2009 Comprehensive Reliability Plan

Comprehensive System Planning Process

FINAL REPORT

May 19, 2009

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Executive Summary

The 2009 Comprehensive Reliability Plan (CRP) completes the NYISO's reliability planning cycle known as the Comprehensive Reliability Planning Process (CRPP). The CRPP encompasses a ten-year planning horizon and evaluates the future reliability of the New York bulk power system. In order to preserve and maintain system reliability, the NYISO, in conjunction with Market Participants, identifies the reliability needs over the planning period and issues its findings in the Reliability Needs Assessment (RNA). The CRP evaluates a range of proposed solutions to address the needs identified in the RNA and sets forth the plans and schedule for the implementation of those solutions.

The 2009 CRPP did not identify any reliability needs. Therefore no solutions are necessary over the ten-year planning horizon 2009 - 2018. The findings indicate that anticipated capacity supply (42,536 MW) will exceed the forecasted peak load (35,658 MW) by 994 MW in 2018, after factoring in the presently required 16.5% Installed Reserve Margin (IRM). There are three major reasons this year's CRPP did not identify any reliability needs over the planning horizon: **a)** a reduction in peak load forecast due to both slower economic growth and projected energy efficiency gains; **b)** an increase in generation additions and Special Case Resource (SCR) participation; and **c)** fewer planned retirements. Moreover, the forecasted load utilized in the 2009 RNA last fall did not anticipate the current economic downturn, which is further reducing the anticipated peak load and energy usage.

However, the 2009 CRP does identify risks scenarios that could adversely impact the current reliability assessment. Per tariff requirements, if the NYISO determines that a reliability need may emerge due to certain risk factors before the next CRPP cycle, it will evaluate whether available market-based projects will satisfy that need. If the NYISO determines the available market-based projects are insufficient and that the need is imminent, it will request that the Transmission Owners (TOs) implement a Gap Solution. If there is a threat to the reliability of the system that will manifest itself during the next CRPP cycle, the NYISO will address the newly-identified reliability need in the subsequent RNA.

In addition to the risk scenarios identified in this CRP, the current economic crisis – both on a global and national level – may change the risks to system reliability, although the magnitude and duration is unknown at this time. The NYISO will also continue to monitor current economic trends and other relevant developments, such as unexpected facility retirements and accuracy of the load forecasts, that could impact the reliability of the bulk power system in the future.

Another significant feature of the 2009 CRPP cycle is that this CRP will be the starting point for the new economic planning process called the Congestion Assessment and Resource Integration Study (CARIS), which will commence in the summer of 2009. In response to its Order 890 compliance filing, the Federal Energy Regulatory Commission (FERC) conditionally approved on October 16, 2008 the NYISO's newly expanded planning process called the Comprehensive System Planning Process (CSPP), which integrates the existing CRPP, as well as the CARIS, into an extended two-year planning cycle.

The NYISO offers the 2009 CRP in accordance with its tariff obligations and also to update ongoing initiatives of the New York Public Service Commission (NYSPSC), the New York State Department of Environmental Conservation (DEC), and the State Energy Planning Board (SEPB).

2009 Comprehensive Reliability Plan

The 2009 CRP sets forth the assumptions and resources utilized in the 2009 Base Case and indicates that the system will remain reliable over the ten-year planning horizon. However, if the implementation of planned resources included in the Base Case either does not occur at all, or is significantly delayed, and/or certain risk scenarios analyzed in the RNA materialize, the system will not meet the reliability requirements. The 2009 CRP identifies Recommendations, Risk Scenarios and Additional Observations.

CRP Recommendations

1. Monitor and track the accuracy of the load forecast levels as impacted by the Energy Efficiency Portfolio Standard (EEPS) initiative and the economic downturn.

The 2009 RNA forecast is an update of the 2008 long term econometric forecast that accounts for the impact of the EEPS. The 2009 RNA forecast results in a reduction of approximately 2,000 MW from the 2008 RNA projected load level due to both slower economic growth and energy efficiency initiatives. Since September 2008, the economic outlook has worsened and further reductions in load and usage forecasts may result in the near term.

2. Monitor and track the implementation of planned generation additions, retirements and SCR registrations.[1]

Planned generation additions of approximately 2,169 MW that are in the Base Case should move forward so that they are in service when anticipated. Retirements of additional generating units beyond those already contemplated (1,272 MW) in the 2009 RNA, for either economic and/or environmental factors, could adversely affect the reliability of the New York Control Area (NYCA) bulk power system. An increase of approximately 761 MW in SCR registration over the 2008 RNA level drives the need to track the implementation of these resources as well. Each of these resources will be tracked on a quarterly basis to ensure that actual amounts realized are comparable to the assumed levels in the 2009 RNA.

3. Monitor and track the implementation of the identified TO Updates and other planned projects. [1]

The NYISO will continue tracking the implementation of the TO Updates such as the addition of capacitor banks at the Millwood Substation, the Con Edison M29 transmission project, the Caithness project, firm capacity in conjunction with granted UDRs, and planned non-bulk power system projects.

[1] Tracking of Resource changes, TO Updates, and Market-Based Projects that are included in the CRP are described in Appendix D.

4. Monitor and track the viability of the Market-Based Projects submitted with the 2008 CRP. [1]

While there were no reliability needs identified in the 2009 RNA, the NYISO must be prepared to act should conditions change establishing an immediate reliability need that requires a solution. The NYISO will therefore continue to assess the viability of market-based projects that were included in the 2008 CRP on a quarterly basis as a further measure to understand all available options.

5. Maintain voltage performance at the bulk power system level.

As reflected in the NYISO RNA studies, voltage constraints are the limiting factor on some key interfaces in the New York Control Area. The NYISO will continue to monitor the voltage performance of the NYCA system to determine that voltage based transfer limits do not degrade below the levels determined in this CRP. The NYISO will continue assessing reactive power assumptions such as load power factor, generator reactive performance, resource commitment, and losses. Finally, the NYISO should continue to investigate procedures and/or measurements governing reactive power to identify additional factors that could enhance or improve reliability through managing the voltage performance of New York's bulk power system. The NYISO is also participating in the PSC proceedings on reduction of losses on electric transmission and distribution systems.

CRP Risk Scenarios

Although the planned system meets the applicable reliability criteria based on the conditions studied, the NYISO has identified several scenarios that, if occurred, would adversely impact the effectiveness of the Plan to meet future system reliability requirements.

Figure i below illustrates the impact of some of the risk scenarios evaluated in the 2009 RNA. The retirement of the Indian Point 2 and 3 nuclear power plant units would have the greatest and most immediate impact on the reliability of the NYCA system. In order to mitigate the impact of these retirements, approximately 1,000 MW of capacity would need to be installed in Southeastern New York (Zones G-K) for each retired unit. The total amount and location of the replacement capacity would depend upon the intra - and inter - area transmission limitations in the vicinity of the capacity additions. For the rest of the scenarios in Figure i, the addition of 1,500 MW of new capacity installed in Southeastern New York would be sufficient to mitigate the adverse reliability impact.

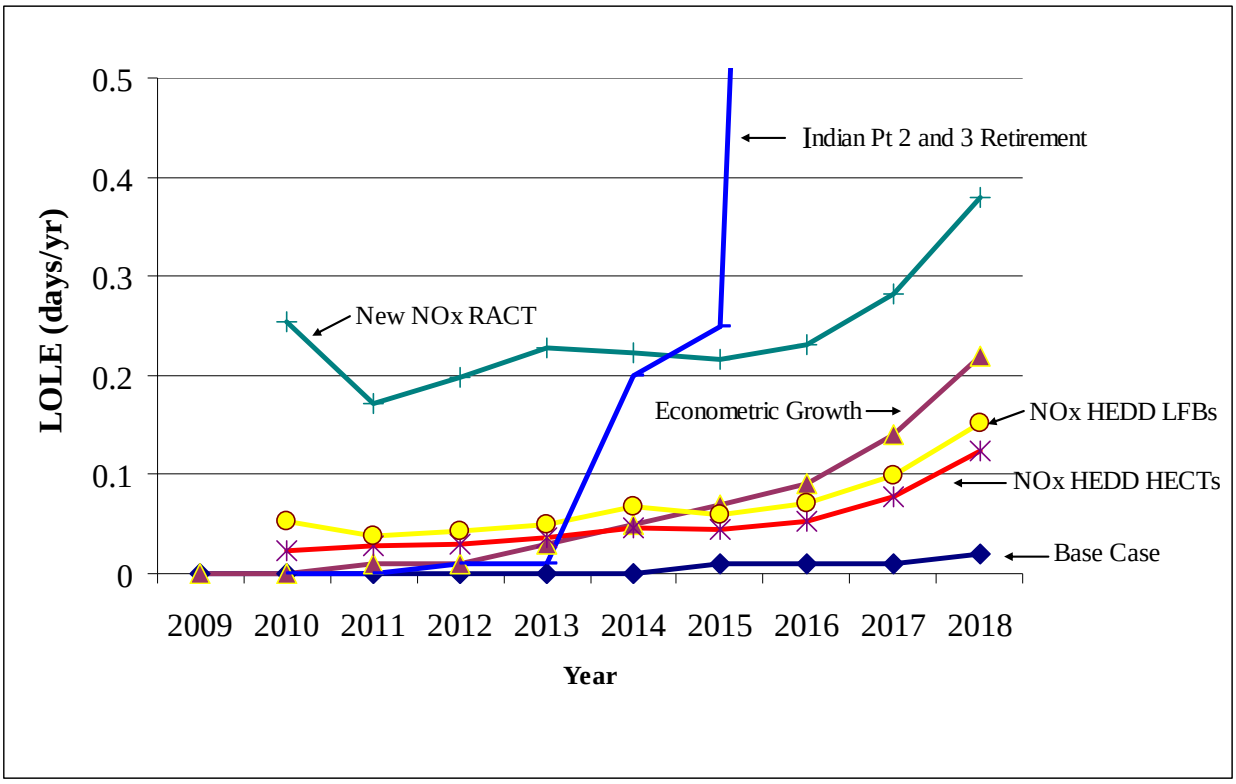

Figure i: 2009 RNA Risk Scenarios

The specific risk scenarios include:

1. Indian Point 2 and 3 Retirement - Unexpected retirement of either of the two Indian Point nuclear plants at the expiration of their current operating licenses would cause immediate resource adequacy violations and the need for new resources in New York. The retirement of one of the two Indian Point nuclear power plant units (1,000 MW each) would cause an immediate violation of the reliability standard in 2014. Retirement of both units would cause a severe shortage in resources needed to maintain bulk power system reliability, resulting in the probability of an involuntary interruption of load that is approximately 40 times higher than the reliability standard in 2018.

