Comprehensive Reliability Planning Process Manual

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Revision History

Revision	Date	Changes
Initial Release	**Add date**	Add Rev history text here.

1 OVERVIEW

1.1 Background

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 in a timely manner 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 Manual is based upon the current version of the CRPP set forth in the OATT Attachment Y.

In February 2007, the FERC issued the final rule in its OATT reform proceeding. Order 890 directed improvements to the Open Access Transmission Tariffs of all Transmission Owners and Operators, including the ISOs and RTOs. Among other things, Order 890 listed nine principles that all Transmission Providers should adhere to in conducting their planning processes for both reliability as well as economic needs. Order 890 will require the NYISO to expand its economic planning process to include additional studies of transmission system congestion at the request of transmission customers. This will require the filing of tariff revisions to Attachment Y. In its Straw Proposal, the NYISO has proposed enhancements to its planning process that will enable it to respond to customer requests by conducting a series of economic planning studies that build upon the reliability planning process under the CRPP.

In addition, the NY Transmission Owners have made a proposal to provide more transparency in their local planning processes—which are provided as input into the NYISO's CRPP. The NYISO will post on its website a redraft of OATT Attachment Y to reflect these changes by September 14, 2007. The FERC will hold a technical conference on NYISO's redraft of Attachment Y on October 15 and 16, 2007. The NYISO's Compliance Filings in response to Order 890 are due on October 11, 2007 (for non-planning matters) and December 7, 2007 (for planning matters). Following final acceptance of the tariff amendments by FERC, this Manual will be updated to incorporate the changes and additional procedures required by Order 890.

Electric system planning is a continuous 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 Study Period, 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 the present and the future.

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.

1.2 The Comprehensive Reliability Planning Process

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

1.2.1 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 5-year and 10-year planning Study Period. 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. 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 Transmission Owner (TO)[1] to proceed with a regulated backstop solution in order to maintain reliability. Market participants can offer and promote alternative regulated solutions that, 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 TO'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 TO 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 5-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: generation, transmission, 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 Responsible TOs. 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.

The NYISO prepares its Comprehensive Reliability Plan following its evaluation of all proposed solutions (including alternative regulated solutions). The CRP identifies all proposed solutions that the NYISO has found to 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

[1] 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.

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 TO to develop a "gap solution" and to pursue its completion and alert the New York State Public Service Commission (NYSPSC). Such a gap solution shall be designed to be a temporary solution and shall strive to be compatible (to the extent possible) with permanent market-based proposals and regulated projects.

Developers of market-based 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, NYSPSC, 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. Figure 1.2.1-1 shows a summary of the process. The time required to complete major tasks within the annual CRPP is shown in Figure 1.2.1-2.

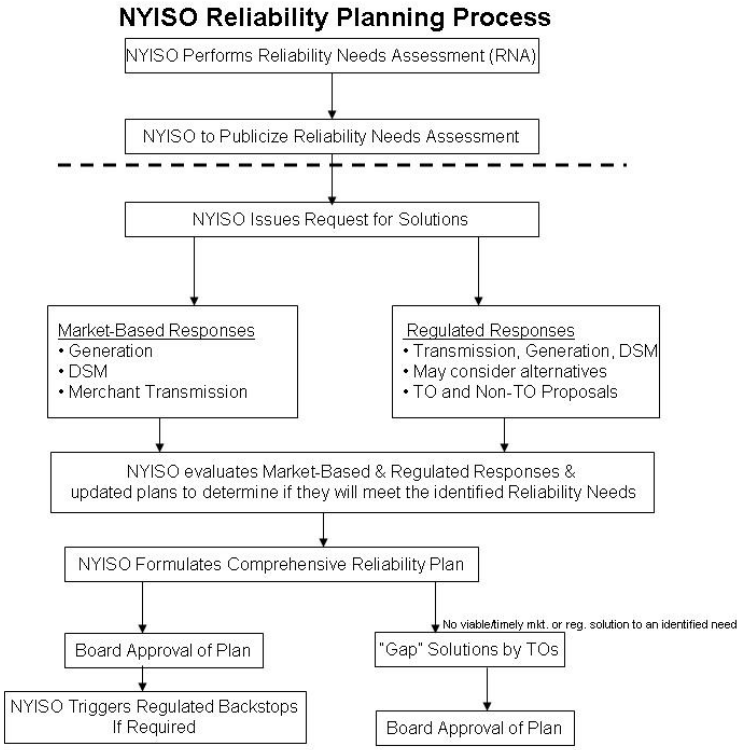


Figure 1.2.1-1: NYISO Reliability Planning Process Diagram

Figure 1.2.1-2: NYISO COMPREHENSIVE RELIABILITY PLANNING PROCESS TIME LINE

Major Tasks	Elapsed Months																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Submission of Data Inputs	■	■																	
Develop Base Case & Scenarios			■																
Reliability Needs Assessment				■	■	■	■	■											
RNA Review & Approval Process									■	■	■	■							
NYISO BOD Action on RNA / Independent Market Advisor Review												◆							
Development of Solutions to Reliability Needs												■	■						
NYISO Evaluation of Proposed Solutions														■	■	■	■		
CRP Review & Approval Process																	■	■	■
NYISO BOD Action on CRP / Independent Market Advisor Review																			◆
Issue / Post Final CRP																			◆

1.2.2 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 continuity of 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[2] 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 adversely affecting the continuity of service.

1.2.3 Overview of the CRPP Analysis Methodology

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

[2] 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.

The primary tool for conducting the transmission assessment studies 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 for conducting 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[3], including the impacts of the transfer capability of the transmission system.

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. Figure 1.2.3-1 summarizes the CRP analysis process.

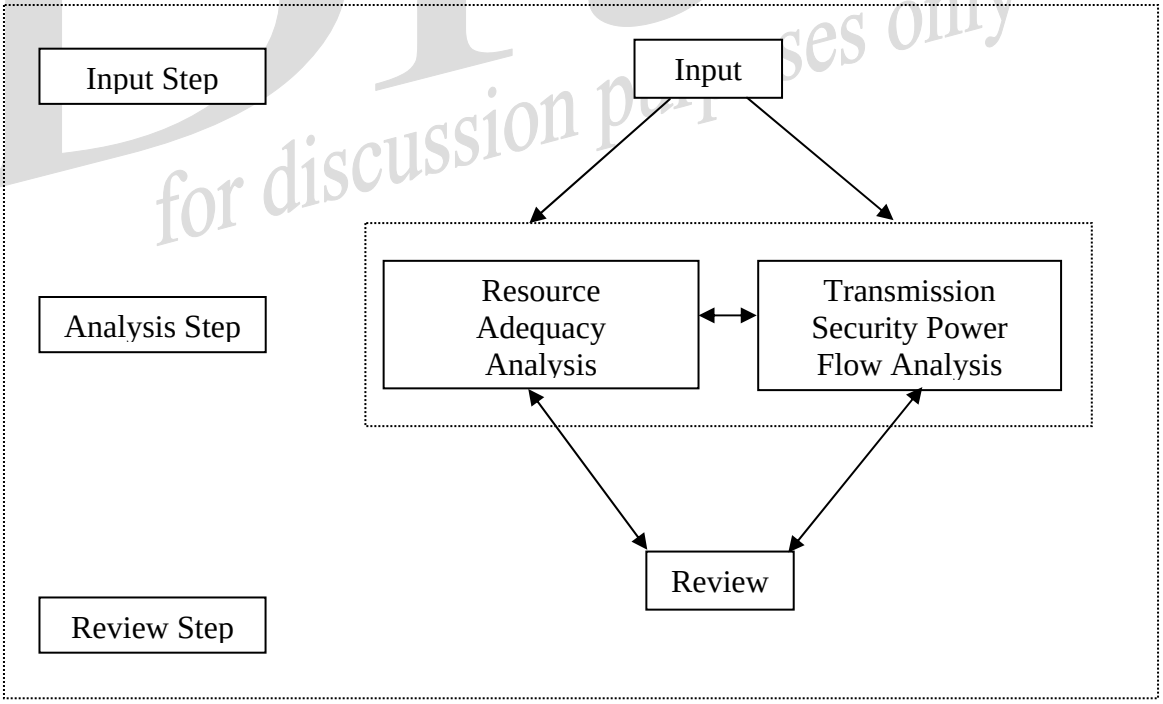


Figure 1.2.3-1: Flow Diagram for the CRP Analysis Process

[3] 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."

2 TARIFF PROCEDURES AND CRITERIA

2.1 Procedures to Establish Qualifications for Valid Market-based Response (§6.3[4])

The NYISO, in conjunction with ESPWG, has established qualifications and criteria for a valid market-based solution. Such qualifications recognize the differences between various resources' characteristics and development time lines. To establish the timeframes in which a market-based solution should appear, the regulated backstop solutions serve as the benchmark. The Regulated Backstop Solution benchmark is defined as follows:

Regulated Backstop Solution Benchmark

- The Regulated Backstop Solution Benchmark ("BM") is defined as the date by which a regulated solution must be triggered to allow a solution to be planned, designed, attain permits as required, and be implemented to meet an identified reliability need.
- The NYISO will determine the BM based upon the time necessary to implement the regulated backstop solution proposed by the Responsible TO(s) and updated plans, if any, the TOs provide to the NYISO with respect to their systems. The NYISO shall make this determination based upon its independent analysis of the project schedule provided by the Responsible TO(s).
- If by the benchmark date the NYISO determines that the market-based solution is not likely to be available to meet the reliability need in a timely manner, the NYISO will trigger the backstop solution.

Proposed Criteria

- The NYISO will determine the estimated time to complete the market-based solution based upon the schedules and other information submitted by the developer. Information that may be required includes, but is not limited to:
  - Evidence of a commercially viable technology
  - Major milestone schedule
  - Demonstration of site control or schedule to obtain necessary site control
  - Whether a contract is under negotiation or in place
  - Status of NYISO interconnection studies
  - Status of NYISO interconnection agreement
  - Schedule for obtaining any required permits and other certifications
  - Evidence of equipment procurement
  - Evidence of financing

[4] The item numbers, when indicated within the parentheses, refer to the section in NYISO OATT Attachment Y.

- The developer shall promptly provide all data required to assist the NYISO in its review of the market-based solutions within the schedule provided for the Request for Solutions process.
- NYISO will treat any confidential data and data requests in accordance with the provisions of Attachment F of the NYISO OATT ("The Code of Conduct"), Attachment Y of the NYISO OATT ("the CRPP Confidentiality Policy"), and the Large Generator Interconnection Agreement ("LGIA").
- Failure to provide any data requested by the NYISO within a reasonable period of time (not to exceed 60 days from the date of the NYISO request) will result in the rejection of the proposed market-based solution from further consideration in that round of the Comprehensive Reliability Planning Process.
- Between three and five years before the BM, the NYISO will use a screening analysis to verify the feasibility of the market-based solution. This analysis will not require such things as final permit approvals or final contract documents.
- Between one and two years before the BM, the NYISO will perform a more extensive review of the proposed market-based solution. This review will include such elements as status of interconnection studies, contract negotiations, permit applications, financing and site control.
- Less than one year before the BM, the NYISO will perform a detailed review of the proposed market-based solution status and schedule. At this stage it is expected, but not required, that the proposed market-based solution will have obtained its final permits, any required interconnection studies will be completed, an interconnection agreement has been filed, financing will be in place, and equipment will be on order.
- The NYISO, prior to making a final determination about the viability* of a market-based solution, will communicate an interim determination to the developer along with the basis for its interim determination. The NYISO shall provide the developer a reasonable period (not more than two weeks) to respond to the NYISO's interim determination, including an opportunity to provide additional information to the NYISO to support the viability of the market-based solution.
- If the NYISO, following its analysis, determines that a market-based solution is not viable the market-based solution will not be included in the CRP.

Note:

*In the context of the CRPP, the terms "viable" and "viability" shall mean that there is a reasonable likelihood that the market-based solution will effectively address the identified reliability needs in a timely manner.

2.2 Criteria to Determine the Viability of Proposed Alternative Regulated Solutions (§6.4(a))

In the event that no market-based solution qualified under section 6.3 of OATT is proposed, the NYISO will initiate the second step of the solicitation process by requesting alternative regulated responses to the reliability needs. Such proposals may include reasonable alternatives that would effectively address the identified reliability need.

Proposed Requirements for Alternative Regulated Solutions

The NYISO will establish the benchmark (BM) based upon its independent analysis of the project schedule to implement the regulated backstop solution proposed by the Responsible TO(s).

- The NYISO will determine the estimated time to complete the alternative regulated solution (ARS) based upon the schedules and other information submitted by the developer. Information that may be required includes, but is not limited to:
  - Evidence of a commercially viable technology
  - Major milestone schedule
  - Demonstration of site control or a schedule to obtain necessary site control
  - Whether a contract is under negotiation or in place
  - Status of NYISO interconnection studies
  - Status of NYISO interconnection agreement needed
  - Schedule for obtaining any required permits and any other necessary certifications
  - Status of equipment procurement
  - Information on financing
- The developer shall promptly provide all data required to assist the NYISO in its review of the proposed ARS within the schedule provided for the Request for Solutions process.
- NYISO will treat any confidential data and data requests in accordance with the provisions of Attachment F of the NYISO OATT (“The Code of Conduct”), Attachment Y of the NYISO OATT (“The CRPP Confidentiality Policy”) and the LGIA.
- Failure to provide any data requested by the NYISO within a reasonable period of time (not to exceed 60 days from the date of the NYISO request) may result in the rejection of the ARS from further consideration in that round of the CRPP.
- Between three and five years before the BM, the NYISO will use a screening analysis to verify the feasibility of the ARS. This analysis will not require such things as final permit approvals or final contract documents.

