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Independent System Operator

Manual 26

Reliability Planning Process Manual

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Revision History

Version	Effective Date	Revisions
1.0	11/20/2007	Initial Release
2.0	06/02/2014	Global ➢ Changed the title of the manual from Comprehensive Reliability Planning Process Manual to Reliability Planning Process Manual ➢ Implemented minor stylistic changes ➢ Implemented programmatic linking for internal cross-references to facilitate navigation within the document ➢ Performed a major rewrite and reorganization of content ➢ Technical Bulletins merged: • TB-171 Monitoring Viability of Solutions to Meet Reliability Needs - NYISO Process (Revised Section 9.1) • TB-188 Large Facilities Interconnection Status Reporting (Revised Section 9.2)
2.1	09/26/2014	Section 1.1 ➢ Updated and clarified the description of the Comprehensive System Planning Process ➢ Clarified who can submit proposals for regulated solutions Figure 1-2 ➢ Updated Figure 1-2 which shows the Comprehensive Reliability Planning Process Section 5 ➢ Added a description of the process leading to the submission of proposed solutions to Reliability Needs ➢ Corrected references to the proper forms for each type of proposed solution ➢ Provided details on the procedures to be used by the NYISO for the initial assessment of proposed solutions Attachment G ➢ New attachment “Study Agreement for Evaluation of Proposed Transmission Solution to a Reliability Need” created.
2.2	12/02/2014	Section 5 ➢ Clarified the role of NYPA and the requirements for all Market Participants, Developers, and other parties in the NYISO planning process as set forth in 31.2.2.4.1 of Attachment Y Section 6 ➢ Provided details on the process for submitting the detailed project proposals which may be requested by the NYISO ➢ Described the procedures to be used by the NYISO to evaluate and select a regulated transmission solution including the cost metrics specified in Attachment Y of the OATT Attachment C ➢ Included website location reference to Attachment C

Version	Effective Date	Revisions
2.3	04/01/2016	Section 1 ➢ Revised information on Gap Solution and RMR processes ➢ Updated Figure 1-2 NYISO Comprehensive Reliability Plan Process Section 3.1 ➢ Revised base case inclusion rules Section 4.13 ➢ Added a new procedure to confirm needs after draft RNA but before soliciting solutions Section 6.3 ➢ Updated Determination of Need for Gap Solution Attachment H ➢ New attachment. Merged TB-232: Procedures for Qualified Developers Proposing Transmission Projects
2.4	01/03/2018	Section 3: ➢ Clarified the RNA Base Case development process and revised the RNA Base Case inclusion rules
2.5	7/5/2018	➢ Throughout the Manual: to remove or revise out-of-date language concerning the NYISO's Generator Deactivation Process and Gap Solution process ➢ Section 9: to clarify and streamline the project monitoring process ➢ Attachment A: to clarify the Developer qualification requirements
2.6	12/12/2019	➢ Update the Deactivations and Additions rules to reflect additional categories ➢ Clarify the RNA Base Case updates (e.g., only those updates that may reduce or eliminate the preliminarily-identified ("1st pass") Reliability Needs ➢ Clarify/update the Base Case updates after the RNA is approved by the NYISO Board of Directors ➢ Clarify RNA's process when non-BPTF violations are observed
2.7	04/02/2021	Recertified ➢ Capitalized Reliability Planning Process to reflect the defined term in the NYISO OATT ➢ Updated the study period for the RNA/CRP to reflect the change in Study Period (i.e., from year 1 through year 10, to year 4 through year 10 following the study start date) ➢ Corrected the section numbering for the overview of reliability criteria and the overview of the RPP analysis methodology ➢ Revised various sections to address the Short-Term Reliability Process instead of the Generator Deactivation Process
2.8	07/11/2022	➢ Updated Section 1.1 to account for the revisions to the Economic Planning Process

Version	Effective Date	Revisions
		➢ Updated Sections 4.1 and 4.5 outlining enhancements to transmission security modeling practices ➢ Conforming changes and corrections to Sections 4.6, 4.8 and 6.1.
2.9	09/19/2023	Recertified Global ➢ Updated broken hyperlinks and NYISO website location references ➢ Corrected ministerial grammatical errors
3.0	06/01/2026	Recertified Global ➢ Updated references to interconnection processes and STRP ➢ Corrected ministerial grammatical errors Section 1 ➢ Updated the descriptions of assessments performed in RPP Section 3 ➢ Updated the RNA Base Case inclusion rules to reflect, among other things, changes to the interconnection processes and consideration of load projects ➢ Added a new subsection, “Generation Unavailability,” to describe existing planning practices and new aging generation assumptions ➢ Modified the thermal derate assumption used in transmission security margin calculation ➢ Added more details on the process for developing scenarios in the RNA Section 4 ➢ Updated descriptions of the transmission security and resource adequacy assessments ➢ Amended the process for the RNA’s consideration and incorporation of relevant system updates, including the elimination of the “1st pass” and “2nd pass” process points Section 6 ➢ Added details on relevant process points for the mechanism to implement the Transmission Owners right of first refusal for upgrades to their existing facilities Section 8 ➢ Added a new section describing the Short-Term Reliability Process to merge Technical Bulletin 250 Short-Term Reliability Process Section 10 ➢ Added a new section describing the administration of Additional Reliability Studies Attachment H ➢ Created new attachment “Aging Generation Model”

1. Overview

1.1. The Comprehensive System Planning Process

This Reliability Planning Process Manual (Manual) describes the NYISO's Reliability Planning Process component of the NYISO Comprehensive System Planning Process (CSPP).[1] The Short-Term Reliability Process is described in Section 8 of this Manual with additional details regarding Generator deactivations provided in Technical Bulletin 185. The CSPP and STRP were approved by the Federal Energy Regulatory Commission (FERC) and their requirements are contained in Attachment Y and Attachment FF of the NYISO's Open Access Transmission Tariff (OATT), respectively. One of the NYISO's responsibilities is to prepare for the impact of expected changes in supply and demand of power on the reliable operation of the New York transmission system. The analyses, evaluations and forecasts produced by the NYISO's system and resource planning activities assist Market Participants, regulators and policy makers as they plan for the future. One way the NYISO accomplishes this responsibility is through the Reliability Planning Process component of the CSPP.

The CSPP is comprised of four components:

1. Local Transmission Planning Process (LTPP),
2. Reliability Planning Process (RPP), along with parts of the Short-Term Reliability Process (STRP),
3. Economic Planning Process, and
4. Public Policy Transmission Planning Process.

The first component in the CSPP cycle is the LTPP. Under this process, the local Transmission Owners (TOs) perform transmission studies for their transmission areas according to all applicable criteria. This process produces the Local Transmission Owner Plan (LTP), which feeds into the NYISO's determination of system needs through the CSPP. This Manual does not provide all of the details of the TOs' processes for developing their LTPs, but rather discusses the communication interface with the NYISO process.

The second component in the CSPP cycle is the RPP, covering year 4 through year 10 following the year of starting the study, along with STRP, covering year 1 through year 5 following the STAR Start Date of the study. The requirements of the RPP are described in this Manual and Attachment Y of the OATT.

[1] Unless otherwise defined in this document, capitalized terms used herein shall have the meanings ascribed to them in the NYISO's Open Access Transmission Tariff or Market Administration and Control Area Services Tariff.

Under the biennial process for conducting the RPP, the reliability of the New York State Bulk Power Transmission Facilities (BPTF) is assessed, any Reliability Needs are identified, solutions to identified needs are proposed and evaluated for their viability and sufficiency to satisfy the identified needs and, if necessary, the more efficient or cost-effective transmission solution to the identified needs is selected by the NYISO. The RPP was originally developed and implemented in conjunction with stakeholders, was approved by FERC in December 2004, and was revised in 2014 to conform to FERC Order No. 1000.

The RPP consists of two studies:

1. The Reliability Needs Assessment (RNA). The NYISO performs a biennial study in which it evaluates the resource and transmission adequacy and transmission security of the New York BPTF over its Study Period, encompassing years 4 through 10 following the year in which the RNA is conducted. Through this evaluation, the NYISO identifies Reliability Needs in accordance with applicable Reliability Criteria. This report is reviewed by NYISO stakeholders and approved by the Board of Directors.

2. The Comprehensive Reliability Plan (CRP). After the RNA is complete, the NYISO requests the submission of market-based solutions to satisfy any identified Reliability Needs. The NYISO also identifies a Responsible TO and requests that the TO submit a regulated backstop solution and that any interested entities submit alternative regulated solutions to address the identified Reliability Needs. The NYISO evaluates the viability and sufficiency of the proposed solutions to satisfy the identified Reliability Needs, and evaluates and selects the more efficient or cost-effective transmission solution to resolve that need. In the event that market-based solutions do not materialize to meet a Reliability Need in a timely manner, the NYISO triggers regulated solution(s) to satisfy the need. The NYISO develops the CRP for its Study Period that sets forth its findings regarding the proposed solutions. The CRP is reviewed by NYISO stakeholders and approved by the Board of Directors. If the RNA does not identify Reliability Needs for which solutions are required, the CRP provides the regional plan that incorporates the findings from the RNA, any solutions from the Short-Term Reliability Process, as available, to maintain reliability over the ten-year planning horizon and any identified risks to plan identified through the development of the CRP.

The STRP uses quarterly Short-Term Assessment of Reliability (STAR) studies to assess the reliability impacts of Generator deactivations on both the BPTF and non-BPTF (local), in coordination with the Responsible Transmission Owner(s). The STAR is also used by the NYISO, in coordination with the Responsible Transmission Owner(s), to assess the reliability impacts on the BPTF due to system changes

that are not related to a Generator deactivation. These changes may include changes to load forecasts, interchange, planned generation and transmission projects, long duration transmission facility outages, and other system topology changes. Section 38 of the OATT describes the process by which the NYISO, Transmission Owners, Market Participants, Generator Owners, Developers and other interested parties follow to plan to meet Generator Deactivation Reliability Needs affecting the New York State Transmission System and other Reliability Needs affecting the BPTF (collectively, "Short-Term Reliability Process Needs").

Each STAR will assess a five-year period, with a particular focus on Short-Term Reliability Process Needs that are expected to arise in the first three years of the study period. The STRP is the sole venue for addressing Generator Deactivation Reliability Needs on the non-BPTF and for BPTF needs that arise in the first three years of the assessment period. With one exception,[2] needs that arise in years four or five of the assessment period may be addressed in either the STRP or RPP.

The STRP concludes if a STAR does not identify a need or if the NYISO determines that all identified needs will be addressed in the RPP. Should a STAR identify a need to be addressed in the STRP, the NYISO would request the submission of market-based solutions to satisfy the need along with a Responsible Transmission Owner's Short-Term Reliability Process Solution. The NYISO evaluates the viability and sufficiency of the proposed solutions to satisfy the identified needs and identifies the solution or solutions that address the need. The NYISO reviews the results of the solution or combination of solutions (including an explanation regarding the solution that is selected) with stakeholders and posts a Short-Term Reliability Process Report detailing the determination with stakeholders.

The third component of the CSPP is the economic planning process (EPP) in which the NYISO performs the System & Resource Outlook. The EPP consists of three study processes:

1. The System & Resource Outlook ("The Outlook") is a biennial report conducted under Section 31.3.1 of the OATT by which the NYISO summarizes the current assessments, evaluations, and plans in the biennial Comprehensive System Planning Process; produces a twenty-year projection of congestion on the New York State Transmission System; identifies, ranks, and groups congested elements; and assesses the potential benefits of addressing the identified congestion. In conducting the process, the NYISO will analyze a base case and scenarios that are developed in consultation with stakeholders. The Outlook report is reviewed by NYISO stakeholders and approved by the Board of Directors.

[2] Generator Deactivation Reliability Needs that arise on the non-BPTF must always be addressed in the STRP.

2. If a Developer proposes a Regulated Economic Transmission Project (RETP) to address constraints on the BPTFs identified in the EPP, the NYISO will perform an Economic Transmission Project Evaluation (ETPE) of the proposed Regulated Economic Transmission Project pursuant to Section 31.3.2 of the OATT to determine the project's initial eligibility for cost allocation and recovery under the OATT and to identify the beneficiaries that would be allocated the cost of the project. The beneficiaries must approve the project's selection for cost allocation and recovery purposes in accordance with the voting requirements in the OATT.

3. Market Participants and other interested parties may also request that the NYISO perform a Requested Economic Planning Study (REPS) pursuant to Section 31.3.3 of the OATT at the requesting party's expense solely for information purposes, which scope and deliverables will be agreed upon by the NYISO and the requesting entity.