2. Econometric Growth - Forecasted econometric load growth level without EEPS impacts, which is 2,126 MW higher than the Base Case load forecast level in 2018, would result in the need for new resources in 2017. Under current economic conditions, surpassing the Base Case load forecast levels by 2,000 MW is unlikely.

3. Environmental restrictions:

    - NOx Emissions – Implementation of new programs to control nitrogen oxides (NOx) emissions from fossil fueled generators, such as the Ozone Transmission Commission (OTC) High Electric Demand Days (HEDD) program and Department of Environmental Conservation (DEC) new NOx Reasonably

Available Control Technologies (RACT) program, could adversely impact the reliability of the electric system. Implementation of the OTC-HEDD Load Following Boilers (LFBs) and High Emitting Combustion Turbines (HECT) program could render some units unavailable and others limited to reduced output at times of peak energy needs, which would result in violations of the resource adequacy criterion in 2017 and 2018. The New York DEC is developing several proposals to lower emission limitations from generators in New York State. If such limitations are implemented without sufficient flexibility, under the new NOx RACT program, up to 3,125 MW of capacity may no longer be available to meet peak load conditions. If such conditions arise, and without any replacement resources, the resource adequacy criterion would be violated for all years from 2009 through 2018.

- CO_2 Emissions - With respect to the Regional Greenhouse Gas Initiative (RGGI) program, higher carbon allowance prices – combined with a reduced fuel price spread and other environmental program compliance costs – will place significant strain on whether, and the degree to which, fossil fueled units, particularly coal units, will be able to continue to operate. For example, as reflected in the 2009 RNA, allowance prices that reach or approximate the same levels as those being registered in the European market (e.g., at the time of the 2009 RNA issuance, \$35 to \$50/ton[2]) will adversely affect the availability of allowances that are needed to operate facilities in New York. The latest RGGI auction was held on December 17, 2008 and all ten RGGI states participated. During the December auction all of the roughly 31.5 million CO_2 allowances were sold at a clearing price of \$3.38 per allowance. Additionally, RGGI future prices for December 2009 and December 2010 are currently trading in the \$3.50/ton to \$3.60/ton range. The RGGI market would be impacted by national cap and trade legislation, if enacted, as well as by the current economic downturn.

- Clean Air Interstate Rule (CAIR) – There is a significant uncertainty about the long term impacts of CAIR on fossil generating units. In the near term impacts are not expected to degrade reliability.

4. Zones at Risk - An increase in load or a reduction in resources of 750 MW in the lower Hudson Valley or a change of between 500 and 750 MW in New York City in 2018 would cause reliability standard violations and a need for additional solutions. Similarly, removing 500 MW each from Zones G, H, and J would also cause a violation of the resource adequacy criterion and a need for additional solutions in 2018.

[2] At the issuance of the 2009 RNA carbon allowance auction prices were estimated at \$35 to \$50 a ton based on the then existing European market for carbon allowances. The European allowance market price has since dropped to a range of \$15.50 - \$24.50/ton exemplifying its volatility.

The evaluation of these risks and the actions the NYISO would take if they arise, are set forth in Section 3.2 of this document.

Additional Observations

Prior CRPs identified and recommended additional actions that are needed to mitigate other conditions that could impact the reliability of the New York bulk power system and/or could adversely affect the implementation of the Plan and future system reliability. These include:

1. Continued progress on initiatives to address issues and concerns with voltage performance on the bulk power system;

2. The New York State Energy Plan should call for the reenactment of a comprehensive siting process for major electric generating facilities;

3. Continued monitoring of the fuel diversity of the power supply system and changes to the fuel supply infrastructure; and

4. The NYISO's participation in regional and interregional planning efforts to maintain adequate models of its neighboring systems' emergency assistance.

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1. Introduction

The Comprehensive Reliability Planning Process (CRPP) encompasses a ten-year planning horizon and evaluates the future reliability of the New York bulk power system. In order to preserve and maintain system reliability, the NYISO, in conjunction with Market Participants, identifies the reliability needs over the planning period and issues its findings in the Reliability Needs Assessment (RNA). The Comprehensive Reliability Plan (CRP) then evaluates a range of proposed solutions to address the needs identified in the RNA, if any. A request for solutions to identified reliability needs is issued with the expectation that Market-Based Solutions will come forward to meet the identified needs. In the event that Market-Based Solutions are not sufficient, the process provides for the identification of Regulated Backstop Solutions proposed by designated transmission owners, and Alternative Regulated Solutions proposed by any market participant. The NYISO then evaluates all proposed solutions to determine whether they will meet the identified reliability needs. Thus, the Comprehensive Reliability Plan (CRP) is developed, setting forth the plans and schedules that are expected to be implemented to meet those needs.

For the first time, this year's CRP will be the starting point for the new economic planning process called the Congestion Assessment and Resource Integration Study (CARIS), which will commence in the summer of 2009. The CARIS will evaluate transmission constraints and potential economic solutions to the congestion identified. All three resource types (generation, transmission and demand side management (DSM) programs) will be considered on a comparable basis as potential economic solutions for alleviating the identified congestion. On October 16, 2008, in response to the NYISO's Order 890 compliance filing, the Federal Energy Regulatory Commission (FERC) conditionally approved the NYISO's newly expanded planning process called the Comprehensive System Planning Process (CSPP), which integrates the existing CRPP and the CARIS into an extended two-year planning cycle.

The NYISO's planning process must take into account a number of other state initiatives. Pursuant to the Energy Efficiency Portfolio Standard (EEPS), New York State Public Service Commission (PSC) has taken initial steps to implement its jurisdictional portion of the Governor's initiative to lower energy consumption on the electric system by 15% of the 2007 forecasted levels by 2015. Using conservative assumptions appropriate to a baseline reliability analysis and current authorized spending levels, the NYISO determined that its Base Case should include a reduction of approximately 5% of peak load from the previously forecasted levels by 2015.

Moreover, the New York State PSC has commenced a three-phase Energy Resource Planning (ERP) proceeding to examine long-term energy planning in New York. In the first phase, the PSC examined how to undertake cost allocation and cost recovery of non-transmission regulated solutions to reliability needs, specifically generation and demand response projects.[3] In the second phase, the PSC examined the process to determine which regulated solutions should be

[3] Cost allocation and cost recovery of transmission regulated solutions to reliability needs occur under the FERC approved NYISO Tariff.

permitted and built to meet reliability needs if Market-Based Solutions are not sufficient.[4] In the third phase, now on hold pending completion of the new State Energy Plan later this year, the PSC will determine whether and how to establish a state resource planning process that takes public policy considerations into account. The NYISO has participated, and will continue to participate, in every phase of the PSC's ERP proceeding to: (i) maintain an all-resource planning process that provides equal consideration and treatment of transmission, generation and demand response resources; (ii) guide the PSC's selection of regulated solutions consistent with the NYISO's tariffs; and (iii) ensure that planning for New York's bulk power system is consistent with the NYISO's competitive markets

In April 2008, the Governor of New York State announced the establishment of a new State Energy Planning Board (SEPB). As the NYISO is not part of government, its authority is limited to the responsibilities contained in its federally approved tariff and its formation agreements. The New York State energy policy initiatives should complement the planning already being conducted by the NYISO, and are proceeding in concert with the NYISO's existing and developing processes. The NYISO is providing its full technical assistance and support to the SEPB for its deliberations.

[4] Case 07-E-1507, Proceeding to Establish a Long-Range Electric Resource Plan and Infrastructure Planning Process, Policy Statement on Backstop Project Approval Process (February 18, 2009).

2. Development of the 2009 Comprehensive Reliability Plan

2.1. Highlights of the 2009 RNA

The 2009 RNA (see Appendix A) indicated that the forecasted baseline system meets applicable reliability criteria for the next 10 years, from 2009 through 2018, without any additional resource needs. There are three primary reasons the 2009 RNA does not identify reliability needs:

1. **Facility additions –** Approximately 1,714 MW above the 2008 RNA resource assumptions, which include approximately 800 MW of new wind capacity, with a lower MW level of scheduled generation retirements than in the 2008 RNA, have been incorporated into the 2009 RNA Base Case. In addition, the continued viability of the TO Updated plans identified in the 2008 CRP and contained in the Base Case for the 2009 RNA, maintained similar transfer limits between the 2008 and 2009 CRPs.

2. **Energy Efficiency Portfolio Standard (EEPS) proceeding –** Pursuant to the EEPS, the New York PSC has taken the initial steps to implement its jurisdictional portion of the Governor's initiative to lower energy consumption on the electric system by 15% of the 2007 forecasted levels by 2015. The PSC authorized in 2005 continued spending of $175 million annually through July 2011 on Systems Benefits Charge Programs, and an additional $160 million annually for energy efficiency programs was authorized in the June 23rd EEPS Order, totaling approximately $335 million per year.[5]

Using conservative assumptions appropriate to a baseline reliability analysis and current authorized spending levels, the NYISO determined that there should be a reduction of approximately 5% of peak load from the previously forecasted levels by 2015. The resulting 2,100 MW decrease in the peak load forecast in 2018 largely contributed to the NYISO's determination that there are no reliability needs in the Base Case. Additional EEPS program spending would further delay reliability needs.

3. **Increased registration in Special Case Resource (SCR) –** The NYISO has experienced a significant increase in the registration of the SCR programs that have effectively reduced the need for additional capacity resources to the system based on customer pledges to cut energy usage on demand. This level of demand response is in addition to the energy efficiency efforts associated with the EEPS. The NYISO currently has registrations of approximately 2,084 MW of SCRs, an increase of 761 MW of resources over the SCR levels included in the 2008 RNA.

Table 1 below summarizes the impact of the lower load forecast level resulting from State public policy programs, increased generator additions, lower scheduled retirements and additional SCR program participation.

[5] The PSC has authorized the collection of $160 million annually. The June 23rd Order also called for the expenditure of an additional $170 million annually through 2011, for a total of $330 million annually during that period. This $330 million amount would be incremental to the $175 million annually in SBC spending that the PSC authorized for the five year period 2006-2011.

