

**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”)
- ISO New England Planning Procedure No. 3 (PP3): Reliability Standards for the New England Area Bulk Power Supply System
- ISO New England Planning Procedure No. 5-1 (PP5-1): Procedure for Review of Governance Participant’s Proposed Plans
- ISO New England Planning Procedure No. 5-3 (PP5-3): Guidelines For Conducting And Evaluating Proposed Plan Application Analyses
- ISO New England Planning Procedure No. 5-6 (PP5-6): Scope of Study for System Impact Studies Under the Generation Interconnection Procedures
- ISO New England Operating Procedure No. 4 (OP4): Action During a Capacity Deficiency
- ISO New England Operating Procedure No. 14 (OP14): Technical Requirements for Generators, Demand Resources and Asset Related Demands
- ISO New England Operating Procedure No. 17 (OP17): Load Power Factor Corrections
- ISO New England Operating Procedure No. 19 (OP19): Transmission Operations

## System Planning Activities Conducted to Support the Forward Capacity Market

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## **Planning Procedure to Support the Forward Capacity Market**

### **1 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, other than imports, 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. 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 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. Analysis of overlapping impacts is required for new and expanded external interface capability. Also, de-list bids seeking participation in either an FCA or an Annual Reconfiguration Auction, or requests for Capacity Supply Obligation Bilateral transactions, 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.

### **2 Timeline**

Network topology development and power system base case development will be performed in preparation for each FCA, Annual Reconfiguration Auction and Annual CSO (Capacity Supply Obligation) Bilateral transaction window in accordance with the procedures outlined in this document. A load forecast for the New England Control Area, States, Capacity Zones, 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.

Initial interconnection analysis for New Generating Capacity Resources and new active Demand Resources is initiated by the submittal of a Show of Interest by the Project Sponsor. Show of Interest applications will be due thirteen months prior to the FCA.

De-list bids must also submit qualification materials to the ISO. De-list bids, other than Dynamic De-list bids, must be submitted to the ISO by the Existing Capacity Qualification deadline, which is nine months before the FCA.

The following timeline 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**

Activity	-15M	-14M	-13M	-12M	-11M	-10M	-9M	-8M	-7M	-6M	-5M	-4M	-3M	-2M	-1M	+1M
Network Model Topology Update	█	█		█												
Potential Capacity Zones & Transfer Limits			█	█	█											
Load Forecast Development			█	█	█	█										
Transfer Limits for RC Review (Output from ISO)						◆										
Installed Capacity Requirement Analysis							█	█	█	█	█	█	█			
ISO Files Zones/ICR/LSR @ FERC													◆			
Show of Interest Applications (Input to ISO)		█														
Review & Accept Show of Interest Applications		█	█													
Develop project models			█	█												
Review Direct Connect			█	█												
Perform Short Circuit Analysis																
Perform Initial Interconnection Analysis																
Perform Overlapping Impacts Analysis																
Input from Transmission Owners re. New Capacity Qualification Determination (Output from ISO)																
De-List Applications (Input to ISO)																
De-List Reliability Analysis																
Notification of de-list rejected for reliability																◆

Forward Capacity Auction

**3 Submittal, Review and Qualification of Transmission Projects**

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

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

- At the start of the model build-up period, the ISO shall provide the Transmission Owners with:
- a) The initial network model, which only includes transmission infrastructure that is already in service at the time of the start of the model build-up,
  - b) A subset of the most current Regional System Plan (“RSP”) project listing, which, in addition to the initial network model is deemed, by the ISO, adequate to build the updated network model. This “preliminary list” of projects lists both the major projects under consideration and their detailed components.

Each Transmission Owner shall review the “preliminary list” and add or delete projects and/or project components 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.

As a result of this step a “revised list” is populated.

For each major project listed on the “revised list”, the responsible Transmission Owner(s) shall provide the ISO with the detailed information described below, only if that information was never provided as part of the network model update of a prior FCA or Annual Reconfiguration Auction.

For each major project, 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 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,
- Incremental data needed to update the initial network model. This data should be adequate for modeling the project in load-flow, short-circuit and stability databases.

This detailed information shall be delivered to the ISO no later than thirty calendar days after the delivery by the ISO of the initial network model and “preliminary list” to the Transmission Owners.

After reception of the above information, the ISO will review the most up-to-date Critical Path Schedules and Statement Letter submitted for each major project of the “revised list” 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.

### **3.2 Continuous updating of the Critical Path Schedules provided to the ISO**

Twice a year, at the request of the ISO, the Transmission Owners shall review and update, as appropriate, all Critical Path Schedule and modeling information that has been provided to the ISO under the process described in section 3.1. The ISO shall request such review in conjunction with each request for Critical Path Schedules as outlined in section 3.1.

