completion and alert the New York Public Service Commission. Such a gap solution shall be designed to be a temporary solution and to strive to be compatible with permanent market-based proposals and regulated projects.

Developers of market solutions are expected to recover their costs from the NYISO's energy, capacity and ancillary services markets. Market based solutions may also obtain revenues from other private contracting arrangements. The costs of implementing regulated backstop solutions, including gap solutions and a developer's alternative regulated solution, are recovered through the NYISO's tariffs with the costs of such solutions ultimately filed with the FERC for approval. Transmission Owner updated plans (Updated Plans) do not constitute regulated backstop solutions or alternative regulated solutions, and their costs are not recoverable under the CRP provisions of the NYISO tariff.

The NYISO does not itself build projects to respond to reliability needs, and the ultimate approval of those projects lies with regulatory agencies such as the FERC, NYPSC, environmental permitting agencies and local governments. The NYISO monitors the progress and continued viability of proposed market and regulated projects to meet identified needs, and reports its findings in annual plans.

Below is a diagram summarizing the process.



Overview of Reliability Policies and Criteria

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 is 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 concept that involves an analysis of the probability of future conditions and events. A system is adequate if the probability of having insufficient 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 an LOLE[5] that 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. This requirement forms the basis of New York's installed capacity or resource adequacy requirement.

Security is an operating and deterministic concept. This means that possible events are identified as having significant adverse reliability consequences and the 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-1 or N-2. 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.

Overview of the CRPP Analysis Methodology

The Comprehensive Reliability Planning Process (CRPP) was performed in three steps: an Input Step, an Analysis Step, and a Review Step. During the Input Step, information was gathered from various stakeholder groups, Neighboring Control Areas, existing reliability assessments, and existing NYISO publications and reports. The Analysis and Review steps were conducted by conducting a transmission screening analysis which was followed by a resource adequacy assessment. These steps were conducted in a sequential and iterative process to maintain internal consistency between the two steps.

The primary tool to conduct the transmission screening is the Power System Simulator for Engineering (PSS/E) software used for electrical transmission planning in conjunction with the NYISO's voltage contingency analysis program (VCAP). PSS/E is a commercial software product offered by Siemens PTI and is currently in use in 123 Countries. Since its introduction in 1976, the PSS/E software has become one of the most comprehensive and widely used commercial programs of its type. The VCAP tool was originally developed by the New York Power Pool.

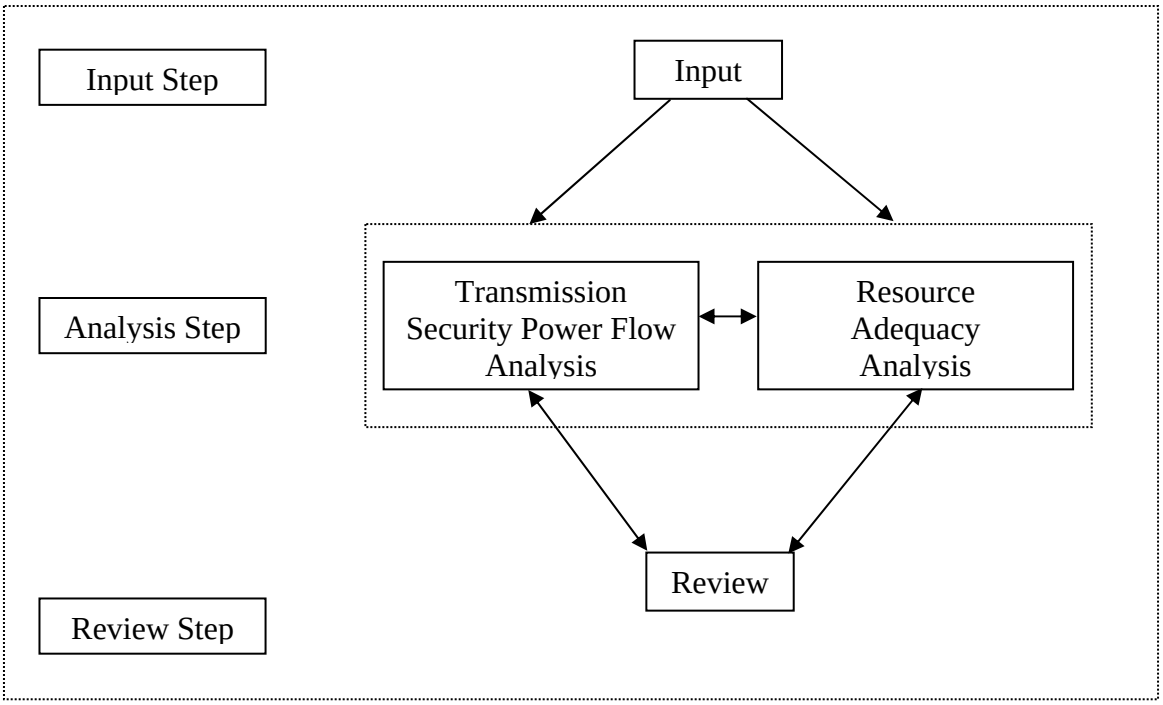
The primary tool to conduct the resource adequacy assessment is GE Energy's Multi-Area Reliability Simulation program (MARS). MARS uses a Monte Carlo simulation to compute the reliability of a generation system comprised of any number of interconnected areas or zones. MARS is able to reflect in its reliability calculations each of the factors listed in NYSRC Reliability Rule AR-1[6], including the impacts of the transfer capability of the transmission system.

[5] There are several reliability indices used in the industry to measure or evaluate resource adequacy such as Daily LOLE (days per year), Hourly LOLE (hours per year), LOEE (loss of energy), frequency (outages per year), duration (hours per outage), etc. NPCC and the NYSRC have adopted the daily loss of load expectation or LOLE as its criterion. It is defined as the expected number of days in a year in which the daily peak load will exceed the available resources. The design standard or reliability criterion is an LOLE of 0.1 days per year.

[6] NYSRC Reliability Rule AR-1 states that: "The NYSRC shall establish the IRM requirement for the NYCA such that the probability (or risk) of disconnecting any firm load due to resource deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation (LOLE) of disconnecting firm load due to resource deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring control areas, NYS Transmission System transfer capability, and capacity and/or load relief from available operating procedures."

The result of combining these tools in a sequential and iterative manner is a planning process that simultaneously addresses the "physics" or electrical properties of the grid and how changes in power system transfer capability interacts with a probabilistic resource adequacy assessment. To the best of the NYISO's knowledge, this is the first electric system reliability planning process that attempts to do this in such a comprehensive an integrated way while giving preference for market based solutions. The diagram below summarizes the CRP analysis process.

Flow Diagram for the CRP Analysis Process



III. Reliability Needs Assessment (RNA)

RNA - The Basics:

The preparation of the RNA is the first step in the Comprehensive Reliability Planning Process that leads to development of the CRP. Prepared annually, the RNA evaluates the reliability of the New York Power System for a 10-year Study Period. It identifies the needs of the baseline bulk power system to maintain reliability based on system adequacy and security criteria. The Study Period for the 2005 RNA spanned 2006 to 2015. The tariff specifies that the 10-year Study Period consists of two separate five year periods. The first five years of the Study Period is identified in the tariff as the Five Year Base Case and is defined as "the model representing the New York State Power System over the first five years of the Study Period". The remaining five years of the Study Period is identified in the tariff as the second five years and is not specifically defined. The baseline system is modeled in the RNA study as the existing system together with changes that have a high probability of occurring over the 10-year Study Period. This base case is developed from inputs and criteria developed in conjunction with stakeholders, including the plans the Transmission Owners already have to implement new resources, such as transmission upgrades and additions and demand side response programs.

The tariff provides that the RNA is drafted by the NYISO Staff with assistance from its consultants and Market Participants. The Electric System Planning Working Group (ESPWG) and the Transmission Planning Advisory Subcommittee (TPAS) jointly review the draft RNA and recommend when the draft should be sent to the NYISO Committees for Review. The tariff states that the Operating Committee reviews and votes on the draft RNA, and thereafter the draft is provided to the Management Committee for its review and vote. Minority views, if any, are presented with the RNA to the NYISO's Board of Directors. The Board then reviews and approves the RNA, either as presented, with its own changes, or after further revision by the NYISO's Committees. Final approval of the RNA triggers the next step in the Reliability Planning Process, which is a request for solutions to the reliability needs identified in the RNA.

RNA – Summary of Findings:

The first RNA[7] was approved by the NYISO's Board of Directors on December 21, 2005. In its groundbreaking RNA the NYISO pointed out potential power generation and transmission trouble spots statewide. The needs identified in the RNA for the first five years were primarily located downstate, from the lower Hudson Valley through New York City and on Long Island. The RNA also identified the Transmission Owners (TOs) in those areas as the responsible TOs. They are Central Hudson Gas and Electric Corporation, Orange and Rockland Utilities, Inc., Consolidated Edison Company of New York, Inc., and the Long Island Power Authority. Subsequent to the completion of and approval of the RNA, a database and software logic error in the resource adequacy tool was found that understated the use of emergency-operating-procedures. The result of the errors was an overstatement of the LOLE and, consequently, the overall needs. The impact of the error is quantified below (see RNA Update below). The impact of the error did not change materially the overall findings for the NYCA but did have an impact

[7] The RNA report is entitled: "Comprehensive Reliability Planning Process (CRPP) Reliability Needs Assessment," dated December 21, 2005, and is available on the NYISO web site home page, www.nyiso.com.

on the Long Island LOLE (see RNA Update below). The modeling updates were accounted for in the NYISO's evaluation of proposed reliability solutions.