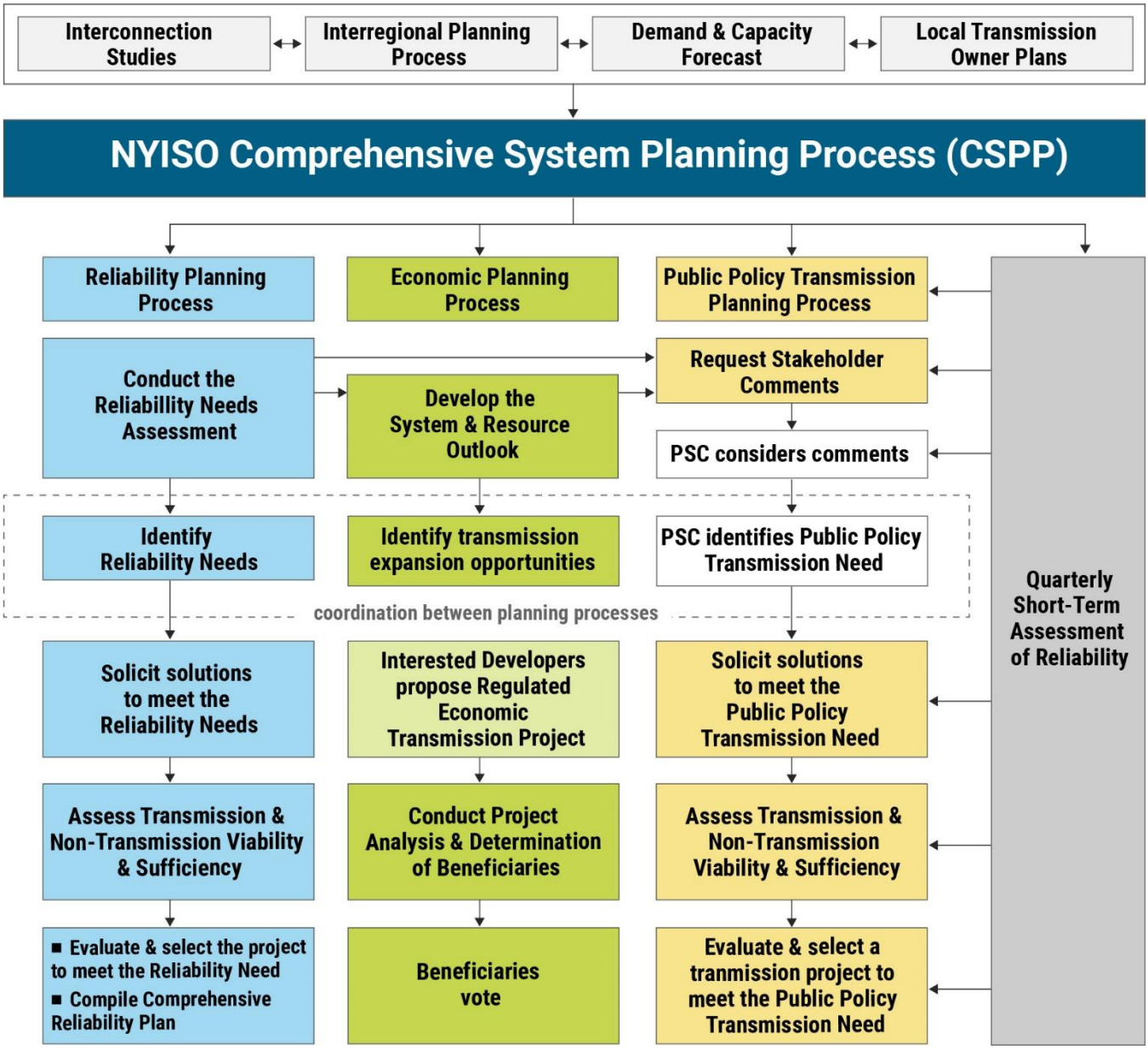
The requirements of the EPP are described in the Economic Planning Process Manual and Section 31.3 of Attachment Y of the OATT.

The fourth component of the CSPP is the Public Policy Transmission Planning Process. Under this process interested entities propose, and the New York State Public Service Commission (NYPSC) identifies transmission needs driven by Public Policy Requirements. The NYISO then requests that interested entities submit proposed solutions to the identified Public Policy Transmission Need. The NYISO evaluates the viability and sufficiency of the proposed solutions to satisfy the identified Public Policy Transmission Need. The NYISO then evaluates and may select the more efficient or cost-effective transmission solution to the identified need. The NYISO develops the Public Policy Transmission Planning Report that sets forth its findings regarding the proposed solutions. This report is reviewed by NYISO stakeholders and approved by the Board of Directors.

In concert with these four components, interregional planning is conducted with NYISO's neighboring control areas in the United States and Canada under the Northeastern ISO/RTO Planning Coordination Protocol. The NYISO participates in interregional planning and may consider Interregional Transmission Projects in its regional planning processes.

The NYISO CSPP is illustrated in Figure 1.

Figure 1: NYISO Comprehensive System Planning Process



1.2. The Reliability Planning Process (RPP)

1.2.1. Overview of the RPP

The RPP is a long-range assessment of both resource adequacy and transmission security of the BPTF conducted over its Study Period. The reliability of the bulk power system is assessed and solutions to Reliability Needs are evaluated in accordance with existing reliability criteria of the North American

Electric Reliability Corporation (NERC), Northeast Power Coordination Council (NPCC), and New York State Reliability Council (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 direct a regulated solution to address the Reliability Need. The NYISO will designate a Responsible TO(s) to offer a regulated backstop solution to maintain reliability. Market Participants and interested parties can also offer alternative regulated solutions. As applicable under Section 31.2.6 of the OATT, the NYISO will select the more efficient or cost-effective regulated transmission solution to address the Reliability Need. Concurrently, the draft CRP will also be provided to the Market Monitoring Unit for its review and consideration of whether market rule changes are necessary to address an identified failure, if any, in one of the ISO's competitive markets. The RPP does not substitute for the planning that each TO conducts to maintain the reliability of its own bulk and non-bulk power systems.

1.2.1.1. Local Transmission Planning Process (LTPP)

Each CSPP cycle begins with the LTPP. As part of the LTPP, local Transmission Owners perform transmission studies for the transmission facilities in their Transmission Districts according to all applicable criteria. The LTPP provides input for the NYISO's Reliability Planning Process. Local TO facilities are included in the RNA base cases as provided in Section 3 of this Manual.

1.2.1.2. Reliability Needs Assessment (RNA)

The NYISO conducts an RNA to determine whether there would be any violations of existing reliability rules with respect to either resource adequacy or transmission system security. The starting point for RNA study is the system as defined for the FERC Form 715 Base Case. The NYISO sets out the details of the development of the RNA Base Case and scenarios according to the procedures set forth in this Manual. The NYISO analyzes whether the BPTF meet all of the Reliability Criteria for both resource adequacy and transmission security in each year of the Study Period and reports the results of its evaluation in the RNA.

Resource adequacy analysis will include a probabilistic evaluation of future conditions and events. The NYSRC defines a system as adequate if the probability of having insufficient transmission and resources to meet expected demand is equal to or less than the system's standard, which is expressed as a loss of load expectation (LOLE). The New York State Power System is planned to meet a NYCA annual LOLE that is less than or equal to an involuntary load disconnection that is not more frequent than once in every ten years or 0.1 event days per year in accordance with the reliability rules promulgated by NYSRC.

Transmission security analyses will include thermal, voltage, short circuit, and stability studies. If any Reliability Criteria are not met in any year, the NYISO shall perform additional analyses to quantify the

approximate level of additional resources and/or transmission transfer capability increases needed to meet the Reliability Criteria, and to determine the expected first year of need for those additional resources and/or transmission. The RNA will not seek to identify specific additional facilities to mitigate Reliability Needs. Reliability Needs will be defined in terms of total deficiencies relative to Reliability Criteria and not necessarily in terms of specific facilities. The deficiencies are translated to a level of compensatory megawatts (MWs) or mega-VARs (MVArs) as discussed in Section 4.8. A short circuit assessment will be performed.

1.2.1.3. Request for Solicitations

Following the review of the RNA by the NYISO working groups, the Operating Committee, the Management Committee, 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 during which a market-based solution's schedule will be further evaluated. Both market-based and regulated solutions are open to all resource types: generation, transmission, and demand response. Non-transmission owner developers, as well as all TOs, 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 will evaluate all proposed solutions to determine whether they are viable and sufficient to meet the identified Reliability Needs by the need date.

1.2.1.4. Comprehensive Reliability Plan (CRP)

If an RNA identifies Reliability Needs and the NYISO solicits proposed solutions to address the identified needs, the NYISO will prepare the CRP following its evaluation of all proposed solutions. The CRP will identify all proposed solutions that the NYISO has found are viable and will meet the identified Reliability Needs. If there are viable and sufficient market-based solutions that will meet the identified need in a timely manner, the CRP will so state. If there are no viable and sufficient market-based solutions and the NYISO determines that a regulated solution must be implemented to maintain the reliability of the BPTF, the CRP will so state and will indicate the viable and sufficient regulated solutions, including any selected regulated transmission solution, that can satisfy the identified Reliability Needs. The CRP will also preliminarily identify the Designated Reliability Transmission Project(s) that make up the selected regulated transmission solution and the viable and sufficient regulated backstop transmission solution (if different) and the Designated Entity responsible for each Designated Reliability Transmission Project. Each

Designated Entity will be eligible for cost allocation and cost recovery under the NYISO's tariff for its Designated Reliability Transmission Project.

If a regulated solution must proceed, the NYISO will trigger the solution to proceed, document its determination in the CRP, or updated CRP, and request the selected regulated solution to proceed with regulatory approval and development of such regulated solution.

If the RNA does not identify Reliability Needs for which solutions are required, the CRP will detail the regional plan, incorporating the findings from the RNA; any solutions from the STRP, as available, to maintain reliability over the ten-year planning horizon; and any identified risks to plan identified through the development of the CRP.

1.2.1.5. Gap Solution Process

If a Reliability Need or an imminent threat to the reliability of the New York State Power System other than a Short-Term Reliability Process Need cannot be addressed through this biennial RPP, the NYISO will seek a Gap Solution to address the need in the CRP or between cycles of the biennial RPP through the process set forth in Section 31.2.11 of the OATT.

1.2.1.6. Short-Term Reliability Process

The STRP uses quarterly STAR studies to assess the reliability impacts of Generator deactivations on both BPTF and non-BPTF (local) systems, in coordination with the Responsible Transmission Owner(s). The STAR is also used by the NYISO, in coordination with the Responsible Transmission Owner(s), to assess the reliability impacts of other system changes on the BPTF. Details of the STRP are found in Section 38 of the OATT and Section 8 of this Manual.

