



# New Generator Projects: Process Guide

*Getting from the **Interconnection Process** to  
**Initial Synchronization** and **Commercial Operation***

Asset Registration and Auditing

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# FOREWORD

*Process Guide*

## Foreword

### *Process Guide*

- **Process Guide**

- The guide is intended to be used as a **general resource tool** to assist a generator **project sponsor**
  - In transition from the interconnection process via **ISO-NE Transmission Services** or the **interconnecting Distribution (utility) company/Transmission Owner (TO)** for **generator projects**
    - That will participate in the ISO-NE administered wholesale electricity markets – and
  - Required to be represented (known as **Defined Generators**) in the ISO-NE Power System Model.
    - » See **ISO-NE Operating Procedure 14: Technical Requirements for Generators, Demand Resources, Asset Related Demands and Alternative Technology Regulation Resources** to determine if a generator project will be classified as a Defined Generator.  
[http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op14/op14\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op14/op14_rto_final.pdf)
    - » Also see the **Generator Asset Registration Options Checklist**.  
<http://www.iso-ne.com/static-assets/documents/2014/10/generator-asset-registration-options.pdf>
- The guide begins within the timeframe of completion (or near completion) of the applicable Pool Transmission Facilities (PTF) or Distribution **System Impact Study (SIS)**, drafting the **interconnection agreement (IA)**, and submittal of the **Proposed Plan Application (PPA)**.
- **ISO-NE governing documents** (Market Rules, Operating Procedures, Manuals, Planning Procedures, etc.) are continuously updated. Where there are discrepancies with this guide and the ISO-NE governing documents, the **governing documents shall prevail**.
  - The guide provides a high-level overview of the process and is not intended to specifically represent the governing documents of ISO-NE, a Transmission Owner (TO), FERC, or any other regulatory or corporate entity.



The Process Guide provides a high-level overview of the transition from the interconnection process with ISO-NE or the interconnecting utility (Transmission Owner or Distribution Company) to the registration of the generator asset, inclusive of the activities required for modeling the generator in the ISO-NE power system, initial synchronization, and commercial operation for the ISO-NE administered wholesale electricity markets. The project sponsor must become familiar with the technical and administrative requirements for the Transmission Owner (TO)/distribution company, the Local Control Center, and ISO-NE for wholesale market activity in addition to local, state, and federal regulatory requirements for generator interconnections.

## DEFINITIONS



## Definitions

- **Administered Transmission System (ATS):** The ATS represents the high voltage transmission and/or distribution lines that transmit electricity throughout the New England power grid. Inclusive of Pool Transmission Facilities (PTF) and non-PTF. (See Large Interconnection Procedures or Small Interconnection Procedures).  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch22/sch\\_22\\_lgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch22/sch_22_lgip.pdf),  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch23/sch\\_23\\_sgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch23/sch_23_sgip.pdf)
- **Commercial Operation:** Once the generator 1) has met all ISO-NE requirements, 2) is not in trial operations (test power), and is available to ISO-NE for dispatch (economic or self-schedule), then its status will be deemed commercial. (See Large Generator Interconnection Procedures or Small Generator Interconnection Procedures).  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch22/sch\\_22\\_lgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch22/sch_22_lgip.pdf),  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch23/sch\\_23\\_sgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch23/sch_23_sgip.pdf)
- **Defined Generator:** A Defined Generator, as identified by its size and/or interconnection point, is represented in the ISO-NE power system model and is required to communicate with ISO-NE via a registered Designated Entity (DE). (See ISO-NE Operating Procedure 14 - Technical Requirements for Generators, Demand Resources, Asset Related Demands and Alternative Technology Regulation Resources).  
[http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/ison/op14/op14\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/ison/op14/op14_rto_final.pdf)



The terms represented on the slide are typically used during the interconnection process and related interactions that a project sponsor can expect to encounter with ISO-NE, the Transmission Owner/distribution company, and Local Control Center. The definitions are presented in layman terms with links to actual definitions within the ISO-NE governing documents.

## Definitions

- **Designated Entity (DE):** A DE represents the physical location (available 24/7/365) that will receive verbal and/or electronic dispatch communications from ISO-NE. A Defined Generator is required to have a DE. (See ISO-NE Operating Procedure 14 - Technical Requirements for Generators, Demand Resources, Asset Related Demands and Alternative Technology Regulation Resources).  
[http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op14/op14\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op14/op14_rto_final.pdf)
- **Electronic Dispatch Capability (EDC):** EDC represents the ability of a Defined Generator to receive dispatch instructions electronically to increase or decrease output in real-time. (See ISO New England Inc. Transmission, Markets, and Services Tariff). [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_1/sect\\_1.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_1.pdf)
- **Generator Asset:** Based on size and interconnection point, a Generating Facility is registered as either a Settlement Only Generator (SOG) or a Defined Generator asset. As such, it will be settled in the ISO-NE administered wholesale electricity markets. There may be multiple distributed energy projects (with separate project affiliations) that have a common point of connection. ISO-NE will review to determine if the Generating Facilities will be aggregated for the determination of the less than five (5) MW eligibility threshold. (See ISO New England Inc. Transmission, Markets, and Services Tariff and ISO New England Manual for Registration and Performance Auditing). [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_1/sect\\_1.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_1.pdf)  
<http://www.iso-ne.com/participate/rules-procedures/manuals>;  
<http://www.iso-ne.com/participate/applications-status-changes/asset-registration>