The RNA determined that transmission and generation resources should be adequate to maintain reliable service on the bulk power system through 2007. But, according to the study, the New York State bulk power baseline system does not meet reliability criteria for the full five-year period, and in order to maintain reliability, additional resources would be needed by 2008.

The RNA results in a Loss of Load Expectation (LOLE) – *i.e.*, the bulk power system should be designed and operated such that the expected loss of load is no more than one occurrence in ten years - for the first Five Year Base Case the LOLE criterion is exceeded by 2008. The LOLE and the resources required to meet the LOLE criterion increased with each year of the study period beyond 2008. For the second five year period, the LOLE for the NYCA continues to increase reaching almost five days per year by 2015. The report highlighted the following areas of concern:

- The RNA identified transfer limit reductions into and through southeastern New York because of diminishing system voltage performance (for example, the transfer capability from the cable interface into New York City declined from 3700 Mw to 2200[8] Mw). This diminished capacity is due primarily to these factors: (i) load growth in the lower Hudson Valley, (ii) the planned retirement of certain generating units in the lower Hudson Valley, (iii) increased MegaVar (MVAr) losses resulting from NYCA network changes and the transportation of power over greater distances and (iv) changes in the neighboring systems.

- Beginning in 2008, the lower Hudson Valley and areas south will need system reinforcements equivalent to 500 MW of capacity, which could consist of transmission system reinforcements, additional generation, demand side management, or a combination of the three.

- Even if voltage constraints on transfer capability are resolved, the Southeastern New York area will require 1,250 MW of electric capacity resources by the end of 2010 and 2,250 MW of new resources by 2015. This capacity may also come from generation, transmission system reinforcements, demand-side management, or a combination of the three.

- Although the RNA noted that some projects are under construction (the Long Island Power Authority's 660 MW Neptune project, the now-completed 500 MW SCS Astoria Energy and New York Power Authority 500 MW projects), these projects will be offset by planned generation retirements and an expected demand increase. Demand – or load growth – is forecast to increase an average rate of 1.6 percent yearly in southeastern New York. Statewide, load is forecast to grow at an average rate of 1.2 percent per year.

[8] During the evaluation of the solutions this transfer capability was restored to 3,500 MW. The improvement in transfer capability was the result of modeling updates that were made (approximately a 300-400 MW improvement in transfer capability) with the balance (approximately 1,100 – 1,200 MW improvement in transfer capability) resulting from system upgrades such as the M29 transmission project, which was originally evaluated as an RNA sensitivity.

- The above conclusions would be exacerbated by any additional plant retirements, especially in SENY.

RNA – An Update:

Subsequent to the approval of the RNA, a modeling error was found in the resource adequacy assessment analysis tool database and software logic. The error resulted in some overstatement of the LOLE and the overall needs requirements. Nonetheless, the fundamental finding of the RNA – *i.e.*, additional resources are needed to maintain the reliability of the bulk power system beginning in 2008, and the need for new resources increases throughout the 10-year Study Period – remains unchanged.

Using the corrected model and no other modeling updates, the 2008 LOLE dropped to 0.309 days per year from 0.395 days per year; and in 2010, it fell to 2.154 days per year from 2.429 days per year. Although the LOLE criteria is determined on a NYCA-wide basis, the operating reserve modeling error had the greatest impact on the Long Island LOLE which dropped from above 0.1 days per year to below 0.1 days per year. Therefore, based upon the limited modeling updates, there were no apparent needs identified for Long Island during the study period. The IRM error and other modeling adjustments reduced the needs in the original RNA. Modeling updates and the corrected model were used in the evaluation of the reliability solutions provided to the NYISO.

IV. **Request for Solutions**

The CRP will list market-based solutions and regulated backstop solutions offered by the Responsible TOs, as well as alternative regulated solutions to satisfy the RNA's outlined reliability needs. Proposals can be large or small generation projects – including distributed generation – demand-side programs, transmission projects, market rule changes, operating procedure changes, and other actions to answer outstanding RNA issues. Market solutions are preferred, but the TOs named in the RNA are responsible for submitting backstop solutions to meet the identified needs.

The needs outlined in the RNA for 2006 through 2010 are located downstate, from the lower Hudson Valley through New York City. Four TOs – Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc., the Long Island Power Authority and Orange and Rockland Utilities, Inc. – have been identified as TOs responsible for addressing the reliability concerns in the RNA.

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 Dec. 22, 2005. It also requested that the Responsible TOs submit regulated backstop solutions to the identified Reliability Needs by February 15, 2006. The NYISO also requested that Market Participants (MPs) and other stakeholders submit market-based responses to the NYISO by that date.

If the market-based responses received by the NYISO do not fulfill all of the RNA's identified reliability needs, the NYISO shall solicit alternative regulated responses. Developers and TOs (including those other than the Responsible TOs) may submit alternative regulated responses. Like market-based solutions and regulated backstop solutions, these proposals may consist of transmission, generation or demand-side projects.

On March 1, 2006, the NYISO made a preliminary determination that the solutions it had received did not fulfill the Reliability Needs for the entire 10-year Study Period. Accordingly, the NYISO requested alternative regulated solutions on that date, and set April 17, 2006 as the deadline for submittal.

Market-based solutions primarily differ from regulated backstop and alternative regulated responses because their costs are not assured recovery through the NYISO's tariffs. Market-based project developers obtain revenues through the NYISO's energy and capacity markets, ancillary services sales, and bi-lateral contracting arrangements. All regulated solutions, once selected and triggered, recover their costs either though the NYISO tariff or in accordance with the provisions of the New York Public Service Law.

The following timeline represents the milestones in the NYISO's process for requesting solutions to the Reliability Needs:

December 21, 2005	RNA approved by the NYISO Board of Directors and issued by the NYISO.
December 22, 2005	NYISO issues formal request for Regulated Backstop Solutions and Market Solutions to be submitted by February 15, 2006.
February 15, 2006	The TOs submitted Updated Plans. Three market solutions were received; all of which were generation proposals.
March 1, 2006	The NYISO made a preliminary determination that the solutions received did not meet Reliability Needs through entire 10-year period. Alternative Regulated Solutions requested by the NYISO.
April 17, 2006	Deadline for Alternative Regulated Solutions to be submitted to the NYISO.
April 17, 2006	Four Alternative Regulated Solutions received one generation proposal and three transmission proposals.

Responsible Transmission Owner Solutions

First Five Year Base Case – 2006 to 2010

Many of the solutions provided by the TOs were previously undertaken by them well in advance of the completion of the CRP and were offered as updates to the Base Case. The projects develop new transmission and generation, implement transmission system upgrades and additions, and include other programs to meet the TOs' systems reliability needs. These additional plans did not make the cutoff for inclusion in the NYISO's Five Year Base Case or were not reflected in the NYISO Five Year Base Case. The TO's informed the NYISO that they intend to complete the following projects:

- Demand side management commitments already made and approved in a New York State Public Service Commission rate case;
- Transmission system projects already under construction (including the addition of capacitor banks for reactive power support); and
- New generators, including the Caithness combined cycle unit and the FPL off-shore wind project under contract to the Long Island Power Authority (LIPA).

This Table 5.1 summarizes the solutions provided by the Responsible TOs for the first Five Year Base Case.

Table 5.1
Summary of Transmission Owner Updated Plans and Solutions

Updated Plans [1]	Regulated Backstop Solutions [3]
• Demand-Side Management o 340 MW In Zone J ▪ Peak reduction 75 MW ▪ Balance is Special Case Resources ▪ 120 MW by 2009 ▪ 340 MW by 2010 o LIPA "Edge" Program 109 MW	• Central Hudson Capacitor Banks o Two 50 MVAr Cap Banks o CH 115 kV o Planned for 2009 and 2010
• Transmission o Con Edison's Sprainbrook to Sherman Creek due in service in 2008 ▪ 345 kV cable M29 Project o LIPA's Neptune and CSC projects treated as UDRs[2]	
• Generation (Zone K 2009) o Caithness 326 MW o Off-Shore Wind 140 MW	
• Cap Banks o LIPA 746 MVARS o O&R 180 MVARS o Installed during first five years	

1) Detail of TO Updated Plans can be found in TO planning documents and NYISO interconnection studies.
2) UCAP Deliverability Rights (UDRs) result in a transmission line becoming the equivalent of an in-State generator from a resource perspective.
3) Because the TO Updated Plans and the delay of the retirement of the Poletti generating unit met the needs for the first five years, the Central Hudson Capacity Banks are not immediately required to meet reliability needs.

Second Five Years – 2011 to 2015

The TOs also provided reliability needs solutions for the CRP's second five years, spanning 2011 to 2015. TOs did not submit specific projects because the timeframe was set too far in the future to determine precisely what system investments would be necessary. Since the CRPP is designed to encourage market solutions, the TOs have committed to fulfill reliability needs for New York's bulk electrical system on a generic basis from 2011-2015.

Generic solutions submitted by the responsible TOs for the second five years of the 10-year Study Period are presented as MW requirements in the evaluation of solutions with 250 MW beginning in 2011 and increasing to 1,500 MW by 2015.

Market Solutions

Three market solutions were submitted to the NYISO. Since these solutions were submitted on a confidential basis, they were initially described in general terms only. The market solutions include a 400 MW proposal and a 550 MW proposal in Zone J (New York City), and a 250 MW proposal in Zone K (Long Island). More specifically these projects are as follows:

The 400 MW Astoria Repowering Project

The 400 MW proposal from NRG Power Marketing, Inc. is identified as the Astoria repowering project and is scheduled to be phased in with 200 MW in service in 2008 and the remaining 200 MW in service by 2010. The project location is NYCA Zone J into the Astoria West 138kV substation and is project number 201 in the NYISO interconnection queue. The facility is designed to maximize use of existing infrastructure, including existing property and interconnections.