1.2.1.7. Solutions to Reliability Needs

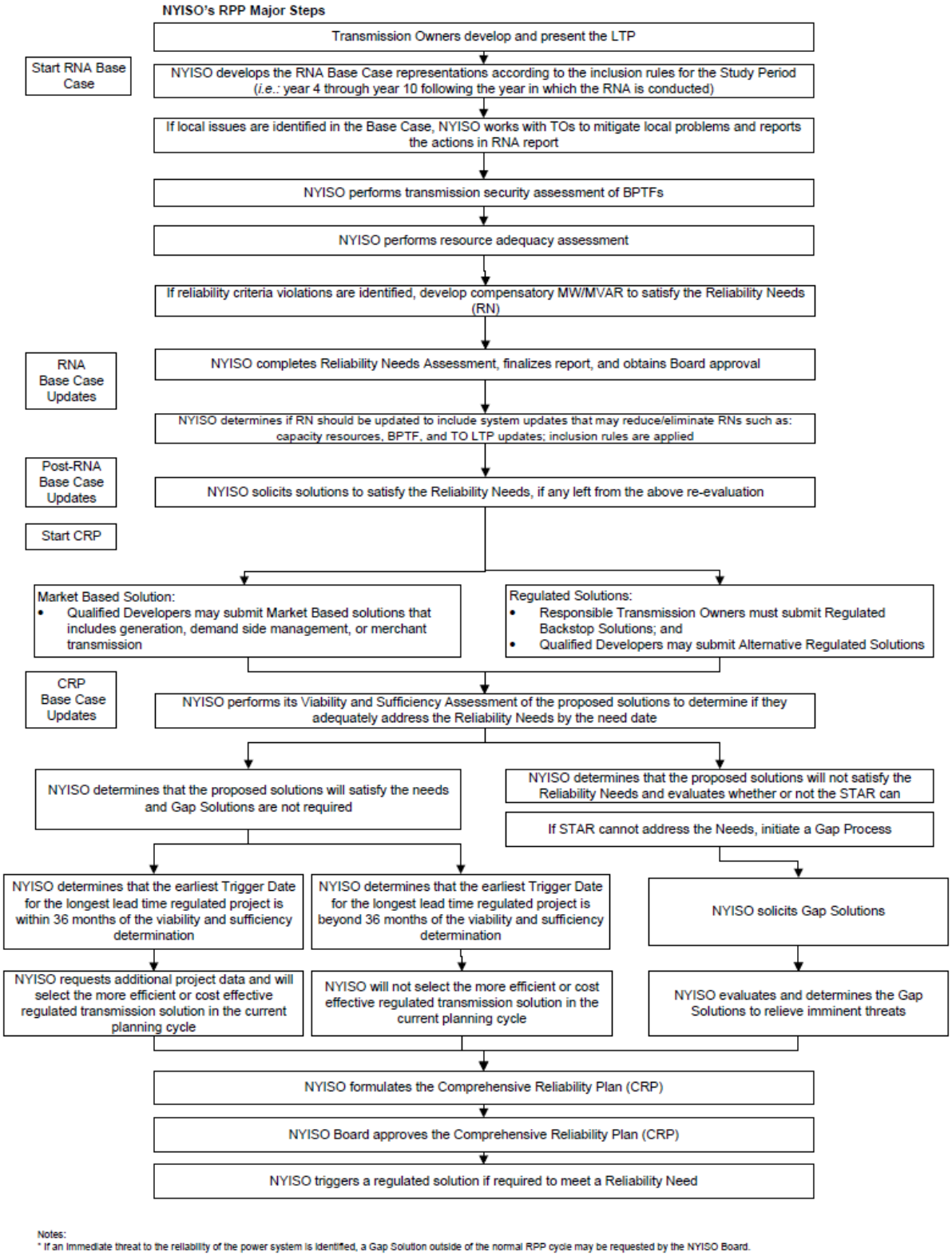
Developers of market-based solutions are expected to recover their costs from the NYISO's Energy, Capacity, and Ancillary Services markets. Market-based solutions may also obtain revenues from other private contracting arrangements. The costs of implementing regulated transmission solutions are recovered through the NYISO's tariffs, including the costs of regulated backstop solutions, a Developer's alternative regulated transmission solution selected by the NYISO as the more efficient or cost effective transmission solution to meet the Reliability Need, and a transmission Gap Solution identified by the NYPSC (or other appropriate governmental agency or authority). The costs of such solutions must be filed with the FERC for acceptance or approval, and thereupon cost recovery may proceed under Rate Schedule 10 or another rate schedule accepted or approved by FERC. The costs of regulated non-transmission projects will be recovered in accordance with the New York Public Service Law and cost allocation and cost

recovery policies or rules established by the NYPSC. The costs of regulated non-transmission projects by the Long Island Power Authority and the New York Power Authority will be recovered in accordance with the New York Public Authorities Law. TO LTPs and updated plans do not constitute regulated backstop solutions or alternative regulated solutions, and LTP project costs are not recoverable under the NYISO tariffs.

The NYISO does not itself build projects to respond to Reliability Needs. The ultimate approval of those projects lies with the applicable regulatory agencies, such as the FERC, NYPSC, environmental permitting agencies, and local governments. The NYISO monitors the progress and continued viability and sufficiency of proposed market-based and regulated projects to meet identified needs as set forth in Section 9 of this Manual.

Figure 2 shows a summary of the RPP.

Figure 2: NYISO Reliability Planning Process - Major Steps



1.2.2. Overview of Reliability 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 adequacy and security. Adequacy is a planning concept that involves an analysis of the probability of future conditions and events. The NYSRC defines a system as adequate if the probability of having insufficient transmission and resources to meet expected demand is equal to or less than the system's standard, which is expressed as a loss of load expectation (LOLE). The New York State Power System is planned to meet a NYCA annual LOLE that is less than or equal to an involuntary load disconnection that is not more frequent than once in every ten years or 0.1 event-days per year. This requirement also forms the basis of New York's installed capacity or resource adequacy requirement.

Security is an operating and deterministic concept which refers to the ability of the electric systems to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements. These events, or contingencies, are sometimes referred to as N-1, N-1-1, or N-2; where N corresponds to a system in normal condition. N-1 refers to the loss of a single element. N-1-1 refers to the loss of two independent elements with a time delay between the events, which allows for adjustments to the system. N-2 is the simultaneous loss of two independent elements. An N-1 requirement, for example, means that the system can withstand the loss of system components arising from one event without adversely affecting the continuity of service. Contingencies and their response requirements are further detailed in applicable standards, criteria and rules of the NERC, NPCC, and NYSRC, as well as the planning guidelines of the TOs.

1.2.3. Overview of the RPP Analysis Methodology

The RPP 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 including New York TOs, neighboring control areas, existing reliability assessments, and existing NYISO publications and reports. The analysis

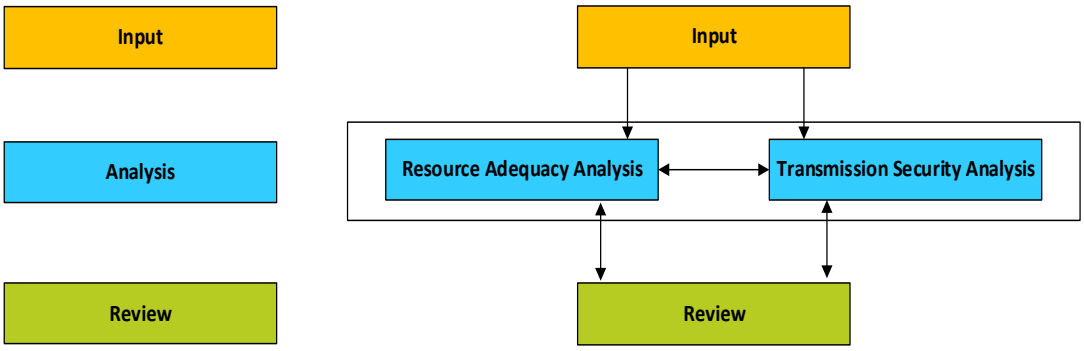
and review steps are conducted by performing transmission assessments consisting of transmission security and resource adequacy assessments.

The primary tools for conducting the transmission security assessments are commercial software products for power flow, stability, and short circuit analyses.

Resource adequacy assessments use Monte Carlo probabilistic simulations to compute the reliability of the power system. These assessments reflect applicable NYSRC Reliability Rules including, for example, the impacts of the transfer capability of the transmission system.

The result of combining these tools is a planning process that simultaneously addresses the "physics" or electrical properties of the grid and how changes in power system transfer capability interact with a probabilistic resource adequacy assessment. Figure 3 summarizes the RPP analysis process.

Figure 3: Flow Diagram for the RPP Evaluations



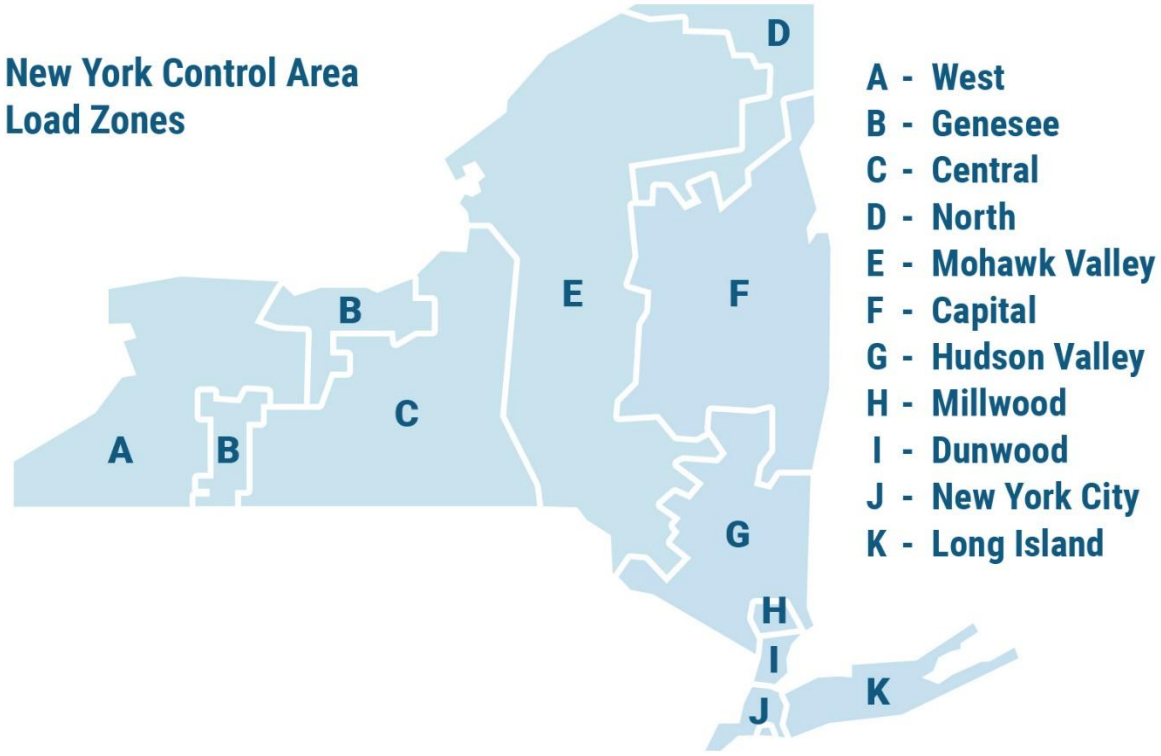
2. Data Inputs

2.1. Data Collection and Coordination

The data and information to be collected encompasses all the load zones within NYCA. This effort is internal to the NYCA and obtains data and information from the Market Participants through existing NYISO communication channels.

The Transmission Planning Advisory Subcommittee (TPAS) has primary responsibility for the reliability analyses, while the Electric System Planning Working Group (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. The NYISO also obtains and shares information regarding the relationship between the natural gas system (interstate pipelines and local distribution company systems) and generators connected to the gas system. Data gathered from NYISO working groups and subcommittees may be relevant to defining base case, sensitivity, and scenario analyses in the RPP. While no formal voting process is established for NYISO working groups, an opportunity for reporting majority and minority views is provided in the absence of a consensus.

Figure 4: NYCA Load Zones



2.2. Transmission Owners and Municipal Electric Utilities

TOs each have their own LTPP. The NYISO will incorporate proposed projects from each TO's Local Transmission Owner Plan (LTP) and each Municipal Electric Utility update to the system representation used for the RPP as appropriate for the NYISO models and the stage of development of the individual projects (see Section 3 for details). By early in the fourth quarter preceding the start of the next RNA, each TO will present its latest LTP. Stakeholders may submit comments on an LTP within 30 calendar days following the TO's presentation of its LTP.

To facilitate the modeling process, the NYISO will solicit TO input regarding plans (at least annually), and may meet or interact with TOs individually or collectively to discuss their input. As a first step to the RPP, and as part of the Reliability Analysis Data Manual process, by quarter four of each year, information from individual TOs will be requested for receipt by early quarter one of each following year for updating the Load and Capacity Data report (Gold Book), the databank base cases, and the FERC 715 base case filing.

Those updates will include information concerning existing and planned additions to the NYS Transmission System for the Study Period, as necessary for the development of the RNA as required by Attachment Y Section 31.2.2.4.1. The TOs will supply that information when requested by the NYISO for both their bulk power system and non-bulk power system facilities.

The TOs will supply data and information regarding their specific plans, including: (i) generation and/or transmission facility additions, retirements, or reconfigurations, for any parts of the system that could have a local reliability need over the Study Period or could lead to a different distribution of zonal resources (e.g., generation bottling or load pockets) that is not identified through the present locational minimum Installed Capacity requirements applicable to the "In City" (Zone J), "Long Island" (Zone K) and the G-J Locality, (ii) any transmission system modifications or upgrades planned for the Study Period that are not included in the most recent Load and Capacity Data Report, (iii) facilities including generation, transmission, and sub-transmission that the TO plans to retire, (iv) any long term firm transmission requests, and (v) network changes that will impact short circuit duties for the next ten years.

2.3. Stakeholder Input

To implement the RPP in an open and transparent manner, the NYISO will consider the input from all the interested stakeholders, including merchant transmission developers, generation plant owners and Developers, and demand response providers. The data and information received via the applicable NYISO process includes:

- Any proposals outside of those identified in the TO LTPs;
- Any other generation additions, upgrades, mothballing or retirements planned during the Study Period;
- Any new contracts or permits or expirations of contracts or permits associated with generation plants during the Study Period;
- Any new contracts or permits or expirations of contracts or permits associated with transmission facilities during the Study Period;
- Any changes in the electrical characteristics of any other facilities, including all transmission facilities, both bulk and non-bulk;
- Any plans that will impact the level of demand response programs for the Study Period.

2.4. Neighboring Control Areas

Geographically, the 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.

