

ISO NEW ENGLAND PLANNING PROCEDURE NO. 10
**PLANNING PROCEDURE TO SUPPORT THE FORWARD
CAPACITY MARKET**

- REFERENCES: ISO New England Transmission, Markets and Services Tariff (the “Tariff”)
- NERC TPL-001, Transmission System Planning Performance Requirements (NERC TPL-001)
- NPCC Regional Reliability Reference Directory #1 Design and Operation of the Bulk Power System (NPCC Directory 1)
- ISO New England Planning Procedure No. 3 (PP3): Reliability Standards for the New England Area Pool Transmission Facilities
- ISO New England Planning Procedure No. 5-6 (PP5-6): Interconnection Planning Procedure for Generation and Elective Transmission Upgrades
- ISO New England Operating Procedure No. 4 (OP4): Action During a Capacity Deficiency
- ISO New England Operating Procedure No. 19 (OP19): Transmission Operations
- Master/Local Control Center Procedure No. 1 – Nuclear Plant Transmission Operations (M/LCC1)
- Master/Local Control Center Procedure No. 15 – System Operating Limits Methodology (M/LCC15)
- Transmission Planning Technical Guide

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1.0 Purpose

This document details requirements and procedures, as well as provides sample forms to be used in planning activities that are conducted pursuant to Section III.12 of the Tariff - Calculation of Capacity Requirements and Section III.13 of the Tariff - Forward Capacity Market.

The ISO will update the base case model to be used in the activities described in this Planning Procedure based on transmission upgrades, load forecast and other system changes as appropriate. The ISO will also calculate inter-area and inter-zonal transfer limits as needed to support the Forward Capacity Auction (FCA).

For New Generating Capacity Resources,¹ seeking qualification to participate in an FCA, an initial interconnection analysis is required if the project is not in possession of a completed Feasibility or System Impact Study under Schedules 22 (LGIP) and 23 (SGIP) of Section II of the Tariff (collectively, (L/SGIP)). Analysis of overlapping interconnection impacts is required for all New Generating Capacity Resources where the total requested output is above the Capacity Network Resource Capability (CNRC). Analysis of overlapping interconnection impacts is required for all new Active Demand Capacity Resources. No overlapping impact analysis is performed in the case of imports qualifying for the Forward Capacity Market as Import Capacity Resources using existing importing interfaces. For new Import Capacity Resources associated with an External Elective Transmission Upgrade (External ETU) that is eligible for Capacity Network Import Interconnection Service (CNIIS),² seeking qualification to participate in an FCA, an initial interconnection analysis is required if the project is not in possession of a completed Feasibility or System Impact Study under Schedule 25 (ETU IP) of Section II of the Tariff. Analysis of overlapping interconnection impacts is required for all Import Capacity Resources associated with an Eligible External ETU where the total requested output is above the Capacity Network Import Capability (CNIC) of the Eligible External ETU. Also, de-list and demand bids seeking participation in either an FCA or an Annual Reconfiguration Auction may be rejected for reliability reasons.

This document is intended to provide guidance for the conduct of these transmission planning studies. Note that completion of studies in accordance with this guidance does not preclude the possibility that some results may suggest the need for additional studies.

¹ For clarity, a New Generating Capacity Resource includes a New Generating Capacity Resource that is associated with an Internal Elective Transmission Upgrade (Internal ETU) in accordance with Schedule 22 or 23 of Section II of the Tariff.

² External ETUs eligible for CNIIS are controllable Merchant Transmission (MTF) or Other Transmission Facility (OTF). In this Planning Procedure, these External ETUs are referred to as "Eligible External ETUs."

2.0 Timeline

Network topology development and power system base case development will be performed in preparation for each FCA and Annual Reconfiguration Auction in accordance with the procedures outlined in this document. A load forecast for the New England Control Area, States, and sub-areas for the appropriate Capacity Commitment Period will be represented in the base case model. Transmission Owners will submit materials in support of transmission projects that are anticipated to be in service by the start of the relevant Capacity Commitment Period. The ISO will update the network topology model based on these submissions and other system changes as appropriate.

Forward Capacity Auction qualification analyses for New Generating Capacity Resources, new Active Demand Capacity Resources and new Import Capacity Resources are initiated by the submittal of a Show of Interest application by the Project Sponsor of the resource. Show of Interest applications are due approximately 10 months prior to the FCA.

Participants submitting Ambient Air Static De-List Bids must submit qualification materials to the ISO by the Existing Capacity Qualification deadline, which is approximately eight months before the FCA.

Participants submitting Static De-List Bids, Export Bids, and Administrative Export De-List Bid must submit qualification and cost materials to the ISO by the Existing Capacity Qualification deadline, which is approximately eight months before the FCA.

Participants submitting Permanent De-List Bids, Retirement De-List Bids or substitution auction (SA) demand bids must submit qualification and cost materials (as applicable) to the ISO by the Existing Capacity Retirement Deadline, which is approximately 11 months before the FCA.

Dynamic De-List Bids are not qualified in advance of the auction and can be submitted during any round of the primary auction of the Forward Capacity Auction in which prices are below the Dynamic De-List Bid Threshold.

The timeline depicted in Table 1 shows the major planning activities and contingent system planning activities associated with New Generating Capacity Resources and de-list bids in preparation for a single FCA.

**Table 1
Timeline of Activities for an FCA**

Activities in preparation for a single FCA (Capacity Commitment Period N)	Year N-5			Year N-4												Year N-3		
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Topology certification	█	█	█															
Potential Capacity Zones & transfer limits				█	█	█												
Load forecast development				█	█	█	█											
Transfer limits for stakeholders review (Output from ISO)							◆											
Installed Capacity and Local Sourcing Requirement analyses								█	█	█	█	█	█					
ISO files Capacity Zones/ICR/LSR with FERC														◆				
Show of Interest applications (Input to ISO)							█											
Review & accept Show of Interest applications								█										
Develop project models								█										
Direct Connect reviews								█	█									
Initial Interconnection Analyses								█	█	█	█	█						
Overlapping Interconnection Impacts Analyses								█	█	█	█	█						
Input from Transmission Owners re. New Capacity											█	█						
Qualification Determination Notifications (Output from ISO)													◆					
Retirement, Permanent De-list Bid and substitution auction demand bids applications (Input to ISO)							◆											
Internal Market Monitor review of Retirement and Permanent De-List Bid applications							█	█	█									
Retirement Determination Notifications (Output from IMM)									◆									
Opting into a reliability review for Retirement De-List Bids and Permanent De-List Bids where the Participant has either elected to retire or has elected Conditional Treatment (Input to ISO)*										◆								
Reliability analyses for Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the IMM Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement De- List Bids and Permanent De-List Bids where the Participant has opted into a reliability review**							█	█	█	█	█							
Reliability review outcome for Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the IMM Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement De-List Bids and Permanent De-List Bids where the Participant has opted into a reliability review** (Output from ISO)												◆						
Static De-List Bid, Export Bid, and Administrative Export De-List Bid applications (Input to ISO)									◆									
Reliability Analyses for Static De-List Bids and Administrative Export De-List Bids at or below the FCA Starting Price, and Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the IMM Retirement Determination Notifications and Export Bids that are below the FCA Starting Price								█	█	█	█	█	█	█	█	█	█	█
Notification of retained for reliability to Static De-List Bids and Administrative Export De-List Bids at or below the FCA Starting Price, Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the IMM Retirement Determination Notifications and Export Bids that are below the FCA Starting Price and substitution auction demand bids (Output from ISO)																		◆

Forward Capacity Auction for CCP N

*As described in Section III.13.1.2.4.1. of Market Rule 1
**As described in Section III.13.1.2.3.1.5.1 of Market Rule 1

The timeline depicted in Table 2 shows the activities associated with Annual Reconfiguration Auctions.

**Table 2
Timeline of Activities for Annual Reconfiguration Auctions (ARAs)**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		FCA										
1 Year after FCA						ARA 1						
2 Years after FCA								ARA 2				
3 Years after FCA			ARA 3			CCP	→					
4 Years after FCA	→											

Specific due dates associated with the above timelines can be found on the ISO New England website on the FCM Auction Calendars page and in the Forward Capacity Tracking System (FCTS)³ in the FCM Calendar tab.

3.0 Submittal, Review and Qualification of Transmission Projects

Prior to each FCA and Annual Reconfiguration Auction, the ISO will create an updated network model, which will simulate topology conditions forecasted for the Capacity Commitment Period associated with the auction or transaction window. The update of the network model topology will be performed pursuant to Section III.12 of the Tariff.

3.1 Creation of the updated network model for an FCA or Annual Reconfiguration Auction

Around October 1st of each year, the ISO shall provide the Transmission Owners with:

- a) The “preliminary list” of projects and/or project components. This list is the most current Regional System Plan Project List (“RSP Project List”), which is deemed, by the ISO, adequate to build the updated network model.
- b) The most current list of certified projects and/or project components.

³ The FCTS is located at the following link: <https://smd.iso-ne.com/FCTS>

Each Transmission Owner shall review the lists and certify project(s) and/or project component(s) based on their determination that a particular project or component will:

- Achieve, or not, an in-service date no later than the first day of the relevant Capacity Commitment Period, and
- Have, or not, a material impact on the final network model and the studies performed with it.

The responsible Transmission Owner(s) shall certify the project(s) and/or project component(s) with the ISO by providing the detailed information described below, only if that information was never provided as part of a prior certification or if the prior certification needs to be updated.

For each major project and/or project component being certified, the detailed information to be provided to the ISO consists of:

- For each component of the project, a Critical Path Schedule as described in the template provided in “Template Schedule” in Appendix E of this procedure,
- A FCM Network Topology Statement Letter, as contained in Appendix E, from a company officer verifying that he/she has reviewed the schedule of each project component submitted to the ISO, that he/she concurs that the schedule is achievable, and that it is the intent of the Transmission Owner company to build the proposed transmission project in accordance with that schedule.

This detailed information shall be delivered to the ISO no later than fifteen calendar days after the request for certification by the ISO. If further requested by the ISO, the responsible Transmission Owner(s) shall also provide incremental data needed to update the ISO’s network model. This data should be adequate for modeling the project in load flow, short-circuit and stability databases.

After receiving the above information, the ISO will review the most up-to-date Critical Path Schedules and Statement Letter submitted for each major project and/or project component to determine whether transmission projects or elements of transmission projects meet all of the initial thresholds contained in Section III.12 of the Tariff. The ISO will use the evaluation criteria contained in Section III.12 of the Tariff to determine whether to include the transmission project or element of the transmission project in the final network model for the relevant Capacity Commitment Period.

Once this step is complete, the ISO will assemble the final network model for use in the relevant Capacity Commitment Period studies described in this procedure.

4.0 Transmission Interface Limit Analysis

The methodology used to determine transfer limits is contained in Appendix I of the Transmission Planning Technical Guide.

5.0 Analysis of New Capacity Resources

Any New Generating Capacity Resource or Import Capacity Resource associated with an Eligible External ETU has a number of potential transmission planning impacts, as described in Table 3, which must be studied before it can interconnect. A valid Interconnection Request for Capacity Network Resource Interconnection Service, submitted and accepted in accordance with Schedule 22 (LGIP) or 23 (SGIP) or 25 (ETU IP) of Section II of the Tariff, is required in order to seek qualification for the FCA. In the absence of a completed Feasibility Study or a completed System Impact Study, an initial interconnection analysis under the Network Capability Interconnection Standard (NCIS) is required for FCA participation. Analysis of overlapping interconnection impacts under the Capacity Capability Interconnection Standard (CCIS) is required for all New Generating Capacity Resources and Eligible External ETUs associated with Import Capacity Resources seeking qualification for the FCA, other than imports seeking to qualify as Import Capacity Resources using existing importing interfaces. Table 3 compares the scope of an initial interconnection analysis under FCM with the full list of potential impacts studied under a System Impact Study.

All potential impacts of New Generating Capacity Resources and ETUs, including changes to Existing Capacity if appropriate, are studied under either the L/SGIP or ETU IP. Analysis of New Generating Capacity Resources and ETUs does not bypass the L/SGIP or ETU IP. Accordingly, all New Generating Capacity Resources must complete the L/SGIP and all ETUs must complete the ETU IP before becoming interconnected.

Table 3
New Generating Capacity and Import Capacity Resource associated with Eligible External ETU
Potential Impacts and Interconnection Analysis Scope

FCM Market Element	Interconnection Analysis under FCM	Potential System Impact Scope of Analysis Required before the project can Interconnect
New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs – Never Previously Listed	<ul style="list-style-type: none"> • Thermal • Short-Circuit • Overlapping Interconnection Impacts • Identify Violations • Determination whether upgrades can be implemented in time for the Commitment Period 	<ul style="list-style-type: none"> • Thermal • Short-Circuit • Voltage • Stability • Other studies as required by the System Impact Study process • Identify Violations • Develop Solutions & Costs
New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs – Capacity Addition to Existing Capacity	<ul style="list-style-type: none"> • Thermal • Short-Circuit • Overlapping Interconnection Impacts (for amounts above CNRC or CNIC) • Identify Violations • Determination whether upgrades can be implemented in time for the Commitment Period 	<ul style="list-style-type: none"> • Thermal, • Short-Circuit • Voltage • Stability • Other studies as required by the System Impact Study process • Identify Violations • Develop Solutions & Costs
New Generating Capacity Resources – Re-powering Modification to Existing Capacity	<ul style="list-style-type: none"> • Thermal • Short-Circuit • Overlapping Interconnection Impacts (for amounts above CNRC) • Identify Violations • Determination whether upgrades can be implemented in time for the Commitment Period 	<ul style="list-style-type: none"> • Thermal (if greater MW) • Short-Circuit • Voltage • Stability • Other studies as required by the System Impact Study process • Identify Violations • Develop Solutions & Costs
New Generating Capacity Resources – Modifications to comply with Environmental Regulations	None (provided no change in capacity or major electrical equipment)	None (provided no change in capacity or major electrical equipment)

The analysis of overlapping impacts for new Active Demand Capacity Resources is described in Section 5.8.4.

5.1 Interactions in the Review of New Generating Capacity Resources and Import Capacity Resources associated with an Eligible External ETUs with De-list Bids

Interactions in the review of New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs with de-list bids are discussed in Section 10 of this procedure.

5.2 Criteria

The Initial Interconnection Analysis under the Network Capability Interconnection Standard is performed consistent with criteria described in ISO New England Planning Procedure No. 5-6 (PP5-6): Interconnection Planning Procedure for Generation and Elective Transmission Upgrades.