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## Definitions

- **Generating Facility:** Also known as the generator project, is the physical equipment and components that will be constructed to produce electrical energy. (See Large Generator Interconnection Agreement or Small Generator Interconnection Agreement).  
[http://www.iso-ne.com/static-assets/documents/2015/02/large\\_generator\\_interconnection\\_agreement.pdf](http://www.iso-ne.com/static-assets/documents/2015/02/large_generator_interconnection_agreement.pdf),  
[http://www.iso-ne.com/static-assets/documents/2015/02/small\\_generator\\_interconnection\\_agreement.pdf](http://www.iso-ne.com/static-assets/documents/2015/02/small_generator_interconnection_agreement.pdf)
- **Host Participant:** The transmission or distribution provider that reconciles metering readings within the Metering Domain. (See ISO-NE Transmission, Markets, and Services Tariff)  
<http://www.iso-ne.com/participate/rules-procedures/tariff>
- **In-Service Date:** The date when the generator project site expects to receive back-feed power from the transmission owner/interconnecting utility/electric distribution company for facility construction and/or on-going station service. Also referred to as the dates that other components (transformers, lines, etc.) related to the project will be activated. The generator project may have a different In-Service date than the other project components. (See Large Generator Interconnection Agreement or Small Generator Interconnection Agreement).  
<http://www.iso-ne.com/participate/applications-status-changes/new-modified-interconnections>



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## Definitions

- **Initial Synchronization Date:** Once the project has met applicable requirements for 1) ISO-NE, 2) the transmission owner, and 3) Local Control Center, the date when the generator project is synchronized to the New England power grid to commence trial operations (test power). (See Large Generator Interconnection Agreement or Small Generator Interconnection Agreement and ISO New England Planning Procedure 5-1).  
<http://www.iso-ne.com/participate/applications-status-changes/new-modified-interconnections>,  
[http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/isonne\\_plan/pp05\\_1/pp5\\_1.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/isonne_plan/pp05_1/pp5_1.pdf)
- **Interconnecting Transmission Owner (TO):** The entity that owns/operates transmission facilities (ATS) that will interconnect with a generator project and has either a two-party (inclusive of the Interconnection Customer for non-FERC jurisdictional projects) or three-party interconnection agreement (inclusive of the Interconnection Customer and ISO-NE for FERC jurisdictional projects). (See Large Generator Interconnection Agreement or Small Generator Interconnection Agreement).  
<http://www.iso-ne.com/participate/applications-status-changes/new-modified-interconnections>
- **Interconnection Customer (IC):** The entity that owns/operates the Generating Facility that will interconnect with the ATS or distribution system and has either a two-party (inclusive of the Interconnecting TO) or three-party interconnection agreement (inclusive of the TO and ISO-NE). (See Large Interconnection Agreement or Small Interconnection Agreement). In some cases, the IC may establish an interconnection with an electric distribution company.  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch22/sch\\_22\\_lgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch22/sch_22_lgip.pdf),  
[http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/sch23/sch\\_23\\_sgip.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/sch23/sch_23_sgip.pdf)



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## Definitions

- **ISO New England (ISO-NE):** The independent, not-for-profit corporation responsible for power system operations, wholesale market administration/operations, and system planning. Will enter into three-party interconnection agreements with the Interconnecting TO and Interconnection Customer for projects that are determined to be FERC jurisdictional. <http://www.iso-ne.com/about>, <http://www.iso-ne.com/participate/rules-procedures/tariff>
- **Lead Market Participant:** As identified on the Asset Registration Form, the Market Participant that is responsible for registering the Generating Facility, compliance, generator scheduling, and all ISO-NE requirements for managing the generator. (See ISO-NE Manual M\_RPA Registration and Performance Auditing). <http://www.iso-ne.com/participate/rules-procedures/manuals>
- **Local Control Center (LCC):** The entities, separate from ISO-NE, that are responsible for managing local transmission facilities within the New England Power System in accordance with the Open Access Transmission Tariff (OATT) and Transmission Operating Agreement (TOA). (See Open Access Transmission Tariff (OATT), Transmission Operating Agreement (TOA)). [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_1/sect\\_1.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_1.pdf)
- **Market Participant:** A legal corporate entity that executed the Market Participant Service Agreement. (See ISO New England Inc. Transmission, Markets, and Services Tariff). Only Market Participants may represent a Generator Asset in the ISO-NE administered electricity markets. [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_1/sect\\_1.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_1.pdf)