Table 1: 2008 RNA – 2009 RNA Load and Capacity Comparison[6]

	2008 RNA Year 2017	2009 RNA Year 2018	Delta MW
NYCA Load	37,631	35,658	(1,973)
SCR	1,323	2,084	761
Unit Additions	455	2,169	1,714
Unit Retirements	1,428	1,272	(156)

As no reliability needs were identified over the 2009–2018 planning horizon, the NYISO conducted analyses of numerous sensitivities and scenarios in order to test the robustness of the bulk power system and to bound the conditions under which resource adequacy or transmission security needs may arise. The sensitivity and scenario analyses revealed that:

1. Reliability needs would arise in 2017 in the absence of effective implementation of the EEPS programs.

2. Implementation of new programs to control nitrogen oxides (NOx) emissions from fossil fueled generators on high electric demand days could render some units unavailable and others limited to reduced output at times of peak energy needs. If such limitations are strictly designed, the availability of up to 1,231 MW of high-emitting combustion turbines (HECT) and up to 1,739 MW of load following boilers (LFB), would be reduced within the planning horizon. Similarly, the implementation of new emission controls, such as Reasonably Available Control Technologies (RACT) would result in up to 3,125 MW of capacity no longer being available to meet peak load conditions. If such circumstances arise, and no replacement resources result, the resource adequacy criterion would be violated for all years from 2009 through 2018.

3. With respect to the Regional Greenhouse Gas Initiative (RGGI), if the new RGGI allowance market operates as expected by the State, (i.e., allowance prices remain low and a substantial spread persists between natural gas and coal pricing), power grid reliability will not be negatively impacted in the near term. Since the release of the 2009 RNA, the latest RGGI auction was held on December 17, 2008 and all ten RGGI states participated. During the December auction all of the roughly 31.5 million CO_2 allowances were sold at a clearing price of $3.38 per allowance. Additionally, RGGI future prices for December 2009 and December 2010 are currently trading in the $3.50/ton to $3.60/ton range. Assuming today's coal and gas fuel price spread and any other environmental program compliance costs, higher carbon allowance prices (e.g. potential auction allowance prices of $35 to $50/ton)[7] would cause the availability of high carbon emitting coal fired capacity to be reduced,

[6] Note that the 2008 RNA totals include Russell 1-4 units, Lovett 5, Poletti, and Astoria GTs. The 2009 RNA totals include Russell 3 and 4 units (Russell 1 and 2 retired in 2007 and were not included in the 2009 RNA totals), Lovett 5, Poletti, and Onondaga Cogen.

[7] At the issuance of the 2009 RNA carbon allowance auction prices were estimated at $35 to $50 a ton based on the then existing European market for carbon allowances. The European allowance market price has since dropped to a range of $15.50 - $24.50/ton exemplifying its volatility.

placing significant strain on these resources. The level of RGGI allowance cost, fuel price spread, and other environmental program compliance costs have an interrelated and cumulative effect on high carbon emitting units, and thus, reliability. The RGGI market would be impacted by national cap and trade legislation if enacted, as well as by the current economic downturn.

4. Similarly, the unexpected retirement of certain generation would cause immediate resource adequacy violations and the need for new resources in New York. For example, due to its location in a constrained part of the system, retirement of one of the two Indian Point nuclear power plant units - which are due for relicensing before the Nuclear Regulatory Commission - would cause an immediate violation of the reliability standard in 2014. Retirement of both units would cause a severe shortage in resources needed to maintain bulk power system reliability, resulting in the probability of an involuntary interruption of load that is approximately 40 times higher than the reliability standard in 2018.

5. An increase in load or a reduction in resources of 750 MW in the lower Hudson Valley, or a change of between 500 and 750 MW in New York City, in 2018 would cause reliability standard violations and a need for additional solutions. Similarly, removing 500 MW each from Zones G, H, and J would also cause a violation of the resource adequacy criterion and a need for additional solutions in 2018.

2.2. Development of Solutions to the 2009 RNA

Following the approval and issuance of the RNA, the planning process enters a solutions phase in which the NYISO requests and evaluates solutions submitted in response to the identified reliability needs, and prepares the CRP. As the 2009 RNA did not identify any reliability needs through the Study Period, there was no need for the NYISO to issue a request for solutions in this year's CRPP cycle. Accordingly, no solutions were evaluated.

2.2.1. Transmission Owner Updated Plans

The NYISO issued a request for TO Updated plans for inclusion in the 2009 CRP. The NYISO did not receive any additional bulk power Updated TO Plans in addition to those provided during the 2009 RNA input phase. The following Table 2 below summarizes the previous CRP Market-Based Projects, TO plans, and their current status.

Table 2: Current Status of the CRP Market - Based Projects (MBP) and TO Plans

Project Type	Submitted	MW	Zone	In-Service Date	Current Status[1]
MBP - Resource Proposals					
Gas Turbine NRG Astoria Re-powering[2]	CRP 2005, CRP 2007, CRP 2008	520 MW	J	Jan - 2011	New Target June 2012 NYISO interconnection queue projects # 201 and # 224
Simple Cycle GT Indian Point	CRP 2007, CRP 2008	300	H	May - 2011	Suspended
DSM SCR EnerNOC	CRP 2008	125	G, H, J	2012 - 2017	Withdrawn
DSM SCR ECS	CRP 2008	300	F, G, H, I, J	Ramps up from 2008 through 2012	Withdrawn
Empire Generation Project	CRP 2008	635	F	Q1 2010	New Target June 2010 Under Construction NYISO interconnection queue project # 69
MBP - Transmission Proposals					
Controllable AC Transmission Linden VFT	CRP 2007, CRP 2008	300 (No specific capacity identified)	PJM - J	Q4 2009 PJM Queue G22	On Target Under Construction NYISO interconnection queue project #125
Back-to-Back HVDC, AC Line HTP	CRP 2007, CRP 2008 and was an alternative regulated proposal in CRP 2005	660 (500 MW specific capacity identified)	PJM - J	Q2/2011 PJM Queue O66	New Target Q4 2011 NYISO interconnection queue projects # 206
Back-to-Back HVDC, AC Line Harbor Cable	CRP 2007, CRP 2008 and was an alternative regulated proposal in CRP 2005	550 (550 MW specific capacity identified)	PJM - J	Jun - 2011	Withdrawn NYISO interconnection queue projects # 195 and # 253
Cross Hudson	CRP 2008	550	J	Jun - 2010	Withdrawn NYISO interconnection queue project # 255 Replaced with queue # 295
Cross Hudson II	CRP 2008	800	J	Jun - 2010	New Target June 2012 NYISO interconnect queue project # 295
TO Plans					
ConEd M29 Project	CRP 2005	500	J	May - 2011	Under construction NYISO interconnection queue projects # 153
Caithness	CRP 2005	310	K	Jan - 2009	On Target Under construction NYISO interconnection queue projects # 107
Millwood Cap Bank	CRP 2007	240 Mvar	H	Q1 2009	New Target May 2009 Under construction

1 Status as provided by Market Participant as of Dec. 31, 2008.

2 NRG submitted three proposals listed in the Interconnection queue. A 520 MW project under Q# 201 and 224, a 789 MW project under Q#266, and an 800 MW project under Q#268 at Arthur Kill. The Arthur Kill project, Q# 268, was withdrawn. For the purposes of the Market-Based solutions' evaluation, the NYISO assumed the lowest MW proposal. There is a retirement of 112 MW at this location reflected in the base case.

2.3. Re-Assessment of Baseline System for the CRP

The baseline system was re-evaluated with the non-bulk power TO Updated Plans to confirm that no additional resources are required for the next ten years (See Table 7). Table 3 below represents the RNA study case load and resources.

Table 3: RNA Study Case Load and Resource Table with Updated TO Plans[8]

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Peak Load										
NYCA	**34,059**	**34,269**	**34,462**	**34,586**	**34,725**	**34,905**	**35,029**	**35,258**	**35,430**	**35,658**
Zone J	12,127	12,257	12,361	12,452	12,537	12,627	12,683	12,787	12,879	12,980
Zone K	5,386	5,395	5,403	5,403	5,377	5,370	5,358	5,374	5,354	5,383
Resources										
NYCA										
"Capacity"	39,992	39,657	40,496	40,496	40,502	40,452	40,452	40,452	40,452	40,452
"SCR"	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084
Total	**42,077**	**41,741**	**42,580**	**42,580**	**42,586**	**42,536**	**42,536**	**42,536**	**42,536**	**42,536**
Res./Load Ratio	123.5%	121.8%	123.6%	123.1%	122.6%	121.9%	121.4%	120.6%	120.1%	119.3%
Zone J										
"Capacity"	10,097	9,206	9,206	9,206	9,206	9,206	9,206	9,206	9,206	9,206
"SCR"	622	622	622	622	622	622	622	622	622	622
Total	**10,719**	**9,828**	**9,828**	**9,828**	**9,828**	**9,828**	**9,828**	**9,828**	**9,828**	**9,828**
Res./Load Ratio	88.4%	80.2%	79.5%	78.9%	78.4%	77.83%	77.49%	76.86%	76.31%	75.71%
Zone K										
"Capacity"	5,938	6,368	6,368	6,368	6,368	6,368	6,368	6,368	6,368	6,368
"SCR"	216	216	216	216	216	216	216	216	216	216
Total	**6,154**	**6,584**	**6,584**	**6,584**	**6,584**	**6,584**	**6,584**	**6,584**	**6,584**	**6,584**
Res./Load Ratio	114.3%	122.0%	121.9%	121.9%	122.4%	122.61%	122.88%	122.52%	122.98%	122.31%

2.3.1. Adequacy and Transmission Security

Figure 1 below displays the bulk power system for NYCA, which is generally facilities 230 kV and above, but does include certain 138 kV facilities and a very small number of 115 kV facilities. The balance of the facilities 138 kV and lower are considered non-bulk or sub-transmission facilities. The figure also displays key transmission interfaces for New York.

[8] New York Control Area (NYCA) "Capacity" values include resources internal to New York, Additions, Reratings, Retirements, Purchases and Sales, and UDRs with firm capacity. Zone K "Capacity" values include UDRs with firm capacity. Wind generation values include full nameplate capacity.

"SCR" values reflect projected August 2009 ICAP capability period values held constant over the ten-year Study Period.