The interconnections among these control areas play an important role in maintaining the reliability of the transmission network. The need for proper representation of neighboring systems 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.

Interregional planning is conducted with NYISO's neighboring control areas in the United States and Canada under the Northeastern ISO/RTO Planning Coordination Protocol. The NYISO participates in interregional planning and may consider Interregional Transmission Projects that meet transmission needs identified in its regional planning processes.

The NYISO will conduct and coordinate its planning activities in compliance with NERC, NPCC, and NYSRC standards, criteria, and rules.

3. RNA Base Case and Scenarios Development

3.1. RNA Base Case Development

The RNA Base Case consists of models that are used in the transmission security and resource adequacy assessments. For the transmission security evaluations, the NYISO will use the most recent FERC Form 715 filing and the information from the most recent Gold Book as a starting point for developing the RNA Base Case system models with the application of the inclusion rules described in Section 3.2 and relevant assumptions for system conditions. For the resource adequacy evaluation, the RNA Base Case system models are developed starting with prior resource adequacy models and updated with information from the most recent Gold Book and historical data, with the application of the inclusion rules described in Section 3.2 and relevant assumptions for system conditions.

The NYISO will review proposed plans and projects and other information collected as part of the input phase of the RPP (described in **Section 2** of this Manual) and apply the inclusion rules described in **Section 3.2**. In applying the inclusion rules, the NYISO will exercise its judgment, using Good Utility Practice, to determine whether to include or exclude a resource from the RNA Base Case. The proposed plans and projects that the NYISO determines meet the criteria will be included with their associated details in the system models for the RNA, as applicable.

The NYISO will review the assumptions for the RNA Base Case with the ESPWG and TPAS and consider stakeholder input prior to finalizing the RNA Base Case.

3.2. RNA Base Cases Inclusion Rules

The NYISO will use the inclusion rules set forth in this section to review projects and plans for inclusion in or exclusion from the RNA Base Case or any update to such case.

3.2.1. Proposed Projects

The proposed projects and plans that the NYISO determines meet the criteria below will be included in the applicable study case, together with interconnection facilities (other than System Deliverability Upgrades, which are separately addressed below) identified for the project or plan through a NYISO transmission expansion or interconnection study or reported to the NYISO by a Connecting Transmission Owner or Affected Transmission Owner for a proposed project or plan studied, or being studied, by such Transmission Owner for purposes of interconnection. Projects that meet the criteria in Category A shall be included in the RNA Base Case. Projects that meet the criteria in Category B to the satisfaction of the NYISO may be included in the RNA Base Case.

Generators entering into service for the first time, entering an outage state, or returning to service after an outage will be modeled in accordance with these rules.

In consideration of a project's progress and risks to commercial operation, projects may be modeled using an in-service date other than the date provided in the NYISO interconnection queue. For the purpose of considering whether a firm transmission project on the BPTF listed in a LTP that is not yet under construction is making reasonable progress towards entering service, the NYISO may consider the extent of delays to previously projected in-service dates to inform (i) the in-service date to model or (ii) the inclusion in or exclusion from the RNA Base Case. Further, in considering a firm transmission expansion or upgrade of the non-BPTF listed in an LTP that is not yet under construction but related to or a necessary component of a separately listed firm transmission expansion or upgrade of the BPTF, the NYISO may choose not to include such firm transmission expansion or upgrade of the non-BPTF in the RNA Base Case when the other associated firm transmission expansion or upgrade on the BPTF is not included in the RNA Base Case.

	Project or Plan Type	RNA Base Case Inclusion Rules Inclusion Category A Project or plan shall be included if:	Inclusion Category B Considerations for inclusion of project or plan:
Generation	**Generating Facility** (evaluated under OATT Attachment X or HH)	a) All major project components (plant, fuel supply and delivery, system upgrades) under construction, and b) Cluster Study or Class Year Interconnection Facilities Study complete, and c) Large Generator Interconnection Agreement or Standard Interconnection Agreement (collectively, "Interconnection Agreement" or "IA") executed or accepted by FERC if filed unexecuted, and d) Making reasonable progress against the milestones in the Interconnection Agreement	Any Generating Facility that has either entered a Cluster Study Phase 2 Study or a Class Year Interconnection Facilities Study, or has an executed Interconnection Agreement or, if unexecuted, filed with FERC, may be included if significant progress has been made in regard to one or more of the following factors: a) Construction status of major project components (plant, fuel supply and delivery, system upgrades) b) Project financing / commitment (*e.g.,* status of an executed contract with a credit-worthy entity or equivalent financial security / closing, or of an award of a contract in response to a federal, state or local procurement process) c) Federal, state, and local permits and regulatory approvals for major project components
	Small Generating Facility (evaluated under OATT Attachment Z)	a) Commercial Operation Date before the summer capability period of year 2 of the Study Period, and b) facilities study complete (if applicable), and c) Standard Small Generator Interconnection Agreement executed or accepted by FERC if filed unexecuted (if applicable), and d) Making reasonable progress against the milestones in the Standard Small Generator Interconnection Agreement	N/A

		RNA Base Case Inclusion Rules	
	Project or Plan Type	**Inclusion Category A** Project or plan shall be included if:	**Inclusion Category B** Considerations for inclusion of project or plan:
Transmission	**Cluster Study Transmission Projects** (evaluated under OATT Attachment HH)	a) Cluster Study complete, and b) Interconnection Agreement executed or accepted by FERC if filed unexecuted, and c) Under construction, and d) Making reasonable progress against the milestones in the Interconnection Agreement	Any Cluster Study Transmission Project that has an Article VII or Article VIII application that has been deemed complete (if applicable) and has entered either a Cluster Study Phase 2 Study or has an executed Interconnection Agreement or, if unexecuted, filed with FERC, may be included if significant progress has been made in regard to one or more of the following factors: a) Construction status of major project components (e.g., terminal equipment, conduit, cables, towers, transmission lines) b) Project financing (e.g., executed contract with a credit-worthy entity or equivalent financial security / closing) c) Federal, state, and local permits and regulatory approvals for major project components
	Regulated Transmission Solutions (identified in OATT Attachment Y)	a) Triggered in the RPP, approved in the Economic Planning Process, selected in the PPTPP, or selected in the Short-Term Reliability Process as a permanent transmission solution to a Short-Term Reliability Need, and b) No indication that the regulated transmission solution is not progressing under the applicable post-selection process of Attachments Y or FF to the OATT	N/A
	Transmission Projects (evaluated under OATT Attachment P)	a) Transmission Project *(other than a transmission upgrade or expansion listed in an LTP or NYPA transmission plan, a Cluster Study Transmission Project, Class Year Transmission Project, or a regulated transmission solution)*, as defined in Section 22.3.1.3. of Attachment P of the OATT, that is not eligible for regional cost allocation, and b) Transmission Project Interconnection Agreement accepted by FERC, and c) Under construction, and	Any Transmission Project *(other than a transmission upgrade or expansion identified in an LTP or NYPA transmission plan, a Cluster Study Transmission Project, Class Year Transmission Project, or a regulated transmission solution)*, as defined in Section 22.3.1.3. of Attachment P of the OATT, that has an Article VII or Article VIII application deemed complete (if applicable), and either has completed a Facilities Study or has an executed Transmission Project Interconnection Agreement, or if unexecuted, filed with FERC may be included if significant progress has been made in regard to one or more of the following factors: a) Construction status of major project components (e.g., terminal equipment, conduit, cables, towers, transmission

		RNA Base Case Inclusion Rules	
	Project or Plan Type	**Inclusion Category A** Project or plan shall be included if:	**Inclusion Category B** Considerations for inclusion of project or plan:
		d) Making reasonable progress toward entering service by the projected In-Service Date	lines) b) Project financing (e.g., executed contract with a credit-worthy entity or equivalent financial security, closing, or rate recovery) c) Federal, state, and local permits and regulatory approvals for major project components d) Projected In-Service Date is prior to the summer capability period of year 4 of the Study Period or other reasonable time period based on the nature of the project
	Local Transmission Owner Plans (LTP) for BPTF	a) Transmission upgrade or expansion of the BPTF identified in the latest TO LTP or NYPA transmission plan that is not eligible for regional cost allocation, and b) Under construction, and c) Making reasonable progress toward entering service by the projected In-Service Date	Any transmission upgrade or expansion of the BPTF that is identified as a firm plan in the latest TO LTP or NYPA transmission plan, has a completed SIS (if applicable), and has an Article VII or Article VIII application deemed complete (if applicable) may be included if it is expected to be in service prior to the summer capability period of year 4 of the Study Period or other reasonable time period based on the nature of the project, and is making reasonable progress toward entering service by the projected In-Service Date.
	Local Transmission Owner Plans for non-BPTF	a) Transmission upgrade or expansion of the non-BPTF that is identified as a firm plan in the latest TO LTP or NYPA transmission plan, and b) System Impact Study complete (if applicable)	N/A
	System Deliverability Upgrades (SDUs)	a) Under construction, and b) Making reasonable progress toward entering service by the projected in-service date	Any SDU triggered for construction or not otherwise deferred may be included if the project(s) triggering the SDU for construction has(have) met the RNA Base Case inclusion rules, taking into consideration progress made in regard to: a) Status of engineering and procurement b) Construction status of major components (e.g., terminal equipment, conduit, cables, towers, transmission lines) c) Federal, state, and local permits and approvals for major project components

		RNA Base Case Inclusion Rules	
	Project or Plan Type	**Inclusion Category A** Project or plan shall be included if:	**Inclusion Category B** Considerations for inclusion of project or plan:
Load	**Load Interconnection Projects** (evaluated in NYISO or TO Load interconnection procedures)	N/A	The project is included in the annual zonal energy and peak demand baseline forecasts, or the project has a System Impact Study pending, in-progress, or approved by the Operating Committee taking into consideration the following factors: a) Nature of the load project, including the proposed interconnection facilities and project end-use b) Progress towards going in service, including the status of the project, construction, facilities study, and completion of network upgrades (as applicable) c) Federal, state, and local permits and approvals, including any known local restrictions (e.g., moratoriums), for construction of load projects d) Project financing

3.2.2. Generation Outage States

Generators currently in an outage state or that intend to enter such a state, will be modeled as of the effective date of entering that outage state as indicated in Figure 5.

Figure 5: Modeling of Generators in Outage States

Generator Status	Modeling in RNA
Forced Out	In-service
Inactive Reserve	In-service
ICAP Ineligible Forced Outage	Out-of-service, unless the owner has provided NYISO a positive indication* that the unit will be returning to service other than pursuant to an RMR agreement or RSSA**
Generator Owner submitted a completed Generator Deactivation Notice to the NYISO	Out-of-service starting from the requested deactivation date
Generator Owner filed or submitted to a government entity or otherwise made public, including but not limited to, an executed agreement, compliance plan, operating license, permit, or permit amendment, or other official notice evidencing their intention to deactivate upon an anticipated deactivation date	May be modeled out-of-service starting from the anticipated deactivation date depending on the circumstances
Generator Owner lacks authority to operate in its current equipment configuration past a date certain (*e.g.*, due to a new or amended environmental law or regulation)	May be modeled out-of-service starting from the anticipated date on which the Generator Owner will lack authority to operate depending on the circumstances. Existing Generators seeking authority to continue to operate as part of a filed compliance plan may continue to be modeled in-service as appropriate under the compliance plan; provided however, if the compliance plan relies on new, related resources, the existing Generator may be modeled out-of-service for a period of time until the new, related resources are modeled in-service. Such existing Generators may be modeled in-service at the same time as the new, related resources relied on in the compliance plan are modeled in-service pursuant to Section 3.2.1, depending on the circumstances.
Operating in accordance with an RMR agreement or RSSA	Out-of-service
In a Mothball Outage or mothballed under the pre-May 1, 2015 rules	Out-of-service, unless the owner has provided NYISO or the NYISO has other evidence providing a positive indication* that the unit will be returning to service other than pursuant to an RMR agreement or RSSA**
Retired	Out-of-service

* Positive indications that a unit will be returning to service include, but not limited to, the following:

- Commenced Repair as defined in MST Section 2.3, or indications of repair evidenced by items such as, but not limited to: (i) a repair plan including schedule, (ii) a list of permits required with indications of active status, (iii) invoices for material, or (iv) contracts for construction.
- Indications of restart are evidenced by items such as, but not limited to: (i) visible site activity, (ii) labor arrangements, (iii) fuel supply arrangements, or (iv) unit testing.

** If the NYISO has such positive indication, the unit will be modeled in the year of its return in the Study Period

Generators providing a short-term solution, such as having an RMR agreement, are eligible to offer themselves as market-based solutions in the CRP.

3.2.3 Generation Unavailability

To account for expected generator availability during studied system conditions, the NYISO will account for the following considerations when performing certain analyses. The specific assumptions for all generation types will be reviewed by the ESPWG and TPAS at the beginning of each reliability study.