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## Definitions

- **Ownership Share:** The percentage share applied to a Market Participant (as an asset owner) for settlement credits or charges for a registered Generator Asset (SOG or a Defined Generator) applicable to the ISO-NE administered wholesale electricity markets. This does not refer to “real-world” equity ownership or other contractual obligations outside the scope of ISO-NE administration. (See ISO New England Inc. Transmission, Markets, and Services Tariff). [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_1/sect\\_i.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_i.pdf)
- **Point of Interconnection (POI):** The point where the Generating Facility interconnects with the ATS. (See Large Generator Interconnection Agreement or Small Generator Interconnection Agreement) [http://www.iso-ne.com/static-assets/documents/2015/02/large\\_generator\\_interconnection\\_agreement.pdf](http://www.iso-ne.com/static-assets/documents/2015/02/large_generator_interconnection_agreement.pdf), [http://www.iso-ne.com/static-assets/documents/2015/02/small\\_generator\\_interconnection\\_agreement.pdf](http://www.iso-ne.com/static-assets/documents/2015/02/small_generator_interconnection_agreement.pdf)
- **Pool Transmission Facilities (PTF):** Transmission facilities owned by a Pool Transmission Owner (PTO) operated by ISO-NE according to the terms in the Transmission Operating Agreement (TOA). (See ISO New England Open Access Transmission Tariff) [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect\\_2/oatt/sect\\_ii.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/oatt/sect_ii.pdf)
- **Power System Model (PSM):** Includes topology, characteristics of the various power system facilities, and equipment ratings that comprise the New England power grid. Defined Generators must be represented in the PSM before they can inject electrical energy (inclusive of trial or commercial operation) into the power system. The PSM is updated three times per calendar year. (See SOP-RTMKTS.0060.0010 Update EMS Network Transmission Topology). [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/sysop/rt\\_mkts/sop\\_rtmkts\\_0060\\_0010.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/sysop/rt_mkts/sop_rtmkts_0060_0010.pdf)



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## OPERATING PROCEDURE 14

*Technical Requirements for Generators, Demand Resources,  
Asset Related Demands and Alternative Technology  
Regulation Resources*



## Operating Procedure 14

*Technical Requirements for Generators, Demand Resources, Asset Related Demands and Alternative Technology Regulation Resources*

- **Key Requirements**

- Telemetering and Revenue Metering
  - Speed and accuracy requirements
  - See ISO-NE Operating Procedure 18: Metering and Telemetering Criteria
- Designated Entity
  - Required for all Defined Generators
  - Dispatch communications: Available 24/7/365
- Voltage Control
  - Each Lead Market Participant is to support system voltage and reactive needs
  - Maintain assigned voltage schedule
  - The Lead Market Participant must keep/maintain an automatic voltage regulator (AVR) in service
- Governor Control
  - For generators with a capability of 10 MW or greater
  - Each Lead Market Participant is obligated to provide/maintain/operate a functioning governor
    - Frequency response



ISO-NE Operating Procedure 14 is the primary document that identifies the elements that constitute a Defined Generator and the application of the power system model and Designated Entity.

## Operating Procedure 14

*Technical Requirements for Generators, Demand Resources, Asset Related Demands and Alternative Technology Regulation Resources*

- **Key Requirements**

- System Protection
  - Install/maintain protection systems per NPCC Regional Reliability Reference Directory #4
- Power System Stabilizers (PSS)
  - Each Lead Market Participant is responsible for maintaining PSS equipment in good operating condition
- Black Start Capability
  - Each Lead Market Participant that provides Black Start capability (in the ISO-NE system restoration plan), must
    - Maintain that generator in good operating condition
    - Promptly report to ISO-NE any problems with the black start capability of each generator in the system restoration plan
      - » Designated Black Start Resource (DBR)



ISO-NE Operating Procedure 14 is the primary document that identifies the elements that constitute a Defined Generator and the application of the power system model and Designated Entity.

## GENERAL SEQUENCE OF EVENTS

*Getting to Initial Synchronization*

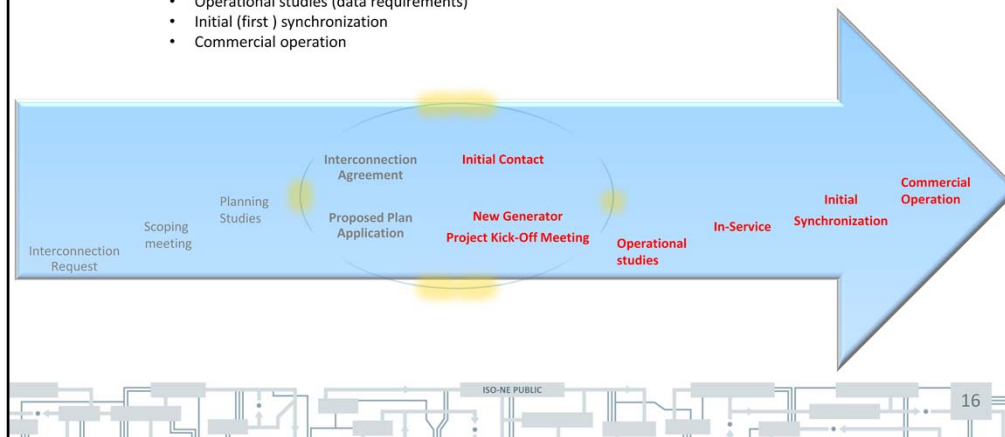


## General Sequence of Events

### *Getting To Initial Synchronization (Background)*

- **High-level sequence**

- The Interconnection Agreement (IA) and Proposed Plan Application (PPA) are not required to be completed before the New Generator Project Kick-Off Meeting
- New Generator Project Kick-Off Meeting; review steps/requirements for-
  - In-Service (back-feed power)
  - Operational studies (data requirements)
  - Initial (first ) synchronization
  - Commercial operation



The general process flow begins with the interconnection request as applicable to ISO-NE or the Transmission Owner (TO), subsequent scoping meetings, data requests, generator interconnection studies, drafting the interconnection agreement (applicable to ISO-NE or the TO), and formal submittal of the proposed plan to the Reliability Committee (RC) and ISO-NE. These activities eventually transition to the New Generator Project Kick-Off Meeting to coordinate efforts with ISO-NE, the TO, the Local Control Center (LCC), and the project sponsor for in-service (for construction or station/facility service), initial synchronization, and commercial operation. All of which need to be approved by ISO-NE, TO, and the LCC. This guide starts as the IA and PPA are in progress, or completed, and the project is getting in queue for operational studies.