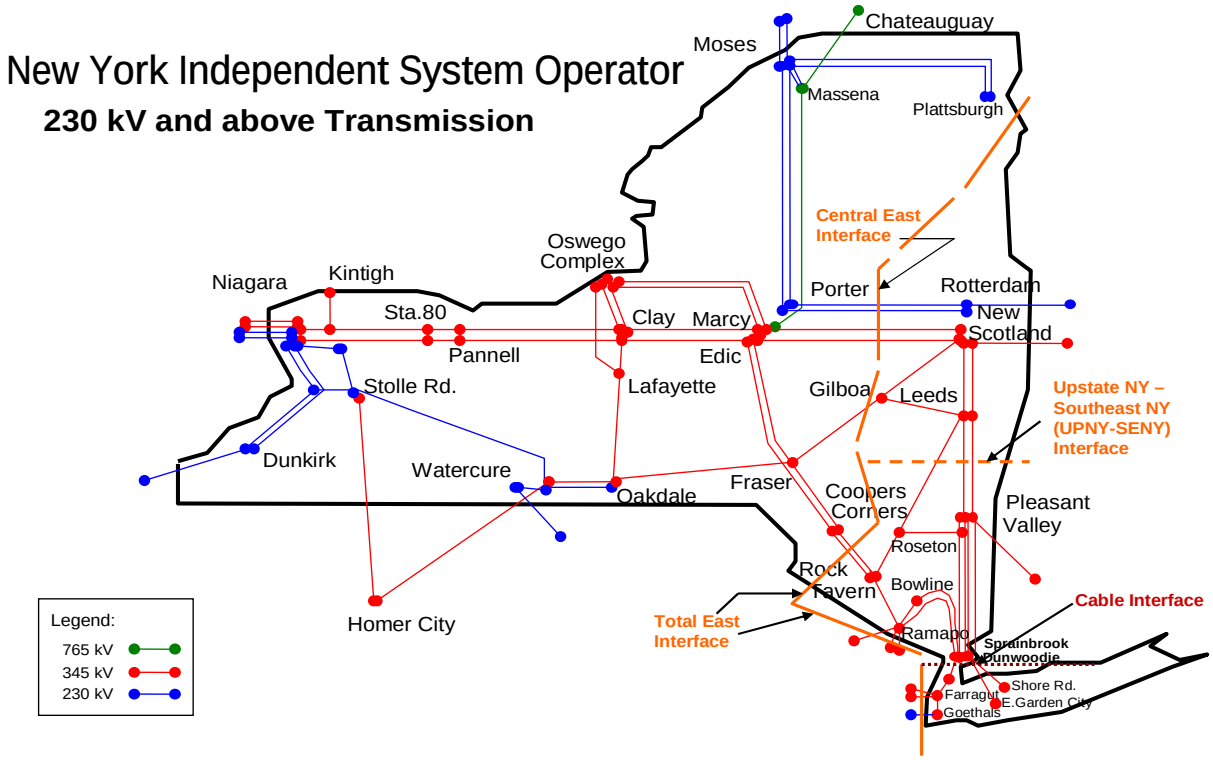

Figure 1: NYISO 230 kV and above Transmission Map

In the resource adequacy analysis for the 2009 RNA, transfer limits were assumed to be constant from the end of the first five years throughout the second five-year period. The assumed transmission transfer limits were confirmed during the CRP evaluation of the baseline system.

As determined in this and prior CRPs approved by the NYISO Board of Directors, it is necessary to reduce transfer limits for key NYCA transmission interfaces during the ten-year Study Period in order to maintain the security of the transmission system. The lower transfer limits are associated with the UPNY/SENY, Dysinger East, West Central, and Dunwoodie South (or the I to J&K) interfaces, together with the persistent Central East voltage/stability interface. This reduction limits the ability of the New York bulk power system to deliver capacity downstream of the constraints which may result in an increase in the Loss Of Load Expectation (LOLE). The major factor driving the reduction in transfer limits is the voltage performance of the New York bulk power system, which is being adversely impacted by load growth and generator retirements. However, the required transfer limit reductions identified in the 2009 RNA and CRP are not as severe as in the prior studies because of the proposed system improvements at the I to J&K interface, the reduction in load due to EEPS initiatives, and external system improvements. Proposed system improvements to increase the voltage-based emergency transfer limits that were presented as TO updates in prior CRPs, were non-bulk power system capacitor banks added in the Southeastern New York area, the proposed addition of the M29 345 kV cable, the proposed addition of the Millwood capacitor bank, and the bypass of the series reactors at Gowanus. To date, non-bulk power system capacitor banks have been installed in the Southeastern New York area and the bypass of the Gowanus series reactors has been implemented. The total

improvements related to the remainder of these projects that have been identified in past CRPs could result in a different cumulative effect on the emergency transfer limits than were projected in those studies when these facilities are actually installed. The level of improvement will be directly affected by the system conditions at the time of installation, for example, the actual load levels, which may be different than those that were modeled in the CRP study. The voltage-based emergency transfer limits projected for the New York system in this 2009 CRP are as set forth in Tables 5 and 6.

The prior CRPs identified actions required to address transmission security and adequacy concerns. These concerns are still relevant to the 2009 CRP, and are reiterated herein along with a summary of the steps that have already been taken to address the required actions.

2.3.2. Baseline System Reliability

Below are the principal findings of the 2009 CRP for the 2009-2018 Study Period.

2.3.2.1. Short Circuit Assessment

Another important element of performing a transmission security assessment is the calculation of short circuit current to ascertain whether the circuit breakers present in the system would be subject to fault levels in excess of their rated interrupting capability. The analysis was performed for the year 2013 with the latest version of the Class Year 2008 Annual Transmission Baseline Assessment (ATBA) and modified to be consistent with the 2009 CRP study conditions. The fault levels were kept constant over the second five years because the methodology for fault duty calculation is sensitive to new generation and there is none during this period. The detailed analysis is presented in Appendix C of this report. The NYISO observed no major changes in fault current from the previous CRPs. Overdutied circuit breakers appear in at least two substations in the analysis, Astoria West and Fitzpatrick. In 2007 an interim operating protocol was developed to limit the number of units connected to the Astoria West bus, thereby preventing the overdutied situation. In April 2008, a Memorandum-of-Understanding (MOU) was signed by Con Edison, NRG, and NYPA. The MOU continues certain provisions of the interim operating protocol until the overdutied breakers are replaced, as committed to by Con Edison, by the summer of 2010. Entergy replaced the Fitzpatrick breaker in early 2008.

2.3.2.2. Resource and Transmission Adequacy

The resultant load forecast, adjusted for the EEPS impact, has not resulted in any increased demands on the transmission system to meet capacity and energy needs in the NYCA system. The transfers into and through Southeastern New York (SENY) will continue to be limited by voltage constraints, rather than thermal constraints. As a result of the three prior CRPs, the TOs are upgrading their systems by bypassing series reactors and adding reactive resources where appropriate. In addition to these improvements, the implementation of the M29 transmission project and the Millwood capacitor bank project will bring the transmission voltage limit close to the thermal limit for the cable interface into Zone J.

Table 4 and Table 5 below illustrate the analysis of the transmission emergency thermal and voltage transfer limits. The TOs did not submit any significant updates to their transmission

plans which would affect the results of the thermal and voltage transfer limit analysis performed for the 2009 RNA. Therefore the 2009 CRP emergency thermal and voltage transfer limits are the same limits reported in the 2009 RNA study. In comparing the 2009 and 2008 transfer limits, the slight variation in transfer limits for E-F (in Table 4 and Table 5), and F-G (in Table 4) is due to the variation in generation dispatch in response to the variation in loads. The reduction in I-J and K transfer limit for the year 2010 (325 MW in Table 4 and 225 MW in Table 5) is due to the change of the M29 transmission project in service date from 2010 to 2011.

Table 4: Transmission System Emergency Thermal Transfer Limits for Key Interfaces in MW

	2009 CRP Study					2008 CRP Study				
Interface	**2009**	**2010**	**2011**	**2012**	**2013**	**2009**	**2010**	**2011**	**2012**	**2013**
E-F*	**3075**	**3075**	**3075**	**3075**	**3075**	**3350**	**3175**	**3250**	**3100**	**3100**
F-G	**3450**	**3450**	**3450**	**3450**	**3450**	**3475**	**3475**	**3475**	**3475**	**3475**
UPNY/SENY	**5150**	**5150**	**5150**	**5150**	**5150**	**5150**	**5150**	**5150**	**5150**	**5150**
I-J	**4025**	**4075**	**4400**	**4400**	**4400**	**4000**	**4400**	**4400**	**4400**	**4400**
I-K	**1290**	**1290**	**1290**	**1290**	**1290**	**1290**	**1290**	**1290**	**1290**	**1290**

* E-F – Central East plus Fraser-Gilboa circuit

Table 5: Transmission System Emergency Voltage Transfer Limits for Key Interfaces in MW

	2009 CRP Study					2008 CRP Study				
Interface	**2009**	**2010**	**2011**	**2012**	**2013**	**2009**	**2010**	**2011**	**2012**	**2013**
E-F*	**3050**	**3050**	**3050**	**3050**	**3050**	**3150**	**3150**	**3150**	**3150**	**3150**
F-G										
UPNY/SENY										
I-J										
I-K										
I-J&K		**5290**	**5365**	**5365**	**5365**		**5515**	**5465**	**5440**	**5440**

* E-F – Central East plus Fraser-Gilboa circuit

Note: Blank entries indicate that the voltage limits are more than 5% above the thermal limits. The I to J and I to K interfaces were combined into one interface grouping since the limit on one interface is sensitive to the flow on the other.

Table 6 below summarizes the emergency transfer limits of most restrictive limiting conditions used in the 2009 CRP study and compares those results to the 2008 CRP study.