For analysis of Overlapping Interconnection Impacts for New Capacity Resources, the following criteria will be used:

- Thermal Analysis
 - Normal Rating – no contingency
 - Long Time Emergency (LTE) rating – for contingencies

5.3 General Conditions for the analysis of New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs under FCM

- Study period
 - The study period will reflect the Capacity Commitment Period N (1 year from June 1st Year N to May 31st Year N+1)
- Transmission Topology
 - The analysis will use the updated transmission topology as discussed in Section 3
- Load level for States, Capacity Zones, and sub-areas
 - For the initial interconnection analysis under the NCIS, load will be modeled at 100% of the 90/10 peak New England Control Area load, as projected in the most recent approved forecast.
 - For the overlapping impacts analysis under the CCIS, load will be modeled at 100% of the 90/10 peak New England Control Area load, as projected in the most recent approved forecast.⁴
- Existing generation

⁴ Limitations in deliverability associated with loading levels lower than the 90/10 forecast peak New England Control Area load are addressed in the transmission planning process, as appropriate.

- For the initial interconnection analysis under NCIS, existing generation will be modeled at up-to⁵ the established Network Resource Capability (NR Capability).
- For the overlapping impacts analysis under CCIS, existing generation will be modeled at up-to the established CNRC.
- Existing Eligible External ETUs
 - For the initial interconnection analysis under NCIS, existing Eligible External ETUs will be modeled at up-to the established Network Import Capability (NIC).
 - For the overlapping impacts analysis under CCIS, existing Eligible External ETUs will be modeled at up-to the established CNIC.
- Queued generation and Eligible External ETUs assumptions
 - Criteria for including queued generation and Eligible External ETUs (and any associated upgrades) in the model shall be consistent with the criteria set forth in Section III.12 of the Tariff, and will also reflect Queue Position, consistent with the criteria used in the L/SGIP and ETU IP, where appropriate.
- Generation and ETU retirement
 - Retired generation and ETUs will not be modeled as existing in the base case after the date for which the retirement takes effect.
 - For the overlapping impacts analysis under CCIS, this includes Permanent and Retirement De-List Bids submitted for the studied Capacity Commitment Period that are known by early July to be certain-to-occur.
- Generation and Import Capacity Resource associated with an Eligible External ETU de-lists
 - Generation and Import Capacity Resources associated with an Eligible External ETUs that permanently de-listed in a previous year will be modeled as existing in the base case for the purposes of initial interconnection analysis, but will not be modeled for the purposes of overlapping interconnection analysis.
- Demand Resources
 - Existing Active Demand Capacity Resources, existing On-Peak Demand Resources and existing Seasonal Peak Demand Resources participating in FCM will be modeled in the base-case.
- Contingencies
 - All single-element contingencies and multiple-element contingencies relevant to satisfy PP3, NPCC Directory 1 and NERC TPL-001.

⁵ The phrase “up-to” when used in this document means that the referenced element may be set at the limit or level described, or may be set at a lower level if the lower level gives rise to a more limiting condition for the given study.

- The post contingency system will be analyzed, if appropriate, to confirm that the system can be brought to a state that is prepared for the occurrence of a subsequent contingency in the time required by, and using the actions allowed in, the applicable ISO New England Planning Procedures and Operating Procedures.

5.4 Show of Interest Form – Submittal & Review

Completed Show of Interest form must be received by ISO before the Show of Interest Application Deadline. Appendix C contains a sample Show of Interest Form and instructions for completion of the form.⁶

The ISO will review the received form for completeness and technical coherence. The ISO may contact the Project Sponsor with questions or requests for clarification regarding the information submitted in the Show of Interest form. If the Show of Interest form is incomplete and if the Project Sponsor does not respond to questions or requests for clarification, then the form will not be accepted and ISO will do no further work on the application.

5.5 Review of Direct Connect

Using the information contained within the Show of Interest form including the information provided pursuant to an active Interconnection Request under the L/SGIP or ETU IP as appropriate, the ISO will review the feasibility of connecting the proposed New Generating Capacity Resource or Eligible External ETU associated with an Import Capacity Resource to the proposed interconnection point. If an interconnection plan is not already developed and defined under a corresponding Interconnection Request under the L/SGIP or ETU IP, the ISO may request, through consultation with the Project Sponsor if necessary, detailed information regarding the feasibility of connecting the resource to the point of common coupling. This information may include: the distance between the resource and the point of common coupling, plans to deal with obstacles and land-ownership issues between the resource and the point of common coupling and plans to ensure the point of common coupling itself can accommodate the new interconnection.

If the ISO determines that there is insufficient information to determine the feasibility of connecting the resource to the requested point of common coupling, or if the ISO determines it is not feasible to connect the resource to the requested point of common coupling in time for the commencement of the Capacity Commitment Period, then the resource will not be qualified to participate in the FCA. Section 5.10 contains supplemental guidelines for determining if a

⁶ The sample Show of Interest Form is for reference only. All Show of Interest Form submittals must be made using the Forward Capacity Tracking System.

qualification transmission upgrade (QTU) could or could not be implemented in time for the Capacity Commitment Period.

5.6 Location Determination for New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs

Using the information contained within the Show of Interest form, including the information provided pursuant to an active Interconnection Request under the L/SGIP or ETU IP as appropriate, the ISO will determine the zonal location for New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs. New Generating Capacity Resources and Import Capacity Resources associated with an Eligible External ETUs will be determined to be in a single Load Zone if it can serve incremental load in that Load Zone, while satisfying the deterministic criteria of PP3, NPCC Directory 1 and NERC TPL-001.

5.7 Initial Interconnection Analysis under the Network Capability Interconnection Standard

Using the information contained within the Show of Interest form, including the information provided pursuant to an active Interconnection Request under the L/SGIP or ETU IP, as appropriate, initial interconnection analysis is performed consistent with criteria and conditions described in ISO New England Planning Procedure No. 5-6 (PP5-6): Interconnection Planning Procedure for Generation and Elective Transmission Upgrades. The initial interconnection analysis of a New Generating Capacity Resource or an Eligible External ETU will be performed at the requested NIC of the proposed project.

For the proposed New Generating Capacity Resource or Eligible External ETU, if the following analysis has not been or will not be conducted as part of a Feasibility or System Impact Study under the L/SGIP or ETU IP, the objective of the initial interconnection analysis is to identify if any upgrades are needed to meet all of the following requirements:

- a) Satisfy the thermal and short circuit performance requirements of PP3, NPCC Directory 1 and NERC TPL-001 on a regional (*i.e.*, New England Control Area) and sub-regional basis, subject to the conditions analyzed.
- b) As a result of the addition of the proposed New Generating Capacity Resource or Eligible External ETU, the maximum collective change in the amount by which other Resources must be re-dispatched to meet the Reliability Standards, does not exceed the capacity of the New Generating Capacity Resource or Eligible External ETU, as measured by its intended high limit. If the request for interconnection involves multiple generating units at a plant and the applicant for interconnection controls all the existing generating units at that plant, the Project Sponsor for interconnection shall specify the desired maximum output for the plant.

- c) The proposed New Generating Capacity Resource or Eligible External ETU does not diminish the transfer capability across any transmission line or relevant interface below the level of achievable transfers during reasonably stressed conditions and does not diminish the reliability or operating characteristics of the New England Area bulk power supply system and its component systems. For a proposed New Generating Capacity Resource in an exporting area, an increase in the transfer capability out of the exporting area, beyond the existing export capability, is not required to meet this interconnection standard.
- d) The addition of the proposed New Generating Capacity Resource or Eligible External ETU does not create a significant adverse effect on the ISO's ability to reliably operate and maintain the system.
- e) Short Circuit analyses will demonstrate that short circuit duties will not exceed equipment capability. All Resources that can physically and concurrently be in service, including those with approved deactivated reserve status, will be modeled in service.

Section 5.7.1 contains a detailed discussion of the application of initial interconnection analysis if the above analysis has not been or will not be conducted as part of a Feasibility or System Impact Study under the L/SGIP or ETU IP. If such analysis determines that violations occur for a proposed New Generating Capacity Resource or Eligible External ETU which cannot be fixed in time for the relevant Capacity Commitment Period, the resource will be qualified to participate in that FCA up to the amount that the resource can operate without fixing the observed violations, unless that level is less than the Resource's Economic Minimum Limit. Section 5.10 contains supplemental guidelines for determining if a qualification transmission upgrade (QTU) could or could not be implemented in time for the Capacity Commitment Period.

5.7.1 Detailed Methodology for Initial Interconnection Analysis under the Network Capability Interconnection Standard

5.7.1.1. Network Capability Interconnection Standard Screening

The goal of the NCIS screening portion of this procedure is to develop a list of potential transmission line, equipment or interface loading problems, pre- or post-contingency, associated with the New Generating Capacity Resource or Eligible External ETU. The New Generating Capacity Resource or Eligible External ETU that is modeled in the base case is called a "study resource."⁷ All of the transmission lines, equipment and interfaces that are monitored for potential loading problems are called "monitored elements." These potential monitored element loading problems are identified by developing stressed transfer conditions to the starting base case⁸ and then

⁷ An Eligible External ETU will be modeled as an injection at the proposed interconnection point to the New England Control Area. The contingency loss of the Eligible External ETU will model the effect of the loss of the relevant facility(ies) in the external control area.

⁸ The base case is developed in accordance with Section 3 and Section 5.3 of this procedure.

determining which monitored elements have the potential to overload due to the addition of a study resource.

Using the list of existing generators in New England, the NCIS screen sorts the list of generators from highest positive distribution factor (DFAX)⁹ to highest negative DFAX for each monitored element, pre- and post-contingency. The distribution factors are a measure of the responsiveness or change in electrical loadings on monitored elements due to a change in output from each generator in New England. The DFAX is expressed as a percent of the change in generation output. The generators with a positive distribution factor DFAX are referred to as “harmer” generation because increasing the output of these generators results in more flow on the monitored element for the specified contingency. The generators with a negative DFAX are referred to as “helper” generators because increasing the output of these generators reduces the flow on the monitored element for the specified contingency. The NCIS screen is performed by completing a transfer from a source of harmer generation to a sink of helper generation for each monitored element. The study resource is included in the model in this step of the screen to ensure that cases are identified where the study resource can act as a harmer generator on a potentially overloaded monitored element. A list of potentially overloaded monitored elements is saved for use in the remainder of the NCIS test.

5.7.1.2. Network Capability Interconnection Standard Test

This portion of the NCIS procedure starts from the list of potential monitored element problems identified during the NCIS screening. A more reasonable set of stressed conditions, described in the following paragraphs, are then applied to these monitored elements to determine if any system problems are attributable to the study resource.

The percent loading on each monitored element is determined without the resource under study. This will provide a base reference loading for the monitored element. The reference loading will be developed by completing a transfer from a source of all harmer generation to a sink of all helper generators. If there is not sufficient helper generation to turn off to accommodate the increase to all harmer generation, then the transfer will continue from the worst harmer generators (highest DFAX) to the harmer generators with the lowest DFAX. The transfer will be limited when any monitored element that was listed as a potential overload in the NCIS screen reaches a loading of 100%.

Next, the percent loading on each monitored element that was listed as a potential overload in the NCIS screen will be calculated by adding the additional flow resulting from the resource under study to the base reference loading. The additional loading caused by the study resource is calculated based on a transfer from the study resource to the next available helper generator. If all

⁹ Unless otherwise explicitly stated, distribution factors are calculated using New England load as a reference.

helper generation was already reduced as part of the base reference transfer then additional loading caused by the study resource will be calculated based on a transfer to the lowest DFAX harmer that was not already used as part of the base reference transfer. If no monitored elements are overloaded, the resource has passed this test.

If any monitored elements are overloaded after the addition of the study resource, it will be determined for each overloaded monitored element whether an equal or lesser amount of generation can be reduced such that the loading on that monitored element is brought below the applicable rating. For this re-dispatch test, helper generation should be increased in reverse order from the helper generation that was reduced when the study resource impacts were determined. If the monitored element loading can be brought below the applicable rating then this unique dispatch will be applied to all other monitored elements to determine if any overload condition exists on the other monitored elements. If any other overloads occur, then a different re-dispatch solution will be reviewed to determine if all overloads can be alleviated. In all cases, re-dispatched generation will be limited such that the total amount of MWs to be turned off to eliminate all overloads does not exceed the size of the study resource. Thus, the unique dispatch is tested against monitored elements that were listed as potential overloads in the NCIS screen associated with the study resource.

5.8 Analysis of Overlapping Interconnection Impacts

Using the information contained within the Show of Interest form, including the information provided pursuant to an active Interconnection Request under the L/SGIP or ETU IP as appropriate, the analysis of overlapping interconnection impacts under FCM is intended to determine if a proposed New Generating Capacity Resource, an Eligible External ETU associated with an Import Capacity Resource or new Active Demand Capacity Resource provides incremental capacity to the system in manner that meets CCIS established in the L/SGIP or ETU IP. This means that a proposed New Generating Capacity Resource or a proposed Import Capacity Resource with an Eligible External ETU will be qualified at the level at which it can operate without re-dispatch of other capacity resources as described in Section 5.8.1. New Active Demand Capacity Resources will be analyzed in accordance with Section 5.8.4.

The qualification analysis of an Eligible External ETU will be performed at the lower of either the requested CNIC of the Eligible External ETU or the MW quantity for the new Import Capacity Resource associated with the Eligible External ETU. In the case where an Eligible External ETU has multiple new Import Capacity Resources associated to it, the qualification analysis will be performed at the lower of either the requested CNIC associated with the Eligible External ETU or the sum of the MW quantities for the new Import Capacity Resources associated with the Eligible External ETU.

5.8.1 Detailed Methodology for Overlapping Interconnection Impacts Analysis

The overlapping interconnection impacts analysis is performed in the form of a group study defined as the Capacity Network Resource (CNR) Group Study under the L/SGIP and ETU IP. The CNR Group Study shall include: (i) all Interconnection Requests for CNR Interconnection Service and CNIIS that are associated with a New Capacity Show of Interest form during the New Capacity Show of Interest submission window for the purpose of qualifying to participate in the same FCA for a Capacity Commitment Period in accordance with Section III.13 of the Tariff; and (ii) Long Lead Time Facilities (Long Lead Facilities), in accordance with Section 3.2.3 of the LGIP and ETU IP.

The Queue Position assigned pursuant to the L/SGIP and ETU IP determines the timing and order in which an Interconnection Request for CNRIS or CNIIS will be included in the CNR Group Study.¹⁰ Interconnection Requests for CNRIS or CNIIS will be included in the CNR Group Study associated with the Forward Capacity Auction for which the generator or, in the case of Eligible External ETU, the associated Import Capacity Resource submitted a Show of Interest Form for purposes of qualifying for participation in a Forward Capacity Auction in relative order to other CNRIS and CNIIS requests seeking to also qualify for that same Forward Capacity Auction.