- Between one and two years before the BM, the NYISO will perform a more extensive review of the ARS. This review will include such elements as status of interconnection studies, contract negotiations, permit applications, financing and site control, and regulatory status.
- Less than one year before the BM, the NYISO will perform a detailed review of the ARS's status and schedule. At this stage it is expected, but not required, that the ARS will have obtained its final permits, any required interconnection studies will be completed, an interconnection agreement has been filed, financing and regulatory approvals will be in place, and equipment will be on order.
- The NYISO, prior to making a final determination about the viability of a specific proposed solution, will communicate an interim determination to the developer along with the basis for its interim determination. The NYISO shall provide the developer a reasonable period (not more than 2 weeks) to respond to the NYISO's interim determination, including an opportunity to provide additional information to the NYISO to support the viability of the ARS...
- If the NYISO, following its analysis, determines that the ARS is not viable, the ARS will not be included in the CRP.

2.3 Criteria to Determine the Viability of Regulated Solutions Based on Project Status (§9.0a)

The NYISO will monitor and report on the status of market-based solutions to ensure their continued viability to meet Reliability Needs on a timely basis in the CRP. The NYISO will develop criteria, in conjunction with the ESPWG, to assess the continued viability of such projects.

Proposed Criteria

- Beginning with the first round of the Comprehensive Reliability Planning Process, the NYISO will develop a list of potential market-based solutions that it has determined would, if implemented, satisfy an identified reliability need.
- In order to remain on the CRP list as a potential market-based solution, the developer will submit updated information to the NYISO twice during each CRPP cycle, first during the input phase of the RNA, and again during the solutions phase during the period allowed for the solicitation for market-based and regulated backstop solutions. If no solutions are requested in a particular year, then the second update will be provided during the NYISO's analysis of whether existing solutions continue to meet identified reliability needs. The updated information of the project status shall include:
    - Evidence of a commercially viable technology
    - Major milestone schedule
    - Demonstration of site control

  - Whether a contract is under negotiation or in place
  - Status of NYISO interconnection studies
  - Status of NYISO interconnection agreement
  - Status of any required permits
  - Status of equipment procurement
  - Evidence of financing
  - Any other information that is requested by the NYISO
- NYISO will treat any confidential data in accordance with the provisions of Attachment Y of the NYISO OATT, the NYISO Code of Conduct, and the LGIA when preparing its report on project status.
- Failure to provide any data requested by the NYISO within a reasonable period of time (not to exceed 60 days from the date of the NYISO request) will result in the rejection of the proposed market-based solution from further consideration in that round of the CRPP. The proposed market-based solution will be removed from that year's CRP.
- The developer will immediately notify the NYISO when it has any indication of a material change* in the status of the market-based solution.
- If the NYISO, at any time, learns of a material change in the status of a market-based solution, it may, at that time, make a determination as to the continued viability of the proposed market-based solution.
- Between three and five years before the BM established by the regulated backstop solution, the NYISO will use a screening analysis to verify the feasibility of the proposed market-based solution. This analysis will not require such things as final permit approvals or final contract documents.
- Between one and two years before the BM, the NYISO will perform a more extensive review of the proposed market-based solution. This review will include such elements as status of interconnection studies, contract negotiations, permit applications, financing, and site control.
- Less than one year before the BM, the NYISO will perform a detailed review of the proposed market-based solution status and schedule. At this stage it is expected, but not required, that the proposed market-based solution will have obtained its final permits, any required interconnection studies will be completed, an interconnection agreement has been filed, financing will be in place, and equipment will be on order.
- The NYISO, prior to making a determination about the viability of a proposed market-based solution, will communicate its intended determination to the project sponsor along with the basis for its intended determination. The NYISO shall provide the sponsor a reasonable period (not more than two weeks) to respond to the NYISO's intended determination, including an opportunity to provide

additional information to the NYISO to support the continued viability of the proposed market-based solution.

- If the NYISO, following its analysis, determines that a proposed market-based solution is no longer viable, the proposed market-based solution will be removed from the list of potential market-based solutions in the next CRP.

Notes:

* In the context of the Comprehensive Reliability Planning Process, the term "material change" shall include, but not be limited to: (a) a change in the financial viability of the developer; (b) a change in the siting status; or (c) a change in a major element of the project development.

2.4 Criteria to Determine the Viability of Market-Based Solutions Based on Project Status (§9.0b)

The NYISO will monitor and report on the status of regulated solutions to determine their continued viability to meet Reliability Needs on a timely basis in the CRP. The NYISO will develop criteria, in conjunction with the ESPWG, to assess the continued viability of such projects.

Proposed Criteria

- Beginning with the first round of the Comprehensive Reliability Planning Process, the NYISO will develop a list of potential regulated solutions that it has determined would, if implemented, satisfy an identified reliability need.
- Such solutions will include backstop regulated solutions proposed by the Responsible TO(s), as well as alternative regulated solutions proposed by a Transmission Owner or other developer.

Regulated Backstop Solutions Proposed by the Responsible TO(s)

- In order to remain on the CRP list as a potential regulated backstop solution, the Responsible TO(s) shall provide to the NYISO, on an annual basis, verification that the proposed solution remains its choice for the regulated backstop solution. Such verification shall also include a statement that the implementation schedule is still valid.
- The Responsible TO shall establish a timeline for permitting activity, for ordering major equipment, and for construction.
- Following the first year that a regulated project is proposed, such verification shall be provided during the Request for Solutions phase of each subsequent CRPP.
- The Responsible TO(s) shall immediately notify the NYISO of any material change in the status of a regulated backstop solution or that a regulated backstop solution may no longer be viable, after which the NYISO shall determine whether another regulated backstop solution is needed outside of the normal CRPP cycle.

- If the Responsible TO(s) determines that there is another solution it wishes to propose as its regulated backstop solution to meet the needs identified in the RNA, it shall notify the NYISO during the Request for Solutions phase of a subsequent CRPP.
- Subject to a determination by the NYISO that the replacement solution will meet the identified reliability need, such solution shall be included in the CRP, in place of the original regulated backstop solution.
- If the new regulated backstop solution does not meet the needs identified in the RNA, the NYISO will provide sufficient information to the Responsible TO(s) to determine how the regulated backstop should be modified to meet the identified reliability needs. Such information that will be provided includes, but is not limited to the type, size, location and timing of the remaining need.
- The Responsible TO(s) shall make necessary changes to its latest proposed backstop solution to address reliability deficiencies identified by the NYISO, and submit a revised proposal to the NYISO for review. This is an iterative process that will continue between the NYISO and Responsible TO(s) until identified needs are appropriately addressed. The NYISO will continue to provide detailed information regarding the remaining needs in each iteration.

Alternative Regulated Solutions Proposed by a Transmission Owner or Other Developer

- In order to remain on the CRP list as a potential alternative regulated solution, the Transmission Owner or Other Developer shall provide to the NYISO, on an annual basis, updated information on the proposed solution, including:
    - Verification that the proposed implementation schedule is within the timeframe of the benchmark (BM) established by the regulated backstop solution.
- Following the first year that an Alternative Regulated Solution is proposed; such verification shall be provided during the Request for Solutions phase of each subsequent CRP process.
- Failure to provide any data requested by the NYISO within a reasonable period of time (not to exceed 60 days from the date of the NYISO request) will result in the rejection of the proposed alternative regulated solution from further consideration in that round of the Comprehensive Reliability Planning Process. Such solution shall be removed from that year's CRP.
- The Transmission Owner or Other Developer will immediately notify the NYISO when it has any indication of a material change in the status of its project.
- If the NYISO, at any time, learns of a material change in the status of an alternative regulation solution, it may, at that time, make a determination as to the continued viability of such solution.
- The NYISO, prior to making a determination about the viability of a specific proposed solution, will communicate its intended determination to the sponsor

along with the basis for its intended determination. The NYISO shall provide the sponsor a reasonable period (not more than two weeks) to respond to the NYISO's intended determination, including an opportunity to provide additional information to the NYISO to support the continued viability of the proposed solution.

- If the NYISO, following its analysis, determines that a proposed solution is no longer viable it will be removed from the list of potential alternate regulated solutions in the next CRP.
- If the Transmission Owner or Other Developer determines that there is another solution it wishes to propose as its alternative regulated solution, it shall submit such proposed solution to the NYISO.
- Subject to a determination by the NYISO that the new proposed regulated solution will meet the identified reliability need, such solution shall be included in the CRP in place of the alternative regulated solution originally proposed.

2.5 Criteria for Halting a Regulated Solution (§9.0c)

The NYISO will apply the criteria in Section 9.0(c) of Attachment Y for halting a regulated solution that is already underway because of the entry of a viable market-based solution that the NYISO has determined will meet the same Reliability Need. These criteria include a cut-off point following which a regulated solution may not be cancelled regardless of the appearance of a market-based solution.

1. The NYISO shall review proposals for market-based solutions, pursuant to Section 7.2 of Attachment Y. If, based on the availability of market-based solution(s) to meet the identified Reliability Need, the NYISO determines that the regulated backstop solution is no longer needed and should be halted, it will immediately notify the Responsible TO(s) and will so state in the CRP. If a regulated backstop solution is halted by the NYISO, all of the costs incurred and commitments made by the Responsible TO(s) up to that point, including reasonable and necessary expenses incurred to implement an orderly termination of the project, will be recoverable by the Responsible TO(s) under the cost recovery mechanism in the NYISO tariff.

2. Once the Responsible TO(s) submits its application for state regulatory approval of the regulated backstop solution, pursuant to Section 8.4(a) of Attachment Y, or, if state regulatory approval is not required, once the Responsible TO(s) submits it application for any necessary regulatory approval, the entry of a market-based solution will not result in the halting by the NYISO of the regulated backstop solution. The NYISO, however, will continue to evaluate proposed market-based solutions to determine their ability to meet the identified Reliability Need in a timely manner, and will provide the results of its review to the Responsible TO(s), market participants and the appropriate state regulatory agency(ies).

3. If a material modification to the regulated backstop solution is proposed by any federal, state or local agency, the Responsible TO(s) will request the NYISO to conduct a supplemental reliability review. If the NYISO identifies any reliability deficiency in the

modified solution, the NYISO will so advise the Responsible TO(s) and the appropriate federal, state or local regulatory agency(ies).

4. If the appropriate federal, state or local agency(ies) does not approve the regulated backstop solution all of the necessary and reasonable costs incurred and commitments made up to the final federal, state or local regulatory decision will be recoverable by the Responsible TO(s) under the NYISO cost recovery mechanism.

5. The NYISO is not required to review market-based solutions to determine whether they will meet the identified Reliability Need in a timely manner after the regulated backstop solution has received federal and state regulatory approval, unless a federal or state regulatory agency requests the NYISO to conduct such a review. The NYISO will report the results of its review to the federal or state regulatory agency, with copies to the Responsible TO(s).

6. If a necessary federal, state or local authorization for a regulated solution is withdrawn, all expenditures and commitments made up to that point including reasonable and necessary expenses incurred to implement an orderly termination of the project, will be recoverable under the NYISO cost recovery mechanism by the Responsible TO(s). When an Alternative Regulated Solution proposed by a TO or Other Developer has been determined by the PSC to be the preferred solution to a Reliability Need and the TO or Other Developer makes all best efforts to obtain necessary federal, state or local authorization, but these authorizations are not granted or are withdrawn, then all reasonably incurred expenditures and necessary expenses incurred to implement an orderly termination of the project, will be recoverable under the NYISO cost recovery mechanism by the TO or Other Developer, provided that such expenditures and commitments were before the PSC when it made its determination that the alternative regulated solution is the preferred solution.

2.6 Criteria to Determine the Cutoff Date for Availability Determination for a Market-Based Solution (§9.0d)

The NYISO, in conjunction with the ESPWG, will develop criteria for determining the cutoff date for a determination that a market-based solution will not be available to meet a Reliability Need on a timely basis.

Proposed Criteria

- In the first instance, the NYISO shall employ its procedures for monitoring the viability of a market-based solution to determine when it may no longer be viable.
- Under the conditions where a market-based solution is proceeding after the date on which the NYISO would otherwise have invoked a regulated backstop solution, it becomes even more critical for the NYISO to conduct a continued analysis of the viability of such market-based solutions.
- The developer of such a market-based solution shall submit updated information to the NYISO twice during each CRPP cycle, first during the input phase of the RNA, and again during the solutions phase during the period allowed for the solicitation of market-based and regulated backstop solutions. If no solutions are

requested in a particular year, then the second update will be provided during the NYISO's analysis of whether existing solutions continue to meet identified reliability needs. The updated information of the project status shall include:

- Major milestone schedule
- Status of final permits
- Status of major equipment
- Current status of construction schedule
- Estimated in-service date
- Any potential impediments to completion by the reliability need date
- Any other information requested by the NYISO

- The developer shall immediately report to the NYISO when it has any indication of a material change in the project status or that the project in-service date may slip beyond the reliability need date.
- Based upon the above information, the NYISO will perform an independent review of the development status of the market-based solution to determine that it remains viable to meet the identified reliability need(s) in a timely manner.
- If the NYISO, at any time, learns of a material change in the project status of a market-based solution, it may, at that time, make a determination as to the continued viability of such project.
- The NYISO, prior to making a determination about the viability of a specific proposed solution, will communicate its intended determination to the project sponsor along with the basis for its intended determination. The NYISO shall provide the sponsor a reasonable period (not more than two weeks) to respond to the NYISO's intended determination, including an opportunity to provide additional information to the NYISO to support the continued viability of the proposed solution.
- If the NYISO determines that a market-based solution that is needed to meet an identified reliability need is no longer viable, it will request the Responsible TO(s) to invoke the regulated backstop solution, or to seek other measures including but not limited to a gap solution, to ensure the reliability of the system within the benchmark timeframe.
- If the NYISO determines that the market-based solution is still viable, but that its in-service date is likely to slip beyond the reliability need date, the NYISO will request the Responsible TO(s) to prepare a "gap solution" in accordance with the provisions of Attachment Y of the NYISO OATT.