Any updates or changes to the Critical Path Schedule information, including changes to individual milestone dates, should be accompanied by an updated Statement Letter to the corrected schedule.

#### **4 Transmission Interface Limit Analysis**

Transmission Interface Limits will be calculated for internal and external interfaces using the network model, updated as described above. These transmission limits may be used for:

- a) Determining the maximum amount of tie benefits that may be used within the calculation of the Installed Capacity Requirements, Local Sourcing Requirements and Maximum Capacity Limits;
- b) Calculating the Local Sourcing Requirements and Maximum Capacity Limits within New England;
- c) Calculating the amount of Import Capacity Offers that can be accepted for purposes of meeting capacity requirements;
- d) Calculating the amount of Export Capacity Bids that can be accepted within the capacity auctions; and
- e) Conducting all analyses described within this procedure.

In order to calculate these limits, thermal, voltage and stability studies are updated consistent with the following criteria and conditions.

##### **4.1 Criteria**

The following criteria will be used when conducting transfer/interface limit analysis:

- Thermal Analysis
  - Normal Rating – no contingency
  - LTE rating – for contingencies
  - STE rating – for contingencies where loading can be reduced below LTE within 15 minutes
- Voltage Analysis
  - Consistent with Transmission Owners' Voltage Criteria
- Stability Analysis
  - Consistent with section 3.1 of PP-3 and Stability Task Force Guidelines
- Contingencies
  - All single-element contingencies and multiple-element contingencies as described in PP-3 Section 3.1.

##### **4.2 Conditions**

The following base case conditions will be used to calculate transfer and interface limits:

- Transmission Topology
  - The analysis will use the updated transmission topology as discussed in Section 3
- Load level for States, Capacity Zones, and sub-areas

- Steady-State (Thermal & Voltage): most recent approved 90/10 Forecast  
Stability: light load levels (45% most recent approved 50/50 Forecast)
- Load Power Factors
  - As found in most recent Load Power Factor surveys performed pursuant to OP-17, and modeled in aggregate for the zones used in the surveys
- Generator Capability
  - MW capability based on Summer Claimed Capability (most recent approved CELT) MVAR capability modeled pursuant to OP-14
- External Study Transfers
  - Multi-year existing import contracts
  - Where appropriate, assuming simultaneous imports from directly connected Control Areas up to<sup>1</sup> the level of tie benefits as calculated in the most recent tie benefits study that may be assumed over the applicable interface
- Internal Study Transfers
  - Internal transfers, other than the interface being studied, shall be at simultaneously achievable transfer limits where appropriate
- Generator Discrete Outages
  - Largest generating unit or generating unit with the most negative impact inside an importing area reduced first as part of the simulated transfer

## **5 Analysis of New Capacity Resources**

Any New Generating Capacity Resource has a number of potential transmission planning impacts, as described in Table 2, 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) 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 seeking qualification for the FCA, other than imports seeking to qualify as Import Capacity Resources using existing importing interfaces. Table 2 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, including changes to Existing Capacity if appropriate, are studied under the L/SGIP. Analysis of New Generating Capacity Resources does not bypass the L/SGIP. Accordingly, all New Generating Capacity Resources must complete the L/SGIP before becoming interconnected.

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<sup>1</sup> 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.



**Table 2: New Generating Capacity Potential Impacts and Interconnection Analysis Scope**

<b>FCM Market Element</b>	<b>Interconnection Analysis under FCM</b>	<b>Potential System Impact Scope of Analysis Required before the project can Interconnect</b>
<b>New Generating Capacity Resources – Never Previously Listed</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Other studies as required by the System Impact Study process</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity Resources - Capacity Addition to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts (for amounts above CNRC)</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal,</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Other studies as required by the System Impact Study process</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity Resources - Re-powering Modification to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts (for amounts above CNRC)</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal (if greater MW)</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Other studies as required by the System Impact Study process</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity Resources – Modifications to comply with Environmental Regulations</b>	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 Resources is described in Section 5.7.4.

## **5.1 Interactions in the Review of New Generating Capacity Resources and De-list Bids**

Interactions in the review of New Generating Capacity Resources and De-List bids are discussed in Section 9 of this procedure.

## **5.2 General Conditions for the analysis of New Generating Capacity Resources 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<sup>2</sup>.
- Existing generation
  - For the initial interconnection analysis under NCIS, existing generation will be modeled at up-to the established Network Resource Capability (NR Capability).
  - For the overlapping impacts analysis under CCIS, existing generation will be modeled at up-to the established Capacity Network Resource Capability (CNR Capability).
- Queued generation assumptions
  - Criteria for including queued generation (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, where appropriate.
- Generation retirement
  - Retired generation will not be modeled as existing in the base-case after the date for which the retirement takes effect.
- Generation de-lists
  - Generation 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.