The 550 MW Oak Point Energy Center

The 550 MW proposal from KeySpan Ravenswood, LLC is identified as the Oak Point Energy Center. It is project No. 16 in the NYISO interconnection queue. An onsite electrical substation will be installed to connect the project via two underground 138 kV cables to Con Edison's Hell Gate substation. Scheduled in service date for this project is the fall of 2009. The project will be a nominal 550 MW combined cycle electric generating plant consisting of two GE Frame 7FA+e gas turbine generators capable of operating on natural gas, one steam turbine generator, two heat recovery steam generators (HRSG) with gas fired duct burners, Selective Catalytic Reduction (SCR) for control of nitrogen oxides (NOX), an oxidation catalyst for control of carbon monoxide (CO) and volatile organic compounds (VOC), and an exhaust stack. Ammonia used in the SCR will be 19% aqueous. The steam from the HRSG will be used to run the steam turbine, with a closed loop air-cooled condensing system acting as a direct heat sink for the steam cycle portion of the plant. The summer and winter (at 92ºF and 20ºF) net output ratings will be approximately 525MW and 575MW respectively.

The 250 MW Spagnoli Energy Center

The 250 MW project from KeySpan Ravenswood, LLC for Long Island is identified as the Spagnoli Road Energy Center. It is project number 20 in the NYISO interconnection queue and is scheduled to be in service and available for the summer of 2009. The project will be a nominal 250MW combined cycle plant consisting of one GE Frame 7FA gas turbine generator, one steam turbine generator, a heat recovery steam generator (HRSG) with Selective Catalytic Reduction (SCR) for control of nitrogen oxides (NOX), an oxidation catalyst for control of carbon monoxide (CO) and volatile organic compounds (VOC), and an exhaust stack. The steam from the HRSG will be used to run the steam turbine, with a closed loop air-cooled system acting as a direct heat sink for the condenser. The summer and winter (at 92ºF and 25ºF) net output ratings will be approximately 222MW and 262MW respectively. An additional output of approximately 8 MW may be realized at 92ºF with air inlet evaporative cooling.

Alternative Regulated Solutions

Four alternative regulated solutions were submitted. One consisted of a generation project, and three proposals involved new or upgraded transmission facility proposals. The alternative regulated responses were as follows:

Mirant Lovett

The generation alternative regulated solution is a proposal submitted by Mirant Lovett, LLC to continue operation of at least the two coal fired units (Lovett Units 4 & 5) rather than retire them as planned. The proposal would keep two of the three units on site in operation, for a total of 365 MW of capacity. If requested by the NYISO, a third gas fired unit Lovett 3 could remain in service to provide an additional 68 MW of capacity. These retirements were originally planned for the 2007 and 2008 time frame. According to the project sponsor, the generating units proposed to remain in service would require considerable investment to remain operational. The owner of the projects states that the current NYISO market structure will not provide sufficient revenue to justify such investment.

New York Regional Interconnect

The first of the transmission proposals consists of the New York Regional Interconnect's high voltage direct current project ("HVDC") transmission line is project No. 96 in the NYISO interconnection queue. The new line would extend from the Edic Substation in the Town of Marcy, Oneida County, to the Rock Tavern Substation in the Town of New Windsor, Orange County. The HVDC transmission system would function as a bipolar, bi-directional facility operated at a rated power flow of 1200 MW at a nominal voltage of ± 400 kV DC. The developer plans to place the project in commercial operation for the summer of 2011.

National Grid

The second transmission proposal was submitted by National Grid and consists of two parts. The first proposes to reconductor the 345 kV transmission lines that run from New Scotland to Pleasant Valley. National Grid owns the majority of the facilities involved, with Consolidated Edison owning a small portion of the line and the Pleasant Valley termination point. The Pleasant Valley substation is located in Central Hudson's franchise area. It is estimated this first component could increase the summer limit of the UPNY-SENY interface by as much as 800 MW. The second component would build a new 345 kV cable between the Sprain Brook and Rainey Substations. This project would increase the transfer capability of the Bulk Power System into Zone J significantly. Together, both project components could increase transfer capability by more than if just one or the other is undertaken. However, more in depth engineering analysis would need to be conducted to make a final determination, and such an analysis is beyond the scope of this CRP.

Harbor Cable

The third transmission proposal was submitted by Harbor Cable Company II, LLC and is project No. 195 in the NYISO interconnection queue. The Harbor Cable Project (HCP) will provide a 500 MW fully controllable electric transmission pathway from generation resources in the PJM system to the New York City Zone J, via a back-to-back HVDC converter station located in New Jersey and an underground HVAC underground cable transmission system between the HVDC

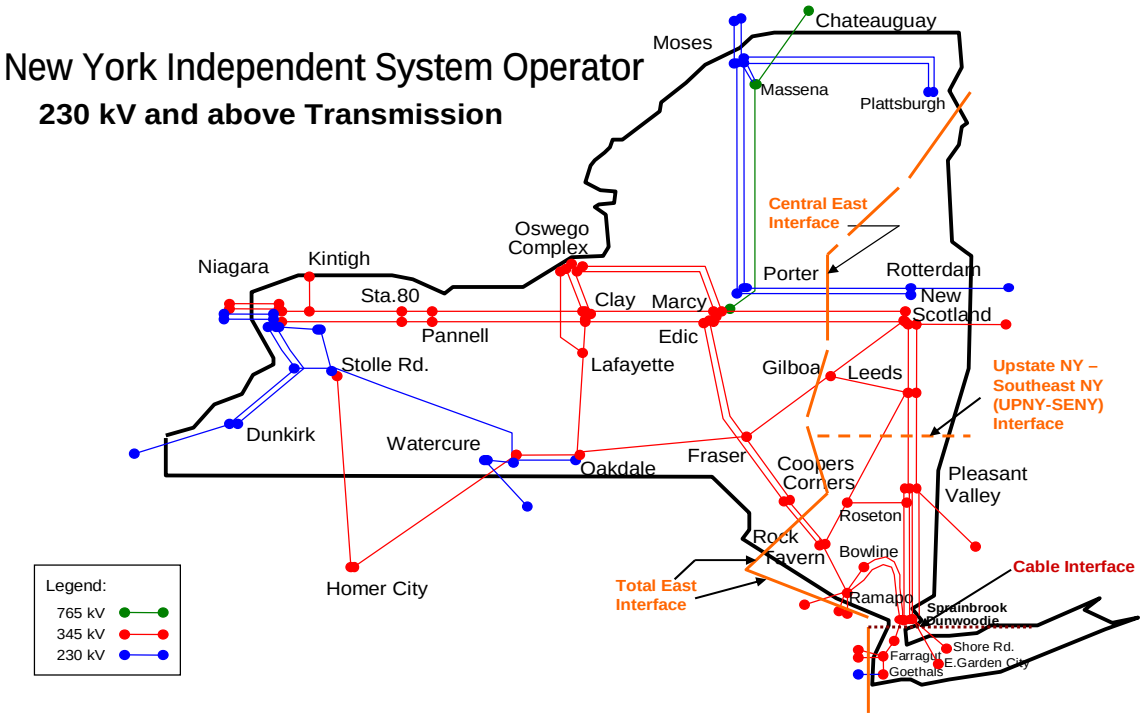
converter station and the Goethals substation in New York City. The HCP will be able to transmit energy in either direction, in a fully controllable manner. That is, precise amounts of power could be transmitted between the PJM and New York control areas. The project sponsor states that the HCP could be in service by June 2008, or any later date to meets the NYISO's requirements.

Proposed Rule Change

Section 6.1 b of Attachment Y states that a Market Participants may submit at any time optional suggestions for changes to NYISO rules or procedures which could result in the identification of additional resources or market alternatives suitable for meeting Reliability Needs. National Grid submitted a proposed change regarding how the statewide installed reserve margin should be calculated. The issues raised by National Grid are being reviewed outside the context of the CRP by the Resource Adequacy Issues Task Force (RAITF), which is a joint group of the NYISO and the NYSRC.

V. **Transmission Security and Adequacy**

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



Transmission interfaces are groupings of transmission lines that measure the transfer capability between regions. The lines connecting Leeds and Pleasant Valley are known as the UPNY/SENY interface while the lines running south from Pleasant Valley and those from Ramapo to the cables feeding into New York City and Long Island are known as the UPNY/ConEd interface. These are the key transmission interfaces in the Hudson Valley.

Given that sufficient resources exist, transmission adequacy can be defined as the ability of the transmission system to deliver the aggregate of the generation to the aggregate load such that LOLE criteria are maintained. A loss-of-load event can occur because sufficient resources are not available or, even if available, sufficient resources cannot be delivered. The latter would be a transmission adequacy deficiency and the former a resource adequacy deficiency. Standard industry practice has been to address transmission adequacy (*i.e.*, load deliverability) and resource adequacy independent of each other. These assessments are conducted simultaneously through use of the GE MARS model as was briefly described in the Section III of this report, and the iterative solution process evaluating both transfer capability and LOLE.

A key input into the MARS model is the emergency[9] transfer capability of key interfaces. The ability of the transmission system to deliver capacity and energy is a function of available generation and system security constraints. The inability of the system to deliver capacity is a reliability issue, while the inability to deliver energy is a congestion or economic concern. System security is evaluated through contingency analysis, which involves the assessment of the loss of one or more system elements to determine the performance of the system and specific elements of the system with respect to the reliability criteria. The performance of the system and its elements are evaluated with respect to the thermal, voltage and stability reliability criteria. The most limiting of the criteria establishes the transfer limit for a group of lines that make up an interface.