Table 6: Transmission System Base Case Emergency Transfer Limits for Key Interfaces in MW

	2009 CRP Study					2008 CRP Study				
Interface	**2009**	**2010**	**2011**	**2012**	**2013**	**2009**	**2010**	**2011**	**2012**	**2013**
E-F*	**3050^{V}**	**3050^{V}**	**3050^{V}**	**3050^{V}**	**3050^{V}**	**3150^{V}**	**3150^{V}**	**3150^{V}**	**3100^{T}**	**3100^{T}**
F-G	**3450^{T}**	**3450^{T}**	**3450^{T}**	**3450^{T}**	**3450^{T}**	**3475^{T}**	**3475^{T}**	**3475^{T}**	**3475^{T}**	**3475^{T}**
UPNY/SENY	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**	**5150^{T}**
I-J	**4025^{T}**	**4075^{T}**	**4400^{C}**	**4400^{C}**	**4400^{C}**	**4000^{T}**	**4400^{C}**	**4400^{C}**	**4400^{C}**	**4400^{C}**
I-K	**1290^{T}**	**1290^{C}**	**1290^{C}**	**1290^{C}**	**1290^{C}**	**1290^{T}**	**1290^{C}**	**1290^{C}**	**1290^{C}**	**1290^{C}**
I-J&K	**5315^{T}**	**5290^{V}**	**5365^{V}**	**5365^{V}**	**5365^{V}**	**5290^{T}**	**5515^{V}**	**5465^{V}**	**5440^{V}**	**5440^{V}**

* E-F – Central East plus Fraser-Gilboa circuit
Note: T = Thermal; V = Voltage, C = Combined

Resource and transmission adequacy is evaluated for the entire ten-year Study Period. Resource adequacy is evaluated for the second five-year period with transfer limits assumed constant. The analysis encompasses the Five Year Base Case and the second five years. The CRP Base Case transfer limits under emergency conditions (from the analysis conducted with the updated Base Cases) were employed to determine resource adequacy needs (defined as a loss-of-load-expectation or LOLE that exceeds 0.1 days per year). The LOLE for the NYCA did not exceed 0.10 days per year in any year through 2018. The LOLE[9] results for the entire ten-year RNA Base Case are summarized in Table 7.

[9] It should be noted that the LOLE results presented for each load zone are determined based on the assumption that load in a particular load Zone has "first rights" to that capacity in that load Zone even though that capacity could be contractually obligated to load in another load Zone or area. General Electric's Multi-Area Reliability Simulations (MARS) logic prorates capacity among zones if more than one zone is capacity deficient.

Table 7: LOLE for the CRP Study Case Transfer Limits

Area/Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AREA-A										
AREA-B										
AREA-C										
AREA-D										
AREA-E										
AREA-F										
AREA-G										
AREA-H										
AREA-I						<0.01	<0.01	0.01	0.01	0.02
AREA-J						<0.01	0.01	0.01	0.01	0.02
AREA-K										
NYCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02

3. 2009 Comprehensive Reliability Plan

The 2009 RNA determined that there are no reliability needs anticipated through 2018. This outlook is an improvement from the findings of the 2008 RNA due to an increase in generation additions and SCR participation, and a reduction in peak load forecast and planned retirements. As a result, the NYISO did not need to request Market-Based, Regulated Backstop, or Alternative Regulated Solutions to meet the reliability needs over the ten-year horizon. The NYISO requested updates from the NYTOs for incorporation into the 2009 CRP Base Case. The NYISO is issuing the 2009 CRP setting forth the assumptions and resources on which bulk power system reliability will rely for the 2009 to 2018 Study Period, as discussed below.

While the 2009 CRP indicates that the system will remain reliable for the next ten years, if the implementation of planned resources included in the Base Case either does not occur at all and/or if certain scenarios analyzed in the RNA materialize, violations of the reliability criteria would result. This fact drives the need for vigilance in monitoring the conditions on the bulk power system as well as pending state and federal initiatives.

The 2009 CRP Base Case will be a starting point for the economic planning process called the CARIS. CARIS is an integral part of the NYISO's newly expanded planning process known as CSPP. CARIS will evaluate transmission constraints and potential solutions to the congestion identified. All three resource types (generation, transmission and DSM programs) will be considered on a comparable basis as potential solutions in alleviating the identified congestion.

This 2009 CRP is based upon the resources and other key assumptions that were included in the 2009 RNA Base Case such as the peak load forecast, Special Case Resources (SCR) forecast, generation additions and scheduled units retirements (see Table 8 below).

The peak load forecast used for the Base Case (35,658 MW) assumed the 2008 Gold Book econometric forecast adjusted for approximately 30% of the EEPS goals. The current economic downturn was not reflected in the peak load forecast.

The SCR forecast assumed an increased SCR registration level in 2009 over the 2008 Gold Book level and this value was held constant over the ten-year Study Period.

Table 8: 2008 RNA - 2009 RNA Load and Capacity Comparison[10]

	2008 RNA Year 2017	2009 RNA Year 2018	Delta MW
NYCA Load	37,631	35,658	(1,973)
SCR	1,323	2,084	761
Unit Additions	455	2,169	1,714
Unit Retirements	1,428	1,272	(156)

The 2009 CRP identifies Recommendations, Risk Scenarios, and Additional Observations.

3.1. CRP Recommendations

1. Monitor and track the accuracy of the load forecast levels as impacted by the Energy Efficiency Portfolio Standard proceeding initiative and the economic downturn.

   An accurate forecast of the electricity demand level over the ten-year Study Period is an essential factor in the development of the CRP. The NYISO will continue to monitor factors influencing the long range load forecast. A number of potential developments that could greatly increase the level of variation in the electricity demand forecast must be continuously considered and monitored. The NYISO will continue its participation in the EEPS proceeding by providing technical expertise on load forecasting, offering opinions on establishing energy savings goals, and offering evaluation, measurement and verification (EM&V) of energy and related demand savings, as well as identifying upside risk to electricity demand.

   On a monthly basis, the NYISO tracks and monitors actual and weather-adjusted energy usage and peak demand. On a semi-annual basis, the NYISO updates the short term forecasts. On an annual basis, the NYISO updates the long term forecasts. With the implementation of the CSPP, the load forecasts and their impacts on system reliability will be re-assessed at the midpoint of the two-year planning cycle.

   Since the completion of the 2009 RNA, the EEPS proceeding has been moving forward. The State's investor-owned utilities under the jurisdiction of the PSC were requested to file 60-day[11] and 90-day plans for developing energy efficiency programs through the year 2011. The impact of these plans has been included in the 2009 RNA. Therefore, there is no need to make further adjustments to incorporate

[10] Note that the 2008 RNA totals include Russell 1-4 units, Lovett 5, Poletti, and Astoria GTs. The 2009 RNA totals include Russell 3 and 4 units (Russell 1 and 2 retired in 2007 and were not included in the 2009 RNA totals), Lovett 5, Poletti, and Onondaga Cogen.

[11] The PSC approved these 60-day Fast Track programs in its January 16, 2009 Order Approving Utility Administered Electric Energy Efficiency Programs with Modifications

additional energy efficiency impacts in the 2009 CRP. The 2009 RNA anticipates that some impacts of energy efficiency programs will occur as soon as 2009.

The 2009 RNA forecast is an update of the 2008 long term econometric forecast that accounts for the impact of the EEPS. The 2009 RNA forecast results in a reduction of approximately 2,000 MW from the 2008 RNA projected load level due to lower underlying economic growth and energy efficiency initiatives. Since September 2008, the economic outlook has worsened and further reductions in load and usage forecasts may result in the near term.

The lower level of energy growth that is now expected further reinforces the fundamental conclusions of the 2009 RNA that reliability will be maintained through 2018, all else being equal. In addition to the Base Case forecast (incorporating the EEPS 15x15 conservation impacts), the 2009 RNA also included two lower growth conservation scenarios. Neither of the two lower growth scenarios demonstrated any need. A lower economic growth scenario would likely fit at an intermediate level between the two higher EEPS penetration scenarios modeled in the RNA.

2. Monitor and track the implementation of planned generation additions, retirements and SCR registrations.[12]

   Planned generation additions of approximately 2,169 MW that are in the Base Case should move forward so that they are in service when anticipated. Retirements of additional generating units beyond those already contemplated (1,272 MW) in the 2009 RNA, for either economic and/or environmental factors, could adversely affect the reliability of the NYCA bulk power system. The retirement of one of the two Indian Point nuclear power plant units, which are located in a constrained area of the system and are due for relicensing before the Nuclear Regulatory Commission, would cause an immediate violation of the resource adequacy criterion. Retirement of both units would result in a severe violation of the reliability rules. An increase of approximately 761 MW in SCR registration over the 2008 RNA level drives the need to track the implementation of these resources as well. Each of these resources will be tracked on a quarterly basis to ensure that actual amounts realized are comparable to the assumed levels in the 2009 RNA.

3. Monitor and track the implementation of the identified TO Updates and other planned projects. [12]

   The NYISO will continue tracking the implementation of the TO Updates such as the addition of capacitor banks at the Millwood Substation, the Con Edison M29 transmission project, the Caithness project, firm capacity in conjunction with granted UDRs, and planned non-bulk power system projects.

4. Monitor and track the viability of the Market-Based Solutions submitted with the 2008 CRP. [12]

[12] Tracking of Resource changes, TO Updates, and Market-Based Projects that are included in the CRP are described in Appendix D.

While there were no reliability needs identified in the 2009 RNA, the NYISO must be prepared to act should conditions change establishing an immediate reliability need that requires a solution. In addition, to the extent merchant developers wish to provide updated information, the NYISO should continue to assess the viability of market-based solutions that were included in the *2008 CRP* on a quarterly basis as a further measure to understand all available options.

5. Maintain voltage performance at the bulk power system level.

   As reflected in the RNA studies that the NYISO has issued, voltage constraints - not thermal constraints - are the limiting factor on some key interfaces on the New York system. The NYISO will continue to monitor the voltage performance of the NYCA system to determine, at a minimum, that voltage based transfer limits do not degrade to a point below the levels determined in this CRP. The NYISO, through its strong commitment to maintaining reliability, is continuously evaluating the models and assumptions that underpin the studies, which are designed to assess the voltage performance of the New York power system. These elements and assumptions include load models, load power factor, generator reactive performance, the processes utilized for committing reactive resources, levels of shunt compensation, reactive reserves and electrical losses. Finally, the NYISO should continue to investigate procedures and/or measurements governing reactive power to identify additional factors that could enhance or improve reliability through managing the voltage performance of New York's bulk power system. The NYISO is also participating in the PSC proceedings on how to reduce losses on electric transmission and distribution systems.

3.2. Risk Scenarios

Although the planned system meets the applicable reliability criteria based on the conditions studied, the NYISO has identified several scenarios that, if occurred, would adversely impact the effectiveness of the Plan to meet future system reliability requirements.