2.7 Confidentiality Policy for the Comprehensive Reliability Planning Process

The Code of Conduct, which is contained in Attachment "F" to the NYISO's OATT, states that the NYISO shall not disclose "Confidential Information" to any Market Participant. The term "Confidential Information" is defined by Section 4.0 of Attachment F to include "any commercially sensitive information including, without limitation, trade secrets, equipment specific information (*e.g.*, generator-specific data such as heat rates, *etc.*), and business strategies, affirmatively designated as Confidential Information by its supplier or owner." The term "Confidential Information" shall include all types of solutions to reliability needs that are submitted to the NYISO as a response to reliability needs identified in any RNA issued by the NYISO as part of the CRPP, if the supplier or owner of that solution designates such reliability solutions as "Confidential Information."

For regulated backstop solutions and plans submitted by the Responsible TOs in response to the findings of the RNA, the NYISO shall maintain the confidentiality of same until the NYISO and the Responsible Transmission Owners have agreed that the Responsible Transmission Owners have submitted sufficient regulated backstop solutions and plans to meet the reliability needs identified in RNA. Thereafter, the NYISO shall disclose the regulated backstop solutions and plans to the Market Participants; however, that any preliminary cost estimates that may have been provided to the NYISO shall not be disclosed.

For an alternative regulated response, the NYISO shall determine, after consulting with the owner or supplier thereof, whether the response would meet part or all of the reliability needs identified in an RNA, and thereafter disclose the alternative regulated response to the Market Participants; however, that any preliminary cost estimates that may have been provided to the NYISO shall not be disclosed.

For a market-based response, the NYISO shall maintain the confidentiality of same during the CRPP and in the Comprehensive Reliability Plan, except for the following information which may be disclosed by the NYISO:

1. The type of resource proposed (*e.g.*, generation, transmission, demand side);

2. The size of the resource expressed in Megawatts ("MW") of equivalent load that would be served by that resource;

3. The subzone in which the resource would interconnect or otherwise be located; and

4. The proposed in-service date of the resource.

In the event that the developer has made a public announcement of its project, has submitted a proposal for interconnection with the NYISO, or has consented to disclosure, the NYISO shall disclose the identity of the market-based developer and the specific project during the CRPP and in the Comprehensive Reliability Plan.

2.8 NYPSC Procedure for Reliability Dispute Resolution (§5. 3 and 8.3)

Subject to the provisions of the Public Service Law, applicable regulations and any relevant procedures that may be adopted by the Public Service Commission ("PSC"), the following guidelines shall apply to a dispute arising under section 5.3 or section 8.3 of Attachment Y of the NYISO OATT that is referred to the PSC for resolution:

1) A party referring a dispute to the PSC shall submit to the PSC and the NYISO a filing describing the specific issue or issues that are being disputed. The NYISO shall publish the filing electronically to the Technical Information Exchange (TIE) list.

2) A dispute must be filed with the PSC and the NYISO within thirty days after the NYISO approval of the RNA for disputes under §5.3 and within thirty days of approval of the CRP for disputes under §8.3, or a party's right to refer the dispute to the PSC will be waived.

3) A party referring a dispute to the PSC shall request utilization of the Department of Public Service's Alternate Dispute Resolution Process (ADR), and request the assignment of an Administrative Law Judge (ALJ).

4) The NYISO shall participate in the ADR proceeding and shall make available in the proceeding the studies and analyses upon which the NYISO decision in dispute was based, subject to confidentiality requirements of the PSC. The NYISO may submit a response to the filing.

5) Responses must be made within fifteen days of the filing of the dispute with the PSC, subject to a determination by an ALJ that additional time is justified.

6) Parties to the ADR proceeding may seek adjudication of only those issues that were previously raised within the NYISO governance process and are described in the filing made with the PSC.

7) Issues litigated in the ADR proceeding shall not be subject to an evidentiary hearing, unless the ALJ determines that there is a factual issue that requires a hearing.

8) A party who refers a dispute to the PSC shall have the burden of going forward and challenging the NYISO decision in dispute.

9) If more than one party challenges the same NYISO decision, the parties will consent to the consolidation of the disputes, subject to the approval of the presiding ALJ.

10) All parties participating in the ADR proceeding shall make a good faith effort to complete the process as promptly as reasonably possible.

3 SUBMISSION OF DATA INPUTS (§4.4)

As set out in section#4.4 of Attachment Y of OATT, NYISO will seek input, data and information from all, including the Market Participants, Transmission Owners and other Stake holders. In addition, necessary data inputs for model building, system planning and coordination with the neighboring ISO's will also be part of this CRPP. These are described in the following subsections.

3.1 Data collection and Coordination

3.1.1 New York Control Area (NYCA)

The New York wholesale electricity market is divided into eleven pricing or load zones. Figure 3.1 presents the geographical boundaries for these pricing zones. The development of these load zones was driven primarily by the topology or configuration of the transmission system and secondarily by the franchise areas of the investor owned utilities. These load areas were initially developed by the New York Power Pool after the 1965 Northeast blackout as part of a process of identifying critical bulk power system transmission interfaces. Subsequently, these load zones were utilized to define pricing zones for the wholesale electricity market.

The data and information to be collected encompasses all the local zones or areas within NYCA (Figure 3-1). This effort is internal to the NYCA, and obtains data and information from the Market Participants through existing NYISO communication channels.

Given that the CRPP addresses both reliability and economic issues, both the TPAS and the ESPWG participate by providing parallel input and review to the CRPP. TPAS has primary responsibility for the reliability analyses, while the ESPWG has primary responsibility for providing commercial input and assumptions utilized in the development of reliability assessment scenarios and in the reporting and analysis of historic congestion costs. The NYISO coordinates between these two groups during the initial stage of the planning process, and seeks consensus at both TPAS and the ESPWG. While no formal voting process is established at this level, which is always the case in NYISO working groups, an opportunity for reporting majority and minority views is provided in the absence of a consensus.

3.1.2 Transmission Owners and Municipal Electric Utilities Input

Transmission Owners each have their own transmission planning process. The NYISO will , properly represent the system and each TO's in the CRPP. To facilitate this process, the NYISO will follow three specific steps:

1) Solicit Transmission Owner Input Regarding Plans
2) Meet With TOs Individually for Input
3) Meet With TOs Collectively

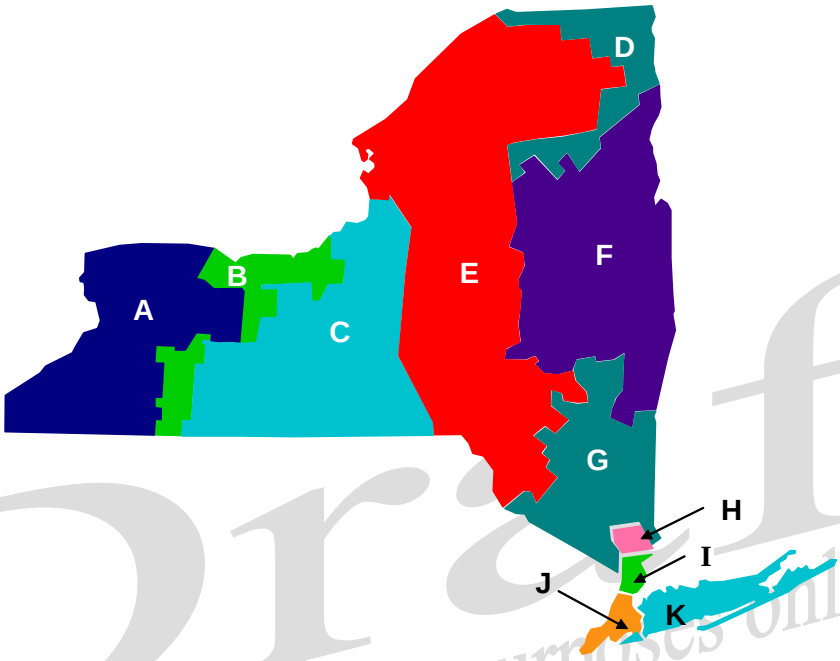


Figure 3-1: NYCA Load Zones or Area

As a first step, information from individual TO's transmission plans will be requested for updating the Load and Capacity Report (Gold Book), the databank base cases, and the FERC 715 base case filing.

The NYISO will request information concerning existing and planned additions to the New York State Transmission System for the Study Period, as required by Section 4.4(a) and (b) of Attachment Y. The TOs will supply information requested by the NYISO for both their Bulk Power Systems and non-Bulk Power facilities. The TOs will supply data and information regarding;

i) Their specific plans, including generation and/or transmission facility additions or reconfigurations, for any parts of the system that could have a local reliability need over the Study Period that is not identified through the present locational capacity requirements applicable to the "In City" and "Long Island" zones (Zones J and K, respectively).

ii) Any transmission system modifications or upgrades planned for the Study Period that is not included in the most recent Load and Capacity Data book.

iii) Facilities, including generation, transmission, and subtransmission, that the TO plans to retire.

iv) Any long term firm transmission requests.

v) Network changes that will impact short circuit duties for the next five and ten years

The NYISO may meet with individual TOs to properly incorporate data and information into the Base Case models. In order to coordinate multiple TOs'plans and data inputs into the NYCA Base Case models, the NYISO may also meet with the TOs collectively.

3.1.3 Stakeholder Input

To implement the CRPP in an open and transparent manner, the NYISO will solicit input from all the interested Stakeholders, including, merchant transmission developers, generation plant owners and developers, and demand response providers. The data and information requested will include;

1) Any proposals outside of those identified in the Class Years to date

2) Any other generation additions, upgrades, or retirements planned during the Study Period

3) Any contract or permit expirations associated with generation plants during the Study Period.

4) Any contract or permit expirations associated with transmission facilities during the Study Period.

5) Any changes in the electrical characteristics of any other facilities, including all transmission facilities, both bulk and non-bulk.

6) Any plans that will impact the level of demand response programs, including Special Case Resources (SCR)and Emergency Demand Response Program (EDRP) programs, for the Study Period.

Stakeholder input will be solicited both directly and through ESPWG and TPAS.

3.4 Neighboring Control Area Assessments

Geographically, the New York Control Area (NYCA) is situated in the center of the Northeast electrical grid, which includes the Mid-Atlantic and New England States in the United States and the Canadian Provinces of Ontario, Quebec, and Maritimes. Figure 3.2 displays the major electricity markets operating in the region.

The total nominal transfer capability between the control areas in the Northeast is less than five percent of the total peak load of the region. However, the interconnections between these control areas play an important role in maintaining the reliability of the transmission network. The need for proper representation of these neighboring control areas is well understood by all control areas. As each of these control areas perform their own reliability and congestion assessments, substantial, accurate and updated data and information are obtained from those assessments. The control area assessments used by the NYISO to model its neighbors are listed below:

- PJM Interconnection --- Most Recent Regional Transmission Expansion Plan ("RTEP")

- ISO-NE --- Most Recent RTEP
- Ontario-IESO --- Most Recent Reports
- Hydro-Qubec --- Most Recent Reports

Based on these reports and other available information, the NYISO will develop its assumptions to represent the adjacent control areas. The NYISO will discuss these input assumptions and its simulations and analyses with its neighbors before they are finalized.