Historically, the transmission interfaces in the Hudson Valley have been limited by thermal criteria. However, as indicated by the study results, robust load growth, modest resource additions, planned retirements, changes in neighboring systems, and changes in the transmission system network such as the addition of the series reactors in the New York City cable system together will result in reduced transfer capability. Reduced capability is the result of having to limit power transfers in the transmission network through the Lower Hudson Valley in order to remain compliant with voltage reliability criteria. The study results show that voltage based emergency transfer limits were more limiting than either limits based on thermal or stability criteria.

The use of stringent screening criteria for including future resources in the baseline resulted in generation additions only in New York City early in the Study Period, and none later in the period. Planned generation retirements occur during the Study Period. As a result of additional load and a projected net decrease in resources in the Hudson Valley, voltage criteria become binding for the transmission facilities in the Lower Hudson Valley. Transfer limits into New York City are 3,700 MW (thermally limited) in the beginning of the Study Period, declining to 2,200[10] MW by the end of the first Five Year Base Case or 2010 as a result of voltage constraints. Similar, but not as severe reductions were observed for the UPNY/SENY and UPNY/CONED interface limits. In recognizing that transfers limits into the Hudson Valley also limit transfers through the Hudson Valley and into New York City and Long Island (because of the reduced generating capacity and increased load) a new interface grouping was created to capture this phenomenon. This interface grouping consists of the two interfaces from the lower Hudson Valley to New York City and Long Island. This allows for the sharing of the limited net resources downstream of UPNY/SENY between New York City and Long Island during the capacity shortages simulated under emergency transfer and operating conditions in the MARS model. Transfer limits into New York City increase greatly with reduced transfers onto Long Island, and as a result, the limit from zones I to J was increased. Even after these adjustments and the implementation of solutions, transfer limits were reduced over time.

[9] The LOLE study utilizes emergency transfers because a loss of load event is executed only after available emergency measures are invoked.

[10] As compared to the RNA, network modeling changes in the solution phase, which included the full utilization of the Consolidated Edison phase angle regulators, the TOs updated plans and changes in neighboring systems resulted in the I to J transfer limits increasing by 1,300 MW by 2010.

This reduction in transfer capability manifested itself as an increase in resource adequacy requirements or MW because of the reduced capability of the transmission system to deliver capacity to the load downstream of the constraints. The reduced transfer limit is necessary to secure the system from voltage collapse. The NYISO also observed degradation in the underlying (non-bulk) power system voltage performance, and the overall load power factor. The sub-zone most affected was the Orange and Rockland's non-bulk system after the planned retirement of the Lovett[11] generating units. The retirement of generating capacity not only results in the loss of MW capability between constraining interfaces, but also dynamic reactive capability to support voltages both pre and post contingency

Transmission System Short Circuit Assessment

The NYISO updated the short circuit assessment in the RNA to include the three types of solutions that were evaluated for this CRP. The methodology employed was the same as used for the RNA. It is described in the "NYSIO Guideline for Fault Current Assessment," contained in Appendix B of the RNA supporting document. The ratings and bus monitored list was the same as that being used for the most current Annual Transmission Reliability Assessment (ATRA) fault current assessment for ease of comparison. The fault levels arising from the implementation of the updated TO plans were compared against the most recent ATRA fault levels to determine if breakers would become over-dutied. The market solutions and alternative regulated solutions were added incrementally to the updated TO plans and individually assessed for fault duty. Assumptions were made as to the exact locations for the solutions in the second five years of the Study Period that will greatly impact the fault levels calculated. Based on the locations assumed for the solutions, fault duties in all three cases did not indicate over-dutied breakers in addition to those identified in the most recent ATRA.

[11] Orange and Rockland non-bulk transmission system capacitor banks that were not incorporated into the initial RNA baseline were added to the network model for the solution phase. The purpose of the system upgrades is to mitigate to some extent the adverse impacts of the retirement of the Lovett generating units.

VI. Evaluation of Solutions

Evaluation of solutions is covered by Section 7 of Attachment Y of the OATT. 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.

Responsible Transmission Owners Solutions

Many of the solutions provided by the TOs were projects previously undertaken by them well in advance to implement upgrades, build new transmission, and fulfill their local systems' reliability needs. The updated TO plans were not incorporated in the NYISO's Five-Year Base Case in the RNA because they did not make the cutoff date for inclusion. Nevertheless, the TOs have informed the NYISO that they are undertaking these projects, notwithstanding the outcome of the CRPP. Accordingly, the TO Updated Plans were included as updates to the Five-Year Base Case for purposes of evaluating the reliability solutions. Taking together these projects represent a substantial investment in the bulk power facilities in New York State.

In addition, TOs did not submit specific projects for the second five year because the timeframe is too far in the future to determine precisely what system investments are necessary now to maintain system reliability. Further, the CRPP is designed to encourage market solutions. Consequently, the TOs committed to fulfill reliability needs for New York's bulk electrical system on a generic basis from 2011-2015 in anticipation of market solutions being proposed.

The evaluation of the Responsible Transmission Owner Solutions is divided into two separate five year periods.

1. First Five Year Base Case:

The first step in evaluating the effectiveness of the proposed solutions is determining their impact on the transfer capability of the transmission system. As identified in the RNA and discussed in the transmission security and adequacy section, load growth in Southeast New York (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 capability of the bulk power transmission system to deliver power reliably to the cable system feeding New York City and Long Island. This impact manifested itself as increased needs in SENY.

The Responsible TOs Updated Plans included the installation of capacitor banks which help improve the voltage performance of the transmission system. Although some elements of the TO Updated Plans are designed to primarily address local reliability issues, they also provides benefits to the bulk power system as well.[12] Moreover, the modeling of the New York City phase angle regulators (PARs) and some of the shunt reactors were updated to reflect full utilization of the PARs and operation of the shunt reactors consistent with the operating protocol. The other major change was the deferred

[12] Local reliability issues are generally outside the scope of the CRPP and are addressed by the transmission owner of those facilities subject to appropriate regulatory oversight.

retirement for one year of the Charles A Poletti generating unit from 2008 until 2009[13]. Incorporating these changes and network upgrades in New York and neighboring control areas improved the transmission capability in the Lower Hudson Valley. Table 7.1 below presents the first Five-Year Base Case solution transmission system transfer capability.

Table 7.1
Transmission System Transfer Limits for Key Interfaces in MW

	Year				
Interface	**2006**	**2007**	**2008**	**2009**	**2010**
Central East	2850 V	2850 V	2850 V	2850 V	2850 V
F-G	3425 T	3425 T	3425 T	3425 T	3425 T
UPNY/CE	4700 V	4600 V	4300 V	4400 V	4200 V
I-J	3700 V	3400 V	3000 V	3775 V	3500 V
I-K	1270 T	1270 T	1270 T	1270 T	1270 T
I-J&K	4950 V	4200 V	4250 V	4150 V	3775 V

T = Thermal Limit V = Voltage Limit

The primary observation is that the transfer capability has improved significantly from the baseline. As an example, the transfer limit for I-J (from the cable interface into New York City) has improved from 2,200 MW to 3,500 MW[14] in the solution case.

These updated transfer limits were incorporated into the MARS model along with the proposed resource additions. The LOLE results are presented in the Table 7.2 entitled: "Base Case Load and Resource Table with TO System Updates." The table shows that the TO Updated Plans in conjunction with the deferred retirement of the Poletti unit meet resource adequacy requirement through 2010. Table 7.2 a presents the LOLE results by zone.

[13] As stipulated in the Article X certificate for the NYPA Astoria 500MW combined cycle plant, NYPA can keep the Poletti unit in service if the NYISO determines that the retirement of the unit will result in the load to capacity ratio in New York City falling below 80%. The NYISO made the determination that the retirement of the unit in 2008 would cause the NYC zone load and capacity ratio to fall below than 80% of the 2008 forecasted New York City peak load. Pursuant to its Article X certificate for the new NYPA Astoria CC, NYPA informed the parties to the proceeding before the Siting Board that the Existing Poletti Unit would not retire in 2008.

[14] The NYISO studies determining that the I to J emergency transfer capability was reduced from the thermal limited 3700 MW to the voltage limited 3500 MW assumed that generating resources reactive power response was limited to the Voltage Support Service (VSS) measured capability.

Table 7.2
Base Case Load and Resource Table with TO Updated Plans

Year	2006	2007	2008	2009	2010
Peak Load					
NYCA	32,400	32,840	33,330	33,740	34,125
Zone J	11,505	11,660	11,805	11,935	12,015
Zone K	5,320	5,410	5,500	5,580	5,680
Resources					
NYCA "Capacity"	39,420	39,160	38,679	38,260	38,260
"-SCR"	1084	1084	1084	1189	1349
"-UDR"	330	990	990	990	990
Total	40,834	41,234	40,753	40,439	40,599
Zone J "Capacity"	10,102	10,102	10,102	9,217	9,217
"-SCR"	172	172	172	277	437
"-UDR"	0	0	0	0	0
Total	10,274	10,274	10,274	9,494	9,654
Zone K "Capacity"	5,340	5,340	5,340	5,806	5,806
"-SCR"	207	207	207	207	207
"-UDR"	330	990	990	990	990
Total	5,877	6,537	6,537	7,003	7,003
NYCA Reserve Margin %	126.0%	125.6%	122.3%	119.9%	119.0%
Zone J Res/Load/ Ratio	89.3%	88.1%	87.0%	79.5%	80.3%
Zone K Res/Load Ratio	110.5%	120.8%	118.9%	125.5%	123.3%
NYCA LOLE	0.002	0.001	0.020	0.047	0.099

Table 7.2 a
NYCA LOLE Table for the First Five-Year Base Case
With TO Updated Plans
LOLE (probability of occurrences in days per year)

AREA	2006	2007	2008	2009	2010
Zone-A thru Zone-F (Upstate NY)	0.000	0.000	0.000	0.000	0.000
Zone-G(Hudson Valley or SENY[15])	0.000	0.000	0.000	0.000	0.000
Zone-H(Hudson Valley or SENY)	0.000	0.000	0.000	0.001	0.004
Zone-I(Hudson Valley or SENY)	0.000	0.000	0.002	0.013	0.035
Zone-J(New York City or SENY)	0.001	0.001	0.019	0.043	0.088
Zone-K(Long Island or SENY)	0.001	0.000	0.000	0.001	0.000
NYCA	0.002	0.001	0.020	0.047	0.099

A sensitivity analysis was conducted to determine the LOLE impact of not deferring the Poletti unit by one year. The Poletti unit has a significant impact on the NYCA LOLE. In the initial analysis indicated in Table 7.1, it was assumed that the Poletti unit retirement was deferred until 2009. If the Polleti unit was to retire in 2008, the NYCA LOLE would increase from 0.020 to 0.191.