## INITIAL CONTACT

*Getting To Initial Synchronization*



## Initial Contact

### *Getting To Initial Synchronization (Going Forward)*

- **12-15 months prior to initial synchronization**
  - The project sponsor must contact ISO-NE to determine when to schedule a New Generator Project kick-off meeting. Send an email notice to-
    - [NewGenCoord@iso-ne.com](mailto:NewGenCoord@iso-ne.com).
  - ISO-NE staff will review the following to determine when to schedule a **New Generator Project kick-off meeting**:
    - Anticipated initial synchronization date and COD
  - Due to applicable construction efforts, installation of data communication equipment, information submittal, etc. kick-off meetings are typically scheduled at least 1-year in advance of the target initial synchronization (test power) date.



Due to the lead times required for any construction, data submittal requirements-review/analysis/confirmation, technical communication requirements, request for data communication circuits/routers and subsequent delivery, installation, configuration, and testing, it is strongly recommended that the project sponsor contact ISO-NE 12-15 months in advance of first synchronization to schedule a kick-off meeting. The kick-off meeting and status calls are the coordinated effort to meet the noted target dates for in-service, first synchronization, and commercial operation.

## NEW GENERATOR PROJECT KICK-OFF MEETING

*How is the project managed?*

## New Generator Project Kick-Off Meeting

*How is the project managed?*



- **Kick-Off meeting**
  - Held at ISO-NE.
  - Introduce the project sponsor to ISO-NE, the Local Control Center (LCC), and TO staff.
  - Project review.
    - The project sponsor will provide an overview of the project and any pertinent information that may affect target dates.
      - Proposed In-Service (facilities back-feed power)
      - First (initial) synchronization
      - Commercial Operation Date (COD)
      - Any potential modifications from project studies to As-Purchased/As-Built data models
  - Review information, communication, and registration requirements for the **Defined Generator**.
  - Identify primary project contacts.
  - Monthly conference calls scheduled to track project status/coordination efforts.
    - As applicable to construction, completion of any applicable studies, communication equipment orders/delivery/installation/testing, dispatch location set-up, documentation, etc.



The New Generator Project Kick-Off meeting is held at the ISO-NE facilities to introduce the project team to ISO-NE, TO, and LCC staff that will coordinate efforts to get the generator project integrated into applicable systems for dispatch control and settlement. The project team may already be familiar with staff members based on the interconnection process. Now that the interconnection process is complete, preparing for the actual MW injection to the power grid is the next phase.

## PROJECT CHECKLIST

*How is the project managed?*

## Project Checklist

*How is the project managed?*

- **New Generation Project Summary and Checklist**
  - In-service date (back-feed power to the site)
  - Initial synchronization date
  - Commercial Operation Date (COD)
  - Due dates: documentation and information requirements to get to initial synchronization and COD
  - Primary project contacts representative of –
    - The project sponsor
    - Market Participant representation
    - ISO-NE
    - Interconnecting utility
    - Local Control Center
    - The Designated Entity
  - See the New Generation Project Summary and Checklist
    - <http://www.iso-ne.com/participate/applications-status-changes/asset-registration>

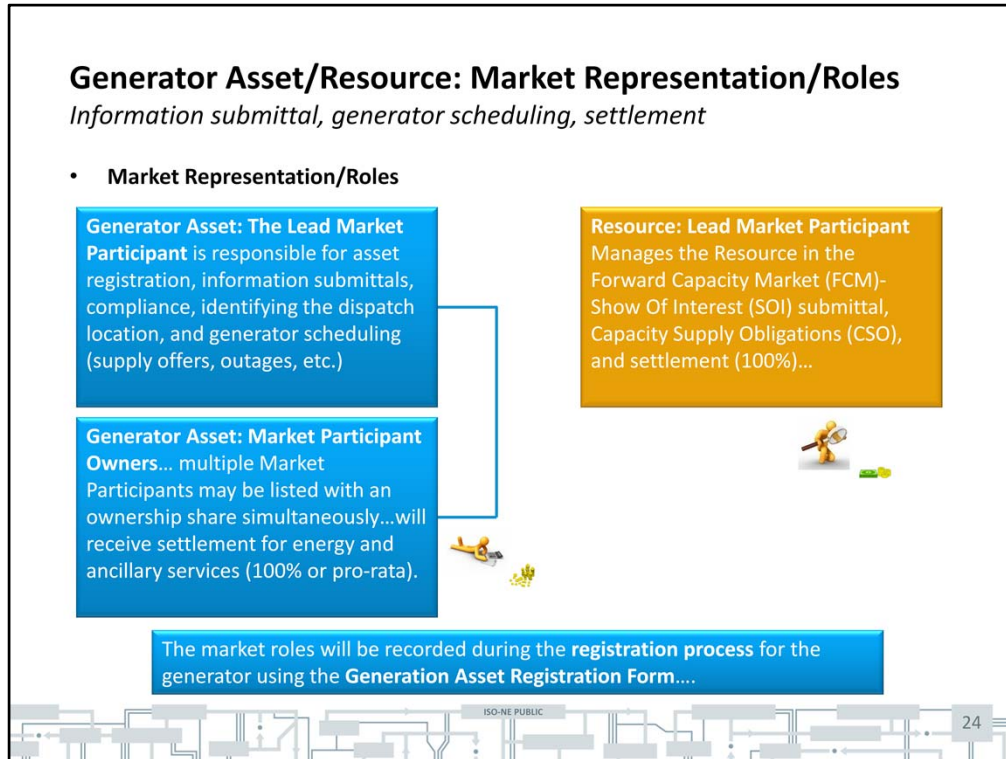


The project checklist is a tool used by ISO-NE to identify the project team contacts and ISO-NE, TO, and LCC staff that are key resources for information requirements for the generator. The point of contact section provides direct phone numbers for ISO-NE, TO, and LCC staff that can be contacted directly during this project phase.