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<sup>2</sup> 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.

- Demand Resources
  - Starting with the qualification review for the fifth Forward Capacity Auction for Capacity Commitment Period beginning June 1, 2014, Existing Demand Resources will be modeled in the base-case.
- Contingencies
  - All single-element contingencies and multiple-element contingencies as described in PP-3 Section 3.1.
  - 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.

### **5.3 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.

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.

### **5.4 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 as appropriate, the ISO will review the feasibility of connecting the proposed New Generating 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, 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 5.9 contains supplemental guidelines for determining if a transmission upgrade could or could not be upgraded in time for the Capacity Commitment period.

## 5.5 Location Determination for New Generating Capacity Resources

Using the information contained within the Show of Interest form including the information provided pursuant to an active Interconnection Request under the L/SGIP as appropriate, the ISO will determine the zonal location for New Generating Capacity Resources. New Generating Capacity Resources 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 Section 3 of PP3 “Reliability Standards for the New England Area Bulk Power Supply System”.

## 5.6 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, as appropriate, initial interconnection analysis is performed consistent with criteria and conditions described in ISO New England Planning Procedure No. 5-6 (PP5-6): Scope of Study for System Impact Studies Under the Generator Interconnection Procedures. For the proposed New Generating Capacity Resource, 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, 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 Sections 3.2, 3.3 and 4 of PP3: “Reliability Standards for the New England Area Bulk Power Supply System” (the “Reliability Standards”) 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, 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, 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 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 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 5.6.1 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. If such analysis determines that violations occur for a proposed New Generating Capacity Resource 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 5.9 contains supplemental guidelines for determining if a transmission upgrade could or could not be upgraded in time for the Capacity Commitment Period.

#### 5.6.1 Detailed Methodology for Initial Interconnection Analysis under the Network Capability Interconnection Standard

##### 5.6.1.1 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 “study generator.” 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 case<sup>3</sup> and then determining which monitored elements have the potential to overload due to the addition of a study generator.

Using the list of existing generators in New England, the NCIS screen sorts the list of generators from highest positive distribution factor (DFAX) 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 generator is included in the model in this step of the screen to ensure that cases are identified where the study generator 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.

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<sup>3</sup> The base case is developed in accordance with Section 3 and Section 5.2 of this procedure.

### 5.6.1.2 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 generator.

The percent loading on each monitored element is determined without the generator 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 generator under study to the base reference loading. The additional loading caused by the study generator is calculated based on a transfer from the study generator to the next available helper generator. If all helper generation was already reduced as part of the base reference transfer then additional loading caused by the study generator 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 generator has passed this test.

If any monitored elements are overloaded after the addition of the study generator, 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 generator 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 generator. Thus, the unique dispatch is tested against monitored elements that were listed as potential overloads in the NCIS screen associated with the study generator.

## **5.7 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 as appropriate, the analysis of overlapping interconnection impacts under FCM is intended to determine if a proposed New Generating Capacity Resource or new active Demand Resource provides

incremental capacity to the system in manner that meets CCIS established in the L/SGIP. This means that proposed New Generating Capacity Resource will be qualified at the level at which it can operate without re-dispatch of other capacity resources as described in Section 5.7.1. New Demand Resources will be analyzed in accordance with Section 5.7.4.

#### 5.7.1 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. The CNR Group Study shall include: (i) all Interconnection Requests for CNR Interconnection Service that have submitted 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 Generating Facilities (Long Lead Facilities), in accordance with Section 3.2.3 of the LGIP.

Study generators will be included in the analysis based on their Queue Position in the interconnection queue, as determined pursuant to the L/SGIP. For example, if the study generator is the fifth in the interconnection queue, the generators that have a higher interconnection Queue Position that are seeking qualification for the same FCA will be included within the analysis.

##### 5.7.1.1 Testing and Re-dispatch Restriction

The percent loading on each monitored element<sup>4</sup> is determined without the study generator. 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 reaches a loading of 100% or when all harmer generation with a distribution factor of 3% or above have been turned on at up-to their established CNR Capability in the case of an existing generator or at the requested CNR Capability 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 generator to the base reference loading. The additional loading caused by the study generator is calculated based on a transfer from the study generator 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.

##### 5.7.1.2 Transfer Level Test Conditions

In order to determine the base dispatch within the Load Zone under study, the generators will be dispatched in a manner that reasonably stresses the system. Existing generation that has not permanently de-listed in a previous FCA will be modeled at up-to its CNR Capability. Internal

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<sup>4</sup> As defined in Planning Procedure No. 10, Section 5.6.1

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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 ranging 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.