[15] Southeast New York is that part of the New York Power System that includes the lower Hudson Valley, New York City and Long Island.

2. Second Five Years

As previously discussed, the Responsible TOs offered generic solutions for the second five years. Table 7.3 below presents the level of generic MW needed to maintain compliance with resource adequacy criteria while Table 7.3 a presents the LOLE results by zone. These generics solutions would need to be located primarily in load zones G through J in order to fulfill the reliability needs. Although these results indicate the level of the MW of solutions that would be required, these amounts could change depending on the specific solutions that are proposed.

Table 7.3
Base Case Load and Resource Table
With TO Updated Plans and Generic Solutions

Year	2011	2012	2013	2014	2015
Peak Load					
NYCA	34,505	34,825	35,105	35,345	35,595
Zone J	12,142	12,219	12,351	12,484	12,573
Zone K	5,779	5,879	5,981	6,085	6,112
Resources					
NYCA “Capacity”	38,510	39,010	39,260	39,510	39,760
“-SCR”	1349	1349	1349	1349	1349
“-UDR”	990	990	990	990	990
Total	40,849	41,349	41,599	41,849	42,099
Zone J “Capacity”	9,467	9,467	9,717	9,967	10,217
“-SCR”	437	437	437	437	437
“-UDR”	0	0	0	0	0
Total	9,904	9,904	10,154	10,404	10,654
Zone K “Capacity”	5,806	5,806	5,806	5,806	5,806
“-SCR”	207	207	207	207	207
“-UDR”	990	990	990	990	990
Total	7,003	7,003	7,003	7,003	7,003
NYCA Reserve Margin %	118.4%	118.7%	118.5%	118.4%	118.3%
Zone J Res/Load/ Ratio	81.6%	81.1%	82.2%	83.3%	84.7%
Zone K Res/Load Ratio	121.2%	119.1%	117.1%	115.1%	114.6%
NYCA LOLE	0.092	0.050	0.099	0.098	0.093
Generic Additions (MWs)	250	500	250	250	250

Table 7.3 a
NYCA LOLE Table for the Second Five Years
With TO System Updated Plans and Generic Solutions
LOLE (probability of occurrences in days per year)

AREA	2011	2012	2013	2014	2015
Zone-A thru Zone-F (Upstate NY)	0.000	0.000	0.000	0.000	0.000
Zone-G(Hudson Valley or SENY)	0.000	0.000	0.000	0.001	0.001
Zone-H(Hudson Valley or SENY)	0.003	0.002	0.004	0.005	0.003
Zone-I(Hudson Valley or SENY)	0.061	0.038	0.072	0.061	0.044
Zone-J(New York City or SENY)	0.079	0.042	0.073	0.077	0.073
Zone-K(Long Island or SENY)	0.002	0.004	0.007	0.008	0.010
NYCA	0.092	0.050	0.099	0.098	0.093

3. Assessment of Responsible TO Regulated Backstop Solutions

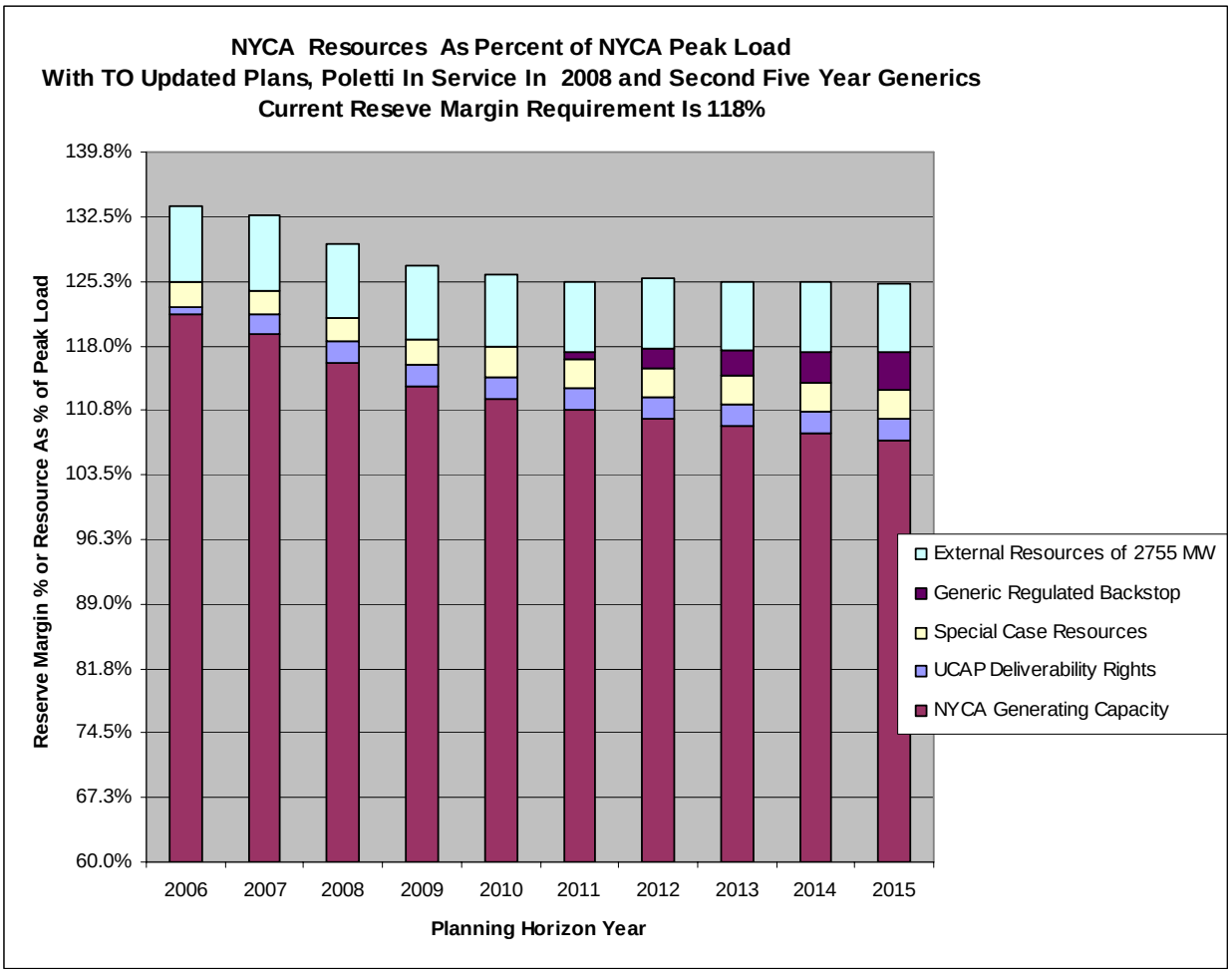
Although the solutions meet the needs through 2010, the fact that LOLE is not much below 0.1 implies there is little room for slippage in resource additions or higher than expected load growth[16], particularly in Zone J (New York City). In addition, once a generic solution becomes an identified need in the first Five Year Base Case, the lead time for a specific regulated backstop solution would be limited to five years or less. The solutions for the first Five Year Base Case provided by the TOs result in a changing resource mix that includes an increasing proportion of special case resources as well as increasing use of resources located in neighboring control areas. A review of NYISO's operational practices will be needed to address this changing resource mix.

The timeframe for implementing a regulated backstop solution is used by the NYISO to establish a benchmark to determine whether market based solutions will meet the reliability needs in a timely manner and whether an alternative regulated solution should be further evaluated. The NYISO has determined that the single backstop solution submitted as part of the first Five-Year Base Case (the Central Hudson Capacitor Banks) was not required to maintain LOLE for that period. Therefore, the NYISO determined that there was no basis to establish a benchmark from a regulated backstop solution, except to identify that a need exists for specific solutions beyond 2010 to maintain system reliability. Since the CRPP is an ongoing process, the system will be reviewed again in the 2006 RNA, which is already underway.

The graph below presents the resource mix that results from the TOs Updated Plans for the first Five Year Base Case, the deferred retirement of the Poletti unit and the generic requirements for the second five years. The resources are presented as a percentage of the forecasted annual peak load. The sum of the resources 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. The resources–as-percent-of-annual-

[16] For instance, the 2006 Load and Capacity Data report contains an updated forecast which close to 3% higher than the forecast used in the current CRPP. The higher load forecast will be addressed in the next round of the CRPP.

peak-load are divided into five categories: (1) in-NYCA generating capacity, (2) unforced capacity deliverability rights (UDRs) which are supported by external capacity, (3) special case resources/demand response, (4) generic regulated backstop resources needed to maintain the 0.1 days per year and; (5) external capacity of 2,755 MW currently eligible to participate in the NYISO markets. While updated annually, the statewide installed reserve margin has been 118% since the year 2000.