## **GENERATOR ASSET/RESOURCE: MARKET REPRESENTATION/ROLES**

*Information submittal, generator scheduling, settlement*





The project sponsor/Lead Participant is required to register the Generator Asset for energy and applicable ancillary market settlements. In addition, the project sponsor may also submit a Show Of Interest request for the generator as a Resource in the Forward Capacity Market.

The Lead Market Participant- Asset is the “asset manager” and can also be an Owner (energy market settlement; full or partial). The Lead Participant is responsible for generator scheduling, registration, compliance, identifying the dispatch location (aka the Designated Entity), administrative functions (information requirements, market monitoring, etc.), and is the authorized submitter of market and technical information for the generator. Only registered, settleable, active market participants, as signatories to the Market Participant Service Agreement (MPSA), are authorized to register a market asset and administer and receive settlement (energy, ancillary markets) for the registered asset.

A Market Participant Asset Owner receives pro-rata settlement in the Day-Ahead (as applicable) and/or Real-Time (balancing) market(s).

The Lead Market Participant- Resource is responsible for administrative functions for the Resource (if applicable) that is linked to the generator asset in the Forward Capacity Market (FCM). The Lead Market Participant- Resource also receives 100% settlement (credit or charge) for any acquired Capacity Supply Obligation (CSO) in the Forward Capacity Auctions (FCA) or bilateral transfers.



## Generator Asset: Market Representation/Roles

*Information submittal, generator scheduling, settlement*

- **Generation Asset Registration Form**
- **Required information (not all inclusive)**
  - Lead Participant for the Asset
  - Ownership
  - Generator Asset Type
    - Intermittent
    - Non-Intermittent
  - FCM Resource ID (if applicable)
  - Location
    - Physical
    - Settlement (Pricing Node)
      - Determines the Locational Marginal Price (LMP)
  - Interconnecting Utility (Host Participant)
  - Meter Reader



The registration form is used to identify the Lead Participant- Asset, Asset Owner (energy settlement), and certain information for the generator asset (name, physical location, settlement location, generator type, etc.) specific for the generator. The listing on this slide is not all-inclusive.

## GENERATOR AND TRANSMISSION SYSTEM INFORMATION

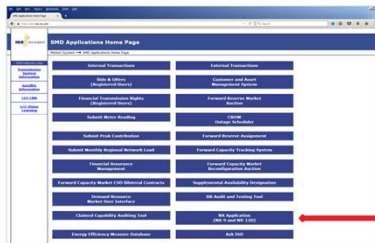
*Getting To Initial Synchronization*



## Generator and Transmission System Information

### *Getting To Initial Synchronization*

- **The Lead Market Participant- Asset must submit information for-**
  - Generator Technical Data (NX-12 form): Submitted to [NewGenCoord@iso-ne.com](mailto:NewGenCoord@iso-ne.com)
  - Voltage and Reactive Control (NX-12D form): Submitted via the **NX Application**
  - Transmission line, Transformers, Reactive devices (NX-9 forms): Submitted via the **NX Application**
    - Data is submitted by the owner or responsible entity for the project/transmission line
      - As applicable, the affected Transmission Owner (TO) may be required to submit this information



...there are information submittals that can only be submitted to ISO-NE via the **Standard Market Design (SMD) portal**. Only Market Participants have access to the SMD portal.

As noted previously, the Lead Participant- Asset is required to submit information to ISO-NE for the generator. Although similar information may be represented in data models that were submitted for the System Impact Studies and may have been reviewed, discussed, and presented to the Reliability Committee, certain information must be submitted to ISO-NE technical groups for database management. Notably for voltage and reactive control, transmission line information and associated equipment, and certain generator technical data.

Data specific to voltage and reactive control, the one-line diagram, and transmission line information must be submitted through the NX Application which is located on the Standard Market Design (SMD) Applications Home Page. This a secure web-site accessed using a digital certificate.

## Generator and Transmission System Data Requirements

### *Getting To Initial Synchronization*

- **Generator Technical Data (NX-12 form, OP14)**
  - Data is required to provide a technical description for the defined generator asset, including-
    - Generator Type (Internal Combustion Engine, Photovoltaic, Steam Turbine, etc.).
    - Associated fuel usage (Start Up, Primary, Alternate).
    - Capabilities (Blackstart, Dispatchable, Fast Start, Auto Start, Regulation).
- **Generator Voltage and Reactive Control Data (NX-12D form, OP12 Appendix B)**
  - Data is required to describe generator reactive capabilities
    - Each generating unit (Generator/inverter/etc.) comprising a Generator Asset that will be represented in the ISO-NE power system model. A Generator Asset may be a composite of multiple generating units.
- **Transmission Equipment Data (NX-9 forms, OP16)**
  - Equipment parameter data is required for-
    - All transmission equipment (lines, transformers, reactive devices) designated as part of the Bulk Electric System (69kV or above).
    - All Generator Step-up Transformers (GSUs) attached to a 1 MW or greater generator participating in the Real-Time Energy Market (regardless of voltage). Individual GSUs for wind and solar farms may be exempted by ISO.
    - Lower voltage equipment may be required when necessary for modeling or market needs.
  - Data requirements depend on equipment type and may include, but not be limited to-
    - Impedance, ratings, reactive capability, voltage schedules, voltage rating, tap range, manufacturer's nameplate document, test report and control scheme documentation.
  - Equipment and data requirements are defined in OP16 Appendices A, B, C, D, G, H and I.