Where a relationship between an Internal ETU and a specific Generating Facility seeking CNRIS has been established, the Queue Position rules in the L/SGIP and ETU IP determine the relevant order in which the Generating Facility's Interconnection Request and the Interconnection Request for the associated Internal ETU will be included in the CNR Group Study to assess the Generating Facility's qualification in the FCM. When the Generating Facility and the associated Internal ETU are at different Queue Positions, the Generating Facility's and the associated Internal ETU's Interconnection Request will be included in the CNR Group Study at the lower of the Generating Facility's or the associated Internal ETU's Interconnection Request Queue Position. It is possible that an Internal ETU may support more than one Generating Facility seeking CNRIS. Where the Queue Position for the Internal ETU's Interconnection Request is lower than that of the associated Generating Facilities, the Queue Positions for the Generating Facilities' Interconnection Requests will be used as a tie breaker to dictate the relative order in which the Generating Facilities' Interconnection Requests will be included in the CNR Group Study.

Table 4 illustrates the examples of the resulting CNR Group Study Queue Positions in the case of a single Generating Facility Interconnection Request associated with a single Internal ETU.

¹⁰ For a New Capacity Resource seeking qualification in the Forward Capacity Market that is not subject to the L/SGIP or ETU IP, the ISO will use the date in which an interconnection request/application was accepted by the interconnecting Transmission Owner/Distribution Owner pursuant to the applicable state interconnection process to perform overlapping interconnection impact analyses.

**Table 4
Overlapping Interconnection Impacts Analysis Study Order Example**

Queue Order	Study Order
Gen 1	Gen 1
ETU 2	
Gen 3	Gen 3 & ETU 2
Gen 4	
ETU 5	Gen 4 & ETU 5
Gen 6	
ETU 7	
Gen 8	Gen 8
Gen 9	Gen 9 & ETU 7
ETU 10	Gen 6 & ETU 10

5.8.1.1. Testing and Re-dispatch Restriction

The percent loading on each monitored element¹¹ is determined without the study resource. This will provide a base reference loading for the monitored element. The reference loading will be developed by completing a transfer from a source of all harmer generation with a distribution factor (DFAX) of 3% or greater for the given monitored element to a sink of all other generators. This transfer will be limited when a monitored element including a modeled intrazonal stability or voltage limited interface reaches a loading of 100% or when all harmer generation with a distribution factor of 3% or above have been turned on up-to their established CNRC in the case of an existing generator or at the requested CNRC in the case of a new generator.

Next, the percent loading on each monitored element will be calculated by adding the additional flow resulting from the study resource to the base reference loading. The additional loading caused by the study resource is calculated based on a transfer from the study resource to generation that is not included in the list of harmer generation with a distribution factor (DFAX) of 3% or greater for the given monitored element.

5.8.1.2. Transfer Level Test Conditions

In order to determine the base dispatch within the Load Zone under study, the generators will be dispatched, up to their CNRC, in a manner that reasonably stresses the system. Internal transfers will be modeled to reflect various conditions ranging from 0 MW transfer up-to their transfer limits. Imports from External Control Areas will be modeled to reflect various conditions changing

¹¹ As defined in Planning Procedure No. 10, Section 5.7.1

from 0 MW transfer up-to the associated capacity import limit. Internal transfers that are constrained by the system's voltage or stability performance will be monitored through the use of internal proxy interfaces.

5.8.1.3. Qualification Transmission Upgrade Identification

For each dispatch that is simulated per Sections 5.8.1.1 and 5.8.1.2 above, when the study resource is delivering its output, the list of those new overloads that result from the addition of the study resource and any existing overloads that are worsened due to the addition of the study resource will be recorded. The list will identify each recorded overload that meets at least one of the following thresholds:

- An overload greater than 10 MVA above the applicable thermal rating of the transmission element; or
- An overload greater than or equal to 2% above the applicable thermal rating of the transmission element; or
- A transfer above the interface transfer capability of the modeled intrazonal stability or voltage-limited interface.
- The study resource will be responsible for recorded overloads that meet any of the above-listed thresholds where, in relation to the Load Zone to which it is interconnecting:
 - The study resource has an observed distribution factor (DFAX)¹² greater than or equal to 3%; or
 - The study resource has an observed impact (as measured by DFAX times proposed MW) greater than or equal to 3% of the applicable thermal rating of the transmission element.

The study resource will not be responsible for increasing the transfer capabilities of interfaces that form the boundaries between existing Load Zones. Where the addition of the study resource, having been added as described in Section 5.8.1.1 above, results in a transfer across an interface (that forms the boundary between existing Load Zones) that is higher than the interface transfer capability, then other harmer resources with the lowest DFAX located on the same side of the interface may be reduced to bring the transfer level back to the interface transfer capability.

5.8.2 Qualified New Generating Capacity Resources and Conditional Qualified New Capacity Resources

If the analysis determines that violations occur for a proposed New Generating Capacity Resource or Eligible External ETU that is associated with a single Import Capacity Resource which cannot be fixed in time for the relevant Capacity Commitment Period, the resource will be qualified to participate in the FCA up to the level that meets the CCIS without fixing the observed violations, unless that level is less than the Resource's Economic Minimum Limit. Section 5.10 contains

¹² In this section exclusively, distribution factors are calculated using the study resource's Load Zone as a reference.

supplemental guidelines for determining if a qualification transmission upgrade (QTU) could or could not be implemented in time for the Capacity Commitment Period.

If the ISO determines that because of overlapping interconnection impacts, New Generating Capacity Resources or an Import Capacity Resource associated with an Eligible External ETU that have otherwise met the requirements to participate in the FCA in accordance with Section III.13 of the Tariff cannot provide the full amount of capacity that they each would otherwise be able to provide in the absence of the other relevant Existing Generating Capacity Resources and New Generating Capacity Resources seeking to qualify for the FCA, those New Generating Capacity Resources will be qualified for participation in the FCA on the basis of their Queue Position, as described in the L/SGIP and ETU IP, with priority given to resources that entered the queue earlier.

A New Generating Capacity Resource or Import Capacity Resource associated with an Eligible External ETU that meets the requirements of Section III.13 of the Tariff, but that would not be accepted for participation in the FCA as a result of overlapping interconnection impacts with another resource having a higher priority in the Queue may be accepted for participation in the FCA as a Conditional Qualified New Capacity Resource.

5.8.3 Detailed Methodology for restudy based on the results of the Forward Capacity Market

The ISO shall complete a post-FCA restudy of the applicable Interconnection Studies and CNR Group Study to determine the cost responsibility¹³ for facilities and transmission upgrades necessary to accommodate the Interconnection Request based on the results of the FCA or Reconfiguration Auction through which the generator or Import Capacity Resource associated with an Eligible External ETU received a Capacity Supply Obligation.

The restudy (to be conducted in accordance with the L/SGIP and ETU IP for the purposes of determining the facilities and transmission upgrades required to meet the CCIS) shall include: (i) all Interconnection Requests for CNR Interconnection Service that obtained a Capacity Supply Obligation in the FCA or Reconfiguration Auction; and (ii) Long Lead Facilities, as provided in Section 3.2.3 of the LGIP and ETU IP. Study resources will be included in the analysis based on their Queue Position in the L/SGIP and ETU IP interconnection queue as described in Section 5.8.1 of this procedure.

The restudy shall include cleared Retirement and Permanent De-List Bids and SA demand bids from the FCA, when the inclusion of these cleared Retirement and Permanent De-List Bids and SA demand bids will reduce or remove the need for transmission upgrades identified in the pre-FCA group study described in Section 5.8.1 of this procedure.

¹³ Cost estimates for the facilities and upgrades identified in the post-FCA restudy are provided by the applicable Transmission Owner.

Note that the provisions of the L/SGIP and ETU IP are used to determine the transmission upgrades required to meet the Network Capability Interconnection Standard. However, as a result of the restudy, upgrades associated with earlier/higher-queued Generating Resources or Eligible External ETUs may need to be advanced, in accordance with the provisions of Construction Sequencing, by the study resource in order to achieve Commercial Operation in time for its associated Capacity Commitment Period.

The results of the restudy will be included in the corresponding Interconnection Study report, as appropriate.

The restudy results will provide the list of transmission upgrades required to meet CNR Interconnection Service. These transmission upgrades must be included in the critical path schedule of the New Capacity Resource in accordance with Section III.13.3 of the Tariff, where progress on the completion of these transmission upgrades must be reported by the Project Sponsor, not the interconnecting Transmission Owner(s).

5.8.4 Detailed Methodology for the Overlapping Interconnection Impact Analysis of New Demand Capacity Resources

Starting with the qualification review for the fifth Forward Capacity Auction for Capacity Commitment Period beginning June 1, 2014, new Active Demand Capacity Resources will be analyzed for overlapping interconnection impacts. New On-Peak Demand Resources and New Seasonal Peak Demand Resources (collectively “Passive Demand Capacity Resources”) will not be analyzed for overlapping interconnection impacts.

Using the methodology contained in Section 5.8.1, each Dispatch Zone will be analyzed to identify whether any new resource could deliver capacity from the Dispatch Zone to which it is interconnecting to the Load Zone to which it is interconnecting. In those Dispatch Zones where, because violations occur which cannot be fixed in time for the relevant Capacity Commitment Period, no new resource could deliver capacity from the Dispatch Zone to which it is interconnecting to the Load Zone to which it is interconnecting, then, no new Active Demand Capacity Resources within that Dispatch Zone will be qualified to participate in the FCA (or applicable Annual Reconfiguration Auctions). To the extent that the new Active Demand Capacity Resource could, without the inclusion of any other new resources submitted for qualification in that Dispatch Zone, deliver any portion of its capacity from the Dispatch Zone to which it is interconnecting to the Load Zone to which it is interconnecting, then the full proposed amount of the new Active Demand Capacity Resource shall qualify under the provisions of this Section.

Using the methodology contained in Section 5.8.1, any individual new Active Demand Capacity Resource that is identified as interconnecting at a single nodal location from which no new resource could deliver capacity to the Load Zone to which it is interconnecting (because violations

are identified which cannot be fixed in time for the relevant Capacity Commitment Period) will not be qualified to participate in the FCA (or applicable Annual Reconfiguration Auctions). To the extent that the new Active Demand Capacity Resource could, without the inclusion of any other new resources submitted for qualification at that nodal location, deliver any portion of its capacity from the nodal location to which it is interconnecting to the Load Zone to which it is interconnecting, then the full proposed amount of the new Active Demand Capacity Resource shall qualify under the provisions of this Section.

5.9 New Generating Capacity Resources and Import Capacity Resources associated with Eligible External ETUs seeking Qualification to submit a Supply Offer for an Annual Reconfiguration Auction

New Generating Capacity Resources and Eligible External ETUs associated with an Import Capacity Resource are analyzed for their ability to meet the CCIS in the FCA CNR Group Study and restudy processes described in this Planning Procedure. A New Generating Capacity Resource or an Import Capacity Resource associated with Eligible External ETUs that qualifies for an FCA but does not achieve a Capacity Supply Obligation may elect to have its critical path schedule monitored by the ISO pursuant to the provisions of Section III.13 of the Tariff.

A critical path schedule that is being monitored with a Commercial Operation milestone date that is prior to the start of the relevant Capacity Commitment Period, for which the Project Sponsor has met all relevant financial assurance requirements, will be qualified to take on a Capacity Supply Obligation in an Annual Reconfiguration Auction.

5.10 Supplemental Guidelines for determining if a QTU could or could not be implemented in time for the Capacity Commitment Period

Around July 15th of each year, the ISO shall provide the Transmission Owners with:

- The preliminary list of violations from the initial interconnection analyses¹⁴ that resulted or were worsened from the proposed addition of New Generating Capacity Resource(s) and/or Eligible External ETU(s) associated with an Import Capacity Resource in their respective territory.

Upon receipt of the violations, each Transmission Owner shall review their list and perform an implementation assessment identifying whether (1) sufficient transmission planning analysis has taken place to identify a qualification transmission upgrade (QTU) that addresses a given violation and (2) if a QTU has been identified whether or not that QTU could or could not be achieved in time for the relevant Capacity Commitment Period.

¹⁴ The initial interconnection analyses for a New Generating Capacity Resource are described in Sections 5.7 and 5.8 of this procedure.

The responsible Transmission Owner shall provide the detailed information described below to the ISO:

- For each violation, a “QTU Implementation Assessment” as provided in the template form in Appendix F of this procedure.
- In cases where the Transmission Owner indicates in the QTU Implementation Assessment that a QTU could be in place in time for the relevant Capacity Commitment Period, a FCM QTU Statement Letter, as contained in Appendix F, from a company officer verifying that he/she has reviewed the implementation assessment(s) for the QTU(s) and that he/she concurs when a QTU(s) could be achieved in time for the relevant Capacity Commitment Period.

This detailed information shall be delivered to the ISO no later than thirty calendar days after receiving the preliminary list of violations.

After receiving the above information, the ISO will review the implementation assessments and Statement Letters. In determining whether the QTU(s) could or could not be implemented in time for the relevant Capacity Commitment Period, the ISO will consider the following non- exclusive list of factors:

- Complexity of the transmission planning analysis (review of different transmission alternatives and I.3.9 review process)
- Ease of siting and permitting
- Ease of land and easement acquisition
- Equipment procurement time
- Ease of construction and characteristics of the required new facilities (for example, length of new overhead line or underground cable)
- Construction sequencing and time requirement
- Need for significant outage scheduling
- The extent to which issues such as those described in this list have already been addressed, implemented or completed and/or the extent to which there are plans in place to address issues such as those described in this list

QTU(s) frequently identified as required upgrades to interconnect generation and Eligible External ETUs are grouped below into three categories of projects. The following, non-exclusive list of examples is provided for illustration of the relative probability of completing projects in-time for the relevant Capacity Commitment Period. The time period from qualification for the FCM until the beginning of the Capacity Commitment Period is nominally three-years, but varies year-by-year over the implementation of the FCM.