Figure 2 below illustrates the impact of some of the risk scenarios evaluated in the 2009 RNA. The retirement of the Indian Point 2 and 3 nuclear power plant units would have the greatest and most immediate impact on the reliability of the NYCA system. In order to mitigate the impact of these retirements, approximately 1,000 MW of capacity would need to be installed in Southeastern New York (Zones G-K) for each retired unit. The total amount and location of the replacement capacity would depend upon the intra- and inter-area transmission limitations in the vicinity of the capacity additions. For the rest of the scenarios in Figure 2 the addition of 1,500 MW of new capacity installed in Southeastern New York would be sufficient to mitigate the adverse reliability impact of the scenarios.

The 2009 RNA scenario that combined the impacts of both the extreme weather conditions and high load growth (total effect of 7.5% higher in the load forecast compared to the Base Case) in each year of the ten-year Study Period, was not identified as a risk scenario in this CRP because it is very unlikely to occur.

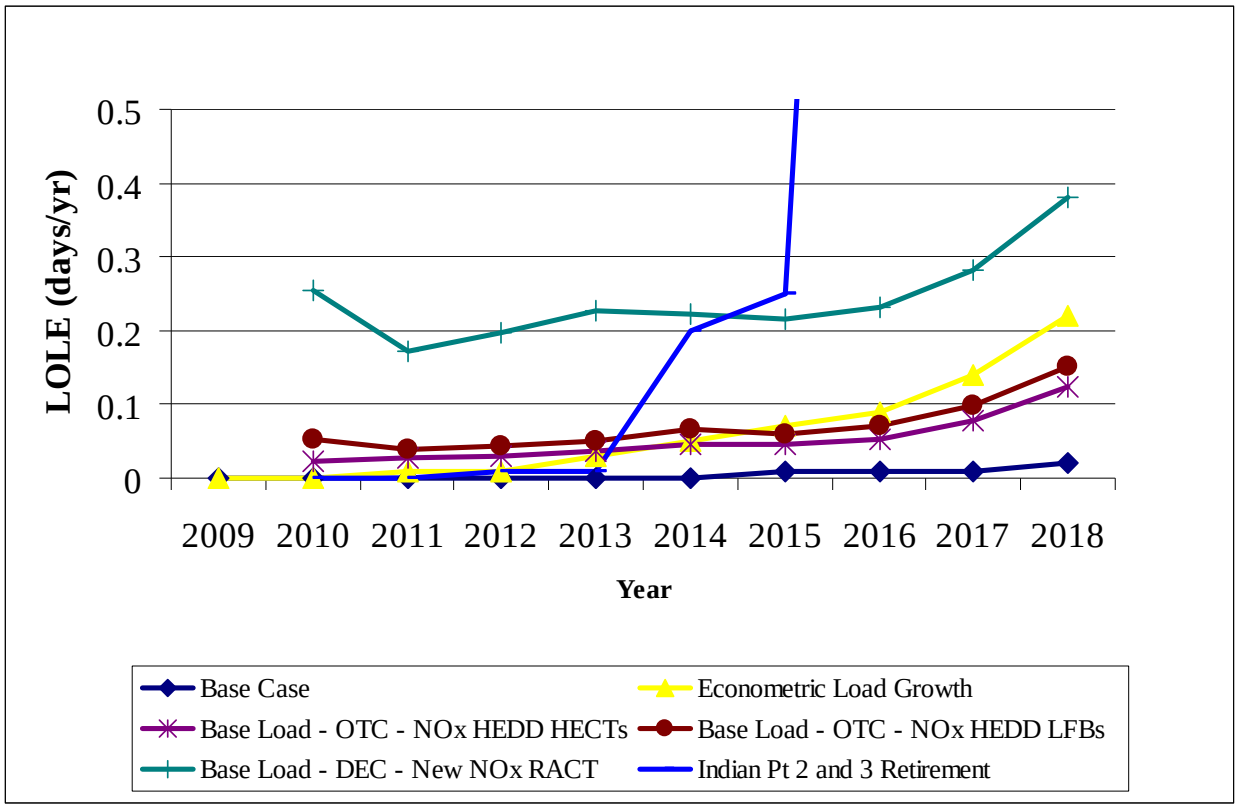

Figure 2: 2009 RNA Risk Scenarios

The specific risk scenarios include:

1. Indian Point 2 and 3 Retirement - Due to their location in a constrained area of the system, unexpected retirement of either of the two Indian Point nuclear plants at the expiration of their current operating license would cause resource adequacy violations and the need for new resources in New York. The retirement of one of the two Indian Point nuclear power plant units (1,000 MW each) would cause an immediate violation of the reliability standard in 2014. Retirement of both units would cause a severe shortage in resources needed to maintain bulk power system reliability, resulting in the probability of an involuntary interruption of load that is approximately 40 times higher than the reliability standard in 2018. These LOLE levels were reached as applied to a Base Case with significant levels of assumed energy efficiency penetration in this part of the State. If load reductions are not achieved, or are achieved at lower levels in this area of the State, violation of the reliability requirements would become even more pronounced.

2. Econometric Growth - Forecasted econometric load growth level without EEPS impacts, which is 2,126 MW higher than the Base Case load forecast level in 2018, would result in a need for new resources in 2017. Under current economic conditions, surpassing the Base Case load forecast levels by 2,000 MW is unlikely.

3. Environmental restrictions:

- NOx Emissions - Implementation of new programs to control nitrogen oxides (NOx) emissions from fossil fueled generators, such as the Ozone Transmission Commission (OTC) High Electric Demand Days (HEDD) program and Department of Environmental Conservation (DEC) new NOx Reasonably Available Control Technologies (RACT) program, could adversely impact the reliability of the electric system. Implementation of the OTC-HEDD program could render some units unavailable and others limited to reduced output at times of peak energy needs. If such limitations curtailed the availability of up to 1,739 MW of load following boilers (LFBs) and up to 1,231 MW of high emitting combustion turbines (HECT), it would result in violations of the resource adequacy criterion in 2017 and 2018 respectively. If it is assumed that the implementation of new emission control program, such as NOx RACT, is required, it is reasonable to expect that up to 25% of affected units would not be able to retrofit to meet the requirements, resulting in up to 3,125 MW of capacity no longer being available to meet peak load conditions. If such circumstances arise, and no other replacement resources result, the resource adequacy criterion would be violated for all years from 2009 through 2018. The NYISO urges the development of a broader range of regulatory initiatives in order to achieve compliance with the ozone standard through the reduction of NOx emissions from power plants that will maintain the reliability of the New York State bulk power system. The United States Environmental Protection Agency (EPA) recently established a new ambient air quality standard for ozone at 75 ppb, which will significantly increase the magnitude of the challenge ahead.

- CO_2 Emissions - Implemented beginning January 1, 2009, the Regional Greenhouse Gas Initiative (RGGI) program caps CO_2 emissions levels initially and then, beginning in 2015, requires a 2.5% reduction per year through 2018. Affected generators are required to own one allowance for each ton of CO_2 emitted. Such allowances are available for purchase through periodic auctions with a limited amount of compliance that may be achieved through the creation of greenhouse gas emission offsets. Emission allowance costs, reductions in the price spread between natural gas and coal and other environmental compliance costs are primary factors considered by fossil fueled generating plant owners to determine the continued viability of such units. For example, while large coal-fired units historically have relied upon fuel cost differentials to obtain incremental revenues to meet some portion of their higher fixed costs, the spread between coal and natural gas has dissipated substantially in recent months.

  Moreover, a number of factors can affect the overall sufficiency of allowances. Increased renewable generation and successful implementation of energy efficiency programs reduce overall emissions level. However, for example, with emission allowance costs that equal or approximate the same levels as those experienced in Europe in 2008, and with natural gas-to-coal price spreads at current ranges of 2 to 1 respectively, the economic viability of large coal-fired units may be threatened. Likewise, the loss of a major nuclear facility would

cause an immediate need for an additional 11.4 million tons per year of CO_2 allowances to operate other facilities to provide the energy currently provided by these largely emissions free, base loaded resources.

The latest RGGI auction was held on December 17, 2008 and all ten RGGI states participated. During the December auction all of the roughly 31.5 million CO_2 allowances were sold at a clearing price of $3.38 per allowance. Additionally, RGGI future prices for December 2009 and December 2010 are currently trading in the $3.50/ton to $3.60/ton range. The RGGI market would be impacted by national cap and trade legislation, if enacted, as well as by the current economic downturn.

- Clean Air Interstate Rule (CAIR) - In December 2008, the U.S. Court of Appeals for the D.C. Circuit agreed to temporarily restore the Clean Air Interstate Rule while the U.S. Environmental Protection Agency works to fix the legal problems the court has identified with the rule. The NYISO will continue to monitor and evaluate the impact that this decision can have on the bulk power system.

4. Zones at Risk - An increase in load or a reduction in resources of 750 MW in the lower Hudson Valley, or a change of between 500 and 750 MW in New York City, in 2018 would cause reliability standard violations and a need for additional solutions. Similarly, removing 500 MW each from Zones G, H, and J would also cause a violation of the resource adequacy criterion and a need for additional solutions in 2018.

Should the NYISO determine that system conditions have changed to be a potential threat to reliability, it will evaluate those changes to assess whether the effectiveness of the Plan is impacted. As of February 2009, the NYISO is aware of over 2,300 MW of viable market-based projects from the 2008 CRP and many other projects in the Interconnection Queue at various stages of development. Per tariff requirements, if the NYISO determines that a Reliability Need could arise before the next CRPP cycle, it will examine whether market-based projects will meet that need. If not, and the NYISO determines that the need is imminent, the NYISO will request the TOs to implement a Gap Solution. If there is a threat to the reliability of the system, and the need is not imminent, the NYISO will address the newly-identified reliability need in the subsequent RNA.

3.3. Additional Observations

The prior CRPs have identified and recommended additional actions that are needed in order to mitigate other conditions that could impact the reliability of the New York bulk power system and/or could adversely affect the implementation of the Plan and future system reliability. These observations and actions are ongoing and are:

3.3.1. Observation 1

For several years, the NYISO has pointed out the need to make progress on a number of NYISO-related initiatives to address issues and concerns with the voltage performance of the bulk power system. These included:

- Continuation of the initiative to complete a comprehensive reliability analysis of reactive power demand and resources in the NYCA.
- Continued progress on a work plan and time table for the Reactive Power Working Group (RPWG) to complete its initiative by the end of 2009 to improve modeling of reactive power sinks and sources in the NYCA power system model.
- A benchmarking of New York's reactive power planning and voltage control practices to the "best practices" identified in the North American Electric Reliability Corporation, Inc (NERC) Blackout Recommendation 7a, to the extent applicable.