The information related to generator technical data, one-line diagram, voltage and reactive control, and transmission equipment are required before the generator can synchronize or inject electrical energy to the power grid. This information will be reviewed by ISO-NE technical experts and discussed directly with the project sponsor lead contacts or during the status conference calls.

## OPERATIONAL STUDIES

*Getting To Initial Synchronization*



## Operational Studies

### *Getting To Initial Synchronization*

- **System Impact Study vs. As-Purchased, As-Built Data, and As-Tested**
  - System Impact Studies (As-Studied)- **Planning/Interconnection**
    - Data model (V.1)
    - Equipment, components (V.1)
  - Operational Studies (As-Purchased, As-Built, As-Tested)- **Technical/Real-Time**
    - Did the data model change (V.2, V.3)?
    - Did any equipment or component change (V.2, V.3)?
      - Auto-voltage Regulator (AVR)? Power System Stabilizer (PSS)? Other control mechanisms?
      - Was a component added that was not part of the study?
      - Was a component removed that was not part of the study?
  - Dynamics Data Management System (DDMS)
    - Dynamic models provided to ISO-NE via DDMS for review, comparison and analysis
    - Accessed via the SMD portal
    - Submittals inclusive of final As-Studied data, As-Purchased data, As-Built data, and As-Tested data
- **Inform ISO-NE and TO of any changes as soon as possible**
- **Operational limitations may be imposed**

A significant delay may be incurred if:

As Studied ≠ As Purchased ≠ As Built ≠ As Tested = Material Modification Determination

As the project transitions from the interconnection phase to the initial synchronization and commercial operation phase, there may be changes to the data model (V.1 to V.2 or V.3, etc.) or changes to the equipment and related components (manufacturer, equipment upgrade, etc.) that was used during the applicable System Impact Studies. A change/upgrade may appear to be an enhancement to the project, but it must be reviewed by ISO-NE and TO technical staff to ensure the modifications do not adversely affect grid operations and reliability. Modifications may be deemed to be a material or a non-material modification. A material modification will likely require additional studies which can affect target deadlines for initial synchronization and commercial operation.

If there are any changes to the As-Studied, As-Purchased, As-Built, As-Tested data it is important for the project sponsor to alert ISO-NE and the TO as soon as possible.

During this time, operational studies (data modeling and simulation) are conducted to determine if system infrastructure is feasible for generator performance. Technical staff will analyze simulated conditions to understand potential risk to New England grid reliability and affect on other Control Areas. Generator operational limitations may be imposed based on the results of these studies.

## POWER SYSTEM MODEL

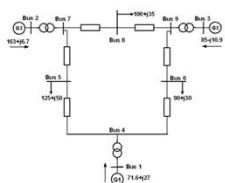
*Getting To Initial Synchronization*



## Power System Model

### Getting To Initial Synchronization

- **Power System Model requirements**
  - Prior to initial synchronization, the project sponsor must submit-
    - One-Line diagram(s)
      - **180 calendar days in advance of the expected equipment In-Service Date**
      - Nomenclature (equipment, terms)
      - Other information (TBD)
      - Reviewed by ISO-NE, TO, and LCC
    - **The generator asset must be in the power system model prior to initial synchronization**
  - Three Updates/Year
    - February/May/September (subject to ISO-NE scheduling)



The power system model, and supporting database systems, is a tool used by ISO-NE to monitor technical components of the NE transmission system (generally 69 kV and greater), interconnecting tie lines and electrical energy flows to other Control Areas, and generator assets (dispatchable or non-dispatchable) that are injecting MWs into the power grid and participating in the ISO-NE administered markets. ***The generator will not be allowed to inject any MWs into the pool transmission facilities (PTF) until it is represented in the power system model.***

In view of the target dates for the initial synchronization and COD, the **timing for the power system model releases must be considered**. There are three power system model releases per year in February, May, and September. A one-line diagram (in good order) must be submitted in advance of initial synchronization or COD. For example, if initial synchronization is **December 20XX**, and project conference calls have started in **January 20XX**, then the project has three opportunities to get into the power system model- **February/May/September of 20XX**. If a one-line is not submitted in time for the **September 20XX** model release, then the next opportunity for the generator project to be added to the model release in **February 20XY of the following year (5 months later)**.