#### 5.7.1.3 Upgrade Identification

For each dispatch that is simulated above, when the study generator is delivering its output to the Load Zone to which it is interconnecting, the list of those overloads that resulted from the addition of the study generator and any overloads that were worsened due to the addition of the study generator will be recorded. The study generator will be responsible for such recorded overloads within the Load Zone to which it is electrically interconnected and such recorded overloads within a neighboring Load Zone but will not be responsible for increasing the transfer capabilities of interfaces that form the boundaries between existing Load Zones.

#### 5.7.2 Qualified New Generating Capacity Resources and Conditional Qualified New Generating Capacity Resources

If the analysis determines that violations occur for a proposed New Generating 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. Section 5.9 contains supplemental guidelines for determining if a transmission upgrade could or could not be upgraded in time for the Capacity Commitment period.

If the ISO determines that because of overlapping interconnection impacts, New Generating Capacity Resources 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, with priority given to resources that entered the queue earlier.

Starting with the fourth FCA, a New Generating Capacity Resource 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 Generating Capacity Resource.

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

The ISO shall complete a restudy of the applicable Interconnection Studies to determine the cost responsibility for facilities and upgrades necessary to accommodate the Interconnection Request



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based on the results of the FCA or Reconfiguration Auction or CSO Bilateral transaction through which the generator received a Capacity Supply Obligation.

The restudy (to be conducted in accordance with the L/SGIP for the purposes of determining the 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 or CSO Bilateral transaction and (ii) Long Lead Facilities, as provided in Section 3.2.3 of the LGIP. Study generators will be included in the analysis based on their Queue Position in the L/SGIP interconnection queue.

Note that the provisions of the L/SGIP are used to determine the upgrades required to meet the Network Capability Interconnection Standard. However, as a result of the restudy, upgrades associated with earlier/higher-queued Generating Resources may need to be advanced, in accordance with the provisions of Construction Sequencing, by the study generator 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.

#### 5.7.4 Detailed Methodology for the Overlapping Interconnection Impact Analysis of New Demand Resources

Starting with the qualification review for the fifth Forward Capacity Auction for Capacity Commitment Period beginning June 1, 2014, new active Demand Resources<sup>5</sup> will be analyzed for overlapping interconnection impacts. New On-Peak Demand Resources and New Seasonal Peak Demand Resources (both “passive” Demand Resources) will not be analyzed for overlapping interconnection impacts.

Using the methodology contained in Section 5.7.1, 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 Resources within that Dispatch Zone will be qualified to participate in the FCA (or applicable Annual Reconfiguration Auctions or Capacity Supply Obligation Bilateral Transactions). To the extent that the new active Demand 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 Resource shall qualify under the provisions of this section.

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<sup>5</sup> Active Demand Resources include Real-Time Emergency Generators and Real Time Demand Resources as defined in ISO Tariff Section III – Market Rule 1. Passive Demand Resources include On-Peak Demand Resources and Seasonal Peak Demand Resources as defined in ISO Tariff Section III – Market Rule 1.

Using the methodology contained in Section 5.7.1, any individual new active Demand 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 or Capacity Supply Obligation Bilateral Transactions). To the extent that the new active Demand 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 Resource shall qualify under the provisions of this section.

### **5.8 New Generating Capacity Resources seeking Qualification to submit a Supply Offer for an Annual Reconfiguration Auction or a Capacity Supply Obligation Bilateral Transaction**

New Generating Capacity Resources 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 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 generator 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 or a CSO Bilateral transaction.

### **5.9 Supplemental Guidelines for determining if a Transmission Upgrade could or could not be implemented in time for the Capacity Commitment Period**

When analyzing New Generation Capacity within New England under Section 5 of this Planning Procedure 10, in determining whether a Transmission Upgrade could or could not be implemented in time for the relevant Capacity Commitment Period, the ISO will consider as appropriate and after consultation with the involved Project Sponsor and Transmission Owner, 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

Project types frequently identified as required upgrades to interconnect generation 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 of a generator 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

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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”.

### **5.10 Imports**

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.

### **5.11 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.

## **6 Transmission Security Analysis Requirement**

Prior to each FCA, the ISO shall determine the capacity requirement of each import-constrained Load Zone or import-constrained subdivision of a Load 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 7.1 and Appendix A of this procedure.

## **7 Analysis of De-List Bids, Demand Bids and Non-Price Retirement Requests**

Using the information provided in the de-list bid (Permanent De-List Bid, Static De-List Bid, Export Bid, and Administrative Export De-list Bid) or Non-Price Retirement Request application and prior to the FCA, the ISO will analyze the thermal, voltage<sup>6</sup> and, if appropriate, stability, reliability impacts of de-list bids and Non-Price Retirement Requests. Appendix B contains the Non-Price Retirement Request form. A sample de-list bid application form is contained in Appendix D. A fully completed de-list bid or Non-Price Retirement Request application is due by the pertinent FCA deadline, as outlined in Market Rule 1.