Group “A”

1. Line/cable terminal equipment upgrade
2. Upgrading existing transformers
3. Overhead line re-sagging
4. Overhead line re-conductoring on existing structures
5. Line or generator lead series reactor insertion
6. Breaker addition at an existing substation
7. New bay and breakers addition at an existing substation (assuming no substation footprint extension)
8. Circuit breaker(s) interrupting capability upgrade
9. Circuit breaker(s) interrupting capability upgrade with upgrade of bus bracing, structural hardware & ground grid at the substation
10. Permanently moving load between supply points

Group “B”

1. Overhead line re-build (assuming no need for new right-of-way)
2. Underground cables re-conductoring, using existing conduits and involving limited splicing work
3. “Looping” of an existing overhead line into a near-by substation (assuming limited new overhead construction)

Group “C”

1. Addition of a new autotransformer
2. Phase shifter insertion
3. Re-connection of generation to the higher voltage side of a substation, using new Generator Step-Up Transformer
4. Double circuit tower separation (through construction of a new circuit)
5. Construction of a new overhead line or underground cable
6. Substation “split” - Construction of a new substation and major relocation of some of the existing substation feeds to the new substation

The probability of completing upgrades in time for the Capacity Commitment Period is, in general, highest for the projects in Group “A”, relatively lower for projects in Group “B”, and lower still for projects in Group “C”. The actual time to complete any project is subject to consideration of the extent to which the project is already being implemented and/or consideration of the bulleted list of factors identified above and the extent to which these factors have been or are planned to be

addressed, and must be reviewed on a case-by-case basis. The level of scrutiny applied by ISO-NE in determining whether a project can be completed in time will be, in general, higher for the projects in Group “C”, relatively lower for projects in Group “B”, and lower still for projects in Group “A”.

Approximately one week after receiving the QTU Implementation Assessments, the ISO shall provide the affected Project Sponsor(s) of a New Generating Capacity Resource(s) or an Import Capacity Resource associated with an Eligible External ETU with (1) the preliminary list of violation(s) from initial interconnection analyses that resulted or were worsened due to the proposed addition of their New Generating Capacity Resource or Import Capacity Resource associated with an Eligible External ETU project and (2) the QTU Implementation Assessment(s) with regards to those violation(s). The ISO shall indicate based on the preliminary QTU implementation assessment that has been performed if a QTU could or could not be implemented in time for the start of the Capacity Commitment Period to address the given violation(s).

If, at any time after sending the preliminary list of violations, the ISO finds additional violation(s) that resulted or were worsened from the proposed addition of New Generating Capacity Resource(s) and/or Eligible External ETU associated with an Import Capacity Resource, the ISO shall share that information with the affected Transmission Owner(s) and provide a reasonable period of time to respond back to the ISO with a QTU Implementation Assessment and FCM QTU Statement Letter for each violation as described earlier in this procedure. Upon receipt of this information, the ISO shall review the implementation assessment(s) and Statement Letter(s) to assess if a QTU could or could not be implemented in time for the start of the relevant Capacity Commitment Period. Following this review, the ISO shall provide the affected Project Sponsor(s) with the violation(s) that resulted or were worsened due to the proposed addition of their New Generating Capacity Resource or Import Capacity Resource associated with an Eligible External ETU project as well as the corresponding QTU Implementation Assessment(s).

If, at any time, a Transmission Owner or Project Sponsor of a New Generating Capacity Resource or an Import Capacity Resource associated with an Eligible External ETU becomes aware of any new information that may affect a QTU Implementation Assessment for a given violation, they shall promptly share that information with the ISO. The deadline for submitting new information to be considered by the ISO in its review of whether or not a QTU could or could not be implemented in time for the start of the relevant Capacity Commitment Period shall be no later than five business days before the issuance of the Qualification Determination Notifications for New Capacity Resources.

5.11 Import Capacity Resources using Existing Import Interfaces

No initial interconnection analysis or overlapping interconnection impact analysis is performed for imports qualifying for the Forward Capacity Market as Import Capacity Resources using existing importing interfaces. The capacity import capability of the interface is calculated pursuant to ISO Tariff Section III.12.9.2.4.

5.12 New Self- Supply Resources

New Self-Supply Resources will be analyzed in the same way as all other new resources as described in this procedure.

5.13 Elective Transmission Upgrades

For an Import Capacity Resource associated with an Eligible External ETU or a New Generating Capacity Resource that is supported by an Internal ETU, the information contained in Appendix G shall be provided pursuant to Section III.13.1.1.2.2.2(c) as part of the Critical Path Schedule.

6.0 Transmission Security Analysis Requirement

Prior to each FCA, the ISO shall determine the capacity requirement of each import-constrained Capacity Zone, by performing a Transmission Security Analysis. The Transmission Security Analysis will be performed in accordance with Section III.12.2.1.2 of Market Rule 1 and the assumptions described in Section 7.2 and Appendix A of this procedure.

7.0 Analysis of De-list Bids and Demand Bids

Using the information provided in the de-list bid (Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, and Administrative Export De-List Bid¹⁵) and prior to the FCA, the ISO will analyze the thermal, voltage¹⁶ and, if appropriate, stability, reliability impacts of de-list bids. A sample de-list bid application form is contained in Appendix D.¹⁷ A fully completed de-list bid is due by the pertinent FCA deadlines, as outlined in Market Rule 1.

During the FCA, the ISO will analyze the thermal, voltage¹⁸ and (to the extent possible and if appropriate) stability, reliability impacts of submitted Dynamic De-List Bids and SA demand bids.

¹⁵ The reliability review shall be conducted once and shall remain valid for the multiyear contract period.

¹⁶ Assuming the unit's VAR capability is not reduced, it is assumed that there is no voltage impact for a partial de-list or partial demand bid.

¹⁷ The sample de-list bid application form is for reference only. All de-list bid application submittals must be made using the Forward Capacity Tracking System.

¹⁸ Assuming the unit's VAR capability is not reduced, it is assumed that there is no voltage impact for a partial de-list or partial demand bid.

During the Annual Reconfiguration Auction, the ISO will analyze the thermal, voltage¹⁹ and (to the extent possible and if appropriate) stability, reliability impacts of submitted demand bids.

7.1 Criteria

The following criteria will be used when conducting the analysis of de-list bids and demand bids:

- Thermal Analysis
 - Normal Rating – no contingency
 - LTE rating – for contingencies
 - Short Time Emergency (STE) rating – for contingencies where loading can be reduced below LTE within 15 minutes
- Voltage Analysis
 - Consistent with Transmission Owners' Voltage Criteria
 - Consistent with Master/Local Control Center Procedure No. 1 – Nuclear Plant Transmission Operations (M/LCC1)
- Stability Analysis (to the extent possible and if appropriate)
 - Consistent with the performance expectations described in the North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC) and ISO-NE standards²⁰.

7.2 Conditions

- Study Period
 - The study period will reflect the Capacity Commitment Period N (1 year from June 1st Year N to May 31st Year N+1).
- Transmission Topology
 - The analysis will use the transmission topology as discussed in Section 3 of this procedure.
- Load Level for States, Capacity Zones, and Sub-areas
 - For thermal and voltage analyses, load will be modeled at 100% of the 90/10 peak New England Control Area load, as projected in the most recent approved forecast.
 - Sensitivity analyses at load levels lower than 100% of the 90/10 peak New England Control Area Load will be considered when such lower load levels might

¹⁹ Assuming the unit's VAR capability is not reduced, it is assumed that there is no voltage impact for a partial de-list or partial demand bid.

²⁰ NPCC Directory 1 and ISO New England OP19

result in high voltage conditions, system instability or other unreliable conditions.

- Resource Assumptions
 - All Existing Capacity Resources will be modeled at their Summer Qualified Capacity for the primary auction of the FCA.
 - Existing Capacity Resources and New Capacity Resources that acquired a Capacity Supply Obligation in the primary auction of the FCA will be modeled at their Capacity Supply Obligation in the SA of the same FCA.
 - New Capacity Resources that are contractually bound through a Request For Proposal (RFP)²¹ to participate in and receive a Capacity Supply Obligation in a FCA will be modeled at their Summer Qualified Capacity for the FCA to which the contractual obligation applies.
 - Existing Capacity Resources will be modeled at the lesser of the Capacity Supply Obligation or the Summer Qualified Capacity for the Annual Reconfiguration Auction for the relevant Capacity Commitment Period in which review is being performed.
- Contingencies
 - All single-element contingencies and multiple-element contingencies as described in OP19, Appendix J and M/LCC 15 will be considered.
 - N-1-1 contingency analysis will be performed for the relevant contingencies in accordance with North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC) and ISO-NE standards.²²
- Transfer Level Assumptions
 - Internal transfers will be modeled to reflect various conditions ranging from 0 MW transfer up-to their bidirectional limits.
 - Transfers from External Control Areas will be modeled to reflect various conditions ranging from 0 MW transfer up-to the total of ICR Tie Benefits plus either qualified Existing Import Capacity Resource(s) for the FCA or cleared Import Capacity Resource(s) for the Annual Reconfiguration Auction, not to exceed the interface transfer limit.
 - Transfers to External Control Areas will be modeled to reflect various conditions ranging from 0 MW transfer up-to either the total of qualified Administrative Export(s) for the FCA or the total of cleared Administrative Export(s) for the Annual Reconfiguration Auction, not to exceed the interface transfer limit.

²¹ Under Attachment K, Section 4.1(f) of the ISO New England Inc. Open Access Transmission Tariff.

²² NPCC Directory 1, ISO New England OP19 and M/LCC 15.

- One critical resource in the electrical vicinity of the resource associated with the de-list bid under review will be assumed out of service.

Appendix A of this procedure illustrates a detailed list of assumptions supporting the above conditions.

7.3 Minimum MW Quantity Threshold

No analysis is required to assess the individual impact of a de-list bid or demand bid with a MW quantity smaller than 5 MW. However, analyses may be conducted to assess the cumulative impact of such de-list bids and demand bids, in conjunction with other de-list bids or demand bids.

For a full de-list or demand bid, the quantity analyzed is the resource's Qualified Capacity, Capacity Supply Obligation or the lesser of the two depending on the type of de-list or demand bid and the timeframe of review, as shown in Appendix A.

For a partial de-list or demand bid, the quantity analyzed is the MW reduction of the de-list or demand bid and applied to the resource's Qualified Capacity, Capacity Supply Obligation or the lesser of the two depending on the type of de-list or demand bid and the timeframe of review, as shown in Appendix A.

7.4 Order of Review

7.4.1 De-list Bids for a Forward Capacity Auction

For a Forward Capacity Auction, de-list bids and demand bids will be reviewed in the order prescribed by Section III.13.2.5.2.5(a) of Market Rule 1.

7.4.2 Demand Bids for an Annual Reconfiguration Auction

For an Annual Reconfiguration Auction, demand bids will be reviewed in the order prescribed by Section III.13.4.2.2(c) of Market Rule 1.

7.5 De-list Bids Rejected for Reliability

Pursuant to Section III.13.2.5.2.5(a) of Market Rule 1, de-list bids shall only be rejected for the sole purpose of addressing a local reliability issue, and shall not be rejected solely on the basis that acceptance of the de-list bid may result in the procurement of less capacity than the net Installed Capacity Requirement or the Local Sourcing Requirement for a Capacity Zone.

For thermal analyses, the capacity associated with the de-list bid or demand bid under review will be maintained to address local loadings beyond the applicable thermal rating of the Element when the removal of the capacity results in either an increase to the loading beyond the applicable thermal rating of the Element greater than 10 MVA or an increase to the loading beyond the applicable thermal rating of the Element that is greater than or equal to 2% of the Element's applicable thermal rating.

De-list bids that retained their Capacity Supply Obligation as a result of a reliability review rejection will be modeled as Existing Capacity in all subsequent reliability reviews performed for the Capacity Commitment Period under consideration until the reliability need has been met.

Following each Annual Reconfiguration Auction, pursuant to Section III.13.2.5.2.5(e) of Market Rule 1, the ISO will re-evaluate any and all de-list bids rejected for reliability reasons to determine if the reliability need which caused the ISO to reject the de-list bid has been met as the result of a new transmission project, formerly de-listed resources, New Capacity Resource(s) having obtained a Capacity Supply Obligation or updates to all relevant assumptions. Rejected de-list bids will be re-evaluated in the order that was used in the initial review and described in Section III.13.2.5.2.5(a) of Market Rule 1.

Pursuant to Section III.13.2.5.2.5(f) of Market Rule 1, should the local reliability issue that caused the ISO to reject the de-list bid be satisfied prior to or during the Capacity Commitment Period, then the resource shall retain its Capacity Supply Obligation through the end of the Capacity Commitment Period for which it was retained for reliability. Resources that submitted Permanent De-List Bids or Retirement De-List Bids shall be permanently de-listed or retired as of the first day of the subsequent Capacity Commitment Period (or earlier if the resource sheds the entirety of the Capacity Supply Obligation as described in Section III.13.2.5.2.5.3(a)(ii) or Section III.13.2.5.2.5.3(b)(ii)).

7.6 Stakeholder Review

In accordance with Section III.13.1.8.(e) of Market Rule 1, the ISO shall post on its website no later than three Business Days after the Existing Capacity Retirement Deadline information (aggregated by Load Zone) concerning Permanent De-List Bids and Retirement De-List Bids, including Permanent De-List Bids and Retirement De-List Bids entered from the prior FCA. The ISO will provide written notice to each affected Transmission Owner and the Reliability Committee after making this posting.

The ISO will consult with the impacted Transmission Owners after the Internal Market Monitor (IMM) provides their cost determination (early July timeframe) for Retirement De-List Bids and Permanent De-List Bids before finalizing the review of each de-list bid. The ISO will consult with the impacted Transmission Owners after the Static De-list Bid finalization window²³ (early October timeframe) for Static De-list Bids, Export De-list Bids and Administrative Export De-List Bids²⁴ before finalizing the review of each de-list bid. The ISO will consult with the impacted

²³ Pursuant to Section III.13.1.2.3.1.1 of the Tariff, after receipt of the IMM cost determination in the late September timeframe, a Static De-List Bid may be revised to a lower price or withdrawn.

²⁴ The reliability review shall be conducted once and shall remain valid for the multiyear contract period.

Transmission Owners during the auction (early February timeframe) for Dynamic De-List Bids before finalizing the review of each de-list bid.

7.6.1 Reliability Review of Static De-List Bids and Administrative Export De-List Bids at or below the FCA Starting Price, and Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications and Export Bids that are below the FCA Starting Price

Studies to evaluate Static De-List Bids and Administrative Export De-List Bids at or below the FCA Starting Price, and Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications and Export Bids that are below the FCA Starting Price will be completed in accordance with Section 7 of this procedure which outlines the scope, study assumptions, and methodology that will be used in assessing the reliability need. For the specific case of Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are below the FCA Starting Price, the joint scoping process involving the ISO and the Transmission Owners and described in Section 7.6.2 of this procedure may also be used in assessing the reliability need. Prior to the start of any de-list bid analyses, the ISO will present to the Reliability Committee the specific assumptions that will be used, including a detailed list of new transmission projects, as determined in accordance with Section 3 of this planning procedure, that will be used in the relevant Forward Capacity Auction network model.