Thermal Units – For resource adequacy and transmission security margin calculation, the expected unavailability of thermal generation will be reflected through the application of effective forced outage rates that are calculated from an average of historical data. In the STRP, years 1 through 3 will use thermal outage rates that are consistent with the effective outage rates used in market operations. For years 4 through 10 in the RNA and STRP, the NYISO will assess the need for adjustments to thermal derates to appropriately reflect longer-term conditions affecting generator availability, including fleet evolution and aging effects.

Intermittent Resources – Unavailability of intermittent resources will be reflected according to the expected output of each resource type.

- Run-of-River Hydro – Dispatch will be modeled based on historical data.
- Wind generation – Dispatch will be based on projected hourly profiles of wind output values. For transmission security, the percentage output is determined using a representative sample of hours within the appropriate window that represents the season and time of day modeled in each power flow case.
- Utility Scale Solar – Dispatch, or solar factor, will be based on expected availability coincident with the represented system condition.
- Battery Storage – For transmission security, batteries are assumed not charging or discharging unless a potential violation is observed that may be addressed by the characteristics of specific battery storage resources.

Conventional Units with Non-Firm Gas – To account for limited natural gas availability in winter periods, gas will be assumed unavailable to units that do not have firm gas. Information on gas service will be based on annual information provided by the NYCA generation fleet. Units with non-firm gas that rely solely on natural gas will be assumed unavailable in studies and cases that evaluate winter

peak conditions. Combined cycle or dual-fuel units with non-firm gas will be assumed available with their secondary fuel type at such capacity that can be achieved on their secondary fuel type.

Aging Generation Assumptions – The reliability impact of a retiring generator in the first five years of the planning horizon is explicitly evaluated through the generator deactivation procedures incorporated in the quarterly STAR studies. However, this does not fully account for the increased risks that generators may fail or retire as the generation fleet, as a whole, ages. Therefore, the NYISO will consider the unavailability of certain units based on their age and technology type in years 6 through 10 of the study period in the RNA for resource adequacy and transmission security margin calculations. Further details on the methodology for determining the aging generation assumption are included in Attachment H.

3.3. Scenarios

The preparation of a reliability plan for the long-term planning horizon is based on forecasts of future economic, societal, technological, and power market conditions. These forecasts involve a great deal of uncertainty. Thus, developing a "plan" based on only one set of forecasted future system conditions may not meet reliability requirements and limits the ability to adapt to the changing conditions and, in particular, rapidly changing conditions. Taking a scenario approach to planning reduces inevitable uncertainty and provides information to the marketplace, stakeholders, and policymakers. For information purposes in the RNA, the NYISO will use scenarios, such as possible changes in load and resources, to model the BPTF to determine the impact of potential changes in future conditions.

3.3.1. Assumptions for Scenarios

As the first step in the development of scenarios, the NYISO will identify the key assumptions to vary from the RNA Base Case, along with a proposed reasonable range for each assumption. The NYISO will present the identified assumptions and their ranges to the ESPWG for stakeholder feedback. In identifying the key assumptions to vary from the RNA Base Case and their ranges, the NYISO may include, but are not limited to, the following:

1. Major components of demand uncertainty informed by the Gold Book, such as:
    a. Large load development, including addition or status changes of planned large loads
    b. Load forecast uncertainty
    c. Components of higher and lower demand forecast by considering:
        i. Electric vehicles and electrification, and/or

ii. Behind-the-meter resources and energy efficiency

d. Demand response programs

2. New Resources

a. Potential delays or unavailability of planned projects (i.e., projects that the NYISO determined to satisfy the inclusion rules and included in the case)

b. Additional projects that meet one or more, but not all, of the inclusion rules set forth in Section 3.2.1 of this Manual

3. Resource Performance and Retirements

a. Higher or lower risk projections of the generator availability assumptions

b. Fuel prices and availability

4. Network Topology

a. Potential delays to transmission projects (i.e., projects that the NYISO determined to satisfy the inclusion rules and included in the case)

b. Inclusion of "non-firm" LTPs and other local planning assumptions

5. Imports and Exports

a. Varying levels of reliance on neighboring systems at risk conditions

b. Availability of emergency assistance

6. Emergency Operating Procedures

a. Varying assumptions related to reliance on emergency operating procedures, such as Special Case Resources, Demand Response Programs, and emergency assistance

7. Policy Implications

a. Additional retirements to meet federal, state, or local law, regulations, or policies

b. Achievement of a Public Policy Transmission Need currently under evaluation

3.3.2. Creation of Scenarios

Potential scenarios will be created by varying one or more assumptions from the RNA Base Case. Each scenario will be constructed with consideration of its alignment with system trends, such as:

1. Trends in performance and availability of resources

a. Operational trends in resource availability

i. Performance trends in historical operating conditions

ii. Historical correlation of resource availability among technology types

b. Operational trends in reactive power and voltage performance

i. Performance trends in historical operating conditions

ii. Historical occurrence of high and low voltage issues

c. Market trends in capacity availability

2. Trends in resource retirements and new resources

a. Market trends in resource development and timelines

b. Information from other planning reports and processes regarding the future siting of new resources

c. Information from other reports and processes regarding potential resource retirement

3. Trends in demand forecast

a. Operational trends in historical demand growth or reduction over time and in various conditions

b. Operational trends regarding demand coincidence

c. Operational trends in special case resource responsiveness

4. Trends in future imports/exports

a. Operational trends that inform expected import/export flows

b. Market trends that indicate uncertainty, such as expiring contracts, or energy price trends that may drive inter-regional flows

c. Inter-regional planning reports such as those produced by NERC and NPCC, which may inform future inter-regional flow patterns

5. Policy goals, statues and regulations, and local planning processes

a. Potential impact of a policy, statute, or regulation on the direction of other assumptions.

b. Information from other planning reports and processes regarding the impact of a particular policy

3.3.4 Selection of Scenarios for Analysis

The NYISO will present its proposed list of potential scenarios that were developed pursuant to Sections 3.3.1, 3.3.2, and 3.3.3 of this Manual to the ESPWG for stakeholder feedback The NYISO will consider any feedback from stakeholders on the proposed list and will post a list of scenarios that the NYISO will assess in the RNA for information purposes. These scenarios are intended to represent a range of plausible system outcomes that cannot be fully captured in the RNA Base Case.

Similar to the RNA Base Case, the NYISO will develop study cases for the chosen scenarios that model

the assumptions that vary from the RNA Base Case assumptions. For each scenario, case creation and analysis will be limited to system conditions where that scenario provides useful information about reliability risks. Such analysis is intended to highlight potential future developments that may lead to new or heightened risks, as well as those that may lessen the risks identified in the RNA Base Case.

In addition to the scenarios described above, the NYISO may also propose and perform analyses on other informational scenarios. Such other informational scenarios are intended to test the robustness of the NYISO's analysis and provide directional guidance to future planning assessments and may consider more extreme assumptions such as extreme weather, "copper sheet," or loss of all imports.

3.4. Sensitivities

The NYISO will evaluate the reliability of the system using the RNA Base Cases. Because the system may be reliably operated in different ways consistent with reliability criteria, the NYISO will develop and utilize multiple base cases where appropriate.

Further details are contained in Section 4.6 of this Manual.

4. Reliability Needs Assessment Approach

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 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, 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.

4.1. Reliability Organizations

Reliability standards and 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 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 Board of Trustees governs NERC with input from a Member Representatives Committee. NERC has formulated Planning and Operating Standards. Pursuant to the Energy Policy Act of 2005, the FERC 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.

NERC and six Regional Entities currently comprise the Electric Reliability Organization Enterprise. Members come from all segments of the industry. The Regional Entity in the northeastern United States is the NPCC. New York State is an Area within the NPCC, which also encompasses New England and Eastern Canada. NPCC implements broad-based, industry-wide reliability standards tailored to its region. NERC and NPCC have received FERC's approval of a delegation agreement by which NPCC will oversee and enforce compliance with NERC and NPCC standards in the NPCC regions of the United States and Canada.

New York State also has its own electric reliability organization, which is the 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 NYPSC formally adopts the NYSRC Rules as regulations enforceable by the State. The NYISO and all organizations engaging in electric transactions on the state's power system

must comply with these rules. Thirteen members, including representatives from different segments of the electric power industry, govern the NYSRC.

The reliability criteria and assessment methodology used for the RNA must comply 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.

4.2. 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. NERC has two major types of such documents: Planning Standards and Operating Standards.

NERC's 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 the system must be 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 a 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. The key NPCC document (for purposes of this Manual) is Directory #1, "Design and Operation of the Bulk Power System," which establishes the principles of interconnection planning and operations.

The NYSRC Reliability Rules[3] 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 Minimum Installed Capacity Requirements (LCR) of LSEs in New York City, Long Island, and the Zones G-J Locality.

4.3. Applicable Reliability Criteria

As noted earlier, a probabilistic approach is used for resource adequacy analyses and a deterministic approach is used for transmission security analyses. A system is adequate if the probability of not having sufficient resources (e.g., generation, transmission, demand response, neighboring systems interchanges, and operating procedures) 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 criteria violations that may lead to the unplanned loss of load on the bulk power system.

4.3.1. Resource Adequacy Reliability Criteria

Resource adequacy is measured using a probability-based index such as LOLE, which is the most common metric used in the industry. It is defined as the expected number of event-days in a year in which the daily peak load may exceed the available resources. According to NPCC Directory 1 and NYSRC Reliability Rules criteria,[4] the New York bulk power system must be planned to meet an annual NYCA LOLE metric of not more than one forced disconnection on the bulk power system in every ten years (expressed mathematically as 0.1 event-days per year) or less.

[3] https://www.nysrc.org/documents/nysrc-reliability-rules-compliance-monitoring/
[4] https://www.npcc.org; NYSRC Reliability Rules & Compliance Monitoring – NYSRC

4.3.2. Transmission System Security Criteria

The criteria for transmission security determination are based on a deterministic approach, which must meet the reliability requirements defined by NERC, NPCC, and NYSRC.[5] 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 (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 can provide insight for planning purposes, but it is not required that the system be designed to withstand an extreme contingency event.

The applicable design criteria can be found in the NYSRC Reliability Rules, the NPCC Directory 1, and the NERC TPL-001 and other relevant standards.

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.

4.4. Methodology for Transmission Security Assessment

The transmission security assessment performs necessary steady state and dynamic simulations for normal system conditions and contingencies. In addition, fault duty level calculations are performed to determine the impact of faults.

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

1. Determine whether there are Reliability Needs based on transmission security criteria, and
2. Evaluate transfer limits for the interfaces included in the resource adequacy model.

The major types of analyses are:

- Thermal contingency analysis
- Voltage contingency analysis
- Voltage collapse/voltage stability analysis
- Transient stability analysis

[5] See Section 1 of this Manual for a definition of these requirements.

- Short circuit analysis
- Transmission security margin analysis

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

- Inter-Regional Reliability Assessments
- NERC Planning Assessments
- NPCC Area Transmission Reviews
- NYISO/Neighboring Areas Inter-Area Studies
- NYISO Seasonal Operating Assessments, Short-Term Operating Studies
- NYISO interconnection studies

The transmission security analysis includes various combinations of credible system conditions intended to stress the system.[6] As transmission security analysis is deterministic, these various credible combinations of system conditions are evaluated throughout the study period to determine whether there are Reliability Needs. The conditions that may be reflected in transmission security analysis include, but are not limited to, generator availability.

Details on specific types of analyses are provided below.

Transmission Security Margin

Transmission security analysis will be conducted to calculate transmission security limits of any constrained area of the BPTF. The transmission security limits combined with forecasted demand and available resources will provide the transmission security margin for the constrained area for the modeled system conditions.

The purpose of the transmission security margin assessment is to identify credible system conditions that may result in a BPTF Reliability Need. This assessment is performed using a deterministic approach through spreadsheet-based methods. A BPTF Reliability Need is identified when the transmission security margin for a constrained area of the system is less than zero.

Transfer Analysis

The basic voltage transfer analysis methodology will be conducted using the power-voltage (P-V) curve approach as described in the NYISO Transmission Planning Guideline #2-1.

[6] NYSRC Reliability Rule B.1 R1.1 states, "Credible combinations of system conditions which stress the system shall be modeled, including load forecast, internal NYCA and inter-Area and transfers, transmission configuration, active and reactive resources, generation availability, and other dispatch scenarios."

Stability transfer analysis will consider angular stability, voltage recovery, and the damping of system oscillations as described in NYISO Transmission Planning Guideline #3-1.

Short Circuit Analysis

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. The methodology for the short circuit calculations is documented in the NYISO Transmission Expansion Interconnection Manual.