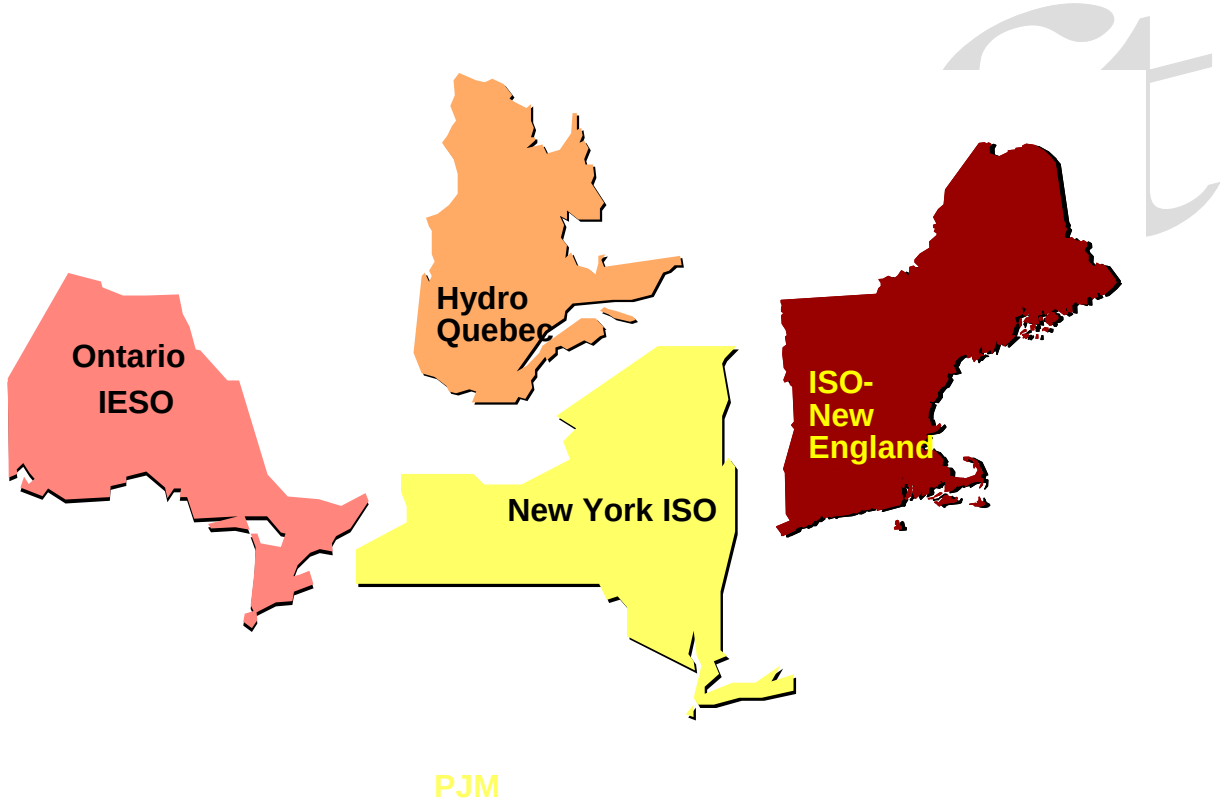


Figure 3-2: Adjacent Control Areas Directly Connected to NYCA

4 DEVELOPMENT OF BASE CASES & SCENARIOS FOR RNA

The steps taken by NYISO for developing various base cases and scenarios for the RNA are shown in work-flow diagram depicted by Figure 4-1. These steps are described in more detail below in separate sections, but not necessarily in the same order. The NYISO will make suitable adjustments to these steps during the base case and scenario development, consistent with Attachment Y.

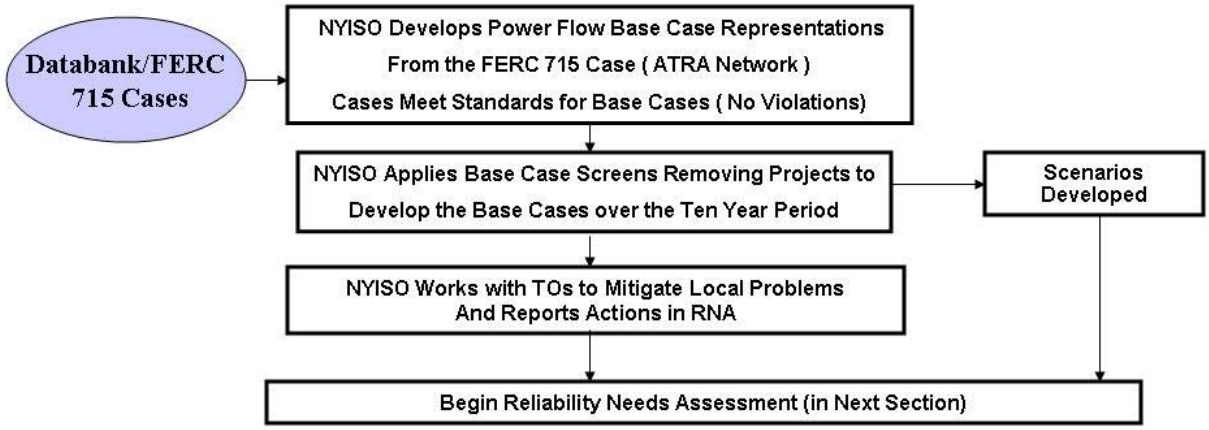


Figure 4-1 Work-flow for Base Case Development and Scenario Definition

This section describes the data and information NYISO requires to perform necessary technical analyses in the RNA. The NYISO uses similar data and information to update the annual Load and Capacity Report (Gold Book), ATRA[5], NPCC Power Flow Base Case preparation, and

[5] ATRA – NYISO Annual Transmission Reliability Assessment.

FERC Form-715 preparation. The following check list sets forth the items and major steps for development of the Base Case:[6]

1. Databank

    a) Bus load forecast[7]
    b) Raw NYCA system representation
    c) Outside NYCA representation
    d) Area interchange schedule
    e) New projects
    f) Future system changes

2. Generator availability & performance data

    a) Generating unit capability ratings
    b) Maintenance data, including refueling outages
    c) Outage rates and other performance data
    d) New projects
    e) Retirements

3. Power Flow

    a) Description of base cases
    b) Treatment of class year projects
    c) Desired zonal interchange/interface flows/dispatch
    d) Outside NYCA representation
    e) Case checks/benchmarking

4. Dynamics

    a) Description of base cases
    b) Compilation & executable creation
    c) Initialization of base case
    d) Case checks/benchmarking

5. Short Circuit

    a) Description of base cases
    b) Treatment of class year projects

[6] This list is not exhaustive.
[7] Load Forecast Adjustment Steps for System Studies, Draft, 9/17/2004

Before conducting the annual RNA exercise, the NYISO will undertake the following two steps:,

- Developing the Base Cases for the different system models for the system performance evaluation
- Defining the relevant Scenarios for the anticipated system operating conditions

These two steps are described in the following sections.

4.1 Develop Base Cases (§4.3)

The Base Case, in the context of CRPP, represents a postulated system condition in the future. The Base Case should be the best possible representation of the network and resources for the period under study. The NYISO will consider the following three categories of future projects for possible inclusion in the Base Cases:

1. All projects and plans that have completed the NYISO interconnection process (Attachment S - cost allocation accepted as of June of the current year)
2. All other merchant projects and plans
3. All projects and plans that constitute Transmission Owner plans[8]

The NYISO will utilize a consistent and common RNA Base Case Screen to identify the projects and plans in the above three categories for inclusion or exclusion from the RNA Study Period Base Cases. The Base Case Screen follows:

RNA Base Case Screen:

A TO projects on non-bulk power facilities will be included.

B Projects that are in service (but not already included) or under construction will be included.

C For those projects and plans not already in-service or under construction:

i. Category 1 projects will be included and modeled at the contracted-for capacity if they have a PSC certificate, or other regulatory approvals and complete review under the State Environmental Quality Review Act ("SEQRA") where the PSC siting process is not applicable, and an executed contract with a credit worthy entity.

ii. Category 2 projects will be included and modeled at the contracted-for capacity if they have a PSC certificate (or other regulatory approvals and SEQRA review) and an approved System Reliability Impact Study ("SRIS") (if applicable), and an executed contract with a credit-worthy entity.

iii. Category 3 Bulk Power System projects will be included if they satisfy one of the following conditions:

a) The project is a Backstop Regulated Solution triggered in a prior year's Comprehensive Reliability Plan; or

[8] Based on individual TOs Transmission Planning Process

b) The project is related to any projects and plans that are included in the Study Period Base Case; or

c) The project is expected to be in service within 3 years, has an approved SRIS (if applicable), and has received PSC certification (or other regulatory approvals and complete revew under SEQRA), if required.

For developing the Base Cases for a new cycle of CRPP, the following data and information will be considered:

1. the most recent Load and Capacity Data Report published by the NYISO on its web site
2. the most recent versions of NYISO reliability analyses and assessments provided for or published by NERC, NPCC, NYSRC, and Neighboring Control Areas
3. information reported by neighboring control areas such as power flow data, forecasted load, significant new or modified generation and transmission facilities, and anticipated system conditions that the NYISO determines may impact the bulk-power transmission facilities
4. Market Participant input

The NYISO will evaluate the expected performance (reliability) of the system using the Base Case. Because, the system may be reliably operated in different allowable ways, the NYISO will develop and utilize multiple Base Cases where appropriate. The NYISO uses four types of system computer modeling tools to conduct its analyses, namely, (i) Resource Adequacy (MARS), (ii) Power-flow (PSS/E), (iii) Dynamics (PSS/E), and (iv) Short-circuit (ASPEN).

The Study Period for the annual RNA is ten years forward. Pursuant to Section 4.3 of Attachment Y, this period is divided into two five-year periods. Thus, these Base Cases will not only differ in the time period covered, but also in the starting conditions modeled in the corresponding Base Case. The process the NYISO will follow in developing Base Cases for the first five year period and the second five year period are described in the following subsections.

4.1.1 Base Case - First Five Years

The NYISO will use the Base Case from the most recent Annual Transmission Reliability Assessment [9] (ATRA) and the Base Case of most recent CRPP to create a "baseline" (year $0^{+)}$ for the relevant system models. Thereafter, the NYISO will review the plans and other information collected as part of the input phase of the CRPP (described in section 3 of this manual) and subject them to the RNA Screen described above. The projects and associated details that pass the screening process will be included in the system models for the RNA.

Depending upon the extent of changes included in the Base Case, the power flow case may not converge, or "solve". However, a converged or solved[10] power flow case is a fundamental prerequisite to determining bulk power transmission system reliability. Thus, certain generic facilities, modeled in the form of building-blocks (representative and practical size and type of generators, lines, transformers, voltage control devices etc.) may be added to the system model to complete the Base Case. These generic building-block additions may be removed or modified or separately identified, at the conclusion of the RNA, as possible requirement(s). It is important to note that some of these additions may be essential to obtaining a minimum solvable power flow base case.

4.1.2 Base Case - Second Five Years

The process of creating the Base Case for the second five year period starts from the latest Base Case of the current CRPP cycle. Thereafter, the same procedure used for the first five-year period for collecting data, information, applying screens and creating system models will be applied for developing the new Base Case for the second five year period .

Depending upon the extent of changes included in the Base Case, the power flow case may not converge, or "solve". However, a converged or solved power flow case is a first requirement for beginning of the determination of bulk power transmission system reliability. Thus, certain generic facilities modeled in the form of building-blocks (representative and practical size and type of generators, lines, transformers, voltage control devices etc.) may be added to the system model to complete the Base Case. These generic building block additions may be removed or modified or separately identified at the conclusion of the RNA as possible requirement(s). It is important to note that some of these additions may be essential to obtaining a minimum solvable power flow base case..

4.2 Develop Scenarios (§4.5)

Preparing long term plan(s) for the future Study Period, is based on forecast of future economic, societal, technological and power market conditions; which involves a great deal of uncertainty. Thus, developing a "plan" based on only one set of forecasted future system conditions may not meet the future reliability requirements . Such an approach would also fail to provide the flexibility necessary to adapt to the changing conditions. This type of situation is best addressed by taking a *scenario* approach to planning. The NYISO will use scenarios to model the bulk power system where multiple and well reasoned future conditions are postulated. An appropriate sub-set of system conditions will be selected to define possible scenarios for determining the reliability needs of the system in the first five-year and second five-year periods.

[10] A solved or converged powerflow is just a mathematical network solution and it does not imply that the changes included are neither optimal nor economic. The changes and facilities added for convergence purposes will be evaluated during reliability needs determination.

The NYISO will consider the following issues, among others, for defining scenarios for further analysis in the RNA; load forecast uncertainty, new resources, new technology, retirements, and regulatory requirements, including limitations established by environmental programs. The NYISO will define two types of possible scenarios for RNA analyses and studies:

1. Load Forecast Scenarios
2. Resource Scenarios

4.2.1 Developing Load Forecast Scenarios

The load requirement in the future is a primary driver for long-term bulk power system planning. Hence, properly defining and including the forecasted load growth into the system models is crucial.

The NYISO will define scenarios for the study period using the following three load levels: Normal or Base-line, High Growth and Low Growth. The NYISO Load & Capacity Report[11] provides the forecast for the first year of the Study Period. The Load Forecasting[12] Working Group will prepare all three forecast scenarios for the Study Period. These aggregate forecasts will be suitably adjusted and expanded for developing Resource and power-flow models.

The three load forecast scenarios are presented to the ESPWG for discussion, review and comments. Based on these comments, the individual load forecasts are finalized and input into the appropriate Study Models and Base Cases.

Depending upon the differences among these three load forecast scenarios, fewer and/or additional scenarios will be included, as necessary.

4.2.2 Develop Resource Scenarios

Defining plausible scenarios that are based on variations in the forecasted availability of resources is more difficult and challenging. Absent a focus on key issues, the number of scenarios to be considered could easily multiply. Even though scenario analysis is one of the best ways of determining common and most useful projects for the future, too many scenarios will cause more confusion rather than provide clarity for decision making. Also, it is important to keep in mind the difference between sensitivity analyses that reflect small variations , versus scenario analyses which are designed to examine large system changes. The NYISO will use the following steps for selecting suitable scenarios:

i. Develop list of resource scenario parameters based upon, among other things, proposed new resources, fuel mix (price and supply), retirements, changes in neighboring system resources, statutory changes, and environmental and other regulatory mandates resulting from statutes or regulations.

[11] NYISO Load & Capacity Data (Gold Book), the latest year edition.