The ISO will review study results with the affected Transmission Owners as they become available. The ISO will also provide the affected Transmission Owners a reasonable period of time to review such results and an opportunity to discuss the results of the ISO's determination with the ISO prior to the relevant Forward Capacity Auction for Static De-List Bids and Administrative Export De-List Bids at or below the FCA Starting Price, and Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications and Export Bids that are below the FCA Starting Price and during the Forward Capacity Auction for Dynamic De-List Bid requests.

The affected Transmission Owners will communicate their opinion regarding the determination assessment of the de-list bid requests to the ISO.

If, at any time, an affected Transmission Owner becomes aware of any new information that may affect the determination of a de-list bid request, they will promptly share that information with the ISO. If, at any time, the ISO becomes aware of any new information that may affect the determination of a de-list bid request, they will promptly share that information with the affected Transmission Owner.

The ISO will provide a summary of accepted de-list bids and the details of rejected de-list bids to the Reliability Committee at their first meeting following the ISO's auction results filing with FERC.

The Reliability Committee shall provide formal input and advice to the ISO with regard to rejected de-list bids after the relevant FCA through an advisory vote. Any member of the Reliability Committee shall provide on-going input and advice to the ISO through comment as appropriate by requesting the Chair of the Committee to include a specific rejected or accepted de-list bid as an item for discussion at a future meeting of the Reliability Committee.

7.6.2 Reliability Review of Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement De-List Bids and Permanent De-List Bids where the Participant has opted into a Reliability Review

For resources submitting a Retirement De-List Bid or Permanent De-List greater than the minimum MW quantity threshold described under Section 7.3 of this procedure the following steps will be taken. The ISO will discuss with the affected Transmission Owners the scope, study assumptions, and methodology that will be used in assessing the reliability need beyond what is in this planning procedure, as well as to develop a schedule for the review. In accordance with the Transmission Operating Agreement (TOA) Section 3.09 the ISO and Transmission Owners shall cooperate, in good faith, to evaluate each Retirement De-List Bid and Permanent De-List Bid. If the ISO and affected Transmission Owners do not reach consensus, the ISO will determine the study characteristics and will delineate the affected Transmission Owners' concerns and rationale in the final study.

The ISO will review study results with the affected Transmission Owners as they become available. Following the dissemination of the Internal Market Monitor's Retirement Determination Notifications and the opt-in period to have the resource reviewed for reliability described in Section III.13.1.2.4.1(a) or Section III.13.1.2.4.1(b), the ISO will finalize the reliability review for the following de-list bids to determine if the resource is needed for reliability: (1) Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are at or above the FCA Starting Price; and (2) Permanent De-List Bids and Retirement De-List Bids for which the Participant has opted to have the resource reviewed for reliability as described in Section III.13.1.2.4.1(a) or Section III.13.1.2.4.1(b). The ISO will provide the affected Transmission Owners a draft determination report for these de-list bids within a reasonable period of time prior to the Reliability Committee meeting at which these de-list bids will be subject to an advisory vote.

The affected Transmission Owners will communicate their opinion regarding the determination assessment of these de-list bid bids to the ISO. If the ISO and affected Transmission Owners do not agree regarding a reliability need determination, the ISO will acknowledge the affected Transmission Owner's perspective in its final report to the Reliability Committee.

If, at any time, an affected Transmission Owner becomes aware of any new information that may affect the determination of a de-list bid request, they will promptly share that information with

the ISO. If, at any time, the ISO becomes aware of any new information that may affect the determination of a de-list bid request, they will promptly share that information with the affected Transmission Owner.

The Reliability Committee shall provide formal input and advice to the ISO through an advisory vote regarding the review of Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement De-List Bids and Permanent De-List Bids where the Participant has opted into a reliability review prior to the ISO making a formal determination regarding the reliability impacts of these de-list bids where, pursuant to Section III.13.1.2.3.1.5.1.(b) of Market Rule 1, notification to the requesting Lead Market Participant shall be made as soon as practicable following the ISO's consultation with the Reliability Committee.

7.7 Capacity Network Resource Capability and Capacity Network Import Capability Adjustments for Cleared Retirement or Permanent De-List Bids and Cleared Substitution Auction Demand Bids

When a partial Retirement De-list Bid, partial Permanent De-List Bid or partial SA demand bid clears in a Forward Capacity Auction or when a full Retirement De-List Bid, full Permanent De-List Bid or full SA demand bid only clears a portion of the bid in a Forward Capacity Auction, the resource's Capacity Network Resource Capability or Capacity Network Import Capability shall be adjusted to account for the amount of the Qualified Capacity reduction resulting from the cleared bid, as further described below.

The Summer Capacity Network Resource Capability (SCNRC) or Summer Capacity Network Import Capability (SCNIC) shall be adjusted using the following formula:

$$SCNRC \text{ (or SCNIC)} MW_{\text{Post-reduction}} = \text{Summer Qualified Capacity } MW_{\text{Pre-reduction}} - \text{Reduction } MW^{25}$$

The Winter Capacity Network Resource Capability (WCNRC) or Winter Capacity Network Import Capability (WCNIC) shall be adjusted using the following formula:

$$WCNRC \text{ (or WCNIC)} MW_{\text{Post-reduction}} = SCNRC \text{ (or SCNIC)} MW_{\text{Post-reduction}} \\ \times \left(\frac{\text{Winter Qualified Capacity } MW_{\text{Pre-reduction}}}{\text{Summer Qualified Capacity } MW_{\text{Pre-reduction}}} \right)$$

To adjust the WCNIC for an External ETU, the total of the winter and summer Qualified Capacity values for all Import Capacity Resources associated with the External ETU are applied for the calculation specified above.

When all price-quantity pairs of a full Retirement De-List Bid, full Permanent De-List Bid or full SA demand bid clears in a Forward Capacity Auction, the Summer and Winter Capacity Network

²⁵ The reduction MW is the amount of the Retirement De-List Bid, Permanent De-List Bid or SA demand bid that cleared (did not receive a Capacity Supply Obligation) in the Forward Capacity Auction.

Resource Capability or Summer and Winter Capacity Network Import Capability shall be removed in entirety from the resource.

7.8 Network Resource Capability and Network Import Capability Adjustments for Cleared Retirement De-List Bids and Cleared Substitution Auction Demand Bids

When a partial Retirement De-List Bid or partial SA demand bid clears in a Forward Capacity Auction or when a full Retirement De-List Bid or full SA demand bid only clears a portion of the bid in a Forward Capacity Auction, the resource's Network Resource Capability or Network Import Capability shall be adjusted to account for the amount of the Qualified Capacity reduction resulting from the cleared bid, as further described below.

The Summer Network Resource Capability (SNRC) or Summer Network Import Capability (SNIC) shall be adjusted using the following formula:

$$SNRC \text{ (or SNIC) } MW_{Post-reduction} = SCNRC \text{ (or SCNIC) } MW_{Post-reduction} \times \frac{SNRC \text{ (or SNIC) } MW_{Pre-reduction}}{SCNRC \text{ (or SCNIC) } MW_{Pre-reduction}}$$

The post-reduction value of SCNRC or SCNIC applied in the above formula shall be the value calculated in accordance with Section 7.7 of this Planning Procedure.

The Winter Network Resource Capability (WNRC) or Winter Network Import Capability (WNIC) shall be adjusted using the following formula:

$$WNRC \text{ (or WNIC) } MW_{Post-reduction} = SNRC \text{ (or SNIC) } MW_{Post-reduction} \times \frac{WNRC \text{ (or WNIC) } MW_{Pre-reduction}}{SNRC \text{ (or SNIC) } MW_{Pre-reduction}}$$

When all price-quantity pairs of a full Retirement De-List Bid or full SA demand bid clears in a Forward Capacity Auction, the Summer and Winter Network Resource Capability or Summer and Winter Network Import Capability shall be removed in entirety from the resource.

8.0 Interactions in the Review of New Capacity Resources and De-list Bids

In preparation for the FCA, New Capacity Resources and potential cumulative or overlapping impacts of New Capacity Resources will be analyzed as described in this procedure. De-lists or retirements and potential cumulative impact of de-lists or retirements will generally be studied separately and independently from New Capacity Resources, other than for the interactions and interdependences described in the following sections.

8.1.1 Inclusion of Retirements or De-list Bids in the Review of New Capacity Resources

As described in Section 5.3 of this Planning Procedure, Permanent and Retirement De-List Bids submitted for the studied Capacity Commitment Period that are known by early July to be certain-to-occur are included in the overlapping impact analysis for New Capacity Resources.

8.1.2 Inclusion of New Capacity Resources in the Reliability Review of De-list Bids or Retirements

Under Attachment K, Section 4.1(f) of the Open Access Transmission Tariff ("OATT"), "the ISO shall incorporate or update information regarding resources in Needs Assessments that have been proposed and ... (ii) have been selected in, and are contractually bound by, a state-sponsored Request for Proposals ...". Consistent with that treatment, the ISO will include New Capacity Resources that are contractually committed pursuant to a state-sponsored Request for Proposal or a similar financially binding contract in the ISO's planning process. To that end, Section 4.1(f) requires a written statement confirming the new resource's selection or assumption of its contractually-binding obligations.

In preparation for a FCA, prior to conducting any analyses outlined in Section 7 of this Planning Procedure, the ISO will request that the Project Sponsor complete and execute a certification form confirming the new resource's contractual commitments under a state-sponsored Request for Proposal or similar financially binding contract. This certification process will be administered at the same time in which the FCA topology is established as outlined in Section 3 of this Planning Procedure. The certification form is available on the ISO website.

The ISO will include the new resource in its FCA reliability assessments, following receipt of the completed and executed certification form.

8.1.3 Inclusion of Potential New Capacity Supply Obligations in the Reliability Review of Demand Bids in Substitution Auctions and Annual Reconfiguration Auctions

When performing the reliability review of demand bids in a SA or reconfiguration auction, resources that would be cleared to acquire new Capacity Supply Obligation MW are modeled at the total Capacity Supply Obligation that they would attain once clearing of the auction is complete.

9.0 Non-Commercial Capacity Deferral Notifications

Non-Commercial Capacity Deferral notifications, as defined in Market Rule 1, Section III.13.3.7, like de-list bids, are reviewed in accordance with Section 7 of this procedure. The ISO will review the specific reliability need with and seek feedback from the Reliability Committee regarding the review of Non-Commercial Capacity Deferral notifications prior to the ISO making a formal determination regarding the reliability impacts of a given Non-Commercial Capacity Deferral notification where, pursuant to Section III.13.3.7 of Market Rule 1, notification to the requesting Lead Market Participant will be made within 30 days of the submission of the Non-Commercial Capacity Deferral notification.

10.0 Document History

Rev. 0 App: RC – 02/13/07; NPC – 03/02/07; ISO-NE – 03/07/07

Rev. 1: Inserted Appendix F and Updated Appendix D – 05/30/07

Rev. 2 App: RC – 08/08/07; NPC – 09/07/07; ISO-NE – 09/10/07

Rev. 3 App: RC – 12/19/07; NPC – 01/04/08; ISO-NE – 01/07/08

Rev. 4 App: RC – 04/15/08; NPC – 05/09/08; ISO-NE – 05/14/08

Rev. 5 App: RC – 11/04/08; NPC – 11/20/08; ISO-NE – 11/24/08

Rev. 6 App: RC – 06/16/09; NPC – 06/22/09; ISO-NE – 07/07/09

Rev. 7 App: RC – 01/28/10; NPC – 02/05/10; ISO-NE – 02/05/10

Rev. 8 App: RC – 06/14/10; NPC – 06/21/10; ISO-NE – 07/19/10

Rev. 9 App: RC – 02/15/11; NPC – 03/04/11; ISO-NE – 04/20/11

Rev. 10 App: RC – 09/17/12; NPC – 10/03/12; ISO-NE – 10/04/12

Rev. 11 App: RC – 02/14/13; NPC – 03/01/13; ISO-NE – 04/22/13

Rev. 12 App: RC – 03/19/13; NPC – 04/05/13; ISO-NE – 04/22/13

Rev. 13 App: RC – 06/18/13; NPC – 08/02/13; ISO-NE – 09/20/13

Rev. 14 App: RC – 06/18/14; NPC – 08/01/14; ISO-NE – 08/07/14

Rev. 15 App: RC – 08/12/14; NPC – 09/12/14; ISO-NE – 09/15/14

Rev. 16 App: RC – 12/17/14; NPC – 01/09/15; ISO-NE – 01/13/15

Rev. 17 App: RC – 05/20/15; NPC – 06/05/15; ISO-NE – 06/18/15

Rev. 18 App: RC – 07/12/16; NPC – 08/05/16; ISO-NE – 08/17/16

Rev. 19 App: RC – 10/17/17; NPC – 11/03/17; ISO-NE – 11/15/17

Rev. 20 App: RC – 03/14/18; NPC – 04/06/18; ISO-NE – 06/01/18

Rev. 21 App: RC – 08/22/18; NPC – 08/24/18; ISO-NE – 12/03/18

Rev. 22 App: RC – ; NPC – ; ISO-NE – 02/01/19

11.0 Appendix A – Assumptions Summary Table to Support Section 6 & 7

Assumptions	Calculation of the Transmission Security Analysis Requirements	Reliability Review for the primary auction of the FCA	Reliability Review for the substitution auction of the FCA	Reliability Reviews for all Annual Reconfiguration Auctions
Load Forecast Data				
Load Forecast Data	Most recent CELT forecast	Most recent CELT forecast	Most recent CELT forecast	Most recent CELT forecast
Resource Data				
Resource Data	Existing Capacity Resources as qualified as of the Existing Capacity Qualification Deadline	Existing Capacity Resources as qualified as of the FERC Informational Filing ⁵ and new resources with contractual commitments (per Section 8.1.2)	New and Existing Capacity Resources that acquired a Capacity Supply Obligation in the primary auction of the FCA and new resources with contractual commitments (per Section 8.1.2)	Cleared Capacity Supply Obligations at time of analysis (based on the outcome of latest auction)
Generating Capacity	Qualified Existing Capacity	Qualified Existing Capacity	Capacity Supply Obligation acquired in the primary auction	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
Active Demand Capacity Resources	Qualified Existing Capacity	Qualified Existing Capacity	Capacity Supply Obligation acquired in the primary auction	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
Passive Demand Capacity Resources	Qualified Existing Capacity	Qualified Existing Capacity	Capacity Supply Obligation acquired in the primary auction	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
Exports to External Areas	See footnote ¹	Qualified Administrative Exports	Cleared Administrative Exports in the primary auction	Cleared Administrative Exports
Imports from External Areas	Qualified Existing Imports	Qualified Existing Imports	Capacity Supply Obligation of Cleared Existing Imports from the primary auction	Lesser of Summer Qualified Capacity or Capacity Supply Obligation for Cleared Imports from the FCA, last annual RA
Import Capacity Resource associated with an Eligible External ETU	Qualified Existing Import Capacity Resources with Eligible External ETUs	Qualified Existing Import Capacity Resources with Eligible External ETUs	Capacity Supply Obligation of Cleared Existing Import Capacity Resources with	Lesser of Capacity Supply Obligation or Summer Qualified Capacity