## DISPATCH COMMUNICATION

*Telemetry and Communication Requirements*



## Dispatch Communication

### *Telemetry and Communication Requirements*



- **Metering and Telemetry Criteria**

- Review Transmission Owner (TO) requirements
- Review Local Control Center (LCC) requirements
- See ISO-NE Operating Procedure (OP) 14 and (OP) 18
  - Electronic Dispatch Capability (EDC)- **If Yes**
    - Review ISO-NE requirements
      - » Remote Terminal Unit (RTU)- directly connected to ISO-NE
      - » Market and reliability parameters
      - » See OP 18, Appendix F- ISO Communication Front End (CFE) Interface Specifications
      - » Complete the ISO-NE Electronic Dispatch- Circuit and Router Form (request from ISO-NE)
      - » Complete the ISO-NE Electronic Dispatch- RTU Information Form (request from ISO-NE)
    - **The electronic dispatch circuit and router must be ordered 90+ days in advance of the desired initial synchronization date**

Data circuit/router provisioning involves external service vendors and external scheduling



See ISO-NE Operating Procedure 18 for detailed information regarding metering and telemetry requirements.

With a few exceptions, ISO-NE requires all modeled generator assets to have a directly connected communications front end (CFE) remote terminal unit (RTU). ISO-NE does not own or warehouse this equipment and will coordinate efforts with service vendors and the project sponsor.

If a directly connected RTU is not required, then there are no market dispatch communications (DDPs). In essence, the Lead Participant must submit a self-schedule/Must Run schedule to ISO-NE via the eMarket application. Reliability data is communicated to the applicable TO/LCC via an RTU connection. The reliability data is then transmitted to ISO-NE via a SCADA/ICCP network. The Lead Market Participant is responsible for providing reliability data to the Local Control Center (LCC) per the LCCs communication protocol.

## Dispatch Communication

### *Telemetry and Communication Requirements*

- **Data communication: Electronic Dispatch circuits/router (as applicable)**
  - The project sponsor must identify where applicable data communication equipment will be located as soon as possible.
    - ISO-NE will coordinate with the project sponsor and the Local Exchange Carrier (LEC).
    - The LEC will conduct a site review to determine if there are **special requirements** for communication infrastructure inclusive of hardwire and wireless set-up.
    - The project sponsor/Lead Participant is responsible for any one-time installation costs and recurring monthly charges.
  - If the LEC determines there are **special requirements**, then the project sponsor must work directly with the LEC to get the site service capable.
    - Special equipment or construction efforts may be required which may involve long lead times for delivery and can affect project deadlines.
    - The project sponsor is responsible for coordinating this effort and will be responsible any additional charges.
  - **Once the site is service capable**, ISO-NE will proceed with the order for the data communication circuits and associated equipment.



Applicable costs for data communication circuits and routers are billed from the service provider to ISO-NE and subsequently billed to the Lead Market Participant for the asset. However, for a given generator project, there may be unique circumstances regarding data communications infrastructure. It is important to provide ISO-NE and the LCC with the desired dispatch location as soon as possible because there may be circumstances where the given Local Exchange Carrier (LEC) may determine that additional work or construction efforts are required for hardwire or wireless circuits. If that determination is made, then the project sponsor must work directly with the LEC or other applicable service providers to coordinate those efforts which may incur additional costs. Special construction or work efforts by the LEC and other applicable service providers may affect project timelines.

## Dispatch Communication

### *Telemetry and Communication Requirements*

- **Designated Entity (DE)**
  - See ISO-NE Operating Procedure 14
  - The Lead Participant identifies the DE
  - The DE is a dispatch location that receives dispatch communications from ISO-NE
    - The DE should understand the generator schedules (supply offers) submitted by the Lead Participant
  - Must be registered and validated before initial synchronization
  - The DE must be available 24/7/365
  - The DE can be at the generating facility or located remotely
  - The DE must maintain situational awareness for the Generator Asset
    - Inclusive of generator operations and schedules
  - The DE must be able to acknowledge ISO-NE instructions and respond/act
    - Or cause an action
  - **New DE registration**
    - **90 days advance notice required**



All generators that are required to be modeled in the power system must have a registered dispatch location (known as the Designated Entity) in order to receive verbal or electronic dispatch communications from ISO-NE. The Lead Participant must identify the Designated Entity (DE) that will receive dispatch communications (on-site or remote) from ISO-NE. It is strongly recommended that the DE not only maintains an awareness of the operating capabilities and real-time conditions of a generator but also maintain an awareness of the supply offers submitted for the generator. As such, the DE will be able to respond to ISO-NE for any discrepancies between the submitted schedule and actual operations. For example, if a unit is not operating (off-line) and the schedule is marked as 'Available', then the DE should be able to respond if the unit can be dispatched to service (on-line). Or, if a unit is operating (on-line) but the schedule is marked as 'Unavailable', then the DE should be able to respond if they want to keep the unit on-line. Communication and understanding between the Lead Participant (scheduling) and the DE (operating) is strongly desired.

## IN-SERVICE

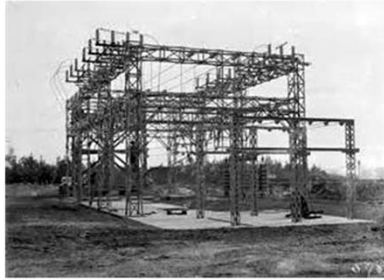
*Facilities back-feed power*



## In-Service

*Facilities back-feed power*

- Construction load
- Station load
- Approved by the Transmission Owner (TO)



The Lead Participant must meet the requirements of the TO and LCC to receive back-feed power to energize the generating facility for construction load, commissioning efforts, and applicable station service.