[12] Load Forecasting Manual, NYISO Manual No. 6, (August 2006).

ii. Review resource parameters for defining scenarios

iii. Selection and definition of preliminary scenarios

Under certain circumstances, it may become necessary to variations on scenarios to capture differences between major and lesser important parameters.

4.3 Define Base Cases for the Scenarios

The NYISO will create separate Base Cases to properly model each of the scenarios. For the MARS model, the resources have to be grouped appropriately for each scenario, including the changes to be modeled for all zones. The NYISO will then prepare the transmission network model, a converged power flow base case for each scenario covering the first five-year period and the second five year period. .

As is the case with the RNA Base Case, The NYISO will develop an RNA study case system for scenario analyses that models the existing system, including the generation and transmission system additions and upgrades and unit retirements that are projected to occur throughout the Study Period. Because emergency assistance from neighboring systems contributes to the reliability of the NYCA system, the load and generation of the neighboring systems will also be modeled. The NYISO will use data on the existing system from the MARS database maintained by NYISO staff for use in determining the annual installed reserve requirements. Load and generation data will be updated through the Study Period based on data from the 2006 NYISO Load & Capacity Data Report. The NYISO will use similar reports from neighboring systems to update the data representing those regions.

5 RELIABILITY NEEDS ASSESSMENT APPROACH

In this section the technical methodology and applicable reliability criteria used to determine the reliability needs will be defined. The type of methodology used to evaluate the reliability and definition of applicable criteria are mutually dependent. Hence, a brief discussion of general methodology and criteria are presented here as preamble to the technical methodologies and criteria.

The work flow steps used by NYISO for determining the Reliability Needs are shown in Figure 5-1. These are described in separate sections, but not necessarily in the same order. Suitable adjustments to these steps will be made during the simulation and analyses consistent with the requirements of Attachment Y.

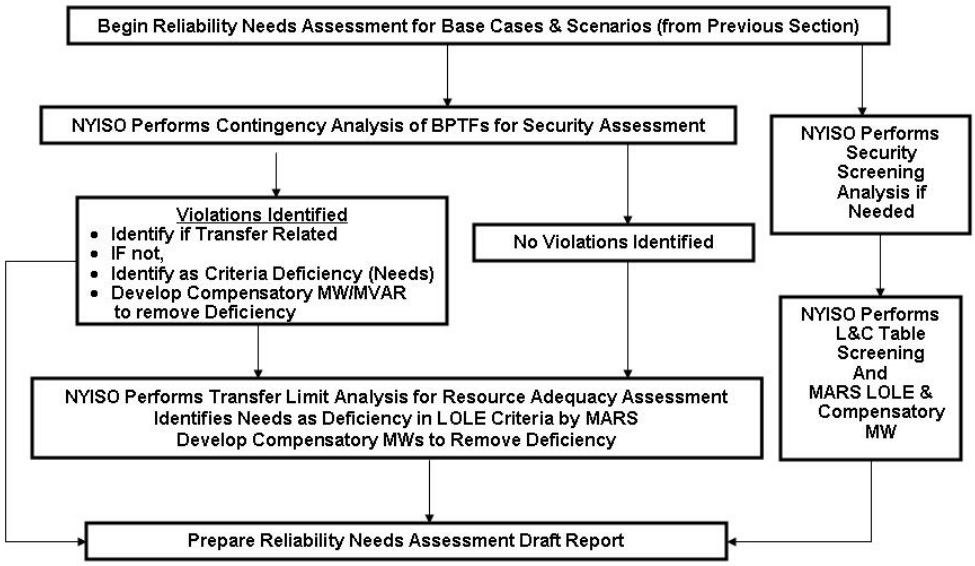


Figure 5-1 Work-flow for Reliability Needs Determination Steps

5.1 Basic Reliability Concepts as Applied to Power System

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 potential service interruptions. Reliability consists of two related concepts; adequacy and capability (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.

The adequacy and capability (security) of a bulk power system are analyzed in two different approaches. Adequacy is a planning and probability concept. A system is adequate if the probability of having sufficient transmission and generation to meet expected demand is equal to or less than the resource or supply reliability threshold. Having defined adequacy as a probabilistic concept, the methodology used for adequacy evaluation also involves probabilistic calculations. Traditionally, this analysis has been called Resource Planning.

Transmission Capability (security) is addressed and analyzed in the electric utility industry by a deterministic approach. This means that most likely (probable) events are identified and the system is planned and operated so that the system can continue to serve load even if these events occur. The events that are less likely, but that have the potential to cause major impacts on the system may also be included in security assessments. Having defined capability (security) as a deterministic concept, the methodology used for adequacy evaluation also involves deterministic ("what-if?") calculations. Traditionally, this analysis has been called Transmission Planning.

The above descriptions assign probabilistic and deterministic approaches to resource and transmission planning, respectively. In a strictly technical sense, the probabilistic and deterministic approaches can be applied to both types of planning. The bifurcation, however, reflects widely-adopted practice in the electric industry.

5.2 Reliability Organizations

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 Council (NERC) and its member organizations, transmission owners, and energy market participants.

NERC was formed as a voluntary, not-for-profit organization in 1968 in response to the blackout of 1965. A ten-member Board of Trustees governs NERC with input from an industry Stakeholder Committee. NERC has formulated planning and Operating Standards. Pursuant to the Energy Policy Act of 2005, the Federal Energy Regulatory Commission approved NERC as the Electric Reliability Organization for North America in 2006. FERC has also approved the governance structure and funding of NERC, as well as mandatory electric reliability standards that will be enforced by NERC.

Ten Regional Reliability Councils currently comprise NERC's membership. Members of these councils come from all segments of the industry. The Council in the northeastern United States is the Northeast Power Coordinating Council (NPCC). New York State is an Area within the NPCC, which also encompasses New England

and northeastern Canada. NPCC implements broad-based, industry wide reliability standards tailored to its region. NERC and NPCC have requested FERC's approval of a delegation agreement by which NPCC will oversee and enforce compliance with NERC and NPCC standards in the northeastern regions of the United States and Canada.

New York State also has its own electric reliability organization, which is the New York State Reliability Council (NYSRC). The NYSRC is a not-for-profit organization that promulgates reliability rules and monitors compliance with those rules on the New York State Power System. The NYISO and all organizations engaging in electric transactions on the state's power system must comply with these rules. Thirteen members from different segments of the electric power industry govern the NYSRC.

The reliability criteria and assessment methodology used for the RNA, as a minimum, has to be in compliance with the rules, regulations and standards specified by the above-mentioned reliability standards organizations. In this context, 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.

5.3 Applicable Reliability Documents

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

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

NERC's Operating Standards set forth fundamental bulk power system operating requirements. The interconnected bulk electric system must be operated in secure state such that the aggregate electrical demand and energy requirements of customers are satisfied in real time. Primary responsibility for reliable operation is vested with the control area operators; for New York State, this is the NYISO. A "control area" is the basic operating unit of an exclusive portion of the interconnected power system. The Operating Standards promote reliable operations within each of the three synchronous 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 key NPCC document

(for purposes of the CRPP Manual) is A-2, Basic Criteria for Design and Operation of Interconnected Power Systems, which establishes the principles of interconnection planning and operations.

The NYSRC Reliability Rules[13] for planning and operating the New York State Power System include the required rules and define the performance that constitutes compliance. These rules incorporate the NERC Planning Standards and Operating Policies and the NPCC Criteria, Guidelines and Procedures. The NYSRC Reliability Rules also include 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. 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 the transfer capabilities of the New York State Transmission System. The NYISO determines the Installed Capacity (ICAP) Requirements for load serving entities (LSEs), including the Locational Capacity Requirements of LSEs in New York City and on Long Island.

5.4 Applicable Reliability Criteria

As noted earlier, a probabilistic approach is used for Resource Adequacy and a deterministic approach is used for Transmission Reliability analyses. A system is adequate if the probability of not having sufficient resources (generation, transmission and other allowable curtailment measures) to meet expected demand is equal to or less than a predetermined value. Similarly, a Transmission System is reliable if specified contingencies do not result in any loss of load.

5.4.1 Resource Adequacy Reliability Criteria

Resource Adequacy is measured using a probability-based index such as loss of load expectation (LOLE), which is the most common metric used. There are different variations of the LOLE standard, such as Daily LOLE (days per year) and Hourly LOLE (hours per year); depending upon the assumptions made in the model and during the calculations. The NPCC and the NYSRC have adopted the daily LOLE as its resource adequacy criterion. It is defined as the expected number of days in a year in which the daily peak load may exceed the available resources. According to the NYCA Installed Reserve Margin Requirement[14], the New York Bulk Power System must be planned to meet an LOLE metric of not more than one forced disconnection on the bulk

[13] NYSRC Reliability Rules for Planning and Operating the New York State Power System, Version 18, January 5, 2007.
[14] Section A-R1 of the above document.

power system in every 10 years (expressed mathematically as 0.1 days per year) or less.

5.4.2 Transmission System Security Criteria

As mentioned earlier, the security criteria for transmission capability determination are based on a deterministic approach. In this approach, a system condition is called as "N" (corresponding to a system in normal condition[15] with all necessary facilities available and in-service). The term "N minus 1" (N-1) represents a single facility outage from the normal system condition, and is commonly referred to as a "single contingency" condition. The term "N minus 2" (N-2) represents two simultaneous or overlapping facility outages, and is referred to as a double contingency.

In the deterministic approach, the security criteria define the types of contingencies and the required performance of the transmission network in the post-contingency (or disturbance) period. The contingencies to be tested and the required performance are defined in Section B (entitled Transmission Capability – Planning) of NYSRC Reliability Rules.

The contingencies for testing are divided into two categories, namely, Design Criteria Contingencies (containing 7 types or classes) and Extreme Contingencies (containing 9 types or classes). Evaluation of design criteria contingencies should not reveal any violation of system performance parameters, or loss or separation of a major portion of the system. Extreme contingency testing should not indicate possibility of wide-spread system shut-down.

The design criteria in Table-A of NYSRC document are listed below for ready reference:

a) A permanent three-phase fault on any generator, transmission circuit, transformer or bus section with normal fault clearing
b) Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with normal fault clearing
c) A permanent phase to ground fault on any transmission circuit, transformer, or bus section with delayed fault clearing.
d) Loss of any element without a fault
e) A permanent phase to ground fault on a circuit breaker with normal fault clearing
f) Simultaneous permanent loss of both poles of a direct current bipolar facility without an ac fault
g) The failure of a circuit breaker to operate when initiated by an SPS following: loss of any element without a fault; or a permanent phase to ground fault, with normal fault clearing, on any transmission circuit, transformer or bus section

[15] Often referred to as Base Case condition

The Applicable NERC Standards group the system condition as; i) pre-contingency condition are defined as *Category A*; ii) contingencies in items (a) and (d) are defined as *Category B contingencies;* and iii) the remaining contingencies (b, c, e, f, and g) are defined as *Category C* contingencies.

The Extreme contingencies in Table-A of NYSRC document are listed below for ready reference:

a) Loss of the entire capability of a generating station
b) Loss of all transmission circuits emanating from a generation station, switching station, dc terminal, or substation
c) Loss of all transmission circuits on a common right-of-way.
d) Permanent three-phase fault on any generator, transmission circuit, transformer, or bus section, with delayed fault clearing and with due regard to reclosing.
e) The sudden loss of a large load or major load center.
f) The effect of severe power swings arising from disturbances outside the NYS Bulk Power System
    i. Failure of a SPS to operate when required following the normal contingencies listed in Table A
    ii. The operation or partial operation of a SPS for an event or condition for which it was not intended to operate
    iii. Sudden loss of fuel delivery system to multiple plants (*i.e.* gas pipeline contingencies)

The system performance requirements under normal conditions (pre-contingency) and after applying the design and extreme contingencies (post-contingency) are defined in B-R1 through B-R4 of the NYSRC Reliability Rules.

5.4.3 Limits for Transmission System Performance Testing

In general, transmission system performance is tested for loadings, voltages and stability for the postulated Base Case(s) and contingencies (in accordance with system security criteria). The thermal ratings (summer and winter) for existing transmission lines are documented in the Gold Book. Based on these thermal ratings, normal, long-time and short-time emergency ratings are included in the power flow models. Application of these loading limits is described in B-R1of NYSRC Reliability Rules. Similarly, pre-contingency and post contingency acceptable voltage ranges (high and low limits) are defined for each existing bus. Application of these voltage limits is described in B-R2 of NYSRC Reliability Rules. The requirements for stability performance are listed in B-R3 of NYSRC Reliability Rules.

5.5 Methodology for Resource Adequacy Determination

Resource adequacy calculates the LOLE for the specified bulk power system conditions. The primary tool used for resource adequacy analysis is General

Electric's Multi-Area Reliability Simulation Model (MARS) program. MARS uses a Monte Carlo simulation to compute the reliability of a generation system comprised of any number of interconnected areas or zones, including the impacts of the transfer capability of the transmission system.

Figure 5.5-1 provides a general overview of the inputs for the MARS model. Figure 5.5-2 contains a simplified version of different zones and the external systems within and adjacent to the New York bulk power system.