Market Solutions

Three Market proposals, one from NRG Power Marketing, Inc., and two from KeySpan Ravenswood, LLC, were submitted in response to NYISO's request for market-based solutions. The 400 MW NRG project and the 550 MW KeySpan project are proposed for New York City (Zone J). The KeySpan 250 MW project is proposed for Long Island (Zone K). These projects are proposed service between 2008 and 2010. Below are the Load and Resource tables that present the benefit to LOLE of the Market Proposals in conjunction with the TO Updated Plans and the deferred retirement of the Poletti unit. The Load and Resource tables are presented for the first Five Year Base Case and then for the second five years. The second five years does not include the TO generic solutions.

The transfer limits utilized to evaluate for the Market Proposals are the same as those used to evaluate the TO Updated Plans. Because the proposed market solutions are generators, they will provide system voltage support within Zones J and K, but they will not increase transfer limits into these zones.

1. First Five Year Base Case

Table 7.4 below presents the Load and Resource table with the TO Base Case Solutions, the deferred retirement of the Poletti unit, and the Market proposals for the first Five Year Base Case.

Table 7.4
Base Case Load and Resource Table
With TO Updated Plans,
Deferred Retirement of Poletti and Market Solutions

Year	2006	2007	2008	2009	2010
Peak Load					
NYCA	32,400	32,840	33,330	33,740	34,125
Zone J	11,505	11,660	11,805	11,935	12,015
Zone K	5,320	5,410	5,500	5,580	5,680
Resources					
NYCA “Capacity”	39,420	39,160	38,799	38,602	39,307
“-SCR”	1084	1084	1084	1189	1349
“-UDR”	330	990	990	990	990
Total	40,834	41,234	40,873	40,781	41,646
Zone J “Capacity”	10,102	10,102	10,222	9,337	10,042
“-SCR”	172	172	172	277	437
“-UDR”	0	0	0	0	0
Total	10,274	10,274	10,394	9,614	10,479
Zone K “Capacity”	5,340	5,340	5,340	6,028	6,028
“-SCR”	207	207	207	207	207
“-UDR”	330	990	990	990	990
Total	5,877	6,537	6,537	7,225	7,225
NYCA Reserve Margin %	126.0%	125.6%	122.6%	120.9%	122.0%
Zone J Res/Load/ Ratio	89.3%	88.1%	88.0%	80.6%	87.2%
Zone K Res/Load Ratio	110.5%	120.8%	118.9%	129.5%	127.2%
NYCA LOLE	0.002	0.001	0.007	0.039	0.004
Market Additions MW	0	0	200	250	750

Second Five Years

Table 7.5 below presents the Load and Resource table with the TO Base Case Solutions, and the Market Proposals for the second five years. Table 7.5 a presents the zonal LOLE results for the second five years.

Table 7.5
Base Case Load and Resource Table with
TO Updated Plans and Market Solutions

Year	2011	2012	2013	2014	2015
Peak Load					
NYCA	34,505	34,825	35,105	35,345	35,595
Zone J	12,142	12,219	12,351	12,484	12,573
Zone K	5,779	5,879	5,981	6,085	6,112
Resources					
NYCA "Capacity"	39,307	39,307	39,307	39,307	39,307
"-SCR"	1349	1349	1349	1349	1349
"-UDR"	990	990	990	990	990
Total	41,646	41,646	41,646	41,646	41,646
Zone J "Capacity"	10,042	10,042	10,042	10,042	10,042
"-SCR"	437	437	437	437	437
"-UDR"	0	0	0	0	0
Total	10,479	10,479	10,479	10,479	10,479
Zone K "Capacity"	6,028	6,028	6,028	6,028	6,028
"-SCR"	207	207	207	207	207
"-UDR"	990	990	990	990	990
Total	7,225	7,225	7,225	7,225	7,225
NYCA Reserve Margin %	120.7%	119.6%	118.6%	117.8%	117.0%
Zone J Res/Load/ Ratio	86.3%	85.8%	84.8%	83.9%	83.3%
Zone K Res/Load Ratio	125.0%	122.9%	120.8%	118.7%	118.2%
NYCA LOLE	0.01	0.022	0.047	0.094	0.164
Market Additions MW	0	0	0	0	0

Table 7.5 a
NYCA LOLE Table for the Second Five Years
With TO Updated Plans and Market Solutions
LOLE (probability of occurrences in days per year)

AREA	2011	2012	2013	2014	2015
Zone-A thru Zone-F (Upstate NY)	0.000	0.000	0.000	0.000	0.000
Zone-G(Hudson Valley or SENY)	0.000	0.000	0.000	0.002	0.004
Zone-H(Hudson Valley or SENY)	0.001	0.003	0.001	0.003	0.006
Zone-I(Hudson Valley or SENY)	0.005	0.012	0.025	0.047	0.086
Zone-J(New York City or SENY)	0.007	0.017	0.038	0.079	0.134
Zone-K(Long Island or SENY)	0.000	0.001	0.003	0.003	0.006
NYCA	0.010	0.022	0.047	0.094	0.164

2. Assessment of the Market Proposals

Given the updated TO plans, deferred retirement of the Poletti unit and current load forecast, the Market Proposals are not required to maintain LOLE criteria for the first Five Year Base Case. If completed, however, these projects would maintain LOLE criteria through 2014. Because of planning uncertainties and the clearly identified needs in the second five years, the NYISO believes that these projects should maintain their current in schedules for permitting, constructions and coming into service.

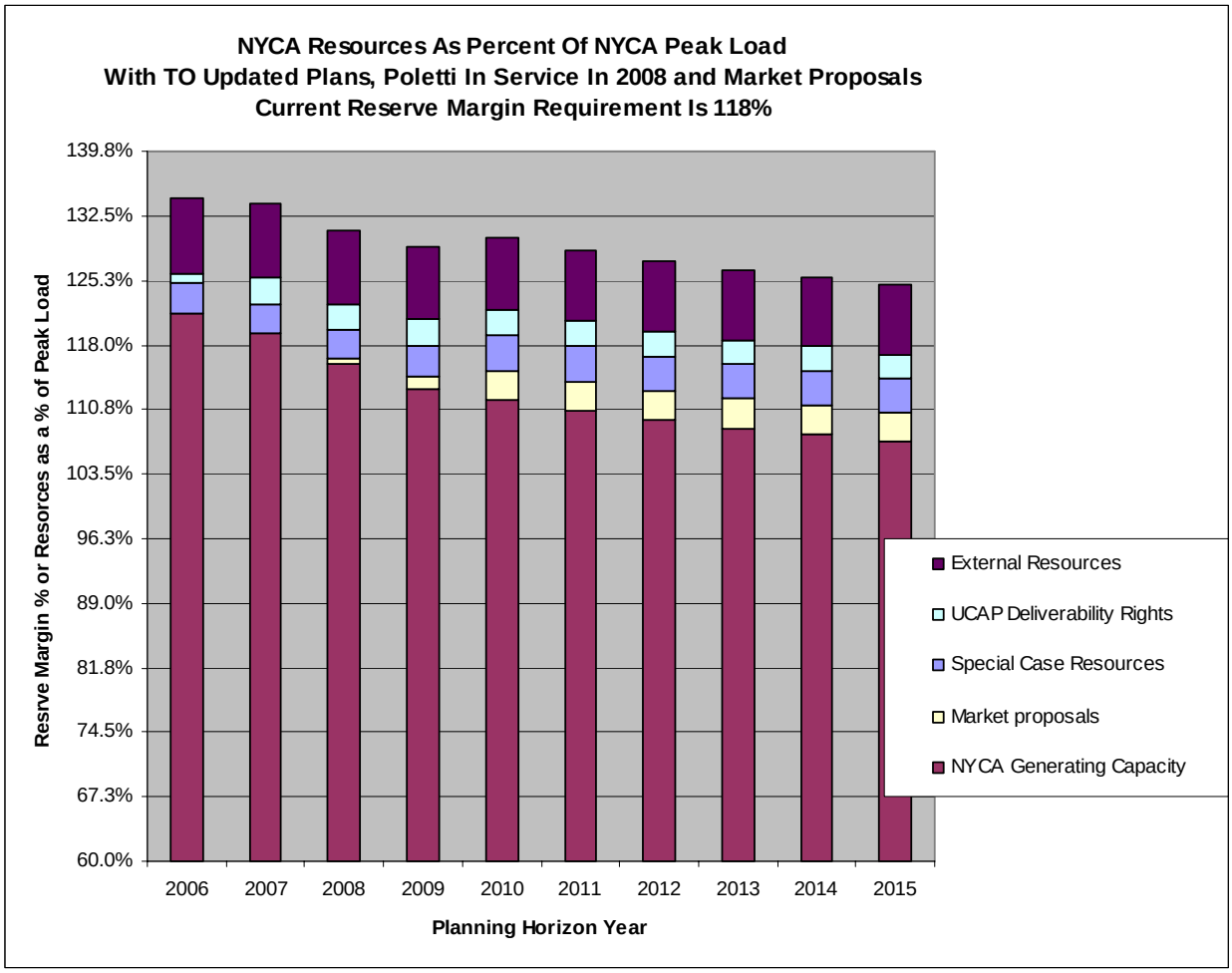
The NYISO has identified two areas of concern with respect to these projects going forward and their potential overall benefits. Although theses developers have significant financial resources available to them, the proponents of market-based generation solutions also stated that their viability may depend upon entry into long-term contracts for the sale of their output. .