Assumptions	Calculation of the Transmission Security Analysis Requirements	Reliability Review for the primary auction of the FCA	Reliability Review for the substitution auction of the FCA	Reliability Reviews for all Annual Reconfiguration Auctions
			Eligible External ETUs from the primary auction	
Resources Forced Outage Assumptions²				
Regular Generation Resources	EFORd	EFORd	EFORd	EFORd
Peaking Generation Resources	Deterministic adjustment factor of 20% ³	Deterministic adjustment factor of 20% ³	Deterministic adjustment factor of 20% ³	Deterministic adjustment factor of 20% ³
Intermittent Generation Resources	No additional availability adjustment	No additional availability adjustment	No additional availability adjustment	No additional availability adjustment
Passive Demand Capacity Resources	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor
Active Demand Capacity Resource	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor
Resource Additions and Subtractions				
Resource Additions and Subtractions	Subtraction of Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement and Permanent De-List Bids that have not elected to be reviewed for reliability pursuant to Section III.13.1.2.4.1(a)	Subtraction of Retirement De-List Bids and Permanent De-List Bids with Prices Contained in the Internal Market Monitor Retirement Determination Notifications that are at or above the FCA Starting Price and Retirement and Permanent De-List Bids that have not elected to be reviewed for reliability pursuant to Section III.13.1.2.4.1(a)	Subtraction of all cleared de-list bids (Retirement De-List Bids, Permanent De-List Bids, Static De-List Bids, Export Bids, Administrative Export De-List bids and Dynamic De-List bids) in the primary auction Addition of New Capacity Resources that acquired a Capacity Supply Obligation in the primary auction	Subtraction of known outages

Assumptions	Calculation of the Transmission Security Analysis Requirements	Reliability Review for the primary auction of the FCA	Reliability Review for the substitution auction of the FCA	Reliability Reviews for all Annual Reconfiguration Auctions
Transfer Limits				
Internal Transmission Transfer Capability⁴	N-1 and N-1-1 limits, as projected for study year	N-1 and N-1-1 limits, as projected for study year	N-1 and N-1-1 limits, as projected for study year	N-1 and N-1-1 limits, as projected for study year
External Transmission Transfer Capability⁴	N-1 limits, as projected for study year	N-1 limits, as projected for study year	N-1 limits, as projected for study year	N-1 limits, as projected for study year
Additional Load Relief from OP4 Actions				
Control-Area-to-Control-Area Emergency Transactions	No	No	No	No
Load Relief from 5% Voltage Reduction	No	No	No	No

¹ For import-constrained Capacity Zones, qualified Administrative Export De-List Bids are not taken into account during the calculation of Transmission Security Analysis requirements for the Forward Capacity Auction. The descending clock auction software used during the Forward Capacity Auction procures both the capacity required for the Administrative Export De-List Bids and the Local Sourcing Requirement for the import-constrained Capacity Zone.

² Depending on the type of analysis, these will be applied by either modeling the Resource’s Capacity at a reduced amount or by modeling equivalent discrete outage(s).

³ Subject to periodic review and update.

⁴ Published in the Regional System Plan and updated in the most recent Reliability Committee presentation regarding Step 1 of the Capacity Zone Development.

⁵ Analyses that are performed before the FERC Information Filing is published rely on the Qualified Existing Capacity known at the time of the analysis.

12.0 Appendix B

This Appendix has been intentionally left blank.

13.0 Appendix C – Sample Show of Interest Form²⁶

Part A) Show of Interest Application- New and Modified Generating Resources and Import Resources

1. Company Information

Are you an ISO New England Customer?

- Yes If yes, enter your ID#: _____, and proceed to #2.
- No If no, enter the following:

Mailing Address for Project Sponsor Company:

PO Box:

Address:

City:	State:	Zip:
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Contact Name for Project Sponsor Company:

Phone Number for Project Sponsor Company:

E-Mail for Project Sponsor Company:

²⁶ The sample Show of Interest Form is for reference only. All Show of Interest Form submittals must be made using the Forward Capacity Tracking System which may have slightly different nomenclature.

2. Project Information

ProjectType:

- GeneratingResource
 - Environmental Upgrade
 - Increase above Threshold
 - Incremental Capacity
 - New Generation < 20 MW
- Import Resource
- Carry over a previously submitted SOI
- New Generation > = 20 MW
- Reestablishment
- Repowering
- Significant Increase

Project Name:

Resource Name:

Expected Commercial Operation Date:

Project Address Information

Address:

City:

State:

Zip:

County:

Offer Review Trigger Price Group:

(Select only one of the below, as applicable)

Resource Type	Offer Review Trigger Price (\$/kW-month) ²⁷
Combustion Turbine	
Combined Cycle Gas Turbine	
On-Shore Wind	
All Other Resource Types	Forward Capacity Auction Starting Price

²⁷ Offer Review Trigger Prices will be published annually on the ISO website by no later than May 1st.

3. Capacity Information

a. Generating Resource - New Generation

GeneratorType:

- Intermittent
- Non-Intermittent

Net MW @ 90 F:	
Net MW @ 50 F:	

Net MW @ 20 F:	
Minimum Net MW @ 90 F:	

b. Generating Resource - Environmental Upgrade/Increases in Output/Reestablishment/Repowering

	Original	Change	NewTotal
Net MW @ 90 F:			
Net MW @ 50 F:			
Net MW @ 20 F:			
Minimum Net MW @ 90 F:			

c. Import Resource

Import Type:

- Backed by Existing External Generation Resource
- Backed by External Control Area
- Backed by New External Generating Resource

Summer Import MW:	
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Winter Import MW:	
-------------------	--

ExternalInterface:

- Hydro-Quebec Highgate
- NewBrunswick
- New York 1385 Cable
- New York AC Ties
- New York Cross Sound Cable
- Phase I/II HQ Excess

Crossing Intervening Control Area:

- Yes
- No

4. Generating Resource - Interconnection Information

Generator Interconnection Status

FERC Jurisdiction:

- Yes
- No
- Undetermined

Interconnection Request Submitted:

- Yes
- No

Queue Position: _____

Feasibility Study Agreement Executed:

- Yes
- No

System Impact Study Agreement Executed:

- Yes
- No

Interconnection Agreement Executed:

- Yes
- No

Interconnection Point

Substation or Transmission Line:	Voltage (kV): _____	New Transmission Line Required: <input type="checkbox"/> Yes Length (Miles): _____ <input type="checkbox"/> No
----------------------------------	---------------------	--

Project Configuration

Total Number of Units:

Prime Mover:

- | | |
|---|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Combined Cycle Total Unit <input type="checkbox"/> Combustion (Gas) Turbine <input type="checkbox"/> Fuel Cell- Electrochemical <input type="checkbox"/> Hydraulic Turbine - Conv Daily Pondage <input type="checkbox"/> Hydraulic Turbine - Conv Daily ROR <input type="checkbox"/> Hydraulic Turbine - Conv Weekly Pondage <input type="checkbox"/> Hydraulic Turbine - Reversible | <ul style="list-style-type: none"> <input type="checkbox"/> Integrated Coal Gasification Comb Cycle <input type="checkbox"/> Internal Combustion Engine <input type="checkbox"/> Other: _____ <input type="checkbox"/> Photovoltaic <input type="checkbox"/> Pressurized Fluidized Bed Combustion <input type="checkbox"/> Steam Turbine <input type="checkbox"/> Wind Turbine |
|---|---|

Primary Energy Source:

- | | |
|--|--|
| <input type="checkbox"/> Agricultural Crop Byproducts/Straw/Energy Crops | <input type="checkbox"/> Other Biomass Liquids |
| <input type="checkbox"/> Anthracite Coal and Bituminous Coal | <input type="checkbox"/> Other Biomass Solids |
| <input type="checkbox"/> Black Liquor | <input type="checkbox"/> Petroleum Coke |
| <input type="checkbox"/> Blast Furnace Gas | <input type="checkbox"/> Purchased Steam |
| <input type="checkbox"/> Coal Synfuel | <input type="checkbox"/> Residual Fuel Oil Bunker C |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 1 | <input type="checkbox"/> Residual Fuel Oil No. 6 020 |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 2 | <input type="checkbox"/> Sludge Waste |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 4 | <input type="checkbox"/> Solar |
| <input type="checkbox"/> Gaseous Propane | <input type="checkbox"/> Subbituminous Coal |
| <input type="checkbox"/> Jet Fuel | <input type="checkbox"/> Tire-derived Fuels |
| <input type="checkbox"/> Kerosene | <input type="checkbox"/> Waste/Other Coal |
| <input type="checkbox"/> Landfill Gas | <input type="checkbox"/> Waste/Other Oil |
| <input type="checkbox"/> Lignite Coal | <input type="checkbox"/> Water |
| <input type="checkbox"/> Municipal Solid Waste | <input type="checkbox"/> Wind |
| <input type="checkbox"/> Natural Gas | <input type="checkbox"/> Wood Waste Liquids excluding Black Liquor |
| <input type="checkbox"/> Nuclear Uranium Plutonium Thorium | <input type="checkbox"/> Wood/Wood Waste Solids |
| <input type="checkbox"/> Other Biomass Gas. Includes digester gas methane and other biomass gasses | |

Alternate Energy Source:

- | | |
|--|--|
| <input type="checkbox"/> Agricultural Crop Byproducts/Straw/Energy Crops | <input type="checkbox"/> Other Biomass Liquids |
| <input type="checkbox"/> Anthracite Coal and Bituminous Coal | <input type="checkbox"/> Other Biomass Solids |
| <input type="checkbox"/> Black Liquor | <input type="checkbox"/> Petroleum Coke |
| <input type="checkbox"/> Blast Furnace Gas | <input type="checkbox"/> Purchased Steam |
| <input type="checkbox"/> Coal Synfuel | <input type="checkbox"/> Residual Fuel Oil Bunker C |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 1 | <input type="checkbox"/> Residual Fuel Oil No. 6 020 |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 2 | <input type="checkbox"/> Sludge Waste |
| <input type="checkbox"/> Distillate Fuel Oil. Including Diesel. No. 4 | <input type="checkbox"/> Solar |
| <input type="checkbox"/> Gaseous Propane | <input type="checkbox"/> Subbituminous Coal |
| <input type="checkbox"/> Jet Fuel | <input type="checkbox"/> Tire-derived Fuels |
| <input type="checkbox"/> Kerosene | <input type="checkbox"/> Waste/Other Coal |
| <input type="checkbox"/> Landfill Gas | <input type="checkbox"/> Waste/Other Oil |
| <input type="checkbox"/> Lignite Coal | <input type="checkbox"/> Water |
| <input type="checkbox"/> Municipal Solid Waste | <input type="checkbox"/> Wind |
| <input type="checkbox"/> Natural Gas | <input type="checkbox"/> Wood Waste Liquids excluding Black Liquor |
| <input type="checkbox"/> Nuclear Uranium Plutonium Thorium | <input type="checkbox"/> Wood/Wood Waste Solids |
| <input type="checkbox"/> Other Biomass Gas. Includes digester gas methane and other biomass gasses | |

New Pipeline Required

- Yes Length (Miles): _____
- No

5. Project Contact Information

Project Sponsor- Project/Technical Contact:

Project Sponsor- Finance/ Credit Contact:

Other Contacts:

First Name: Last Name:

Job Title:

WorkPhone/Ext: Fax:

E-mail:

Address:

City: State: Zip:

6. Project Attachments

Site Control: _____

Plot Plan: _____

One Line Diagram: _____

7. Generator Technical Data

UnitDescription: _____

Unit Ratings:

- kVA Capacity Rating: _____
@ Degrees F: _____
- Max Turbine MW: _____
@ Degrees F: _____
- Generator Terminal Voltage (kV): _____
- Power Factor: _____
- Short Circuit Ratio: _____
- Connection (e.g. Wye): _____
- Stator Amperes at Rated kVA (A): _____
- Field Volts (V): _____

Reactance Data:

- Direct Axis Subtransient Reactance (Saturated) X''_{dv} (Per unit-rated kVA): _____
- Quadrature Axis Subtransient Reactance (Saturated) X''_{dq} (Per unit-rated kVA): _____
- Positive Sequence X/R Ratio: _____
- Positive Sequence Resistance R1 (Per unit-rated kVA): _____
- Negative Sequence Reactance (Saturated) X2 (Per unit-rated kVA): _____
- Negative Sequence Resistance R2 (Per unit-rated kVA): _____
- Zero Sequence Reactance (Saturated) X0 (Per unit-rated kVA): _____
- Zero Sequence Resistance R0 (Per unit-rated kVA): _____

Generator Step-Up Transformer Rating:

- Self-Cooled kVA Capacity Rating (kVA): _____
- Maximum Nameplate Capacity Rating: _____
- Generator Side Voltage Rating (kV): _____
- System Side Voltage Rating (kV): _____
- Generator Side Winding Connection (e.g. Wye): _____
- System Side Winding Connection: _____

Generator Step-Up Transformer Impedance:

- Positive Sequence Impedance Z_1 (% on self-cooled kVA rating): _____
- Positive Sequence X/R Ratio: _____
- Zero Sequence Impedance Z_1 (% on self cooled kVA rating): _____
- Zero Sequence X/R Ratio: _____

Part B) Show of Interest Application- New and Modified Demand Resources

1. Customer Information

Are you an ISO New England Customer?

- Yes If yes, enter your ID#: ____
- No If no, enter the following:

Mailing Address for Project Sponsor Company:

PO Box:

Address:

City: State: Zip:

Contact Name for Project Sponsor Company:

Phone Number for Project Sponsor Company:

E-Mail for Project Sponsor Company:

2. Project Information

Project Type:

- Demand Resource
- New Demand Resource
- Incremental Increase of Existing Demand Resource
- Carry over a previously submitted SOI

Project Name:

Resource Name:

FCM Participation Type:²⁸

Commercial Operation Date:

²⁸ Lead Market Participants are required to choose the FCM Participation Type upon submittal of the Show of Interest Form for On-Peak Demand Resources and Seasonal Peak Demand Resources. FCM Participation Types include FCM Participating Resource, Load Side Reduction DR, and PFP-Only DR. The FCM Participation Type is defaulted to FCM Participating Resource for Active Demand Capacity Resources and cannot be modified.