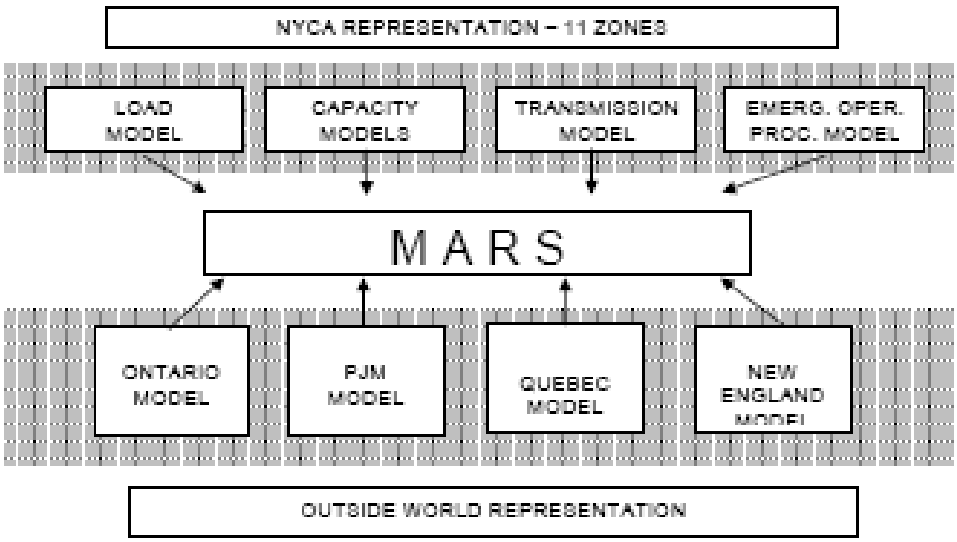


Figure 5.5-1: A general overview of representation of external systems and internal zones for the MARS model

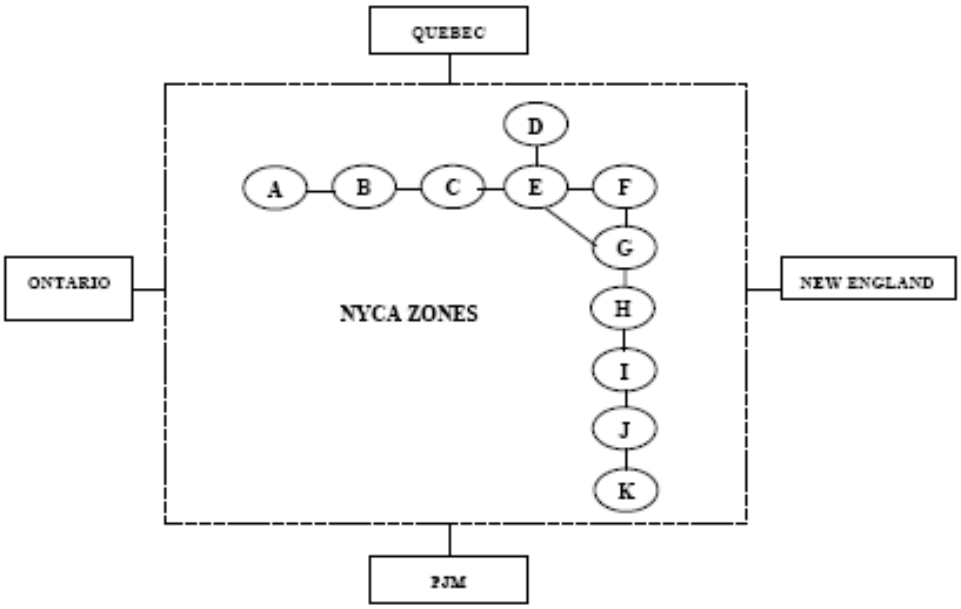


Fig 5.5-2: A simplified version of different zones and the external systems

The initial study case system is developed by modeling the existing system,[16] including expected generation and transmission system additions and upgrades in accordance with Section 4.1 of this Manual.

Given that the Transmission Topology utilized in the MARS Analysis is a transportation algorithm, rather than being based upon network flow, many assumptions have to be made in translating network-based transfer limits into the interface transfer limits utilized by MARS. These assumptions involve the construction of interface groupings and nomograms to capture the important effects and conclusions that may be derivable from the analysis of a network flow based model. The construction complexity and implementation is impacted by other assumptions made in the MARS model.

Underground cables generally have much longer repair times than overhead lines.

Because of the potential impact of these extended cable outages on transfer capability, interfaces that include transmission circuits that are comprised of cables are modeled in the MARS simulation with discrete transition rates, based on historic facility forced outage rates. This modeling captures the effect of reduced transfer capability on a probabilistic basis across such interfaces due to the typically long duration of cable outages.

The following computation steps will be used during resource adequacy evaluation:

LOLE for entire NYCA

Resource adequacy analysis will determine whether the installed generation is sufficient to satisfy the load demand, without considering any transmission transfer limitations within the NYCA system.

Zonal LOLE with thermal transfer limits only.

The resource adequacy calculations will be repeated by including internal (to NYCA) thermal transfer limitations to determine whether the NYCA transmission system was adequate to deliver the generation to the loads.

Zonal LOLE with thermal and voltage transfer limits.

The resource adequacy calculations will be repeated by including both thermal and voltage based transfer limitations (within NYCA) to determine whether a deficiency in available reactive resources is affecting the zonal LOLEs.

If the system failed to meet the LOLE criterion, in any of the above three steps, then the reliability based needs will be determined by repeating the above three steps with additional and representative generation and transmission block additions. The amount of resource(s) necessary to bring-up the LOLE index to the acceptable threshold (established by the reliability criterion) will indicate the magnitude of

[16] Existing system data is available from the MARS database that is used in determining the annual installed reserve margin (IRM) and installed capacity (ICAP) requirements.

expected resource adequacy short-falls. The actual solution to the identified reliability need may consist of different types, sizes and locations; depending upon the market based or regulated responses offered to the NYISO.

5.6 Methodology for Transmission Reliability Assessment

The transmission reliability assessment is done by performing necessary steady state and dynamics simulations for normal system conditions and contingencies. In addition short-circuit level calculations will be performed to determine the impact of faults.

Analyses conducted of the bulk power system in steady state will consist mainly of power flow simulations, contingency analyses (both thermal and voltage aspects) and voltage collapse analysis. Simulations of the system under dynamic conditions will include voltage stability and angular stability (including oscillatory damping). The transmission system analyses will also include determination of power transfer limits over the ties to external systems and the interfaces within NYCA.

The basic voltage analysis methodology will be conducted using the power-voltage (P-V) curve approach as described in NYISO Transmission Planning Guideline #2-0 and Operations Engineering Voltage Guideline (dated April 11, 2006).

5.7 Transmission Reliability Evaluation

The NYISO will conduct the transmission system analyses to fulfill two separate purposes, namely,

i. Determine Transmission Reliability Needs

ii. Calculate transfer capabilities for the MARS resource adequacy model

Before beginning these studies, the NYISO will review of other existing transmission security studies related to the CRPP. This step is also a part of establishing base cases (section 4.1).

5.8 Transmission System Screening Analysis

The purpose of this screening analysis is to determine the emergency thermal and voltage transfer capability between different zones within the NYCA system. The NYISO will use the transfer limits obtained from this screening analysis as inputs into the MARS model.

The NYISO will perform only steady state simulations and analyses for screening purposes. Emergency thermal transfer analysis will be performed using the linear power flow technique (Transfer Limit Table Generator--TLTG) for the following transmission interfaces:

i. Dysinger East Open

ii. West Central Open

iii. Moses South

iv. Volney East
v. Total East
vi. Central East
vii. Central East + Fraser-Gilboa
viii. Central East Group
ix. Zones F to G
x. UPNY-SENY
xi. UPNY-ConEd
xii. Millwood South Closed
xiii. Dunwoodie South (Planning Definition)
xiv. Dunwoodie South (Operating Definition)
xv. Zones I to J
xvi. LIPA Imports

The voltage-based transfer limits are determined by using the NYISO Voltage Analysis Method[17] (referred to as VCAP – Voltage Contingency Analyis Procedure), which is based on the P-V curve approach.

Transmission System Analyses

This subsection addresses the manner in which a typical transmission planning study consisting of power flow (steady state) and stability (dynamics) simulations and analyses will be conducted by the NYISO. The four major types of analyses are,

1. Thermal analysis
2. Steady-state Voltage Drop analysis
3. Voltage Collapse/Voltage Stability analysis
4. Transient (Angular) Stability analysis

These types of studies are also performed for several other purposes, as shown below:

- Inter-Regional Reliability Assessments (NPCC-*Reliability* First Seasonal Assessments)
- NPCC Area Transmission Reviews
- NYISO/Neighboring Areas Inter-Area Studies
- NYISO Seasonal Operating Assessments, Short Term Operating Studies

[17] See NYISO TRANSMISSION PLANNING GUIDELINE #2-0 entitled:"Guideline for Voltage Analysis and Determination of Voltage-Based Transfer Limits".

- NYISO Interconnection Project Studies (Feasibility Studies, SRIS, SIS, and Facilities Studies)

Technical consistency and coordination of procedures, models, applicable criteria and methodology used in these above studies and the CRPP Transmission studies is important. For example, the difference in phase angle regulators (PARs) control for the system intact condition (pre-contingency or normal) and contingency analyses should be observed. Similarly, the SVCs and STATCOMs (which are provided solely for dynamic reactive support purposes) are dispatched at zero MVAR (but within the bus voltage limits) for pre-contingency condition. Nevertheless, these types of equipment are allowed to regulate the bus voltage for post-contingency conditions. Slower- acting devices such as transformer taps and switched shunts are assumed to be in the same position or setting for both pre and post-contingency conditions.

5.8.1 Perform Analysis for the Base Case of the Study Periods

NYISO will perform four types of transmission studies, in the order listed in section 5.8.2, for the First and Second Five Year study periods. The NYISO will utilize applicable reliability criteria (design criteria and extreme contingencies) and limits (as described in subsections 5.4.2 & 5.4.3) for these simulations to identify violations.

Depending upon future load requirements, available generation and transmission facilities, the power flow Base Case may not converge, may be severely lacking reactive capacity (steady-state or dynamic) to support system voltages, or simply may be transiently unstable. In such situations, representative transmission solutions need to be inserted into the Base Case models. These additions are for study and analytical purposes only, and they are not considered to be optimal or economic. However, generation dispatch may be adjusted, to the extent possible, to resolve the criteria violations and base case convergence requirements. Nevertheless, the NYISO will test the system stability (both angular & voltage) for stressed system conditions.

The NYISO will repeat the calculations and analyses described in the above paragraphs for all the scenarios defined by the NYISO in accordance with Section 4.2. Comparison of the reliability needs of all scenarios will yield the minimum requirement and will provide insight into future requirements under a host of possible future conditions of supply and demand.

5.9 Resource Adequacy Assessment

Resource adequacy assessment primarily consists of determining the LOLE for the NYCA bulk power system for the Study Period. The NYISO will use the criteria and tools described in earlier sections (5.4.1 and 5.5) for this assessment. This section describes the procedure used to compute the LOLE.

The resources available to NYCA include the imports and emergency assistance available from external systems. The LOLE's are calculated by appropriately representing the NYISO transmissison system within multiarea MARS model. Hence, within the context of CRPP, the NYISO evaluates resource adequacy after completing its assessment of transmission security.

The NYISO will first determine the power transfer capability from external systems and among different zones (Fig 5-2) within the NYCA system. The following steps will be utilized to determine the transfer capability:

1. Assess the future validity of the Installed Reserve Margin (IRM) study transmission model based on existing studies
2. Assess the future validity of other IRM assumptions based on existing studies
3. Perform additional analysis to update the IRM model, as necessary.
4. Assess transfer capability into load pockets from existing studies[18]
5. Assess transfer capability support levels from neighboring systems[5]
6. Assess treatment of future projects.

Before proceeding with the LOLE calculations, the NYISO will review other existing resource adequacy studies (for e.g. NPCC, IRM). This review will determine that the system model used for this task is consistent or compatible with the assumptions and conclusions from the other studies. Also, such review will minimize the amount of calculations and analyses by avoiding unnecessary repetition of cases.

5.9.1 Perform Analysis for the Base Case of 1st Five Years

The NYISO will calculate the LOLE for the bulk power system for the Study Period year conditions for the following three parameters (as noted in Section 5.5)

1. LOLE for the entire NYCA
2. Zonal LOLE with thermal transfer limits only
3. Zonal LOLE with thermal and voltage transfer limits

If the calculated LOLE does not meet the reliability criterion of 0.1 days per year, additional representative generation units will be added until the LOLE criterion is attained. The system-wide and zonal resource requirements are determined by using the procedure stated in the appropriate reference document[19].

[18] See Transmission Screening in Section 5.8.1.
[19] Appendix-A & B – NYSRC Policy No. 5-1; Procedure for Establishing New Control Area Installed Capacity Requirement, November 14, 2006.

The analyses of the first year of the Study Period year are followed by LOLE calculations for the four following years (years two through four of the first five year Base Case) sequentially. For each year, the system wide and zonal resource requirements are determined.

The NYISO will repeat the calculations and analyses described in this section, for all of the scenarios defined by the NYISO in accordance with Section 4.2. Comparison of the reliability needs of all scenarios will yield the minimum requirement and will provide insight into future resource requirements under a host of possible future supply and demand conditions.

5.9.2 Perform Analysis for the Base Case of Second Five Years

The NYISO will follow the same procedure and calculations for the second five years of the Study Period as described in the previous section for the first five year Base Case. The starting point for these calculations will be the bulk power system conditions resulting from the first five years of the Study Period.