The NYISO will calculate the maximum short-circuit level at all substations for the horizon year 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 will be identified for further assessment. The NYISO will repeat these calculations to determine in which year the fault levels will be exceeded. The intervening year calculations will be undertaken only for the specific fault locations and substations where the excessive fault levels were identified. Individual breaker assessments may be required to refine the results of the fault current assessment and determine if a specific circuit breaker is over-dutied, and by how much.

If the calculated short-circuit values are within the lowest rating of the existing breakers, then there is no necessity to perform these calculations for the intervening years.

Reliability Needs and Case Creation

Attachment Y of the OATT describes the process that the NYISO, the TOs, and Market Participants shall follow for planning to meet the Reliability Needs of the BPTF and contains the definitions for Reliability Criteria and Reliability Need. If the NYISO observes an overload on the non-BPTF that could cascade onto the BPTF due to a violation of applicable reliability criteria for the non-BPTF (*e.g.*, NERC criteria or Transmission Owner planning criteria), the Transmission Owner of the non-BPTF facility has the obligation to address the non-BPTF violation with a Corrective Action Plan, which would be documented in their LTP.

If the voltage is significantly below criteria such that thermal violations cannot be satisfactorily ascertained (*e.g.,* the power flow case does not reach a solution), certain generic facilities (such as reactive support) may be added in order to facilitate the evaluation of the thermal loading on the system. Additionally, if the system as modeled for transmission security analysis lacks enough MW reserve to allow for redispatch of generation to avoid potential thermal overloads, generic generator facilities may be added or generic load reduction may be modeled in order to facilitate the evaluation of the system.

4.5. Methodology for Resource Adequacy Assessment

Resource adequacy calculates the NYCA annual LOLE for the specified bulk power system conditions and compares it against the 0.1 event-days/year criterion threshold. The NYISO uses a Monte Carlo simulation to compute the reliability of the NYCA system, which is comprised of any number of interconnected zones, including the impacts of the transfer capability of the transmission system.

The initial study case system is developed by modeling the existing system, including expected generation and transmission system additions and upgrades, in accordance with Section 3 of this Manual. A starting point for the assumption matrix and modeling is the matrix and modeling from the most recent reliability study conducted under the RPP. The NYISO will adjust the assumptions to conform to the rules and procedures for conducting the RNA. Information on modeling of neighboring systems is based on the input received from the NPCC CP-8 working group.

Given that the transmission topology[7] utilized in the resource adequacy 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 the model. These assumptions include 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 are impacted by other assumptions made in the 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 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 the transmission and resource adequacy evaluation, as applicable:

- Annual NYCA LOLEs are determined with the base case transfer limits representing the most limiting value for thermal, voltage, or stability. This step is the initial base case assessment.
- Annual NYCA LOLEs are determined without considering any transmission transfer limitations within the NYCA system (free flow case). This will differentiate whether any LOLE violations identified in step 1 are purely resource related or if they are caused by limitations in the transmission system. The LOLEs are compared to those in step 1, and if any violations

[7] Each transmission topology can be found in each of the RPP reports, posted on the NYISO web site.

identified in step 1 no longer exist, the problem is identified as a transmission adequacy deficiency.

- LOLEs for the entire NYCA and its individual Load Zones are determined with thermal transfer limits only for the internal NYCA system. The LOLEs are compared to those in step 1 to determine whether any voltage limited interfaces are contributing to any violations.

The resource adequacy calculations are performed with the voltage limits removed to determine whether a deficiency in available reactive resources is affecting the annual NYCA LOLEs. If the voltage limits are found to be contributing to any of the LOLEs, analysis will be performed to determine the amount of real or reactive power resources that would be required to return the interface limit to the thermal limit, if reasonably possible.

Further details and expansion of this analysis for the development of the compensatory megawatts appear in Section 4.8.

4.6. Evaluate Operational Modes

In accordance with Section 31.2.2.6 of the OATT, 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 re-dispatch, split bus operation, temporary connection or disconnection of certain facilities, remedial action schemes, and short time operational responses.

4.7. Determination of the Reliability Needs

Reliability Needs are identified if any Reliability Criteria are not met in the in the RNA Base Case.

Throughout the RNA, the NYISO may consider including system updates that arise after the RNA Base Case is developed if those changes meet the inclusion rules in Section 3.2 of this Manual and if those changes could materially impact the Reliability Needs determination. Such system updates may include:

- Updated LTPs
- Changes in BPTF

- Change in resources, such as generating unit status or authority to operate in current equipment configuration past a date certain (e.g., due to a new or amended environmental law or regulation)
- Change in load forecast or demand response resources

If the NYISO determines that the Reliability Needs could be impacted by the system changes, the NYISO will re-assess the Reliability Needs as appropriate and as time permits.

4.8. Compensatory Megawatts

After the Reliability Needs are initially identified as deficiencies in LOLE or other applicable reliability criteria, the NYISO will translate those deficiencies into MW (or MVArs for reactive power deficiencies) of resources that could satisfy the needs. These resources have locational dependency and are referred to as compensatory MWs or MVArs.

The Reliability Needs determined by the NYISO may be met through various combinations of resources located in different NYCA load Zones, and the NYISO may provide examples of alternative amounts and locations of compensatory megawatts to meet the identified 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 calculations of compensatory megawatts are not meant to reflect specific facilities or types of resources that may be offered as solutions to Reliability Needs. Accordingly, compensatory megawatts may reflect generating capacity, demand management or transmission additions that may be offered as market-based, regulated backstop or alternative regulated projects to meet Reliability Needs. Reactive power (MVAr) could be static or dynamic as needed. For this analysis, the amount and effective location of the compensatory megawatts is determined by testing combinations of generic blocks of generation on the system-wide LOLE or other criteria violations.

4.9. Responsible Transmission Owners

When the RNA identifies a Reliability Need, the NYISO designates one or more Responsible TOs to prepare a proposal for a regulated backstop solution to a Reliability Need and may be directed to proceed with the regulated solution. The Responsible TO will normally be the TO in whose transmission district the NYISO identifies a Reliability Need. Accordingly, the TOs in whose transmission districts the need for compensatory megawatts has been identified are normally the TOs that will be designated by the NYISO as the Responsible TOs for purposes of identifying regulated backstop solutions. When designating the Responsible TO, the NYISO may consider which TO owns the transmission facilities that are in violation of applicable reliability criteria and/or the TO that owns the facilities, the outage of which, creates the

reliability violations. For situations in which statewide Reliability Needs are identified, all NYCA TOs other than the New York Power Authority (NYPA) will be designated as Responsible TOs. Ordinarily, NYPA will not be designated as a Responsible TO because it does not have an obligation to serve native load in a service territory. The NYISO will request that NYPA work with the other TOs on the development of regulated backstop solutions on a voluntary basis. Attachment Y provides that the Responsible TOs will develop a regulated backstop solution or combination of solutions to timely address Reliability Needs identified in the RNA.

4.10. Preparation of RNA Draft Report

Upon completion of all the analyses for the RNA, the NYISO Staff will prepare a draft report in accordance with Section 31.2.2.8 of the OATT. The draft report may consist of a main report, supporting document(s) and appendices containing more detailed information. All of these documents in combination constitute the RNA.

4.11. Review and Approval of RNA Draft Report

The requirements for Market Participants' review of the RNA draft report are set forth in Section 31.2.3.1 of the OATT. The requirements for the NYISO Board of Directors' review and action on the RNA draft report are set forth in Section 31.2.3.2 of the OATT.

5. CRP: Development of Solutions to Reliability Needs

5.1. Base Case Updates before Solicitation for Solutions

After the NYISO Board of Directors approves the RNA Report and before NYISO issues a solicitation for regulated backstop, market-based, and alternative regulated solutions, the NYISO will request updated LTPs, NYPA transmission plans, and other status updates relevant to reducing, or eliminating, the Reliability Needs, as timely received from Market Participants, Developers, TOs, and other parties. Any such update must meet, in NYISO's determination, the RNA Base Case inclusion rules, as defined in Section 3 of this Manual. The Responsible TOs and NYPA will report at ESPWG and TPAS those updates in their LTPs that meet the inclusion rules in Section 3 of this Manual and that could reduce or eliminate the Reliability Needs. Additionally, the NYISO will present at the ESPWG and TPAS any other RNA Base Case updates received that meet the inclusion rules in Section 3 of this Manual, and that could mitigate the identified Reliability Needs, along with its determination with respect to all the applicable updates. The NYISO will then request solutions for the remaining Reliability Needs, if any. Developers should use this information in responding to the Reliability Needs.

If the RNA-identified Reliability Needs are removed by these updates, a solicitation for solutions is no longer needed. In this case, the CRP will update the RNA results; incorporate any solutions from the STRP, as available; and any identified risks to plan to maintain reliability over the ten-year planning horizon.

5.2. CRP Base Case and the CRP Assessments

If there are still remaining Reliability Needs after the post-RNA updates, then the NYISO will solicit solutions to address the needs.

For purposes of modeling the CRP base case, the NYISO may request, and Market Participants, Developers, and other parties will provide, applicable information as set forth in Section 31.2.2.4.1 of the OATT. The NYISO will incorporate information in accordance with the inclusion rules specified in Sections 3 of this Manual.

The NYISO will evaluate all of the submitted solutions to determine their viability and sufficiency to meet the identified Reliability Needs. Proposed solutions may take the form of new, upgraded or returning generation, new or upgraded transmission projects, demand-side management or energy efficiency programs, operating procedure changes, or any combination of these solution types.

The initial assessment of proposed solutions will address their viability and sufficiency as described in Section 5.7 of this Manual. Following the initial assessment and if the NYISO determines that the Trigger

Date of any proposed regulated solution that was found to be viable and sufficient will occur within thirty-six months of the date that the NYISO presented the Viability and Sufficiency Assessment to the ESPWG, the NYISO will perform the evaluation and selection of the more efficient or cost-effective regulated transmission solution as described in Section 6 of this Manual.

5.3. Developer Qualifications

Entities wishing to be eligible to propose a regulated transmission solution to an identified Reliability Need and to be eligible to use the cost allocation and cost recovery mechanism for regulated transmission projects, shall submit their qualifications to the NYISO as required in Section 31.2.4.1 of Attachment Y and as set forth in the Developer Qualification Form in Attachment A of this Manual.

5.4. Request for Regulated Backstop Solutions

The NYISO will undertake three steps to begin the development of regulated backstop solutions:

1. The NYISO will designate the Responsible TO or TOs to propose a regulated backstop 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 may be called upon by the NYISO to fulfill Reliability Needs in case a sufficient, viable and timely market-based solution(s) is not forthcoming.

2. The appropriate and relevant system models and base cases will be provided to the Responsible TO(s) subject to the NYISO rules for confidentiality and other stipulations.

3. The necessary lead-time for each of the proposed regulated backstop solutions must be established. 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, regulated backstop solutions submitted by the Responsible TO(s) must provide the necessary lead-time for each of the solutions because it is a key factor for the NYISO's evaluation of their feasibility.

Proposals for regulated backstop solutions must contain the information required in Section 31.2.4.4 of Attachment Y. The form for the initial submission for a proposed solution is provided in Attachment B of this Manual. The form for a Qualified Developer's submission of information for the NYISO's evaluation and

selection of the more efficient or cost-effective regulated transmission solution is provided in Attachment C of this Manual.

5.5. Request for Market-Based Solutions

Market-based solutions are 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 Installed Capacity markets, Ancillary Services sales, and bilateral contracting arrangements.

Proposals for market-based solutions must contain the information required in Section 31.2.4.6 of Attachment Y. The form for such submissions is provided in Attachment B of this Manual.

Subject to the execution of appropriately drawn confidentiality agreements and the Federal Energy Regulatory Commission's standards of conduct, the NYISO and the appropriate TO shall provide access to the data that is necessary to develop proposed solutions.

5.6. Request for Alternative Regulated Solutions

Alternative regulated solutions may consist of transmission, generation or demand-side projects. The NYISO will also solicit proposal(s) for alternative regulated solutions. Other Developers and TOs, at their option, may propose alternative regulated solutions to address a Reliability Need and submit such proposals to the NYISO. Other Developers and TOs may submit such proposals to the NYDPS for review at any time.

Proposals for alternative regulated solutions must contain the information required in Section 31.2.4.8 of the OATT. The form for the initial submission is provided in Attachment B of this Manual, and the form for the submission of information for the NYISO's evaluation and selection of the more efficient or cost-effective regulated transmission solution is provided in Attachment C of this Manual.

5.7. Initial Assessment of Proposed Solutions

In each planning cycle, Developers will have 60 days from the date the NYISO solicits solutions to deliver such solutions to the NYISO. Incomplete proposals will be returned to the Developer for completion and must be returned within 15 days.