Offer Review Trigger Price Group:
 (Select only one of the below, as applicable)

Resource Type	Offer Review Trigger Price (\$/kW-month) ²⁸
Commercial and Industrial DR	
<input type="checkbox"/> Load Management and/or Previously Installed Distributed Generation	
<input type="checkbox"/> New Distributed Generation	
<input type="checkbox"/> Energy Efficiency	
Residential	
<input type="checkbox"/> Load Management	
<input type="checkbox"/> Previously Installed Distributed Generation	
<input type="checkbox"/> Energy Efficiency	
<input type="checkbox"/> New Distributed Generation	
Other Resources	
<input type="checkbox"/> All Other Resource Types	Forward Capacity Auction Starting Price

3. Capacity Information

Total Summer DRV MW: _____

Total Winter DRV MW: _____

Demand-Resource Type:

- On-Peak Demand Resource
- Active Demand Capacity Resource
- Seasonal Peak Demand Resource

Dispatch Zone:

- | | |
|--|---|
| <input type="checkbox"/> Bangor Hydro (.Z.MAINE) | <input type="checkbox"/> Norwalk – Stamford (.Z.CONNNECTICUT) |
| <input type="checkbox"/> Boston (.Z.NEMASSBOST) | <input type="checkbox"/> Portland Maine (.Z.MAINE) |
| <input type="checkbox"/> Central MA (.Z.WCMASS) | <input type="checkbox"/> Rhode Island (.Z.RHODEISLAND) |
| <input type="checkbox"/> Eastern CT (.Z.CONNNECTICUT) | <input type="checkbox"/> Seacoast (.Z.NEWHAMPSHIRE) |
| <input type="checkbox"/> Lower SEMA (.Z.SEMASS) | <input type="checkbox"/> SEMA (.Z.SEMASS) |
| <input type="checkbox"/> Maine (.Z.MAINE) | <input type="checkbox"/> Springfield MA (.Z.WCMASS) |
| <input type="checkbox"/> New Hampshire (.Z.NEWHAMPSHIRE) | <input type="checkbox"/> Vermont (.Z.VERMONT) |
| <input type="checkbox"/> North Shore (.Z.NEMASSBOST) | <input type="checkbox"/> Western CT (.Z.CONNNECTICUT) |
| <input type="checkbox"/> Northern CT (.Z.CONNNECTICUT) | <input type="checkbox"/> Western MA (.Z.WCMASS) |
| <input type="checkbox"/> Northwest Vermont (.Z.VERMONT) | |

Proposal Description:

²⁸ Offer Review Trigger Prices will be published annually on the ISO website by no later than May 1st.

4. Project Description

Measure Type:

- Distributed Generation
- Energy Efficiency
- Load Management

Customer Class:

- Commercial
- Industrial
- Other
- Residential

Single Facility >=5MW:

- Yes
- No

For Distributed Generation:

Aggregate Nameplate MW: _____
 Non Coincident Peak Load MW: _____

Facility Information (For Distributed Generation or Single Facility >= 5 MW ONLY)

Address:

City: State: Zip:

Pnode: _____ Summer MW: _____ Winter MW: _____

5. Project Contact Information

Project Sponsor-Project/Technical Contact:

Project Sponsor- Finance/ Credit Contact:

Other Contacts:

First Name: Last Name:

Job Title:

Work Phone/Ext: Fax:

E-mail:

Address:

City: State: Zip:

14.0 Appendix D – Sample De-list Application Form

De-list Application Form²⁹

1. Lead Participant Company Name: _____

2. Lead Participant ID #:

3. Resource Name:

4. Resource ID #:

5. Resource Type: Generator
 Import
 Demand Resource

6. Type of De-list Requested

- Static (general)
- Static (ambient air)
- Administrative
- Export
- Permanent
- Retirement

7. Administrative/Export Interface

- None
- New York Cross Sound Cable
- New York AC Ties
- New Brunswick
- Hydro-Quebec Phase I/II
- Hydro-Quebec Highgate

8. De-list Reason

- Potential Retirement
- Potential Deactivation
- Significant Decrease in Capacity
- Summer Capacity greater than Winter Capacity
- Reductions in Ratings Due to Ambient Air Conditions
- Other: _____

9. Requested De-list

Segment	Price (\$/kW-Month)	MW
1		
2		
3		
4		
5		

For partial Retirement De-List Bids, describe the portion of the facility being retired.

Note: List any underlying assets that are being retired in the description above.

10. Do you elect the de-list bid to be rationed? Yes No

11. Requested de-list Capacity Commitment Period: _____

12. Lead Market Participant Signature: _____

²⁹ The sample de-list bid application form is for reference only. All de-list bid application submittals must be made using the Forward Capacity Tracking System.

13. Lead Market Participant Signature Name:

14. Lead Market Participant Contact Name:

15. Lead Market Participant Contact Phone Number:

16. Lead Market Participant Contact Fax Number:

17. Lead Market Participant Contact E-mail:

15.0 Appendix E – FCM Network Topology Certification Forms

Date _____

Officer’s Statement of Critical Path Schedule Validity and Corporate Intent to Build

In accordance with Market Rule 1, Section III.12.6, this letter is a statement to ISO New England, Inc. that the critical path schedule information submitted by:

(Transmission Owner Company)

Regarding the transmission project:

(Name of transmission project)

Including all of this project’s components¹ is achievable; and that it is the intent of our company to build the proposed transmission project and its components in accordance with this schedule.²

Sincerely,

(Company’s Officer Signature)

(Company’s Officer Name)

(Company’s Officer Title)

¹ As outlined in the most recent Regional System Plan Project Listing published.

² The officer’s statement included in this document is done with the understanding that the statement shall not create any liability on the officer and that any liability with respect to the Transmission Owner’s obligations shall be as set forth in the Transmission Owner Agreement (TOA) and not be affected by such officer’s statement.

Project Name:	
Component*:	ISO Component ID*:
Transmission Owner:	Date:

#	Major task/Milestone				
1	Does the project have I.3.9 approval? (check box) If Yes, please provide I.3.9 #: If No, please provide expected approval date (MM/YY):	Y		N	
1a	Is Certification for a portion of a larger Project? (check box) If Yes, please provide study data substantiating stand-alone operation of Certified portion of Project. (A copy of a Feasibility Study is sufficient.)	Y		N	
1b	Incremental Data Requirements for each Certified Project: (Forward these items to the MOD Administrators via email at modadmin@iso-ne.com) 1. idv in PSSE v32 format modeling the Certified components of Project only 2. If Transmission Owner does not use PSSE, provide in text format necessary modeling data as follows: - Line Data: Thermal Ratings/Impedance/Line Length/To and From bus numbers and names - Transformer data: Thermal Ratings/Impedance/To and From bus numbers and names - Other changes to the model that would occur due to a Project such as terminal changes for lines/transformer/generator leads/loads etc.				

2	Siting and permitting (please list the major permits to be obtained and the responsible permitting agencies)			Start Date		End Date	
	Permitting Agency	Permit Name	Description of Permit	Month	Year	Month	Year

2a	Are there potential issues with obtaining the above permits on time? If Yes, please explain:	Y		N	
2b	Is siting required for the project? Are there potential issues with the siting process for the project? If Yes, please explain:	Y		N	
		Y		N	

3	Engineering	Start Date		End Date	
		Month	Year	Month	Year

4	Land				
4a	Purchase/Easement required? If Yes, please provide schedule:	Y		N	
		Start Date		End Date	
		Month	Year	Month	Year
4b	Is a new Right of Way required?	Y		N	
4c	Are there any wetlands or environmental issues with your project site? If Yes, please explain:	Y		N	

4d	Will the substation need to be expanded? If Yes, please explain:	Y		N	

5	Physical site work	Start Date		End Date	
		Month	Year	Month	Year
		Civil work (foundations)			
	Electrical work				

6	Major equipment delivery and testing	Ordered		Delivered		
		Month	Year	Month	Year	
		Major Equipment / System Name				

7	Energization (Please list the major components to be energized)	Start Date		End Date		
		Month	Year	Month	Year	
		MajorComponent				
		Commercial Energization Date:	Start Date		End Date	
		Month	Year	Month	Year	

*Transmission project components and components IDs are listed on the Regional System Plan Transmission Project Listing.

16.0 Appendix F – FCM Qualification Transmission Upgrade (QTU) Forms

Date: _____

Officer’s Statement on FCM Qualification Transmission Upgrade(s)

In accordance with Market Rule 1, Section III.13.1.1.2.3 and Planning Procedure 10 - Planning Procedure to Support the Forward Capacity Market (“PP10”), Section 5.10, this letter serves as a statement from _ *(Transmission Owner Company)* to ISO New England Inc. ("ISO") that, based on a good faith assessment and estimate, the following qualification transmission upgrade(s) is(are) achievable by June 1, _____. This time estimate is for use by the ISO in assisting its determinations regarding whether a new generating resource(s) may qualify for participation in a given Forward Capacity Auction and creates no new binding obligation on the executing Transmission Owning Company. Statement letters containing caveats to the feasibility of meeting the QTU in-service date will not be accepted.

(Name of qualification transmission upgrade), (Associated RSP Project ID, if applicable)

Sincerely,

(Company’s Officer Signature)

(Company’s Officer Name)

(Company’s Officer Title)

Qualification Transmission Upgrade Implementation Assessment Form

1. Description of violation:

2. For the given violation, please describe the qualification transmission upgrade (QTU) that has been identified through existing engineering analysis work to address the violation. If a QTU has not been identified, please indicate what further engineering analysis work would be needed to identify one.

3. If the QTU has been identified, please answer the following:

#	Major Tasks				
1	Is the QTU included in the Regional System Plan, Local System Plan, or Transmission Project Listing? (check box) – If Yes, please provide Component ID & description:	Y		N	
2	Has the project received I.3.9 Approval? (check box) – If Yes, please provide I.3.9 #: – If No, please provide the expected timeline for the Proposed Plan Application and the expected approval date.	Y		N	

Permitting and Siting						
3a	Please list the major permits that would need to be obtained and the responsible permitting agencies.			Approximate Timeframe Needed to Acquire		
	Permitting Agency	Permit Name	Description of Permit			
3b	Would there be potential issues with obtaining the above permits on time? If Yes, please explain below.			Y		N
	Explanation:					
3c	Is siting required for the QTU?			Y		N
3d	Are there potential issues with the siting process for the QTU? If Yes, please explain below.			Y		N
	Explanation:					

Land					
4a	Would Purchase/Easement be required?	Y		N	
4b	Would new Right of Way be required?	Y		N	
4c	Would there be any wetland or environmental issues with the project site? If yes, please explain below.	Y		N	
	Explanation:				
4d	Would the substation need to be expanded? If Yes, please explain below.	Y		N	
	Explanation:				

5	Please list the major equipment that would be required for the QTU and the approximate timeframe to deliver and test such equipment.		Approximate Timeframe		
	Major Equipment / System Name				

6	Engineering		Approximate Timeframe		
			Start Date	Duration	
	Preliminary Engineering to Support Land Acquisition & Permitting/Siting Needs				
Detailed Engineering to Support Procurement & Final Construction					

7	Approximately how long would physical site work take to complete such an upgrade?				
---	---	--	--	--	--

8	Given the above, could the QTU be implemented in time for the relevant Capacity Commitment Period? Check box and please explain below.	Y		N	
	Explanation:				

17.0 Appendix G – Elective Transmission Upgrade (ETU) Critical Path Schedule Forms

Date: _____

Officer’s Statement on Critical Path Schedule Validity and Corporate Intent to Build

In accordance with Market Rule 1, Section III.13.1.1.2.2.2(c), this letter is a statement to ISO New England Inc. that the critical path schedule information submitted by:

(ETU company)

Regarding the Elective Transmission Upgrade (ETU):

(Name of transmission project, Queue Position)

including project component(s):

(Name of project component(s), Proposed Plan Application ID(s))

is achievable; and that it is the intent of our company to build the proposed transmission project in accordance with this schedule should the resource associated with the ETU qualify and clear in the given Forward Capacity Auction.

Sincerely,

(Company’s Officer Signature)

(Company’s Officer Name)

(Company’s Officer Title)

Elective Transmission Upgrade (ETU) Critical Path Schedule Form

ETU Project Name:	
Component:	PPA ID:
Transmission Owner:	Date:

#	Major task/Milestone			
1	Does the component associated with the ETU have I.3.9 approval? (check box) If Yes, please provide I.3.9 #: If No, please provide expected approval date (MM/YY):	Y	N	

2	Siting and permitting (please list the major permits to be obtained and the responsible permitting agencies)			Start Date		End Date	
	Permitting Agency	Permit Name	Description of Permit	Month	Year	Month	Year
2a	Are there potential issues with obtaining the above permits on time? If Yes, please explain:			Y		N	
2b	Is siting required for the project component?			Y		N	
	Are there potential issues with the siting process for the project component? If Yes, please explain:			Y		N	

3	Engineering		Start Date		End Date	
			Month	Year	Month	Year
		Preliminary Engineering to Support Land Acquisition & Permitting/Siting Needs				
		Detailed Engineering to Support Procurement & Final Construction				

4	Land					
4a	Purchase/Easement required? If Yes, please provide schedule:		Y		N	
			Start Date		End Date	
			Month	Year	Month	Year
4b	Is a new Right of Way required? If Yes, please provide description and schedule including any known permits and obstacles anticipated with the purchase of the Right of Way:		Y		N	
			Start Date		End Date	
			Month	Year	Month	Year
4c	Are there any wetlands or environmental issues with the project component site(s)? If Yes, please explain:		Y		N	
4d	Will any substation(s) need to be expanded? If Yes, please provide detailed description:		Y		N	
4e	Will any new substation(s) need to be constructed? If Yes, please provide detailed description:		Y		N	

5	Physical site work	Start Date		End Date	
		Month	Year	Month	Year
		Civil work (foundations)			
	Electrical work				

6	Major equipment delivery and testing	Ordered		Delivered		Tested		
		Major Equipment / System Name	Month	Year	Month	Year	Month	Year

7	Energization (Please list the major components to be energized)	Start Date		End Date		
		Major Component	Month	Year	Month	Year
	Commercial Energization Date:		Start Date		End Date	
		Month	Year	Month	Year	

18.0 Appendix H

This Appendix has been intentionally left blank.

19.0 Appendix I – Fuel-Security Reliability Review for Forward Capacity Market (FCM)

1.0 Purpose

This appendix will establish the process and criteria for evaluating the reliability impacts of FCM (a) Retirement De-List Bids, (b) substitution auction demand bids, (c) bilateral transactions, and (d) all reconfiguration auction demand bids on system fuel security as required by Section III.13.2.5.2.5A of the Tariff. The process for this fuel-security reliability review is set out in this Appendix I to PP10.

1.1 Term and Sunset of this Appendix I

This appendix shall remain in use for the period described in Section III.13.2.5.2.5A.a of the Tariff.