The NYISO will repeat the calculations and analyses described in the above paragraphs for all the scenarios defined in Section 4.2. Comparison of the reliability needs of all scenarios will yield the minimum requirement as well as provide insight into future resource requirements under a host of possible future conditions of supply and demand.

5.10 Short Circuit Analyses

These calculations determine whether the interrupting duty of the existing circuit breakers within the NYS Transmission System would be exceeded or not. In addition, these calculations also provide information for the rating of new circuit breakers and capability remaining in the existing breakers.

Before beginning these calculations, the NYISO will review other existing short circuit adequacy studies. The basis and methodology for the short-circuit calculations is documented in the "NYISO Guideline for Fault Current Assessment", dated January 30, 2003.

The NYISO will calculate the maximum short-circuit level at all substations for all of the scenarios in the horizon year (5^{th} or 10^{th}) of the Study Period. The NYISO substations in which the total fault current exceeds the lowest interrupting duty of the breakers in the corresponding substations are identified for future individual breaker duty requirements. If the calculated values are within the rating of the existing breakers, then there is no necessity to perform these calculations for the intervening years. Otherwise, the NYISO will repeat these calculations to determine in which year the fault levels will be exceeded. The intervening year calculations (performed backwards) will be performed only for the specific fault locations and substations where the excessive fault levels were identified for the next year.

5.11 Evaluate Operational Modes

In accordance with Section 4.6, of Attachment Y, the NYISO will conduct appropriate sensitivity analyses to determine whether alternate system configurations or operational modes can mitigate the previously identified Reliability Needs. The nature of sensitivity studies is to examine the impact of smaller changes to the base case assumptions, configuration and limits. These types of studies are distinctly different in scope and extent in that only 'micro' changes are evaluated as compared to Scenario Analyses, where 'macro' changes are considered. The changes considered may include factors, such as, redispatch, split bus operation, temporary connection or disconnection of certain facilities, special protection systems, and short time operational responses.

5.12 Compensatory MWs

After the reliability needs are initially identified as deficiencies in LOLE or other applicable reliability criteria, the NYISO will translate those deficiencies into compensatory MWs of resources that could satisfy the needs. This translation provides further information to the marketplace on the magnitude of the resources that are required to meet bulk power system reliability needs. The calculation of compensatory MWs will be provided for illustrative purposes only. Such calculations are not meant to reflect specific facilities or types of resources that may be offered as solutions to reliability needs. Accordingly, compensatory MWs may reflect either generating capacity, demand management or transmission additions that may be offered as market-based, regulatory backstop or alternative regulatory projects to meet reliability needs. For this analysis, the amount and effective location of the compensatory MWs is determined by testing combinations of generic blocks of generation on the system-wide LOLE or other criteria violations.

5.13 Responsible Transmission Owners

The reliability needs determined by the NYISO may be met through various combinations of resources located in different NYISO load Zones. The TOs in those Transmission Districts where the need for compensatory MWs has been identified are typically the TOs that will be designated by the NYISO as the Responsible Transmission Owners for purposes of identifying backstop regulated solutions. For situations where the reliability needs could be satisfied with different combinations of resources located across NYISO load Zones located in the Transmission Districts of most of the New York Transmission Owners, all NYCA Transmission Owners will be designated as Responsible Transmission Owners. Ordinarily, the New York Power Authority (NYPA) will not be designated as a Responsible TO because it does not have an obligation to serve native load in a service territory. Rather, NYPA generally serves its customers on the basis of bilateral contracts entered into in accordance with the terms of statutory programs established in the New York Public Authorities Law. Attachment Y requires the Responsible Transmission Owners to develop a regulated backstop solution or combination of solutions to address the identified statewide (NYCA) LOLE needs determined in this RNA. The NYISO expects that NYPA will

work with the other Transmission Owners on the development of regulated backstop solutions to statewide needs on a voluntary basis.

5.14 Preparation of RNA Draft Report (§4.7)

Upon completion of all the analyses for RNA, NYISO Staff will prepare a draft report including discussion of its assumptions, reliability criteria, the results of its analyses and conclusions. The draft report may consist of a main report, a supporting document(s) and appendices containing more detailed information. All of these documents in combination constitute the RNA.

Under the CRPP, the NYISO also has an affirmative obligation to report historic congestion on the transmission system. ESPWG has primary responsibility for providing commercial input and the reporting and analysis of historic congestion costs. Historic congestion data is reported in the Reliability Needs Assessment (RNA) to inform the marketplace in evaluating what proposals to make in response to identified reliability needs.

5.15 Review and Approval of RNA Draft Report (§5.0)

Market Participants are involved in reviewing the RNA draft Report through TPAS and ESPWG. Upon approval by TPAS and ESPWG, the draft RNA will be presented to Operating Committee for discussion and action. The Business Issues Committee shall be notified of the date of the draft RNA presentation to the Operating Committee. Following the Operating Committee vote, the draft RNA will be transmitted to the Management Committee for discussion and action.

Following the Management Committee vote, the draft RNA, with working group, Operating Committee, and Management Committee input, will be forwarded to the NYISO Board for review and action. The NYISO will report minority views on the RNA expressed at the Operating Committee to the Management Committee, and such views expressed at the Management Committee to the Board.

Concurrently with transmittal of the draft RNA to the Board, the draft RNA will be provided to the Independent Market Advisor for review. The Independent Market Advisor will indicate whether the requirements identified within RNA draft report are appropriate and will likely improve the economic signals needed to allow the market to resolve these needs. Also, Independent Market Advisor will determine whether market rules changes are necessary to address an identified failure, if any, in one of the NYISO's competitive markets.

The Board may approve the RNA as submitted, or propose modifications on its own motion. If any changes are proposed by the Board, the revised RNA shall be returned to the Management Committee for comment. The Board shall not make a final determination on a revised RNA until it has reviewed the Management Committee

comments. Upon approval by the Board, the NYISO shall issue the final RNA to the marketplace by posting it on its web site.

5.16 Procedure for Reliability Dispute Resolution (§5. 3)

Guidelines for resolving disputes arising from the RNA report are described in section 2.8 of the CRPP manual.

6 DEVELOPMENT OF SOLUTIONS TO RELIABILITY NEEDS (§6.0)

All of the submitted solutions must meet the required reliability needs. The actual evaluation of these solutions is described in section 7. Two main steps in the development of solutions to the identified RNA are;

1. NYISO Board of Directors approve the RNA Report.
2. NYISO issues formal request for solutions in three separate categories:
    - Regulated Backstop Solutions
    - Market Based Solutions
    - Alternative Regulated Solutions

The CRPP prefers Market Based Solutions as 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**,** a Regulated Backstop Solution will be necessary to maintain the reliability of the bulk power system in accordance with planning and operating criteria. Thus, the NYISO will solicit simulataneously Market Based Solutions from the market place and Regulated Backstop Solutions from the Responsible TOs.

The reliability needs may be met by any one of the above three categories or a combination of these categories. Proposed solutions may take the form of

- New Generation additions (large or small)
- Distributed Generation
- New Transmission Projects
- Transmission Upgrades
- Demand-side Programs
- Operating Procedure Changes
- Market Rule Changes

The approach used to solicit the solutions from different sources is described in this section.

The solutions will be requested for the two separate planning study periods.

6.1 Request Proposal for Regulated Backstop Solution & Lead Time (§6.1)

NYISO will undertake three steps to begin the development of Regulated Backstop Solutions:

1. Designate the responsible Transmission Owner (TO) to propose a regulated solution or solutions to meet all the identified reliability needs.

The responsible TO will normally be the Transmission Owner in whose Transmission District the NYISO identifies a Reliability Need. The Responsible TO or TOs are obligated to prepare one or more Regulated Backstop Solutions for each identified need. These solutions will be called upon by the NYISO to fulfill reliability needs in case appropriate and timely market based solution(s) is not forth-coming.

The appropriate and relevant system models and Base Cases will be provided to TO(s) under the NYISO rules for confidentiality and other stipulations.

2. Establish necessary lead-time for each of the proposed Regulated Backstop Solution.

The greatest challenge to meeting reliability for future system conditions is constructing and commissioning the proposed projects (solutions) by the time of actual need. Thus, careful evaluation of the lead time necessary for completing each proposed Regulated Backstop Solution is critical. Accordingly, among the alternative Regulated Backstop Solutions submitted by TOs, the necessary lead-time for each of the solutions must be provided because it is a key factor for the NYISO's evaluation of their feasibility.

The Responsible TOs will have a prespecified duration (commensurate with the type of reliability need being addressed) from the date the NYISO solicits Regulated Backstop Solutions to submit such solutions to the NYISO.

3. Conduct Two Step Process for Response Solicitation

In accordance with Attachment Y, the NYISO will also request proposals to meet the reliability needs from,

1. Market Based Solution or Solutions to meet all the identified reliability needs (§6.2)
2. Alternative Regulated Responses (§6.4)

6.1.1 Request Market Based Solutions

Attachment Y prefers Market Based Solutions as the first choice to meet reliability needs. These proposals may consist of transmission, generation or demand-side projects.

Market-based project developers obtain revenues through the NYISO's energy and capacity markets, ancillary services sales, and bilateral contracting arrangements.

The NYISO will request Market Based Solutions to meet reliability needs. Appropriate. Market Participants shall request , in writing, required system models and Base Cases and any other relevant information. This request will be addressed to Director of Planning at NYISO. The NYISO will provide relevant system models and Base Cases to Market Participants within a reasonable time after receiving the written request. The data and models provided wii be subject to the NYISO's rules for confidentiality and other stipulations including protection of critical energy infrastructure information.

Market participants and other stake holders will have a prespecified duration (commensurate with the type of reliability need being addressed) from the date of the NYISO's request to submit Market Based Solution(s)

6.1.2 Request Alternative Regulated Responses

The NYISO will request Alternative Regulated Solutions if:

i. there are no market based solution(s)

ii. market based solution(s) do not meet the identified reliability needs

iii. market based solution(s) meet the identified reliability needs, but only partially

These proposals may consist of transmission, generation or demand-side projects. NYISO will solicit proposal(s) for Alternative Regulated Solutions from any developers who wish to offer them. TOs other than those designated as Responsible TOs that must offer Regulated Backstop Solutions to reliability needs may also offer Alternative Regulated Solutions.

Entities wishing to submit Alternative Regulated Solutions will have a prespecified duration (commensurate with the type of reliability need being addressed) from the date the NYISO solicit such solutions to submit them to the NYISO.

Two evaluations will be conducted regarding proposed Alternative Regulated Solutions:

1. the NYISO will determine whether the proposed solutions are feasible and satisfy the identified reliability needs in a timely manner.
2. The New York Public Service Commission and other licensing and permitting agencies will determine whether proposed Alternative Regulated Solutions are more desirable than the TO's Regulated Backstop Solutions. This evaluation will occur under applicable statutes and regulations outside of the CRPP, but the results of regulatory review and licensing will be factored into the NYISO's analyses under the CRPP.

6.2 Assess Submittals for Procedural Solutions to Reliability Needs (§7)

NYISO will conduct an initial screening to determine whether the submitted proposals, incluing Market Based Solutions and Alternative Regulated Solutions, are viable and are capable of meeting the procedural and scheduling requirements necessary to be in service by the BM established for the Regulatory Backstop Solution to the reliability needs. The NYISO will use the criteria in Sections 2.1.1 and 2.1.2 of this Manual to conduct this screening.

Based on this initial screening, NYISO may classify the various proposed solutions into various categories, including,

i. Necessity for additional data, information and clarification
ii. Solutions that are not timely (may not be completed by the time of requirement)
iii. Solutions/Projects (even though new for the CRPP) which have made further progress
iv. Solutions/Projects which may conflict with other projects under implementation
v. Solutions/Projects which may improve or enhance other projects under implementation

7 NYISO EVALUATION OF PROPOSED SOLUTIONS (§7)

In this phase of the CRPP, the purpose is to determine whether the proposed and viable[20] solutions in the three categories[21] (namely, Market Based Solutions, Alternative Regulated Solutions and Regulated Backstop Solutions) can meet the identified Reliability Needs in a timely manner. The work flow steps used by NYISO for evaluating the proposed solutions for the Reliability Needs are shown in Figure 7-1. These steps are described in separate sections, but not necessarily in the same order. Suitable adjustments to these steps would be necessary and will be made during the simulation and analyses, but consistent and within the Tariff guidelines.