During the FCA, the ISO will analyze the thermal, voltage<sup>6</sup> and (to the extent possible and if appropriate) stability, reliability impacts of submitted Dynamic De-List Bids.

During the Annual Reconfiguration Auction, the ISO will analyze the thermal, voltage<sup>6</sup> and (to the extent possible and if appropriate) stability, reliability impacts of submitted demand bids.

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<sup>6</sup> Assuming the unit’s VAR capability is not reduced, it is assumed that there is no voltage impact for a partial de-list.

## 7.1 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 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 FCA. 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.
  - New Capacity Resources that are contractually bound through a Request For Proposal (“RFP”)<sup>7</sup> 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.
- Contingencies
  - All single-element contingencies and multiple-element contingencies as described in OP-19 Section II.A.2 will be considered.
  - The occurrence of two contingencies (N-1-1) will be considered where appropriate.
- 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.
- One critical resource in the electrical vicinity of the resource associated with the de-list

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<sup>7</sup> Under Attachment K, section 4.2(a) of the ISO New England Inc. Open Access Transmission Tariff

bid under review will be assumed out of service.

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

## **7.2 Minimum MW Quantity Threshold**

No analysis is required to assess the individual impact of a de-list bid, demand bid or Non-Price Retirement Request<sup>8</sup> with a MW quantity smaller than 5 MW. However, analyses may be conducted to assess the cumulative impact of such de-list bids, demand bids or Non-Price Retirement Requests, in conjunction with other de-list bids, demand bids or Non-Price Retirement Requests.

## **7.3 Order of Review**

### **7.3.1 Non-Price Retirement Requests**

Non-Price Retirement Requests will be reviewed in the order in which they are received by the ISO and will be reviewed prior to any de-list bid submitted for the same Capacity Commitment Period.

### **7.3.2 De-list Bids for a Forward Capacity Auction**

In analyzing de-list bid(s), the study will first “turn off” all Non-Price Retirement Requests and higher priced de-list bids<sup>9</sup> that have not been denied for reliability reasons; then, the de-list bid under study is “turned off”.

If several de-list bids are submitted at the same price, the ISO will “turn off” de-list bids in an order that will seek to maximize the aggregate quantity that can be de-listed.

In the case that several de-list bids from a single station are submitted at the same price, the ISO will “turn off” de-list bids in an order that will seek to provide [1] the least cost capacity solution and [2] the minimum aggregate quantity required for reliability from the station. The least cost capacity solution will be based on Section III.13.2.5.2.5.1 (e) of Market Rule 1.

### **7.3.3 Demand Bids for an Annual Reconfiguration Auction**

For an Annual Reconfiguration Auction, demand bids will be reviewed in the order prescribed

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<sup>8</sup> In the case of an entire resource Non-Price Retirement Request, the MW quantity to be analyzed is equal to the Resource’s Summer Qualified Capacity for the FCA which the Non-Price Retirement Request was submitted. For a partial Non-Price Retirement Request, the MW quantity to be analyzed is equal to the Resource’s Summer Qualified Capacity for the FCA which the Non-Price Retirement Request was submitted minus the new summer Capacity Network Resource Capability as requested within the Non-Price Retirement Request application.

<sup>9</sup> Export Bids and Administrative Export De-list Bids will be “turned off” at the point of export, i.e. they will be modeled as an incremental amount of export on the interface supporting the export.

by section III.13.4. of Market Rule 1.

#### **7.4 De-list Bids and Non-Price Retirement Requests Rejected for Reliability**

Following each FCA, pursuant to section III.13.2.5.2.5 of Market Rule 1, the ISO will re-evaluate any and all de-list bids and Non-Price Retirement Requests rejected for reliability reasons to determine if any of the de-list bids or Non-Price Retirement Requests can be accepted 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 and Non-Price Retirement Requests will be re-evaluated in the order that was used in the initial review and described in section 7.3 of this procedure.

#### **7.5 Stakeholder Review**

The ISO will consult with the impacted Transmission Owners before finalizing the review of each de-list bid and Non-Price Retirement Request.

##### **7.5.1 De-list Bid Request**

Studies to evaluate a de-list bid request 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 Permanent De-List Bid requests, the joint scoping process involving the ISO and the Transmission Owners and described in section 7.5.2 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 Permanent and Static De-List Bid and Export Bid requests 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.

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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.

### 7.5.2 Non-Price Retirement Request

Within two weeks after receiving a Non-Price Retirement Request, the ISO will provide written notice to each affected Transmission Owner and the Reliability Committee.