2.0 Timeline and Applicability

The timeline for and applicability for fuel security reliability reviews is set out at Section III.13.2.5.2.5A.b of the Tariff.

2.1 Input Review with Stakeholders

Each year in February or March, prior to the commencement of the fuel-security reliability review for a FCA, the ISO will discuss the inputs described in Section 3 below with the Reliability Committee.

2.2 ISO Notification of Fuel-Security Reliability Review Results to the Participant

The results of the fuel-security reliability review will be quantified in an ISO issued determination notification that is issued pursuant to Section III.13.2.5.2.5A.f of the Tariff.

2.3 ISO Notification and Review of Determination with Stakeholders

The ISO determinations described in Section III.13.2.5.2.5A.f will be reviewed with stakeholders, at the Reliability Committee, in the same general timeframe that resources retained for transmission security are reviewed, as outlined in PP-10, Section 7.6.

2.3.1 50/50 Load Informational Analysis Presentation

An informational fuel-security reliability review with a 50/50 peak load forecast from the most recent CELT will also be performed in all scenarios analyzed for units retained utilizing the 90/10 peak load forecast, and included in with the materials described in this Section 2.3. This analysis is not used for unit retention determinations.

3.0 Fuel-Security Reliability Review

The fuel-security review consists of an hour-by-hour chronological simulation of the New England electric supply systems for a winter period from the beginning of December through the end of February. One of the key assumptions driving the results of the review is the amount of natural gas available for electric generation.

Natural Gas Assessment

The fuel-security reliability review models natural-gas consumption on a daily basis. The primary, independent variable is average daily temperature converted to heating degree days (HDD). Given a daily temperature, the total gas demand for Residential, Commercial and Industrial (RCI) customers is established based on updated gas demand reports and the sources for serving this gas demand are based the following:

- Gas from Pipelines – The first source utilized for natural gas comes from the pipeline supply encompassing Algonquin, Tennessee, Iroquois, and Portland Natural Gas Transmission System (PNGTS) from the west and Sable Island and Deep Panuke from the east (both assumed to be inactive in the near future).
- Satellite Liquefied Natural Gas (LNG) – On cold days with 53 HDD or more, the model assumes that injections from gas Local Distribution Company (LDC) satellite LNG storage facilities will be activated in order to support the LDC behind-the-meter operations by increasing pressures and limiting draws from pipelines in accordance with their contractual agreements and supply plans.
- Pipeline Connected LNG – Any remaining needs of the LDCs are supplied by large pipeline-connected LNG facilities such as Canaport, Distrigas and the Excelerate buoy. Depending on the assumed daily “cap” on LNG vaporization (the cap is a proxy for LNG inventory management) all of the assumed sources are prorated by the same percentage (Factor = daily cap / total vaporization capability).

Once the gas LDC demand is served, the remaining amount of natural gas for electric generation – and its supply source – can be determined. If the gas LDC demand was ‘low,’ then pipeline gas may be available for electric generators. After the pipeline gas is fully utilized, the next source of gas for electric generation would be from unused pipeline connected LNG facilities. The maximum daily amount of gas available from both classes of supply to the electric sector is then passed to the Electric Sector Dispatch Model.

Electric Sector Dispatch Model

The maximum daily amount of natural gas available to the electric power sector is allocated to each hour using a heuristic algorithm to shape the available gas. The algorithm provides more gas during the higher load hours and less gas to lower load hours with the goal of ensuring that

all of the available gas would be consumed each day before turning to other liquid fuel resources. Separate accounting is done for gas supply available from pipelines and gas supply available from pipeline connected LNG facilities.

The amount of gas available from both sources in each hour is converted to available electric MWh in each hour assuming an average conversion efficiency of 7,400 Btu/kWh. This amount of MWhs from available gas is used by the dispatch algorithm where pipeline gas is used first and then resources using gas from vaporized LNG facilities are dispatched subsequently.

Electric Sector Load

The New England electric loads used in the model are based on the loads and temperatures experienced during the winter of 2014/15. All winter hourly loads are then scaled using the ratio of the forecast 90/10 peak demand (net of Energy Efficiency) for the applicable future Capacity Commitment Period year to the observed peak in the historical benchmark year (2014/15).

Reserves

Thirty-Minute Operating Reserves and Ten-Minute Operating Reserves are being served by the distillate oil-only resources with the highest heat rates, which are the best suited to providing reserves.

Resource Availability

The fuel-security model does not assume any scheduled outages. Random unavailability due to forced outages and derates is treated by “derating” the capacity of a resource by an Equivalent Forced Outage Rate on Demand (EFORD) utilizing the ISO’s Generating Availability Data System (GADS) data as described below.

Dispatch Order

Energy to serve the load comes from dispatching the resources in an economic order reflecting winter conditions. Wind and Photovoltaics (PV) are dispatched first using profiles adjusted to reflect expected amounts of those resources as described in the Static Inputs below. Other renewables such as wood, biomass and municipal solid waste are then assumed to be dispatched next, followed by nuclear resources and then coal generators; the Seasonal Claimed Capability of these resource technologies is based from the most recent CELT report as described in the Static Inputs below. Pumped storage is dispatched next using a daily pumped storage profile used to reflect the characteristic operation of this resource by storing energy during low load periods and generating energy during the higher load periods as described below in the Static Inputs.

Next, conventional hydro-electric generation is dispatched as a constant MW amount in all hours based on average hydro conditions as described in the Static Inputs below. This is

followed by the dispatch of imports as a constant MW resource in accordance with assumptions set forth in Section A below.

Next, the aggregate natural gas only resources are dispatched on pipeline gas in each hour, subject to the hourly availability of pipeline gas MWhs. If there is remaining pipeline gas, it is used by the gas-fired, dual-fueled, combined-cycle resources to serve remaining energy demands until the gas MWhs are exhausted.

Next in the dispatch order are the natural-gas only resources that would be dispatched on pipeline-connected-LNG gas, subject to the hourly availability of pipeline-connected-LNG gas MWhs. If there is remaining pipeline-connected-LNG gas, it is used by the gas-fired, dual-fueled, combined-cycle resources to serve remaining energy demands until the pipeline-connected-LNG gas MWhs are exhausted.

If more load still needs to be served, the dual-fueled combined cycle resources that have not been previously dispatched on pipeline or pipeline-connected-LNG are dispatched on distillate oil, subject to fuel in a specific generator's associated oil tank as determined in Section A below.

Next in the dispatch order are the distillate only generators not held for reserve and residual oil generators, subject to fuel in a specific generator's oil tank determined in Section A below.

Last, the dispatch of demand response resources will be applied to the unmet energy.

Any remaining energy not served is then converted to MWhs of Operating Procedure – 4 Actions, Ten-Minute Reserve Depletion and Operating Procedure – 7 Load Shed.

The following inputs will be used when performing the fuel-security reliability reviews.

A. STATIC INPUTS

A fuel-security reliability review will utilize the following static inputs:

- i. **Peak Load:** This is calculated using the most recently available CELT Net 90/10 winter peak load (including the effects of energy efficiency) as presented to the Participants Advisory Committee (PAC) in the March timeframe, prior to the annual issuance of the CELT report on May 1.
- ii. **Winter Energy Profile:** The hourly system demand from the 2014/2015 winter will be used to create an hourly load shape by using the ratio of the CELT peak load for the relevant Capacity Commitment Period to the 2014/2015 winter peak load. The hourly temperature from the 2014/2015 winter will be used as the modeled hourly temperature.

-
- iii. **LDC Gas Demand:** Set for modeled Capacity Commitment Period with future year total forecasted LDC gas demand held constant from last known Integrated Resource Plan based on vendor-supplied information annually.
 - iv. **Pipeline Capacity:** Set for modeled Capacity Commitment Period based on vendor-supplied information annually.
 - v. **Satellite LNG facility vaporization:** Set for modeled year based on vendor-supplied information annually.
 - vi. **Oil-Only inventory levels:** Set to levels determined using the most recent December fuel surveys submitted to the ISO. Tank inventories then will be assumed to be replenished with one proxy tanker truck per hour when the reorder level is reached. The reorder level is provided using the most recent fuel survey.
 - vii. **Resource Seasonal Claim Capability:** The winter Seasonal Claimed Capability (MW) from the most recently published CELT report for all Existing Generating Capacity Resources qualified for the instant FCA and energy-only generators active in ISO New England markets. For non-commercial Existing Generating Capacity Resources that are not in the CELT report, the fuel-security reliability review will use the resource's winter Qualified Capacity.
 - viii. **PV Forecast:** The PV Forecast-Nameplate, year of analysis, and the sum of Markets Total Cumulative and Behind-the-Meter Total Cumulative values from the most recently available CELT report.
 - ix. **Wind Resource Nameplate:** Based on the most recently available CELT report and Existing Generating Capacity Resources with a Primary Fuel Type = WND, where the sum of the Nameplate (MW) values will be used.
 - x. **Sun Profile:** The ISO will use the observed hourly profile from the winter of 2014/2015, adjusted to reflect the expected performance of the fleet assumed in service in the study year, and updated annually.
 - xi. **Onshore Wind Profile:** The ISO will use the observed hourly profile from the winter of 2014/2015, adjusted to reflect the expected performance of the fleet assumed in service in the study year, and updated annually.
 - xii. **Offshore Wind Profile:** The ISO will use an hourly profile reflecting the expected performance of the fleet assumed in service in the study year as though it had been in operation in the winter of 2014/2015, and updated annually.
 - xiii. **Demand Response Resources:** The winter Seasonal Claimed Capability (MW) reduction value from active Demand Response Resources.

- xiv. **EFORd:** The ISO calculated Equivalent Forced Outage Rate on Demand (EFORd) utilizing the ISO's Generating Availability Data System (GADS) data. EFORd will be applied to Seasonal Claimed Capability, vii above, in the same manner it is applied for ICR and related values calculations.
- xv. **OP-4 Action MW:** Estimated hourly MW relief for each action of OP-4.
- xvi. **Export De-List Bids and Administrative Export Bids:** Resource capacity associated with Export De-List Bids and Administrative Export Bids qualified for the instant FCA will not be included as capacity available to ISO to meet internal New England load, and these bids will not be modeled.
- xvii. **Pumped Storage:** Set to levels using a daily pumped storage profile used to reflect the characteristic operation of this resource by storing energy during low load periods and generating energy during the higher load periods.
- xviii. **Conventional Hydro-Electric Generation:** This resource is dispatched at an hourly output based on the weighted average hydro Capacity Factor calculated using the latest 5-year NERC EFORd Capacity Factor Class Averages for HYDRO 1-29 and HYDRO 30 Plus.

B. VARIABLE INPUTS:

The fuel-security reliability review will consider the following variable inputs:

- i. **Imports:** Imports for this review will be defined as the total net flow across the NY-NE, NB-NE and HQ-NE interfaces. The values are set at 2,800 MW, 3,000 MW, and 3,500 MW and will be utilized in separate scenarios.
- ii. **LNG Injections:** LNG injections for this review will be defined as the total LNG injected into the pipeline transmission system by the region's three available LNG facilities, Canaport, Distringas and Buoy. The values are set at 0.8 Bcf, 1.0 Bcf and 1.2 Bcf and will be utilized in separate scenarios.
- iii. **Dual-Fuel resource tank inventory:** Dual-Fuel resource tank inventory for this review will be defined as a multiplier for the onsite fuel-storage tank of the individual resource. The values are set at 1.25 and 2 and will be utilized in separate scenarios. When the value is set to 1.25, the onsite available fuel for the individual resources will be set to 125% capacity of the individual resources' tanks at the start of the analysis. When the value is set to 2, the onsite available fuel for the individual resources will be set to 200% capacity of the individual resources' tanks at the start of the analysis.

The variable inputs in this section can be changed based upon historical trends, new infrastructure, fuel surveys and as the ISO deems necessary, and the information will be provided to the Reliability Committee in accordance with section 2 above.

C. SYSTEM MODEL STARTING POINT

The model will include all new resources that have a binding and enforceable contract under a state procurement to be in-service by the December 1 of the associated Capacity Commitment Period that, by the time the fuel-security reliability review is conducted, have submitted the certification described in Section 10 of PP10, pursuant to Section 4.1(f) of Attachment K to Part II of the Tariff. The model will take into consideration any obligation(s) to operate under these contracts, or lack thereof, regarding energy deliveries specific to winter stress conditions being reviewed for fuel security.

Table 1

Timetable for ISO Notification to Include Resources in the Fuel Security Reliability Review

Date	CCP13 2022-2023	CCP14 2023-2024	CCP15 2024-2025	Submission of Certification of Contractual Commitment from Resources Being Built in Accordance with Attachment K to the ISO*
Receipt of FERC order for FCA 13				Sep-15-18
Feb-19	FCA			Jan-15-19
Feb-20		FCA		Jan-15-19
Jun-20	ARA1			Apr-15-20
Feb-21			FCA	Jan-15-20
Jun-21		ARA1		Apr-15-21
Aug-21	ARA2			Jun-15-21
Mar-22	ARA3			Jan-15-22
Jun-22			ARA1	Apr-15-22
Aug-22		ARA2		Jun-15-22
Mar-23		ARA3		Jan-15-23
Aug-23			ARA2	Apr-15-23
Mar-24			ARA3	Jan-15-24

* If the notification to ISO indicates the contract for the resource is pending regulatory approval of the state's review, the ISO will require an update 5 business days prior to the auction or prior to the retirement de-list bid deadline that the pending contracts have been approved. If the notification timeline is not met, the resources will be removed from the model for the given auction for fuel-security reliability review.

D. ORDER OF REVIEW

Bids reviewed for fuel-security will be reviewed in the order prescribed by Section III.13.2.5.2.5A.d of the Tariff.

E. RESULTS OF THE FUEL-SECURITY RELIABILITY REVIEW

The fuel-security reliability review results will document the following metrics per scenario:

- OP-4 Action 1 MWh
- OP-4 Action 1 Hours
- OP-4 Actions 2-5 MWh
- OP-4 Actions 6-11 MWh
- 10 - Minute Reserve Depletion MWh
- 10 - Minute Reserve Depletion Hours
- 10 - Minute Reserve Depletion less than 700 MW in Hours
- OP-7 Action: Load Shedding MWh
- OP-7 Action: Load Shedding Hours
- OP-7 Action: Load Shedding Individual Days

Hourly curves profiling the MWh of OP-4 Actions and OP-7 Actions across the applicable analyzed winter period will also be documented.

4. Reliability Need for a Generator Based on Fuel-Security Reliability Review Results

The ISO New England fuel-security reliability review standard is set out at Appendix L of Section III of the Tariff. Results from the testing described in this Planning Procedure 10, Appendix I will be measured against the trigger set out in that Appendix L.