The NYISO will conduct three initial assessments to determine whether the submitted proposals, including market-based solutions and alternative regulated solutions, are: (1) complete, (2) viable and (3) sufficient to satisfy the Reliability Need(s) throughout the Study Period by the need date(s). The NYISO will

identify any reliability deficiencies in each of the proposals and will discuss any identified deficiencies with the Developer. The Developer must resolve any reliability deficiency in their proposal within 30 days of being notified by the NYISO.

The NYISO, after determining the completeness of each proposed solution, will evaluate each complete proposed solution independently to confirm whether the solution proposed by the Developer is viable and sufficient as defined in Sections 31.2.5.3 and 31.2.5.4 of Attachment Y of the OATT. Proposals not deemed viable and sufficient will be rejected from further consideration during that planning cycle. These individual assessments will be performed in parallel for all proposed solutions. The NYISO will report in the CRP whether each proposed solution is viable and is sufficient to satisfy the identified Reliability Need by the need date, and the Trigger Dates for the proposed regulated solutions as required by Section 31.2.5.7 of Attachment Y of the OATT.

6. Evaluation and Selection of More Efficient or Cost-Effective Solutions

The purpose of this phase in the development of the CRP is for the NYISO to evaluate and select among the viable and sufficient regulated transmission solutions as provided by Attachment Y of the OATT. These solutions will have been previously determined to be viable and sufficient to meet the identified Reliability Needs throughout the Study Period and would then be eligible for selection for purposes of cost allocation and recovery under the NYISO tariffs.

If the NYISO determines, pursuant to Section 31.2.6.1 of the OATT, that the Trigger Date for any regulated backstop solution or alternative regulated solution, which has been found to be viable and sufficient within the current planning cycle, would be within 36 months of the NYISO's presentation of the viability and sufficiency assessment to the ESPWG, the NYISO will commence the process for the evaluation and selection of the more efficient or cost-effective transmission solution.

If the NYISO, however, determines that no regulated backstop solution or alternative regulated solution, which has been found to be viable and sufficient in the current planning cycle, would have a Trigger Date within 36 months of the NYISO's presentation of the viability and sufficiency assessment to the ESPWG, the NYISO will not perform an evaluation and selection of the more efficient or cost effective transmission solution in the current planning cycle and move to the preparation of the CRP.

6.1. Evaluation and Selection of the Regulated Transmission Solution

Before the NYISO commences the evaluation of proposed regulated transmission solutions that have been determined to be viable and sufficient, the Developer shall enter into a Study Agreement with the NYISO. The pro forma Study Agreement is presented in Attachment F to this Manual.

The NYISO evaluates eligible transmission solutions using the metrics set forth in Attachment Y based on the project information provided by the Developer and all other information available to the NYISO. The NYISO may engage an independent consultant to assist in the review of the reasonableness and utilization of the information submitted by a Developer. Requirements for a Developer's submission of project information are set forth in Attachment C to this Manual which contains, as attachments, standard forms for the submission of information by the Developer.

In determining which of the eligible proposed regulated transmission solutions is the more efficient or cost-effective solution to satisfy the Reliability Need, the NYISO will consider and rank each proposed solution based on the quality of its satisfaction of the metrics. The metrics are set forth in Section 31.2.6.5.1 of the OATT and include: capital costs, cost per MW ratio, expandability, operability and performance of the solution, availability of property rights, and schedule for project completion. The NYISO may also rely on

the independent consultant's analysis in evaluating the proposed project using some or all of the metrics. The NYISO will consult with the NYDPS (Section 31.2.7) regarding the basis of the NYISO's selection and seek input from NYDPS for inclusion in the draft CRP.

The metrics as set forth in Section 31.2.6.5.1 of the OATT will be evaluated as prescribed in that section and as further described below:

Capital costs for a proposed transmission solution will be evaluated for accuracy and reasonableness and will be performed on a comparative basis with other proposed transmission solutions. The Developer must submit detailed and credible estimates for the capital costs associated with the engineering, procurement, permitting, and construction of a proposed transmission solution as specified in Attachment C of this Manual. The total capital cost estimate must be accompanied by a cost certainty range surrounding the estimate to account for anticipated contingencies.

The metric "Cost per MW" is calculated by dividing the present worth of the total capital cost by the MW value. The present worth is calculated by using a discount rate which is the current weighted average cost of capital for the NYTOs as determined in the most recent Economic Planning Process study. The MW value is determined by adding the minimum compensatory megawatts associated with the Reliability Need in the horizon year, which are provided by the proposed solution, to any additional beneficial MW (on that same binding interface associated with the Reliability Need) that the proposed project offers. Additional beneficial MW cannot exceed the amount of MW which would bring the NYCA to its free-flow LOLE.

In assessing the expandability of the proposed project, the NYISO may consider the ease of physically expanding a facility, which can include consideration of future opportunities to economically expand a facility, and the facilitation of future transmission siting. Such consideration may include future modifications to increase equipment ratings of the proposed facilities, staging or phasing of future transmission development, or otherwise benefiting from the proposed facilities for future reliability or congestion relief purposes.

The assessment of the relative operability and performance of the solution may consider any improved or diminished operability and performance even if only a qualitative or relative impact can be attributed to these factors. The NYISO will consider and evaluate any claims of operability and performance impacts made by the Developer, as well as considering any potential impacts raised by NYISO operations, planning, or other personnel. Because a proposed project might provide beneficial MW on more than one constrained interface, the NYISO may also calculate the Cost per MW for any substantive benefits and combine the value of the benefits. This value can be used, as appropriate, for quantitative or qualitative comparisons among competing projects.

In assessing the availability of property rights the NYISO may seek the use of consultants, the knowledge of the NYDPS, other government agencies and departments, and any information provided by the TO(s) in the applicable Transmission District(s).

The schedules for project completion are first evaluated as part of the initial viability assessment and then again using the additional engineering and design information provided in the subsequent evaluation and selection process as required in Section 31.2.6.5.1.7 of Attachment Y to the OATT. The scheduling metric will ensure that each proposed solution remains viable to satisfy the Reliability Need by the need date.

6.2. Identification of Reliability Transmission Upgrades and Designated Entities

In 2025, the NYISO added a mechanism to the RPP that implements a right of Transmission Owners in New York to build, own, and recover the costs of upgrades to their existing transmission facilities identified in the CRP. As an initial step and prior to the presentation of the draft CRP to stakeholders, the NYISO will (i) prepare a list that contains all of the facilities (but not including any potential interconnection facilities identified by the Developer in its project information) of the proposed regulated backstop transmission solutions and alternative regulated transmission solutions, which has been found to be viable and sufficient in the current planning cycle, and (ii) classify each facility as either a "new" transmission facility or a "Reliability Transmission Upgrade," as defined in Attachment Y of the OATT. The list will also specify the Transmission Owner that owns the existing transmission facility that is proposed to be upgraded by an identified Reliability Transmission Upgrade, to the extent such information is available.

At the same time that it posts the list of the transmission facilities comprising the regulated backstop transmission solutions and alternative regulated transmission solutions, the NYISO will also post on its website a separate list of interconnection facilities identified in the Developer's project information. The list of interconnection facilities is for *informational purposes*, and the NYISO will not classify such facilities are either new transmission facilities or Reliability Transmission Upgrades. Additionally, the NYISO will not change a Developer's identification of an interconnection-related facility submitted in its proposed solution to a transmission facility that is a part of the project and, therefore, eligible for classification as a new transmission facility or Reliability Transmission Upgrade.

Within 20 calendar days of the NYISO's posting of the list classifying the facilities of the proposed regulated transmission solutions, any interested party may dispute the NYISO's classification of a part of a proposed solution as either a new transmission facility or Reliability Transmission Upgrade by providing the NYISO written notice detailing the dispute classification. Any notices received by the NYISO will be

posted on the NYISO's website. The NYISO and the disputing party will attempt to resolve the dispute through the existing dispute resolution procedures in Attachment Y.

The NYISO will post a final list with the classification of the proposed facilities on or before the NYISO's presentation of the draft CRP to the NYISO's Operating Committee.

6.3. Determination Regarding Triggering and Halting a Regulated Solution

The NYISO will direct Responsible TOs or the selected Developer to proceed with their regulated solutions to satisfy a Reliability Need – i.e., to "trigger" the projects – following the completion of the NYISO's evaluation and selection process pursuant to the requirements set forth in Section 31.2.8.1 of Attachment Y of the NYISO OATT. Specifically, the NYISO will not trigger a regulated solution if it determines that there are sufficient market-based solutions to satisfy the identified Reliability Need. However, if the NYISO determines that: (i) there are not sufficient market-based solutions to satisfy the Reliability Need and (ii) the Trigger Date for a regulated solution – either the regulated backstop solution or an alternative regulated transmission solution selected by the NYISO in the CRP as the more efficient or cost-effective transmission solution – will occur within thirty-six months of the NYISO's presenting the results of its review of the viability and sufficiency of proposed solutions, the NYISO will trigger the regulated backstop solution and/or the selected alternative regulated transmission solution pursuant to the provisions of Section 31.2.8.1 of Attachment Y of the NYISO OATT.

The NYISO will inform the appropriate Responsible TO and/or Developer of the triggered regulated solution(s) that it should submit its proposed solution to the appropriate governmental agencies and authorities to begin the necessary approval process to site, construct, and operate the solution, and the relevant Developer should make such submission. If the NYISO triggers an alternative regulated transmission solution to satisfy the Reliability Need, the appropriate Other Developer or Transmission Owner must satisfy the requirements set forth in Section 31.2.8.1.6 of Attachment Y of the NYISO OATT to ensure that it will develop and construct its project to meet the Reliability Need, including entering into a development agreement with the NYISO and providing its project milestones.

If the NYISO triggers a regulated solution to ensure the Reliability Need is met, the NYISO may later halt the development of this project pursuant to the requirements set forth in Section 31.2.8.2 of Attachment Y of the NYISO OATT.

6.4. Determination of Need for Gap Solution

If the NYISO determines that neither market-based proposals nor regulated proposals can satisfy the Reliability Need(s) identified in the RNA in a timely manner, the NYISO will set forth its determination that

a Gap Solution is necessary in the CRP. As appropriate, the NYISO will follow the Gap Solution process set forth in Section 31.2.11 of Attachment Y to address the need for a Gap Solution in the CRP or between cycles of the biennial Reliability Planning Process.

6.5. Preparation of Draft Comprehensive Reliability Plan

The NYISO will prepare a draft CRP, which includes input from various stakeholders and 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 CRP offers valuable information to the state's wholesale electricity marketplace.

Technical evaluation and comparison of various solutions offered from the market-based, regulated backstop, and alternative regulated solutions are the essential part of the draft CRP. The results, analyses and conclusions from the evaluation of all the solutions for the study period will be documented in the CRP. When required according to Section 31.2.7 of the OATT, the CRP will also present the more efficient or cost-effective regulated transmission solution. The CRP will include (1) the final list that classifies the facilities of regulated transmission solutions considered by the NYISO to address a Reliability Need as new transmission facilities and Reliability Transmission Upgrades prepared as detailed in Section 6.4 of this Manual and (2) a list of Designated Reliability Transmission Projects and the identified Designated Entities for the selected regulated transmission solution and regulated backstop transmission solution (if different). If there is both a selected regulated transmission solution and a viable and sufficient regulated transmission backstop solution, the CRP will identify Designated Reliability Transmission Projects and Designated Entities for each solution, as one or both projects could be triggered in accordance with the provisions of Section 31.2.8 of the OATT.

For the regulated transmission solution recommended for selection and for the viable and sufficient regulated backstop transmission solution (if different), the NYISO will designate the entity that proposed the regulated transmission solution as the Designated Entity for the new transmission facilities of the selected project, which facilities will be included in a single Designated Reliability Transmission Project. The NYISO will also designate the applicable TO as the Designated Entity for those facilities of such regulated transmission solution that meet the definition of a Reliability Transmission Upgrade and that upgrade the NYTO's existing transmission facilities. These will be included in a separate Designated Reliability Transmission Project for each affected TO. The NYISO will also group components of a regulated transmission solution into Designated Reliability Transmission Projects based on the Designated Entity, as

applicable.[8] For example, if a regulated transmission solution does not contain any Reliability Transmission Upgrades, then there would only be one Designated Reliability Transmission Project and the Developer that sponsored the solution would be the Designated Entity. If a Developer proposes a regulated transmission solution that contains a new transmission facility and a Reliability Transmission Upgrade for which it is not the owner of the existing transmission facility to be upgraded, then there would be two Designated Reliability Transmission Projects—one made up of the new transmission facility and the other being the Reliability Transmission Upgrade. However, if an incumbent transmission Developer (i.e., an New York TO that proposes modifications to its existing transmission facilities) proposes, as a regulated transmission solution, both new transmission facilities and upgrades only to its own existing transmission facilities, then the NYISO will group all of the facilities into a single Designated Reliability Transmission Project for which the New York TO is initially identified as the Designated Entity.