Last year, the NYISO commented in the New York PCS's proceeding on establishing an EEPS that significant energy efficiency savings could be realized, and reliability could be enhanced, by making cost-effective equipment upgrades to the electric transmission and distribution systems.[13] The PSC subsequently established a proceeding to evaluate the potential for reducing electric system losses.[14]

Actions required

To address Observation 1, the NYISO Reactive Power Working Group (RPWG) has several initiatives underway. They include, but are not limited to, the following:

- A review of the NYISO Voltage Guidelines such as the adequacy of the 5% margin used to determine interface transfer limits above which voltage collapse potentially would occur.
- A review of a number of the factors that impact the voltage performance of the power system. They include the load forecast, the modeling of system loads, and the testing of generator reactive capability, metering, load power factor and zonal power factors. The RPWG is also reviewing the tools that are used for power system simulation.

These efforts are ongoing and the RPWG has been providing monthly reports to the Operating Committee regarding their progress. The reports have covered such topics as complex load modeling, survey of reactive power resources, metering needs, and power factor sensitivity testing. The NYISO urges the TOs to work through the NERC standard development process to create a reactive power standard for the bulk power system in the NYCA.

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[13] PSC Case 07-M-0548 – Order Establishing Energy Efficiency Portfolio Standard and Approving Programs (Issued and Effective June 23, 2008), at 62.

[14] PSC Case 08-E-0751 – Proceeding on Motion of the Commission to Identify Sources of Electric System Losses and the Means of Reducing Them, Order Clarifying Scope of Proceeding (Issued and Effective July 17, 2008).

Moreover, in support of the PSC proceeding on system losses, the NYISO is conducting a comprehensive study with the Department of Public Service Staff to identify the locations on the bulk power system and at the interface between the bulk system and local distribution systems where losses are the greatest and where equipment upgrades will be most effective. The results of this study should be available in 2009.

3.3.2. Observation 2

The absence of a "one-stop" siting process could impede the construction and operation of new generating facilities to meet reliability needs should they arise in the future. New York State once had a streamlined siting process for large power plants (Article X of the New York Public Service Law), but that process expired at the end of 2002. The NYISO's evaluation of the viability of project timelines will reflect the absence of an Article X process.

Actions Required

The New York State Energy Plan should call for the re-enactment of a comprehensive siting process for major electric generating facilities in Article X of the Public Service Law.

3.3.3. Observation 3

The mix of resources in New York has changed since the inception of the NYISO's markets. A number of coal-fired units have retired and additions to the system have been predominantly natural gas-fired combined cycle or gas turbine units. In addition, a substantial amount of wind generation has been added in New York by virtue of the PSC-adopted Renewable Portfolio Standard (RPS). Accordingly, New York has maintained a relatively fuel diverse generating fleet to date. Specifically, 37% of the Summer 2008 NYCA capacity represents dual fuel (gas and oil) units, 17% gas units, 14% hydro units, 13% nuclear units, 9% oil units, 8% coal units, and 2% other units including wind.

Actions 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, but it should be noted that planned additions of renewable resources within the State pursuant to its RPS have and will continue to contribute to fuel diversity. The NYISO will also monitor changes to the fuel supply infrastructure, such as new fuel gas pipelines and liquefied natural gas facilities. For more information see the NYISO's white paper on fuel diversity (http://www.nyiso.com/public/webdocs/documents/white_papers/fuel_diversity_11202008.pdf).

3.3.4. Observation 4

The level of emergency assistance from neighboring control areas to meet resource adequacy requirements is projected to increase through the ten-year planning period. This is a function of the forecasted increase in loads over the ten-year period with no new resource additions in the Base Case after 2013 due to inclusion rules.

Actions Required

The NYISO and two of its neighboring control areas, ISO-New England and PJM, as parties to the Northeastern Coordinated System Planning Protocol (NCSPP) have implemented a process to evaluate their systems from an inter-regional perspective. Coordination with the other two neighboring control areas, Ontario and Hydro Quebec, is done through Northeast Power Coordinating Council (NPCC) work groups. The NYISO will participate in the NCSPP and the NPCC efforts to maintain accurate models of its neighboring systems to insure that the needed level of emergency assistance is available.

Appendix A – 2009 RNA

The 2009 RNA report can be found through this link:

http://www.nyiso.com/public/webdocs/services/planning/reliability_assessments/RNA_2009_Final_1_13_09.pdf

Appendix B –The Comprehensive System Planning Process (CSPP)

B.1 Comprehensive System Planning Process (CSPP)

The CRPP is part of the NYISO's newly expanded planning process known as the Comprehensive System Planning Process (CSPP). The public policy context underlying the NYISO's Comprehensive Reliability Planning Process (CRPP) changed substantially over the last year, at both the federal and state levels. In Order 890, the FERC determined that the Open Access Transmission Tariffs (OATT) of electric transmission service providers nationwide should be reformed to provide for, among other things, an open, transparent and coordinated planning process at both a regional and a local level. Among other things, Order 890 cited the decline in transmission investment since its landmark open access Order 888 was issued in 1996, and the consequent growth in significant transmission constraints. Order 890 required the NYISO to file an expanded process in conformance with nine planning principals.

On December 7, 2007, the NYISO filed a Comprehensive System Planning Process (CSPP) as an amendment to its OATT Attachment Y that contained three main components; 1) the new Local Transmission Owner Planning Process (LTPP), 2) the existing CRPP process, and 3) the new economic process called the Congestion Assessment and Resource Integration Study (CARIS). The new LTPP process will provide the opportunity for stakeholders to participate in the TOs local planning efforts and will form an input into the CRPP. The NYISO filed only minor changes to the CRPP to make corrections and conform to the FERC planning principles. The CRPP process, in particular the CRP, will form the basis of a new economic planning process, known as CARIS. The CARIS will consist of a series of three studies of future congestion on the New York bulk power system, including an analysis of the costs and benefits of alternatives to alleviate that congestion. The NYISO proposed that economic transmission upgrades could proceed with cost allocation to all beneficiaries if at least 80% of the designated beneficiaries vote in favor. On October 16, 2008, the FERC conditionally approved the NYISO's planning compliance filings, subject to certain conditions. The NYISO made a further compliance filing on January 18, 2009 to clarify certain matters in Attachment Y, including dispute resolution, transparency, and the ability to replicate study results, public participation, and the comparable treatment for transmission, generation and demand response resources. FERC has granted the NYISO's request for an additional 120 days, until May 19, 2009, to make a further compliance filing providing further detail on additional metrics to be used in evaluating the costs and benefits of transmission projects that would relieve congestion, and on cost allocation and cost recovery from economic transmission projects.

Figure B-1 and Figure B-2 below summarize the new CSPP process.

NYISO Comprehensive System Planning Process (CSPP)