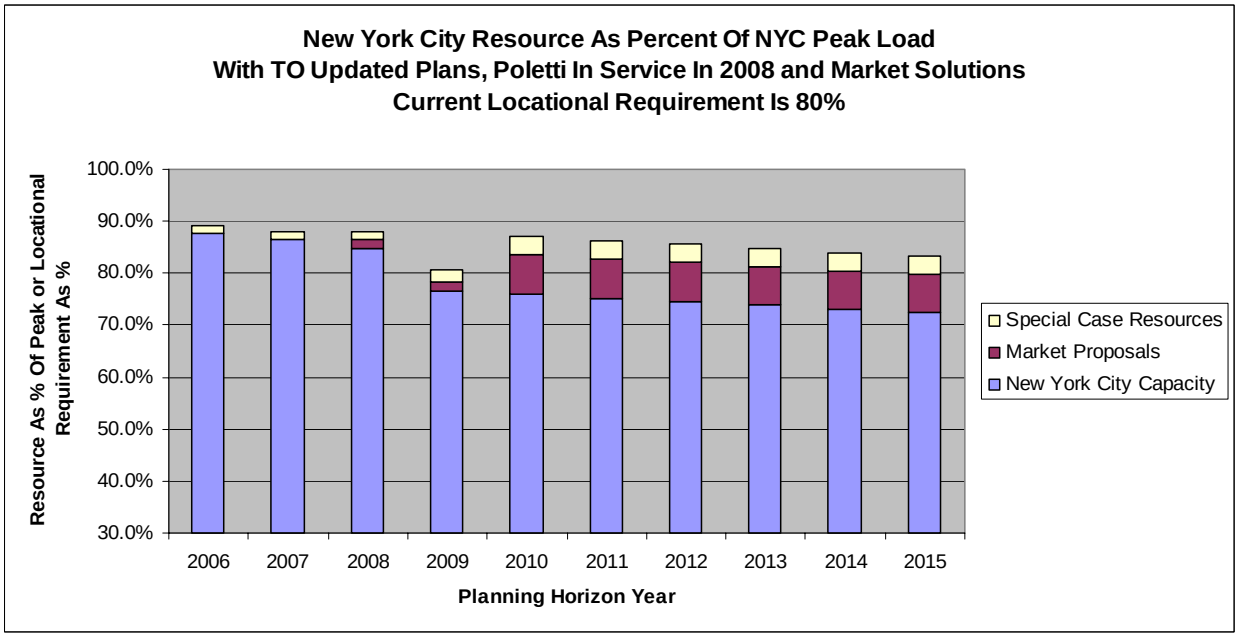
The projects' point of interconnection is also a concern. Two of these projects are proposing to connect to Consolidated Edison's 138 kV system. There have been a significant number of recent capacity additions to the New York City 138 kV system in the vicinity of Astoria, Queens. Additional capacity being added to the 138 kV system could potentially raise some load deliverability issues that have not been evaluated as part of this CRP. This is an issue that may need to be looked at more carefully in the next CRP.[17]

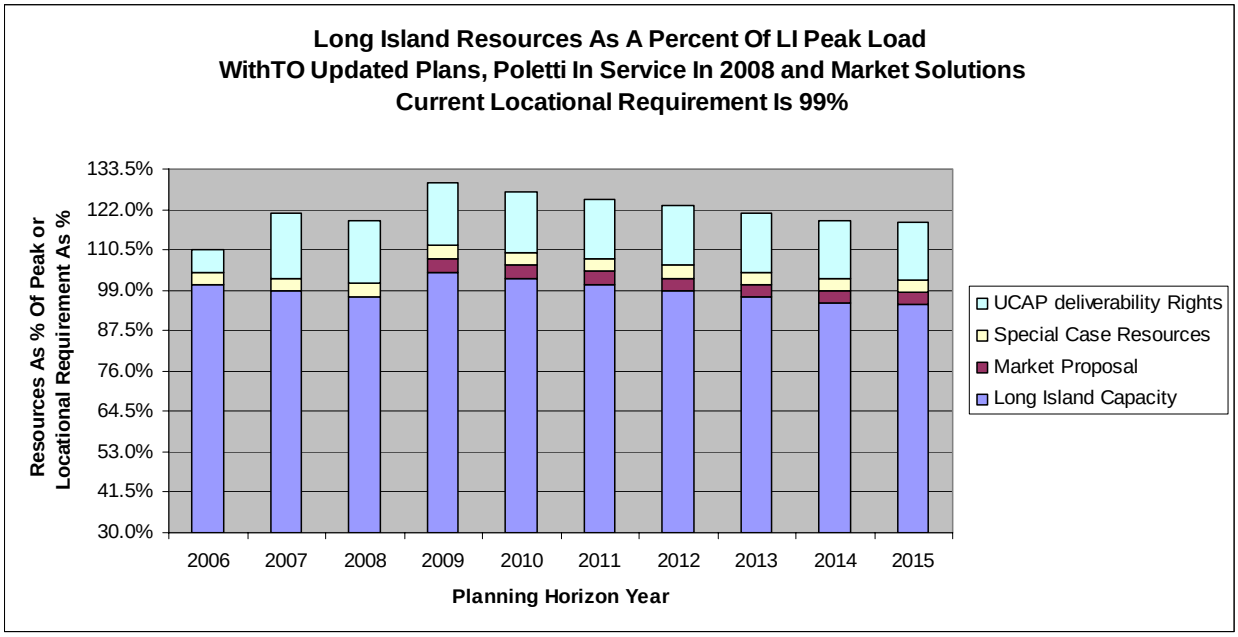
The graph below presents the installed reserve margin that results from the TO Updated Plans for the first Five Year Base Case, the deferred retirement of the Poletti unit and the Market Proposals for the full 10-year Study Period. The resources are presented as a percent of the annual peak load. The sum of the resources equal the installed reserve margin which is a generally accepted measure of the level of resources needed to maintain reliability. While updated annually, the statewide installed reserve margin has been 118% since year 2000. The resources-as-a-percentage-of-annual-peak-load are divided into five categories: (1) in-NYCA generating capacity, (2) market proposals that are additions to NYCA generating capacity, (3) special case resources/demand response, (4) UDRs supported by external capacity, and (5) external capacity of 2,755 MW currently eligible to participate in the NYISO markets.

Also, below are graphs that present the resources for New York City and Long Island as a percent of their respective peak loads. The sum of the resources is equal to the amount of installed locational resources 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 requirements are 80% and 99% respectively.

[17] It should also be noted that the issue of capacity deliverability is currently under review by the NYISO Interconnection Issues Task Force (IITF).


NYCA Resources As Percent Of NYCA Peak Load
With TO Updated Plans, Poletti In Service In 2008 and Market Proposals
Current Reserve Margin Requirement Is 118%
Resrve Margin % or Resorces as a % of Peak Load
139.8%
132.5%
125.3%
118.0%
110.8%
103.5%
96.3%
89.0%
81.8%
74.5%
67.3%
60.0%
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Planning Horizon Year
External Resources
UCAP Deliverability Rights
Special Case Resources
Market proposals
NYCA Generating Capacity


New York City Resource As Percent Of NYC Peak Load
With TO Updated Plans, Poletti In Service In 2008 and Market Solutions
Current Locational Requirement Is 80%
Resource As % Of Peak or Locational Requirement As %
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Planning Horizon Year
Special Case Resources
Market Proposals
New York City Capacity



Evaluation of Alternative Regulated Responses

Having determined that the initial set of TO Updated Plans and Market Proposals did not meet the needs for the entire 10-year Study Period, the NYISO initiated a request for alternative regulated responses to meet the needs identified in the second five-year period. As discussed previously, four alternative regulated responses were submitted. The responses consisted of one generation proposal and three transmission proposals. Below is an evaluation of the generation alternative followed by an evaluation of the transmission alternatives. An in-depth review of each of the transmission proposals was not undertaken at this time because the NYISO determined that none of the alternatives are required at this time. As a result, the NYISO conducted a generic analysis of the reliability benefits of increasing transfer capability between upstate New York and downstate New York by evaluating the reliability benefits of adding transfer capability to the transmission system over the second five year period.

1. **Regulated Generation Alternative**.

The regulated generation alternative is a proposal by Mirant Lovett, LLC to keep the Lovett coal-fired units 4 & 5 in service by upgrading the emission controls for the units. The Load and Resource Table 7.7 below presented the impact of the Lovett units remaining in service for the second five years. Also, Table 7.7a presents the LOLE results by zone for the second five years. The alternative was evaluated in conjunction with the TO Updated Plans and Market Proposals

Table 7.7
Base Case Load and Resource Table with TO Updated Plans, Market Proposals and Generation Alternative for the second five years

Year	2011	2012	2013	2014	2015
Peak Load					
NYCA	34,505	34,825	35,105	35,345	35,595
Zone J	12,142	12,219	12,351	12,484	12,573
Zone K	5,779	5,879	5,981	6,085	6,112
Resources					
NYCA "Capacity"	39,672	39,672	39,672	39,672	39,672
"-SCR"	1349	1349	1349	1349	1349
"-UDR"	990	990	990	990	990
Total	42,011	42,011	42,011	42,011	42,011
Zone J "Capacity"	10,042	10,042	10,042	10,042	10,042
"-SCR"	437	437	437	437	437
"-UDR"	0	0	0	0	0
Total	10,479	10,479	10,479	10,479	10,479
Zone K "Capacity"	6,028	6,028	6,028	6,028	6,028
"-SCR"	207	207	207	207	207
"-UDR"	990	990	990	990	990
Total	7,225	7,225	7,225	7,225	7,225
NYCA Reserve Margin %	121.8%	120.6%	119.7%	118.9%	118.0%
Zone J Res/Load/ Ratio	86.3%	85.8%	84.8%	83.9%	83.3%
Zone K Res/Load Ratio	125.0%	122.9%	120.8%	118.7%	118.2%
NYCA LOLE	0.005	0.011	0.019	0.049	0.068