The CRP will also identify the required in-service date for a selected regulated transmission solution and regulated backstop transmission solution (if different). The required in-service date will generally be tied to the start of the Reliability Need identified in the RNA, including any adjusts as a result of relevant changes to the system. Such in-service date will apply to all of the Designated Reliability Transmission Projects that make up the selected regulated transmission solution and the viable and sufficient regulated backstop transmission solution (if different). The CRP may also include specific dates by which one or more of the Designated Reliability Transmission Projects (or components of a Designated Reliability Transmission Project) must be in service for the regulated transmission solution to meet the overall in-service date. The relevant in-service date(s) will be memorialized in the Development Agreement for each Designated Reliability Transmission Project.

6.6. CRP Review and Approval Process

The requirements for Market Participants' review of the CRP draft report are set forth in Section 31.2.7.1 of Attachment Y of the OATT. The requirements for the NYISO Board of Directors' review and action on the CRP draft report are set forth in Section 31.2.7.2 of Attachment Y of the OATT.

[8] Since the CRP can identify a viable and sufficient regulated transmission backstop solution and select an alternative regulated transmission solution, there might be a situation where a TO is a Designated Entity for Designated Reliability Transmission Projects for both solutions. In such case, the NYISO will not combine elements of both projects into a single Designated Reliability Transmission Project but rather identify more than one Designated Reliability Transmission Project that is specific to each solution.

6.7. Finalizing Designated Entities for a Regulated Transmission Solution

The right of TOs in New York to build, own, and recover the costs of upgrades to their existing transmission facilities provides a TO the ability to decline its designation as the Designated Entity for a Designated Reliability Transmission Project that was proposed by a non-incumbent transmission developer. To effectuate this right, a TO that has been identified as a Designated Entity for a Designated Reliability Transmission Project (*i.e.*, one that includes one or more Reliability Transmission Upgrades on the TO's system) must provide notice to the NYISO within 60 calendar days of the approval of the CRP, or updated CRP, by the NYISO Board of Directors if it does not intend to serve as the Designated Entity for one or more Designated Reliability Transmission Projects. Section 31.2.7.5 of the OATT contains the details on the TO's responsibility to notify the NYISO and the finalization of the Designated Entities for the Designated Reliability Transmission Projects.

6.8. Posting of Solutions from the CRP

Following the later of the approval of the CRP, or an updated CRP, by the Board of Directors or the conclusion of the period identified in Section 31.2.7.5 of the OATT, if applicable, the NYISO will post on its website a list of (1) all Developers that have undertaken a commitment to the NYISO to build a market-based response or gap solution and/or (2) all Designated Entities that are responsible for a Designated Reliability Transmission Project that is necessary to ensure system reliability.

7. NYISO Cost Allocation and Recovery Principles and Analysis

The cost allocation principles and methodology covering regulated transmission solutions to Reliability Needs are contained in Sections 31.5.3.1 and 31.5.3.2 of the OATT.

8. Short-Term Reliability Process

The STRP uses quarterly STARs to assess, in coordination with the Responsible Transmission Owner(s), the reliability impacts of Generator deactivations on both the BPTF, as well as non-BPTF, and other system changes on the BPTF that occur from quarter to quarter. The NYISO performs the STARs on a quarterly basis with the following start dates:

Figure 6: STAR Start Dates

STAR	STAR Start Date
Quarter 1	January 15
Quarter 2	April 15
Quarter 3	July 15
Quarter 4	October 15

Each quarterly STAR looks out five years from its STAR Start Date. Each STAR will be completed within 90 days of its STAR Start Date. The STRP concludes if a STAR does not identify a need or if the NYISO determines that all identified Short-Term Reliability Process Needs will be addressed in the RPP.

All Initiating Generators that have completed their Generator Deactivation Notice prior to the start of the last STAR will be included in the next STAR. The following table provides guidance on when a Generator Deactivation Notice must be complete in order to be eligible to be studied in a particular STAR.

Figure 7: Generator Deactivation Notice Completion Dates

Generator Deactivation Notice Completed By	STAR Start Date
January 14	Quarter 1 STAR
April 14	Quarter 2 STAR
July 14	Quarter 3 STAR
October 14	Quarter 4 STAR

For a Generator that is in an ICAP Ineligible Forced Outage (IIFO), the NYISO has the option (a) to immediately initiate a stand-alone Generator Deactivation Assessment, (b) to add the IIFO Generator to a STAR that is already in-progress, or (c) to wait until the next STAR to perform the assessment. Each Initiating Generator that is not in an IIFO will be modeled as out-of-service commencing on its requested deactivation date in the applicable STAR. The system representation for each STAR will use the most recent

base case from the RPP and include updates to that base case made in accordance with the inclusion rules detailed in Section 3.2 of this Manual and other adjustments (e.g., updated load forecasts), as applicable. As soon as practicable after the STAR Start Date, the key study assumptions for each STAR will be reviewed with stakeholders. The system representation for each STAR will include updates to the most recent base case made in accordance with the inclusion rules detailed in Section 3.2 of this Manual and other adjustments (e.g., updated load forecasts, aging generation risk modeling, as applicable).

Given that the study period for the STRP overlaps in year 1 with the Installed Reserve Margin (IRM)/locational capacity requirement (LCR) calculation and years 4 and 5 with the RNA, the following considerations are applied to each year of the five-year study horizon. At-risk generation assumption (e.g., age-based generator risk) is not included in the STRP. Additionally, the NYISO applies specific study assumptions to Generator Deactivation Assessments as described below.

Figure 8: STAR and RNA Assumptions Summary

Planning Study	Study Year	Demand	Thermal Derates	Resource & Transmission Additions	At-Risk Generation
IRM/LCR & STAR	1	Consistent with IRM/LCR	Consistent with IRM/LCR Derates	Consistent with IRM/LCR	N/A
STAR	2	Gold Book Baseline	Consistent with IRM/LCR Derates	As-planned	N/A
	3				
STAR & RNA	4	Gold Book Baseline	Consistent with RNA Derates	As-planned	N/A
	5				
RNA	6-10	Gold Book Baseline	RNA Derates	As-planned	Aging generation assumption as referenced in Section 3.2.

The Generator Deactivation assessment process only provides for a single opportunity within the STRP where the deactivation is being evaluated to identify Generator Deactivation Reliability Needs. Therefore, the NYISO evaluates a broader range of key assumptions to manage uncertainty. In evaluating the planned system, Generator Deactivation Assessments will also identify any dependencies on future planned projects (a.k.a. "status quo"). Should a dependency be identified on a future planned project, the NYISO may identify a Generator Deactivation Reliability Need. In evaluating Generator Deactivation Reliability Needs, the NYISO may also include an assessment of higher demand forecast in years 2 through 5.

9. Project Monitoring and Reporting

Attachment Y of the OATT establishes the responsibility of the NYISO for monitoring and reporting the progress of all solutions to assess their continued viability to meet the identified Reliability Needs on a timely basis. Section 9.1 of this Manual describes this process. The NYISO also monitors projects that meet the screening criteria described in Section 3 of this Manual.

The interconnection procedures contained in the OATT also require quarterly status updates from Interconnection Customers, Transmission Developers, Connecting TOs and Affected TOs throughout the development of a new Facility. In order to meet the applicable reporting requirements, Interconnection Customers, Transmission Developers, Connecting TOs, and Affected TOs shall submit a status report as described in Section 9.2 of this Manual.

The NYISO may also request regular status reports from Developers or sponsors of other projects that may be of interest to the NYISO in relation to the CSPP.

9.1 Reliability Solutions

The NYISO will monitor and report on the status of market-based solutions and regulated solutions in accordance with Section 31.2.13 of the OATT.

As coordinated by the NYISO (generally ten days prior to the first day of each calendar quarter), each Developer shall electronically provide status reports based on the progress set forth in the milestones described in the latest available and applicable Agreement (e.g., Development Agreement, Interconnection Agreement, Transmission Interconnection Agreement). The NYISO will treat any confidential data in accordance with the provisions of Attachment Y of the OATT and the NYISO Code of Conduct, which is contained in Attachment F of the OATT.

Finally, the Developer of a market-based solution or a proposed alternative regulated solution must notify the NYISO immediately of any material change in the status of the proposed solution in accordance with Section 31.2.8.3.4 or Section 31.2.4.8.3 of the OATT, respectively.

9.2 Generating and Transmission Facilities

Each Interconnection Customer and Transmission Developer (collectively, "Developer") and applicable TO shall submit a status report on a quarterly basis for any: i) Facility as defined in Attachment HH of the OATT, Large Generating Facility evaluated under Attachment X of the OATT and Small Generating Facility evaluated under Attachment Z of the OATT; ii) Transmission Project as defined in Attachment P of the OATT; or iii) Local Transmission Owner Plan posted by a Transmission Owner under Section 31.2.1 of the

OATT or as submitted to the NYISO under Section 31.2.2.4.2 of the OATT that the NYISO determines satisfies the screening criteria from the inclusion rules as set forth in Section 3.2.1 in this Manual, or as requested by the NYISO.

The status reports shall be submitted electronically in accordance with the schedule requested by the NYISO using the form available on the NYISO's website and until the submission of as-built data. The Developer and the TO shall only provide information regarding the portion of the project that is under their control and responsibility as described in the Development Agreement, applicable interconnection and/or construction agreement(s), or Local Transmission Owner Plan. The NYISO will treat data designated as "Confidential Information" by the Developer or applicable TO in accordance with the applicable provisions of Attachments P and HH of the OATT, and the NYISO Code of Conduct, which is contained in Attachment F of the OATT.

The responsible party shall provide the planned start and finish date for each milestone, as set forth in the latest applicable Development Agreement, applicable interconnection/construction agreement(s), or Local Transmission Owner Plan. If schedule changes have occurred or an item has been completed since the last report, the responsible party shall enter these dates in the appropriate fields provided in the form and provide supporting details describing the nature or the schedule change, where applicable. Additional milestones may be added as appropriate to accurately describe the scope of work required for the project.

If any scope changes have occurred to the project, its Attachment Facilities, or its upgrades (e.g., System Upgrade Facilities, System Deliverability Upgrades, Distribution Upgrades, Network Upgrades, Network Upgrade Facilities, or other upgrades), as applicable, since the completion of the Facilities Study or the Cluster Study, the responsible party shall separately notify the NYISO of the change in a timely manner as required by Attachment P or Attachment HH of the OATT and/or the applicable interconnection agreement. The responsible party shall provide a description of the change, the reason for the change, and supporting documentation outlining the change. The responsible party should not wait until the next reporting period to submit information regarding a change. However, any scope changes should be noted in the Project Status Report.

10. Additional Reliability Studies

Market Participants and other interested parties may also request that the NYISO perform an Additional Reliability Study (ARS) to inform the requesting party whether a change in the configuration, location, or amount of resources will impact the reliability of the BPTF. Based on its availability of resources to perform the study, the NYISO will perform an ARS at the requesting party's expense solely for information purposes, which scope and deliverables will be agreed upon by the NYISO and the requesting entity. The Request for Additional Reliability Study request form is located in Attachment D of this Manual and the agreement for Additional Reliability Studies form is located in Attachment E of this Manual.

Attachment A NYISO Developer Qualification Form

The NYISO Developer Qualification Form is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

https://www.nyiso.com/manuals-tech-bulletins-user-guides

Attachment B Qualifications for a Proposed Solution to a Reliability Need.

The Qualifications for a Proposed Solution to a Reliability Need Form is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

https://www.nyiso.com/manuals-tech-bulletins-user-guides

Attachment C Developer's Data Submission for Solutions to Reliability Needs

The Developer's Data Submission for Solutions to Reliability Needs is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

https://www.nyiso.com/manuals-tech-bulletins-user-guides

Attachment D Request for Additional Reliability Study

The Request for Additional Reliability Study Form is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

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Attachment E Agreements for Additional Reliability Studies

The Agreements for Additional Reliability Studies Form is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

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Attachment F Study Agreement for Evaluation and Selection of Proposed Regulated Transmission Solutions Which Have Been Found to be Viable and Sufficient

The Study Agreement Form is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

https://www.nyiso.com/manuals-tech-bulletins-user-guides

Attachment G Procedures for Qualified Developers Proposing Transmission Projects

The Procedures for Qualified Developers Proposing Transmission Projects is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

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Attachment H Aging Generation

The methodology for the calculation of aging generation assumption for the Reliability Needs Assessment is available under the *Reliability Planning Process Manual* which is located in the Library>Manuals>Planning folder on the NYISO Manuals & Guides Web site:

https://www.nyiso.com/manuals-tech-bulletins-user-guides