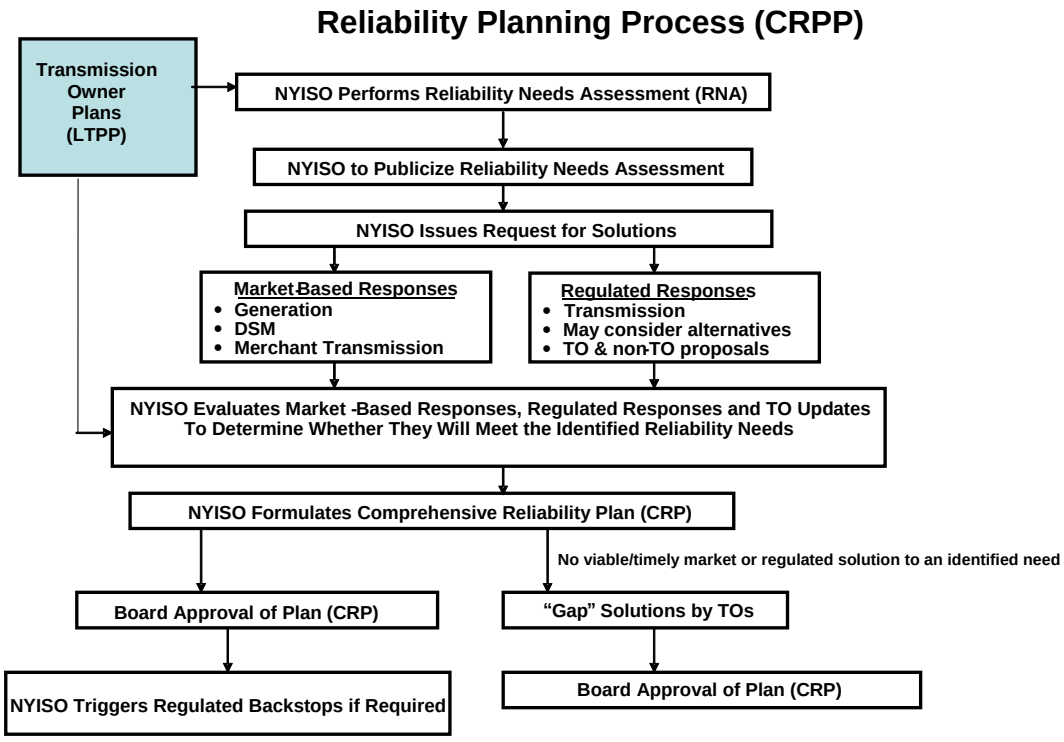

Figure B-1: Reliability Planning Process

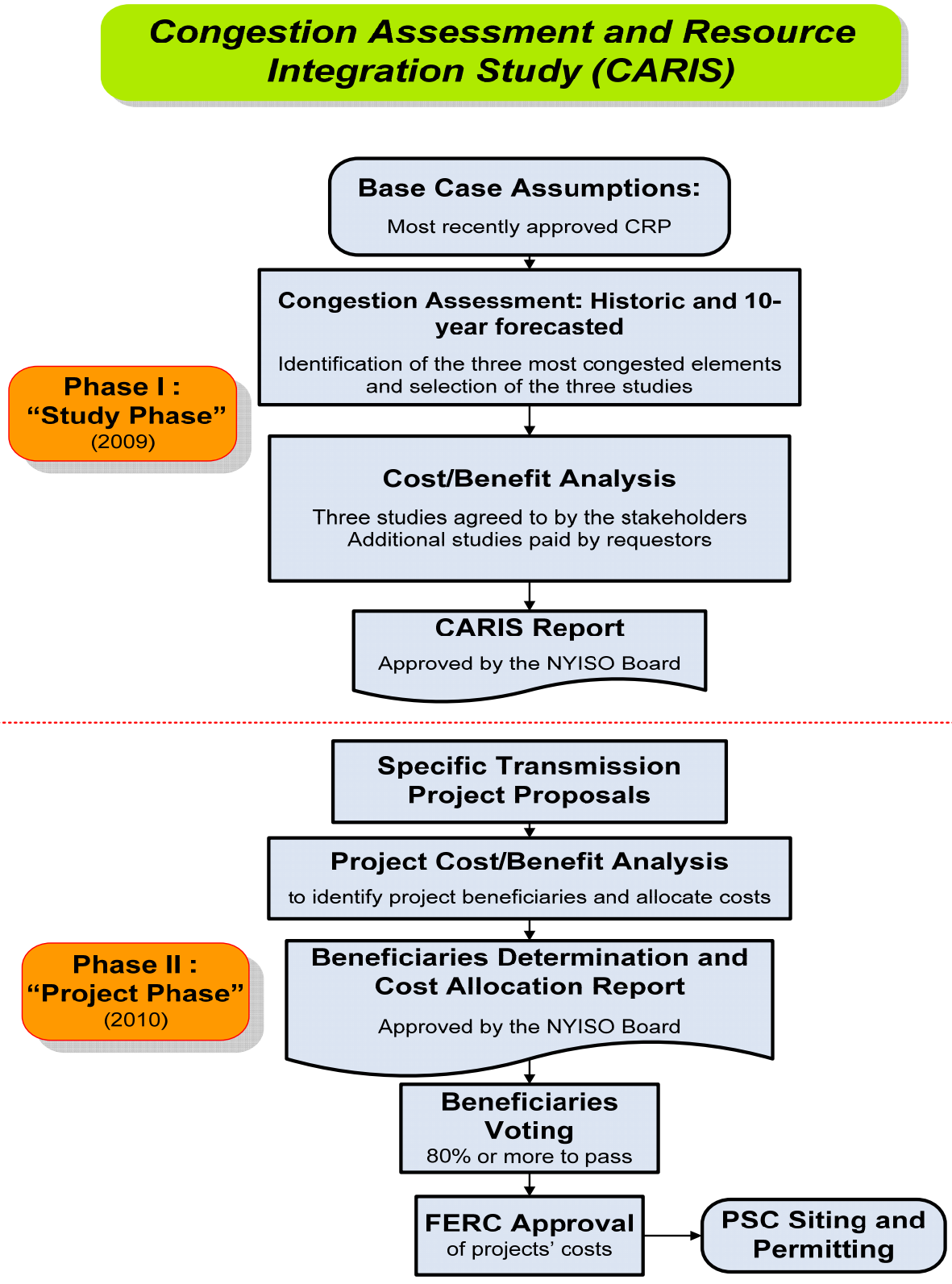

Figure B-2: Economic Planning Process (CARIS)

B.1.1 NYISO Reliability Planning Process - 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 ten-year planning horizons.

As set forth in NYISO OATT, Attachment Y, the five objectives of the CRPP are as follows:

1. Evaluate the reliability needs of the bulk power transmission facilities (BPTF).
2. Identify factors and issues that could adversely impact the reliability of the BPTF.
3. Provide an opportunity and a process whereby solutions to identified needs are proposed, evaluated, and enacted in a timely manner to maintain the reliability of the system.
4. Provide for the development of Market-Based Solutions, while maintaining the reliability of the BPTF through Regulated Backstop Solutions as needed.
5. Coordinate the NYISO's reliability assessments with those undertaken by neighboring control areas.

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

The second step in the CRPP process is the development of the Comprehensive Reliability Plan (CRP), which identifies and evaluates proposed solutions to maintain power system reliability. Those solutions may include Market-Based, Regulated Backstop and/or Alternative Regulated Solutions that may result in new generation additions, transmission upgrades and additions, and/or expanded demand response programs.

A detailed description of the CRPP is contained in the CRPP Manual, which is posted on the NYISO's website, http://www.nyiso.com/public/documents/manuals/planning.

B.1.1.1 Summary of Reliability Policies and Criteria Applicable to the NYISO

The foundation of the CRPP is the reliability policies and criteria applicable to the NYISO. The phrase "reliability policy and criteria" is used broadly to include standards, requirements, guidelines, practices, and compliance. The following presents an overview of these policies and criteria in the context of basic reliability concepts and the organizations that develop, promulgate, implement, and enforce the related policies and criteria.

B.1.1.2 Basic Reliability Concepts

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

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

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

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

B.1.1.3 Organizational Structure

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

The NERC was formed as a voluntary, not-for-profit organization in 1968 in response to the blackout of 1965. A 10-member Board of Trustees governs the NERC with input from an industry stakeholder committee. The NERC has formulated planning standards and operating policies. Pursuant to the Energy Policy Act of 2005, the FERC approved the NERC as the Electric Reliability Organization for North America in 2006. The FERC has approved many

NERC standards as enforceable as of June 18, 2007, and the NERC and the FERC are in the process of approving additional standards that carry the weight of federal law.

Eight regional reliability councils currently comprise the NERC's membership; and members of these councils come from all segments of the industry. New York State is an area within the NPCC, which also includes New England and northeastern Canada. The NPCC implements broad-based, industry-wide reliability standards tailored to its region. The NERC and the NPCC have received the FERC's approval of a delegation agreement by which the NPCC oversees and enforces compliance with NERC and NPCC standards in the northeastern regions of the United States and Canada.

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

B.1.1.4 Reliability Policies and Criteria

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

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

Operating Standards provide the fundamental operating requirements. The interconnected bulk electric system must be operated in secure state such that the aggregate electrical demand and energy requirements of customers are satisfied in real time. Responsibility for reliable operation is vested primarily with the NYISO. The objective of these Operating Standards is to promote reliable interconnection operations within each of the three interconnections in North America without burdening other entities within the interconnection. The NYISO is within the Eastern Interconnection.

NPCC has three basic categories of documents: Criteria, Guidelines, and Procedures, respectively referred to as Type A, B, and C documents. The foundational NPCC document is A-2, Basic Criteria for Design and Operation of Interconnected Power Systems, which establishes the principles of interconnected planning and operations.

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

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

B.2 NYISO Economic Planning Process - CARIS

Upon the approval and issuance of the 2009 CRP, the NYISO will start with the implementation of the newly adopted economic planning process called CARIS. The CARIS will align with the reliability planning process and will assume a reliable system for the ten-year study period based on the most recently approved CRP. Each CARIS cycle will consist of a series of three congestion studies developed with market participants' input and any additional studies for which individual market participants wish to pay. In conducting the CARIS, the NYISO will perform the cost/benefit analysis of each potential solution to the congestion identified by using the production cost metric as a primary benefit metric. All resource types, such as generation, transmission and demand response will be considered on a comparable basis as potential solutions to congestion.

The objectives of the economic planning process are to: 1) project congestion on the New York State BPTFs over the ten-year planning period, 2) identify, through the development of appropriate scenarios, factors that might mitigate or increase congestion, 3) provide information to market participants and interested stakeholders regarding projects to reduce congestion;, 4) provide an opportunity for the development of market-based solutions to reduce the congestion; (5) provide a process for the evaluation and approval of regulated economic transmission projects in order to obtain cost recovery under the NYISO Tariff; and 6) coordinate the NYISO's congestion assessments and economic planning process with neighboring Control Areas.

Appendix C – Detail Technical Data

Power Flow Assessment Output (Subject to Confidential Energy Infrastructure Information (CEII)) - To be provided upon request

Appendix D – CSPP Monitoring and Tracking

A full description of the monitoring and tracking process for CRP solutions is detailed in the CRPP Manual. This appendix provides a high level summary of the monitoring and tracking process. In order to effectively assess the validity of market-based reliability solutions and TO projects against the requirements of the CSPP, the NYISO tracks status on a quarterly basis. Specifically, quarterly status updates are required from market participants for:

1. Projects included in the base case for the Comprehensive Reliability Plan (CRP)
2. Each of the market-based solutions (MBS)
3. Regulated backstop solutions (RBS)
4. Generation Retirements.

Each solution accepted in the CRP, whether in the form of demand response, transmission, or generation, are included in the quarterly updates. RBS from prior CRPs are no longer tracked once a new CRP is adopted unless they were previously triggered and have not been halted. The complete list of projects in the CRP that have been accepted as potential solutions to reliability needs and which are tracked and assessed by the NYISO is updated every two years when a new CRP is adopted. Upon receiving updated information from the market participants, the NYISO performs an independent analysis and verification to determine if each solution remains as a viable solution to the reliability needs. If the NYISO determines that an MBS is no longer viable or is not likely to meet the reliability needs in a timely manner, the solution will be excluded from the upcoming CRP, the NY State Public Service Commission (PSC) and TOs will be appropriately informed, and RBS(s) will be triggered if necessary (as noted below, because this CRP finds no reliability needs, no MBS(s) were requested).

To establish the timeframes in which a MBS must be built, the proposed RBS(s) serve as Benchmark[15]. The Benchmark dates are also tracked and assessed by the NYISO on a quarterly basis.

2009 CRP Project Assessment

Since the 2009 RNA has shown no needs between 2009 and 2018, once the 2009 CRP is issued, there will no longer be any Market-Based Solutions. However, major projects that have been included in the base case of the 2009 RNA will be tracked on a quarterly basis. As a contingency measure, the 2008 CRP Market-Based Projects will also continue to be tracked, provided that the developers continue to cooperate and support the NYISO's planning process. Additionally, NYISO Staff will assess all the key assumptions included in the 2009 RNA in an interim reliability need analysis towards the end of 2009 in order to determine if a gap solution may be necessary.

[15] The Benchmark is defined as the date by which an RBS must be triggered to allow the solution to be planned, designed, permitted, and implemented to meet an identified Reliability Need.