Table 7.7 a
NYCA LOLE Table for the Second Five Years
With TO Updated Plans, Market Solutions and Generation Alternative
LOLE (probability of occurrences in days per year)

AREA	2011	2012	2013	2014	2015
Zone-A thru Zone-F (Upstate NY)	0.000	0.000	0.000	0.000	0.000
Zone-G(Hudson Valley or SENY)	0.000	0.000	0.001	0.000	0.001
Zone-H(Hudson Valley or SENY)	0.000	0.001	0.002	0.002	0.003
Zone-I(Hudson Valley or SENY)	0.003	0.004	0.009	0.025	0.045
Zone-J(New York City or SENY)	0.004	0.009	0.015	0.041	0.053
Zone-K(Long Island or SENY)	0.000	0.001	0.001	0.002	0.004
NYCA	0.005	0.011	0.019	0.049	0.068

The generation alternative results in both increased capacity in Zone G or SENY below the Leeds Pleasant Valley congestion point and provides additional dynamic reactive power capability. The additional reactive capability increases the transfer limits across the UPNY/CE and I-J transmission interfaces by approximately 200 MW and improves the voltage performance of the transmission system in the lower Hudson Valley. In addition,. the alternative improves NYCA LOLE, contributes to LOLE criteria being maintained throughout the entire 10-year study period, and helps maintain a more diverse fuel mix.

2. Alternative Transmission Responses

As discussed, the NYISO received three alternative transmission responses. Two of these projects were in the early stages in the NYISO interconnection process and the other was not in the queue. Based on updated information and modeling, the NYISO had determined that there was no need to require a regulated backstop solution. As a result, the alternative regulated transmission proposals were not evaluated as specific alternatives to regulated backstop solution. Rather, these proposals were evaluated as generic increases to transfer capability.

To evaluate the benefits of increased transfer capability associated with the in-NYCA transmission proposals, selected interfaces in the MARS modeled were increased to simulate the potential benefits of additional transmission capability. These simulations were performed for year 2015 of the Study Period. The baseline case for the study year was the updated transmission owner plans without their generic solutions or market solutions. The LOLE for year 2015 without generics or market solutions was 1.545 days per year.

The initial simulation increased transfer limits between upstate NY and the lower Hudson Valley by 1,000 MW. The resulting NYCA LOLE decreased from the 1.545 days per year to 0.996 days per year. The second step was to increase transfer capability from the lower Hudson Valley into New York City by 1,000 MW. This increase in transfer capability reduced the LOLE from 0.996 days per year to 0.349 days per year.

Simulations were also conducted that increased transfer capability between PJM and New York City by 500 MW to account for the potential benefit of the Harbor Cable Project. The MARS simulations performed for the year 2015 LOLE resulted in a reduction of the LOLE from 1.545 days per year to 1.025 days per year. The analysis of this transmission proposal does not include potential intra-zonal transmission constraints between Staten Island and the rest of Zone J.

3. Assessment of the Alternative Regulated Responses

The above analysis for 2015 clearly indicates that the alternative regulated responses would provide reliability benefits. The generation alternative regulated solution would provide voltage support, and increase transfer capability and available capacity, which would be beneficial to the lower Hudson Valley region. Clearly, increasing transfer capability through implementing transmission alternative regulated solutions would have benefits only if there is capacity available to be delivered. The reduction in LOLE demonstrates that additional capacity was available (most likely external to New York) to meet New York's load requirements. These projects would also provide the flexibility to site additional resources in upstate New York. Also, each of these projects has their own unique characteristics that could provide other benefits. For instance, the New York Regional Interconnect has included reactive power capability for the Rock Tavern terminal which might provide additional reactive capability for the Lower Hudson Valley. These benefits would need to be verified in the system reliability impact study.

The bottom line, however, is that the Updated TO Plans and deferred Poletti retirement will satisfy New York's reliability needs for the first five years of the Study Period. If the three market responses remain on schedule as proposed, the NYCA would maintain LOLE criteria throughout the 10-year Study Period except for the last year (2015). Consequently, neither a regulated backstop solutions 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 planned resources are available in timely manner.

VII. Findings, Conclusions and Recommendation

Introduction

Section 8 of the CRPP (NYISO OATT Attachment Y) 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 as, described in Attachment Y of the OATT, the draft CRP will become final once approved by the NYISO Board of Directors.

The Reliability Plan[18] – A Summary

The RNA determined that additional resources would be needed over the 10-year study period in order for the NYCA to remain compliant with applicable reliability criteria. As a result, the NYISO requested market-based and regulated backstop solutions to the reliability needs. As previously discussed, a broad range of solutions, including TO Updated Plans, Market Proposals and Alternative Regulated Responses, were submitted. Based on evaluation of the market proposals, Updated TO Plans, modeling refinements, and continued operation of the Poletti unit, the NYISO has that determined sufficient resource additions to the NYCA are planned or under development such that the NYCA can meet reliability criteria for the first five years of the Study Period and through four of the second five years of the Study Period. In order to meet criteria for the last year of the study period, additional Market Proposal or Regulated Solutions will be needed. Given that this need is sufficiently far in the future and the next annual CRPP cycle has already begun, the NYISO has determined that no action needs to be taken at this time to implement any regulated backstop solution or an alternative regulated solution to address this reliability need.

The plan consists of the following actions:

1. The deferred retirement of the New York Power Authority's Charles A Poletti generating unit in New York City from 2008 until 2009.
2. The implementation of the Responsible Transmission Owner plans, which include transmission additions and upgrades, reactive resource additions, capacity additions totaling 466 MW, capacity equivalent Unforced Deliverability Rights (UDRs) totaling 990 MW supported by generation in neighboring control areas, and demand-side management (DSM) programs totaling 449 MW. These solutions result in total resource additions of 1,905 MW through 2010.

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

3. The development of 1,200 MW of merchant generation projects in New York City and Long Island, in particular, the 950 MW proposed for New York City. It is important that this generation be in service as scheduled but no later than the summer of 2011.

4. Planned resource additions as noted in 2 and 3 above, total 3,105 MW by 2015.

Findings, Conclusion and Recommendation

Finding Number One – Transmission Security and Adequacy:

The criteria used to establish the baseline for the 10-year Study Period resulted in a significant reduction in transfer limits in order to maintain the security of the transmission system. The lower transfer limits reduced the ability of the transmission system to deliver capacity downstream of the constraints. The result was an increase in the LOLE that 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 impacted by load growth and generator retirements.

Action Required: The primary lesson learned from the first finding is that the criteria and process for establishing the baseline for the first five years of the study period need to be reviewed. In particular, analysis is needed of how reductions in the baseline system transfer limits resulting from more limiting transmission security constraints are going to be addressed in determining reliability needs.

A secondary action item is to re-emphasize the importance of 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 as well as the non-bulk system, to the extent that it affects the bulk power system. They include:

1. Continuation of the initiative to complete a comprehensive reliability analysis of reactive power demand and resources in the NYCA.
2. Development of a work plan and time table for the Reactive Power Working Group to complete its initiative to improve modeling of reactive power sinks and sources in the NYCA power system model.
3. 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 factors that could enhance or improve the voltage performance of the New York's transmission system, from the reliability perspective.

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:

4. First and foremost is that the construction of the planned resources and transmission upgrades moves forward on the schedules provided. The NYISO, with its stakeholders, is developing criteria and procedures to monitor the ongoing viability of solutions and the need to determine when solutions need to be "triggered". If solutions were 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.

   Action required: The monitoring processes for tracking all planned system additions that are identified as necessary to maintain reliability are currently under development by the Electric System Planning Working Group (ESPWG) must be finalized, approved and implemented by September 2006. The New York State Legislature should reenact Article X of the Public Service Law.

5. Except for the 140 MW of off-shore wind[19] off Long Island all the planned generator additions in this plan will be natural gas fired units with Number 2 fuel oil or kerosene as the back up.

   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.

6. The plan depends increasingly on the availability of capacity resources in neighboring control areas in order 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.

4. No transmission solutions were submitted as market solutions. The proponents of market-based generation solutions also stated that their

[19] While not part of this plan, New York State has a significant initiative to site additional renewable resources. See New York Public Service Commission Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retain Renewable Portfolio Standard, Order Regarding Retain Renewable Portfolio Standard (September 24, 2004).

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 states that, concurrently with submission for Board Review, "the draft CRP will also be provided to the Independent Market Adviser for his review." The Independent Market Advisor should review if market rule changes are necessary to address and identify failure, if any, in one of the NYISO competitive markets. (OATT Attachment Y, Section 5.2).

5. Increased load growth[20] or retirement of additional generating units beyond those already included in the plan for either economic and/or environmental factors, as well as continued degradation of the voltage performance of the New York System, would adversely affect reliability.

Action Required: The next round of the CRPP process needs to progress on schedule. 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.

Recommendation

This CRP has determined that under the conditions studied, the solutions submitted and the Responsible TO Updated Plans, the proposed system upgrades will maintain the reliability of the New York power system without the need for regulated backstop or alternative regulated solutions at this time. Therefore, the NYISO Staff recommends that the CRP 2005 be approved.

[20] For instance, the 2005 CRP resource and transmission additions will maintain criteria under an expected NYCA peak load forecast of 34,200 MW for 2010 while the 2006 CRP resources will need to meet an expected peak load 35,042 MW or approximately 840 MW of additional load.