For resources submitting a Non-Price Retirement Request that would require analysis under section 7.2 of this procedure or at the specific request of any affected Transmission Owner or the Reliability Committee, the following steps will be taken. The ISO will arrange a meeting with the affected Transmission Owners to discuss and attempt to reach consensus on 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 Non-Price Retirement 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. The ISO will provide the affected Transmission Owners a draft determination report within a reasonable period of time prior to the Reliability Committee meeting at which Non-Price Retirement Request will be subject to an advisory vote.

The affected Transmission Owners will communicate their opinion regarding the determination assessment of Non-Price Retirement Requests 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 Non-Price Retirement 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 Non-Price Retirement 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 Non-Price Retirement Requests prior to the ISO making a formal determination regarding the reliability impacts of a given Non-Price Retirement Request where, pursuant to Section III.13.2.5.2.5.(a)(i) of Market Rule 1, notification to the requesting Lead



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Market Participant will be made within 90 days of the submission of the Non-Price Retirement Request.

## **8 Analysis of Capacity Supply Obligation Bilaterals**

A completed CSO Bilateral request must be received by the ISO no later than the pertinent FCM CSO Bilateral transaction deadline. CSO Bilaterals will be reviewed in the order prescribed in Market Rule 1, Section III.13.5. The Capacity Transferring Resource will be reviewed in accordance with sections 7.1 and 7.2 of this procedure and with the Capacity Acquiring Resource included.

## **9 MW Proration Review**

MW proration elections, as defined in Market Rule 1, Section III.13.2.7.3 (b), like de-list bids, are reviewed in accordance with section 7 of this procedure. Prorated MWs for each cleared Resource are “turned off” in an order that will seek to maximize the aggregate quantity that can be pro-rated. If more than one solution can maximize the aggregate quantity that can be pro-rated and a group of resources is at a tie, no resource within that group will be allowed to prorate their MW.

## **10 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 and potential cumulative impact of de-lists will be studied separately and independently from New Capacity Resources. With the exception of the Attachment K certification of New Capacity Resources described in the following paragraphs, no interaction and interdependence between de-lists and New Capacity Resources is considered.

Under Attachment K, Section 4.2(a) of the Open Access Transmission Tariff ("OATT"), the ISO is required to 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 4.2(a) requires a written statement confirming the new resource's selection or assumption of its contractually binding obligations.

In preparation for a FCA, and to update the basic assumptions for all analysis related to the ISO's transmission planning process, the ISO will request that all resources that submitted a New Capacity Resource offer below  $0.75 * \text{CONE}$ , where CONE is the Cost of New Entry and further defined in Section III.13 of the Tariff, to provide the information necessary to implement Attachment K, Section 4.2(a).

The Project Sponsor shall complete and execute a certification of contractual commitment, confirming the new resource's contractual commitments under a state-sponsored Request for Proposal or similar financially binding contract. The ISO will include the new resource in its

planning process, including the FCA reliability assessments, following receipt of this Certification.

### **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 – ; 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

**Appendix A – Assumptions Summary Table to Support Section 7**

<b>Assumptions</b>	<b>Calculation of the Transmission Security Analysis Requirements</b>	<b>Reliability Review for the FCA</b>	<b>Reliability Reviews for all Annual Reconfiguration Auctions and Annual CSO Bilaterals</b>
<b>Load Forecast Data</b>	Most recent CELT forecast	Most recent CELT forecast	Most recent CELT forecast
<b>Resource Data</b>	Existing Capacity Resources as qualified as of the Existing Capacity Qualification Deadline	Existing Capacity Resources as qualified as of the FERC Informational Filing and qualified New Capacity Resources with RFP-contractual obligation(s)	Cleared Capacity Supply Obligations at time of analysis (based on the outcome of latest auction and/or bilateral window)
<b>1) Generating Capacity</b>	Qualified Existing Capacity	Qualified Existing Capacity	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
<b>2) Active Demand Resources (including RT-EG)</b>	Qualified Existing Capacity	Qualified Existing Capacity	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
<b>3) Passive Demand Resources</b>	Qualified Existing Capacity	Qualified Existing Capacity	Lesser of Capacity Supply Obligation or Summer Qualified Capacity
<b>4) Exports to External Areas</b>	Qualified Administrative Exports	Qualified Administrative Exports	Cleared Administrative Exports
<b>5) Imports from External Areas</b>	Qualified Existing Imports	Qualified Existing Imports	Lesser of Summer Qualified Capacity or Capacity Supply Obligation for cleared Imports from the FCA, last annual RA and/or latest bilateral window
<b>Resources Forced Outage Assumptions</b> *			
<b>1) Regular Generation Resources (non Peaking, non Intermittent, non DR)</b>	EFORd	EFORd	EFORd
<b>2) Peaking Generation Resources</b>	Deterministic adjustment factor of 20%**	Deterministic adjustment factor of 20%**	Deterministic adjustment factor of 20%**
<b>3) Intermittent Generation Resources</b>	No additional availability adjustment	No additional availability adjustment	No additional availability adjustment
<b>4) Passive Demand Resources</b>	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor
<b>5) Active Demand Resources (including RT-EG)</b>	Availability based on performance factor	Availability based on performance factor	Availability based on performance factor