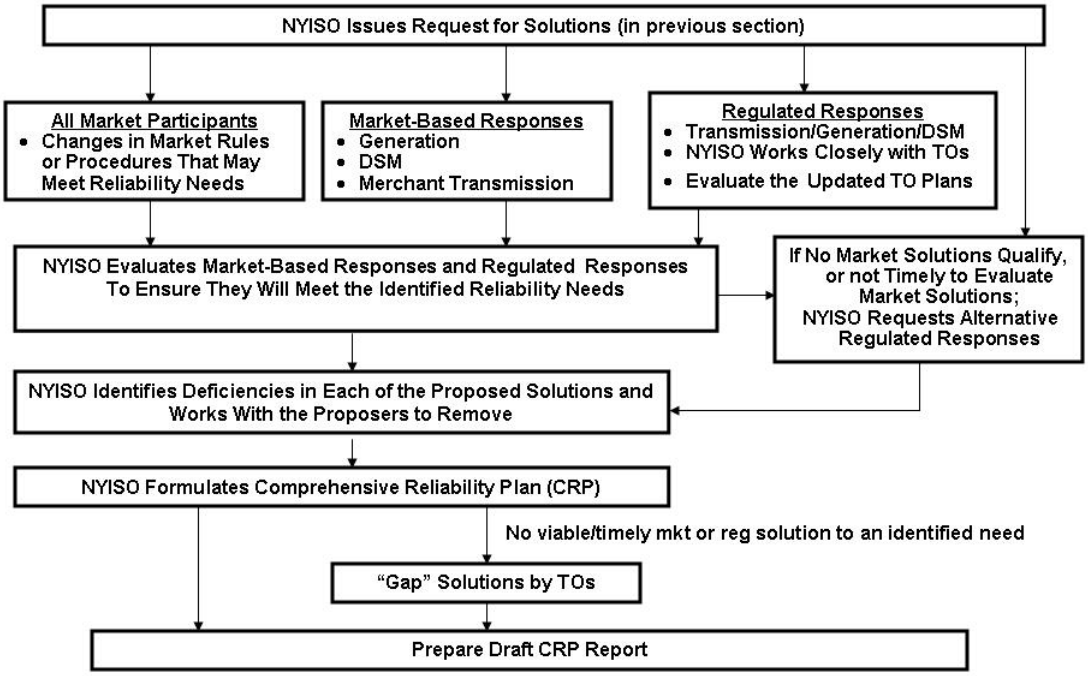


Figure 7-1 Work-flow for Reliability Solution Evaluation

The proposed solutions may be in the form of

- New generation additions (large or small)
- Distributed generation
- New transmission projects
- Transmission upgrades
- Demand-side response programs
- Operating procedure changes

[20] Establishing the viability of the proposed solutions described in section 6.
[21](i) Market Based Solutions (ii) Alternative Regulated Solutions and (iii) Regulated Backstop Solutions.

- Market rule changes

The models and procedures described in Section 5.7.2 for determining resource adequacy and in Section 5.8.2 for transmission system analyses will be utilized for these evaluations. The calculations and analyses for these evaluations will be consistent with the timing, the type and magnitude of the solution being evaluated.

As shown in Figure 7-1, the three different types of solutions, namely, i) Market Rules or Procedures ii) Market Based Responses and iii) Regulated Backstop Responses will be evaluated in parallel. To begin with, any changes in Market Rules or Procedures, proposed by any or all participants will be evaluated to determine whether these proposed changes will fulfill the Reliability Needs. Secondly, the various solutions received from Market Participants will be evaluated individually and collectively to determine the extent to which these satisfy the Reliability Needs identified earlier. For each of the Market Based Solutions received to address all or part of a Reliability Need, the evaluation will consist of determining the sufficiency of the solution to fulfill the particular need. The third item for evaluation is the Regulated Backstop Responses submitted by the Responsible TOs.

7.1 Identify and Resolve Deficiencies in Proposed Solutions

Market based solutions may not fully meet the Reliability Needs by the BM for triggering Regulatory Backstop Solutions. However, with some changes and adjustments, some of these proposed solutions may become sufficient to fully or partly meet the Reliability Needs. The necessary changes and adjustments will be identified in cooperation with the proponents of various projects. As mentioned earlier, any deficiency in the Market Based Solutions offered to NYISO will be addressed first, to the extent practicable. However, because extensive discussions to resolve deficiencies and concerns may be needed, the resolution of problems in these two categories of solutions may not be completed in sequential order. However, preference to market based solutions over regulated solutions is always respected.

7.2 Determine Whether Regulated Backstop Projects Need to be to Implemented (§8.4)

a. If the NYISO determines in the CRP that implementation of a regulated solution is necessary, the NYISO will request the Responsible TO to submit its proposal for a backstop regulated solution to the appropriate state regulatory agency(ies) to begin the approval process. The Responsible TO in response to the NYISO request shall make such a submission. Other Developers proposing alternative regulated solutions pursuant to Section 6.4.b that have completed any changes required by the NYISO under Section 7.3.b, which the NYISO has determined will resolve the identified deficiencies, may submit these proposals to the appropriate state regulatory agency(ies) for review.

b. If the NYISO determines in the CRP that it is necessary for the Responsible TO to

proceed with the regulated solution identified in 8.4.a in parallel with a market-based solution in order to ensure that a Reliability Need is met in a timely manner, the Responsible TO shall proceed with due diligence to develop it in accordance with Good Utility Practice unless or until notified by the NYISO that it has determined that the regulated solution is no longer needed.

c. If, after consultation with the Responsible TO, the NYISO determines that the Responsible TO has not submitted its proposed solution for state regulatory action within a reasonable period of time, or that the TO has been unable to obtain the approvals or property rights necessary under applicable law to construct the project, the NYISO shall submit a report to the FERC for its consideration and determination of whether any action is appropriate under federal law.

7.3 Evaluation of Alternative Regulated Solution (§8.4)

Alternative Regulated Solutions are invoked only when the NYISO has triggered Reliability Backstop Solutions to fulfill the Reliability Needs, and a developer(s) has proposed an Alternative Regulated Solution to take the place of a Reliability Backstop Solution. The NYISO will evaluate the viability and capability of Alternative Regulated Solutions in detail when requested to do so by the New York Public Service Commission in the course of reviewing alternatives to the Regulatory Backstop Solutions triggered by the NYISO.

7.4 Determine Need for Gap Solution (§7.4)

If the NYISO determines that neither market-based proposals nor regulated proposals can satisfy the Reliability Needs in a timely manner, the NYISO will set forth its determination that a Gap Solution is necessary in the CRP. The NYISO will also request the Responsible TO to seek a Gap Solution. If there is an imminent threat to the reliability of the New York power system, the NYISO Board, after consultation with the NYDPS, may request the appropriate Transmission Owner or Transmission Owners to propose a Gap Solution outside of the normal planning cycle. Upon the NYISO's determination of the need for a Gap Solution, the Responsible TO will propose such a solution, as soon as reasonably possible, for consideration by the NYISO and NYDPS.

Any party may submit an alternative Gap Solution proposal to the NYISO and the NYDPS for their consideration. The NYISO shall evaluate all Gap Solution proposals to determine whether they will meet the Reliability Need or imminent threat. The NYISO will report the results of its evaluation to the party making the proposal as well as to the NYDPS and/or other appropriate regulatory agency(ies) for consideration in their review of the proposals. Gap Solution proposals submitted under Sections 7.4.a and 7.4.b (Attachment Y of the Tariff) shall be designed to be temporary solutions and strive to be compatible with permanent market-based proposals. A permanent regulated solution, if appropriate, may proceed in parallel with a Gap Solution.

7.5 Prepare Draft Comprehensive Reliability Plan Document

Preparing a draft of Comprehensive Reliability Plan (CRP) document is the second major step in the CRPP. This draft report includes input from various stake holders. This draft report forms a basis for the annual CRP which assesses and establishes the grid's reliability needs and solutions to maintain long-term reliability of NYCA's bulk power system. In addition to addressing reliability issues, the CRPP offers valuable information to the state's wholesale electricity marketplace.

Technical evaluation and comparison of various solutions offered from the market and alternative regulated solutions is the essential part of this draft CRP. The results, analyses and conclusions from the evaluation of all the solutions for the Study Period will be documented in this report.

8 NYISO COST ALLOCATION AND RECOVERY PRINCIPLES AND ANALYSIS

Cost allocation Principles are set forth in NYISO's OATT Section 10 of Attachment Y entitled "10.0 Cost Allocation Principles" sheet 958 (Oct 19, 2004).

According to Section 10.1, the costs of market-based solutions shall be the responsibility of the developer of the market-based proposal.

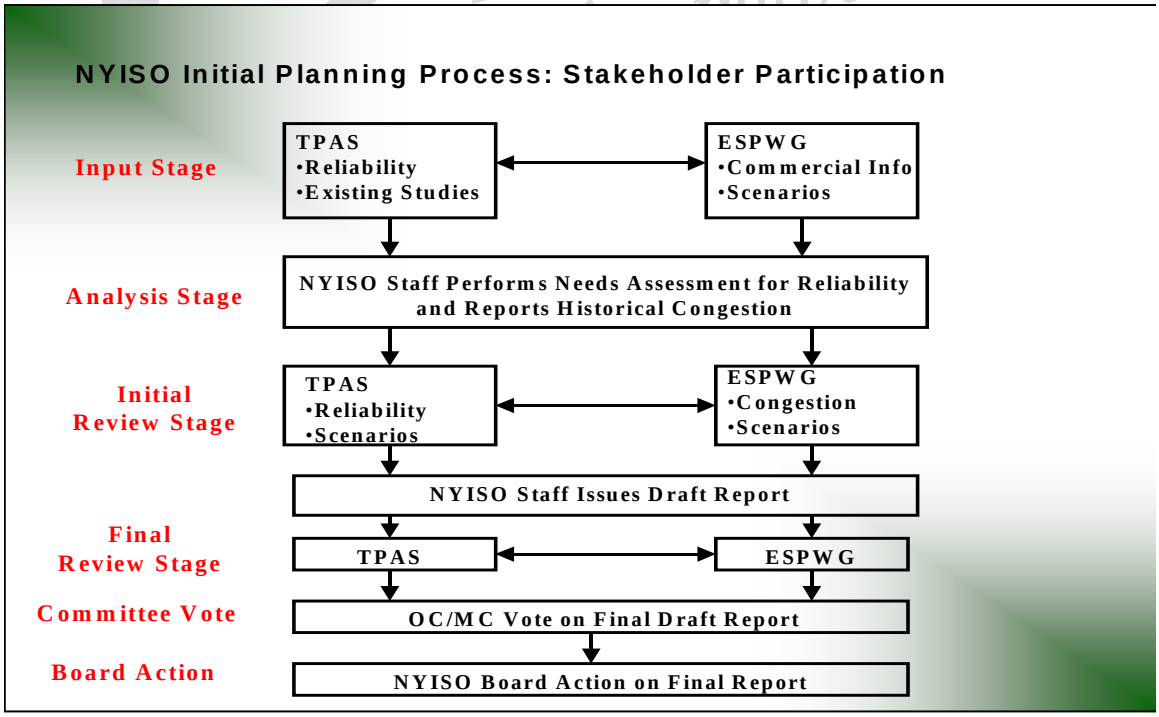
As noted in Section 10.2, Cost allocation for regulated solutions to Reliability Needs shall be determined by the NYISO based upon the principle that beneficiaries should bear the cost responsibility. The specific cost allocation methodology, to be developed by the NYISO in consultation with the ESPWG, will incorporate the 11 elements listed under this section. This document is under preparation and will be included in this Manual as an Appendix when it is complete.

9 CRP REVIEW & APPROVAL PROCESS (§8)

The draft CRP, prepared by NYISO staff will be reviewed, revised as necessary and approved in several individual steps.

9.1 TPAS & ESPWG Review of Draft CRP

The Transmission Planning Advisory Subcommittee (TPAS) and the Electric System Planning Working Group (ESPWG) provide the for a stakeholders participation in preparation and review of the CRP, as shown in Figure 8.1. TPAS has primary responsibility for the reliability analyses, while the ESPWG has primary responsibility for providing commercial input and assumptions utilized in the development of reliability assessment scenarios and the reporting and analysis of historic congestion costs. Coordination between these two groups and NYISO Staff is established during each stage of the initial planning process.
The intent of this process is to achieve consensus at both TPAS and the ESPWG. While no formal voting process is established at this level,an opportunity for reporting majority and minority views is provided in the absence of a consensus.



NYISO staff prepares a draft CRP Report and presents it to TPAS and ESPWG. Based on their review, the NYISO staff will undertake additional analyses as necessary, revise the draft CRP document, and prepare a final draft CRP document for the Operating Committee's review and action.

9.2 Dispute Resolution (§8.3 & 12.0)

A Market Participant can offer alternatives and discuss changes with NYISO staff during the CRPP through TPAS and ESPWG. However, a Market Participant can raise unresolved or new disputes for resolution by NYPSC[22] and/or FERC in accordance with Sections 8.3 and 12.0 of Attachment Y.

9.3 Operating Committee and Management Committee Review and Vote on the CRP

The NYISO Operating Committee reviews and votes on the draft CRP document. The Operating Committee will determine whether to recommend that the Management Committee Recommend that the Board of Directors approve the draft CRP. Thereafter the final draft CRP document is provided to the Management Committee for its review and vote. The NYISO will report minority opinions on the draft CRP from the Operating Committee to the Management Committee.

9.4 NYISO BOD Action on CRP and Independent Market Advisor Review

The NYISO will present minority views dissenting from the draft CRP, if any, to the NYISO's Board of Directors following the Management Committee's review and vote..

Concurrently, the draft CRP will also be provided to the Independent Market Advisor for review and comments. The Board will review and approve the CRP, either as presented, with its own changes, or after further revision by the NYISO's Committees. Upon final approval of the CRP by NYISO's Board of Directors; NYISO prepares the final CRP document for that cycle of the CRPP.

9.5 Issuance and Posting of the Final CRP

Upon final approval of the CRP by the NYISO's Board of Directors, the final CRP document will be issued and posted on the NYISO's website.

[22] Please see Section 2.9 of this manual.

10 REFERENCES

To be added Later.

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