<b>Resource Additions and Subtractions</b>	None	Subtraction of accepted Non-Price Retirement Request(s) submitted after the FERC Informational Filing	Subtraction of known outages
<b>Transfer Limits</b>			
<b>1) Internal Transmission Transfer Capability</b>	N-1 and N-1-1 limits, as projected for study year - Published in most recent Regional System Plan	N-1 and N-1-1 limits, as projected for study year - Published in most recent Regional System Plan	N-1 and N-1-1 limits, as projected for study year - Published in most recent Regional System Plan
<b>2) External Transmission Transfer Capability</b>	N-1 limits, as projected for study year - Published in most recent Regional System Plan	N-1 limits, as projected for study year - Published in most recent Regional System Plan	N-1 limits, as projected for study year - Published in most recent Regional System Plan
<b>Additional Load Relief from OP4 Actions</b>			
<b>1) Control Area-to-Control Area Emergency Transactions</b>	No	No	No
<b>2) Load Relief from 5% Voltage Reduction</b>	No	No	No

\*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 discreet outage(s).

\*\*Subject to periodic review and update.

**Appendix B – Non-Price Retirement Request Form**Email completed form to: [ProposedPlans@iso-ne.com](mailto:ProposedPlans@iso-ne.com)

1. Lead Participant Company Name:
2. Lead Participant Customer ID #:
3. Resource Name:
4. Resource ID #:
5. Station Name and Location:
6. Capacity Commitment Period for which the Non-Price Retirement Request is Submitted:
7. Lead Participant Contact Name:
8. Lead Participant Contact Phone Number:
9. Lead Participant Contact Fax Number:
10. Lead Participant Contact Email:
11. Non-Price Retirement Type (Full or Partial):

*If the Non-Price Retirement Type is Partial, please answer the questions on Page 2*

12. Description of Portion of Facility Being Retired

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

13. Demand Resource MW Reduction Information	Original Demand Reduction Value (MW)	MW Reduction	New Demand Reduction Value (MW)
	Summer		
	Winter		

14. Generating Resource MW Reduction Information

	Original (MW)	Reduction (MW)	New (MW)
Net MW at 90 Degrees F			
Net MW at 50 Degrees F			
Net MW at 20 Degrees F			
Net MW at 0 Degrees F			

15. Generating Resource MW Reduction Information

	Original (MW)	Reduction (MW)	New (MW)
Gross MW at 90 Degrees F			
Gross MW at 50 Degrees F			
Gross MW at 20 Degrees F			
Gross MW at 0 Degrees F			

16. Generating Resource Reactive Capability

	Original (MVAR)	Change (MVAR)	New (MVAR)
Overexcited (Lagging) MVAR Capability at 90 Degrees F			
Overexcited (Lagging) MVAR Capability at 50 Degrees F			
Overexcited (Lagging) MVAR Capability at 20 Degrees F			
Overexcited (Lagging) MVAR Capability at 0 Degrees F			

Underexcited (Leading) MVAR Capability at 90 Degrees F			
Underexcited (Leading) MVAR Capability at 50 Degrees F			
Underexcited (Leading) MVAR Capability at 20 Degrees F			
Underexcited (Leading) MVAR Capability at 0 Degrees F			

**Appendix C – Sample Show of Interest Form**

**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:

Contact Name for Project Sponsor Company:

Phone Number for Project Sponsor Company:

E-Mail for Project Sponsor Company:

**2. Project Information**

Project Type:

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

Project Name:

Resource Name:

Expected Commercial Operation Date:

*Project Address Information*

Address:

City:  State:  Zip:

County:

**3. Capacity Information**

**3.a Generating Resource - New Generation**

*Generator Type:*

- Intermittent
- Non-Intermittent

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

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

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

	Original	Change	New Total
Net MW @ 90 F:			
Net MW @ 50 F:			
Net MW @ 20 F:			
Minimum Net MW @ 90 F:			

**3.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:	
Winter Import MW:	

*External Interface:*

- Hydro-Quebec Highgate
- New Brunswick
- 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*

Interconnection Request Submitted: <input type="checkbox"/> Yes <input type="checkbox"/> No	Queue Position: _____
Feasibility Study Agreement Executed: <input type="checkbox"/> Yes <input type="checkbox"/> No	System Impact Study Agreement Executed: <input type="checkbox"/> Yes <input type="checkbox"/> No
Interconnection Agreement Executed: <input type="checkbox"/> Yes <input type="checkbox"/> 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:

- |  |  |
|--|--|
| <input type="checkbox"/> Combined Cycle Total Unit               | <input type="checkbox"/> Integrated Coal Gasification Comb Cycle |
| <input type="checkbox"/> Combustion (Gas) Turbine                | <input type="checkbox"/> Internal Combustion Engine              |
| <input type="checkbox"/> Fuel Cell- Electrochemical              | <input type="checkbox"/> Other: _____                            |
| <input type="checkbox"/> Hydraulic Turbine - Conv Daily Pondage  | <input type="checkbox"/> Photovoltaic                            |
| <input type="checkbox"/> Hydraulic Turbine - Conv Daily ROR      | <input type="checkbox"/> Pressurized Fluidized Bed Combustion    |
| <input type="checkbox"/> Hydraulic Turbine - Conv Weekly Pondage | <input type="checkbox"/> Steam Turbine                           |
| <input type="checkbox"/> Hydraulic Turbine - Reversible          | <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                       |

- Municipal Solid Waste
- Natural Gas
- Nuclear Uranium Plutonium Thorium
- Other Biomass Gas. Includes digester gas methane and other biomass gasses

- Wind
- Wood Waste Liquids excluding Black Liquor
- Wood/Wood Waste Solids

Alternate Energy Source:

- Agricultural Crop Byproducts/Straw/Energy Crops
- Anthracite Coal and Bituminous Coal
- Black Liquor
- Blast Furnace Gas
- Coal Synfuel
- Distillate Fuel Oil. Including Diesel. No. 1
- Distillate Fuel Oil. Including Diesel. No. 2
- Distillate Fuel Oil. Including Diesel. No. 4
- Gaseous Propane
- Jet Fuel
- Kerosene
- Landfill Gas
- Lignite Coal
- Municipal Solid Waste
- Natural Gas
- Nuclear Uranium Plutonium Thorium
- Other Biomass Gas. Includes digester gas methane and other biomass gasses

- Other Biomass Liquids
- Other Biomass Solids
- Petroleum Coke
- Purchased Steam
- Residual Fuel Oil Bunker C
- Residual Fuel Oil No. 6 020
- Sludge Waste
- Solar
- Subbituminous Coal
- Tire-derived Fuels
- Waste/Other Coal
- Waste/Other Oil
- Water
- Wind
- Wood Waste Liquids excluding Black Liquor
- Wood/Wood Waste Solids

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:

Work Phone/Ext:  Fax:

E-mail:

Address:

City:  State:  Zip:

**6. Project Attachments**

---

Site Control: \_\_\_\_\_

Plot Plan: \_\_\_\_\_

One Line Diagram: \_\_\_\_\_

**7. Generator Technical Data**

Unit Description: \_\_\_\_\_

## 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)  $X_2$  (Per unit-rated kVA): \_\_\_\_\_
- Negative Sequence Resistance R2 (Per unit-rated kVA): \_\_\_\_\_
- Zero Sequence Reactance (Saturated)  $X_0$  (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:

Commercial Operation Date:

**3. Capacity Information**

Total Summer DRV MW: \_\_\_\_\_

Total Winter DRV MW: \_\_\_\_\_

Demand Resource Type:

- On-Peak Demand Resource
- Real-Time Demand Response Resource
- Real-Time Emergency Generation 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:

**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:

Node: \_\_\_\_\_ 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:

**Appendix D – Sample De-list Application Form**

De-list Application Form

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

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		

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:

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:



**Appendix E – Transmission Upgrade Forms**

Date \_\_\_\_\_

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

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 components 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<sup>1</sup>.

Sincerely,

\_\_\_\_\_  
(Company’s Officer Signature)

\_\_\_\_\_  
(Company’s Officer Name)

\_\_\_\_\_  
(Company’s Officer Title)

<sup>1</sup> In accordance with section III.12.6 of the proposed revised Market Rule #1, approved by the Participants Committee on December 8, 2006 and filed with FERC on December 22, 2006. 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.

<b>Project Name:</b>	
Component*: Transmission Owner:	ISO Component ID*: Date:

#	Major task/Milestone	Y	N
1	I.3.9 Approval (check box) - If Yes, please provide I.3.9 #: - If No, please provide expected approval date:	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 below.			Y		N	
	Explanation:						

2b	Is siting required for the project?	Y		N	
2c	Are there potential issues with the siting process for the project? If yes, please explain below.	Y		N	
	Explanation:				

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 wetland or environmental issues with your project site? If yes, please explain below.	Y		N	
	Explanation:				
4d	Will the substation need to be expanded? If Yes, please explain below.	Y		N	
	Explanation:				

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	
		Major Equipment / System Name	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	

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

**Appendix F –**

This Appendix has been intentionally left blank.