## INITIAL SYNCHRONIZATION

*Commissioning, Test Power (Non-Commercial Operations)*



## Initial Synchronization

*Commissioning, Test Power (Non-Commercial Operations)*

- **Generator Asset represented in the ISO-NE Power System Model**
- **Approvals received**
  - Interconnecting Utility
  - Local Control Center
  - ISO-NE
- **Designated Entity (DE) registered/validated**
  - Location, contact information confirmed
  - Dispatch communication established
    - Electronic Dispatch Capable (as applicable)
    - Verbal (dedicated bell line required; Auto Ring Down circuit as applicable)
  - Situational awareness confirmed (generator visibility)
- **Registration/Technical data is in good order**
- **Trial operations (test power)**
  - Commissioning
    - MW output
    - Settlement (Yes)
  - Production schedule (test plan) submitted daily
    - ISO-NE Forecast Desk/Control Room



At the coordinated discretion of ISO-NE, the TO, and LCC, the generator may be allowed to inject electrical energy into the power grid (distribution, PTF) once it is determined, at minimum, the following items are complete- 1) the generator is represented in the ISO-NE power system model, 2) the Designated Entity (DE) is registered with ISO-NE and affirms situational awareness 3) ISO-NE tested and approved data communications with the DE (if applicable), 4) the generator has satisfied registration requirements and technical data submittals 5) the TO approves first synchronization, 6) the LCC approves first synchronization.

At least 45 days prior to initial synchronization, the Lead Participant should prepare to establish web services for a wind generator asset.



### Commissioning, Test Power (Non-Commercial Operations)

- eMarket (**Unavailable:** Unit Default Parameters)
- Non-commercial communications protocol



During initial synchronization (test power, non-commercial operations), the unit default offer schedules must be marked UNAVAILABLE. The eMarket application data translates into the ISO-NE Control Room databases as Unit Commitment Mode (UCM) 1- Offline and unavailable for dispatch. This UCM designation informs an ISO-NE Operator that unit cannot be dispatched on-line by ISO-NE. However, the Lead Participant for the generator must contact the ISO-NE the day prior to the operating day with the commissioning (test power) schedule. After normal business hours and into real-time, the DE must contact ISO-NE if there are any anticipated variations to the production schedule.

## COMMERCIAL OPERATION

*Available for dispatch*



## Commercial Operation

*Available for dispatch*

- **Approvals received**
  - ISO-NE determines when all applicable requirements are met
    - ISO-NE Operational studies in good order
    - As-Studied, As-Purchased, As-Built, As-Tested in good order
    - Registration/Technical data in good order
    - Data communications in good order
    - Designated Entity in good order
    - Web services in good order (applicable to wind units)
    - Other issues as deemed necessary in good order
- **Commissioning is in good order**
  - Lead Participant/project sponsor validation
- **Commercial Operation**
  - Lead Participant designation
    - Lead Participant submits notification to ISO-NE (New Generation Coordinator)
  - Interconnection Customer submits notification to ISO-NE
    - Large Generator Interconnection Agreement (LGIA), Appendix E (as applicable)
    - Small Generator Interconnection Agreement (SGIA), Attachment 7 (as applicable)
  - Unit marked as 'Available' in eMarket
    - Lead Participant submits economic or self-schedules



Once ISO-NE deems that all applicable requirements are satisfied, then ISO-NE will deem that the generator is ready to submit supply offers and schedules through the eMarket application. At that time, the Lead Participant/project sponsor/Interconnection Customer may notify ISO-NE of the desired commercial operation date. Note that ISO-NE does not state that a generator asset is commercial, but informs the Lead Participant/project sponsor that the generator meets all applicable requirements. The Interconnection Customer to the applicable Large Generator Interconnection Agreement or the Small Generator Interconnection Agreement must submit formal notification to ISO-NE via the applicable addendum (Appendix E or Attachment 7, respectively).

## Commercial Operation

*Available for dispatch*

- **Generator Asset: Scheduling (Day-Ahead and/or Real-Time)**
  - eMarket (**Available**: Unit Default Parameters)

The screenshot displays the eMarket User Interface for ISO-NE. The main window is titled "eMarket User Interface" and shows a "Unit Daily Default Parameters" form. The form includes fields for "Asset ID", "Unit Start Name", "Unit Long Name", "Type of Unit", "Range Rate (MW/Hz)", "Range Rate Cap", "Claim 10 (MW)", "Claim 15 (MW)", "Claim 20 (MW)", "Claim 30 (MW)", and "Claim 35 (MW)". There are also checkboxes for "Economic", "Operational", and "Must Run". The interface is designed for configuring generator assets for scheduling.

During commercial operations, the Lead Participant must mark appropriate schedules AVAILABLE in the eMarket application. eMarket data translates into the ISO-NE Control Room databases with the appropriate Unit Commitment Mode (UCM) that identifies that the unit is available for dispatch (economic or self-scheduled). This UCM designation informs an ISO-NE Operator that the unit can be dispatched by ISO-NE from either an off-line or on-line state.

As with initial synchronization, the DE must contact ISO-NE after normal business hours and into real-time, if there are any anticipated variations to the production schedule as submitted by the Lead Participant in the eMarket application.

# WIND GENERATION INFORMATION REQUIREMENTS

*Supplemental*



## Wind Generation Information Requirements

### *Supplemental*

- See ISO-NE Operating Procedure 14, Appendix F (Wind Plant Operator Guide)
  - The (Lead) Market Participant- Asset must obtain access to-
    - Sandbox WPF WebServices - WPLP
    - WPF WebServices - WPLP
  - The (Lead) Market Participant- Asset must complete the Wind Plant Static Data Form (technical data)
    - Nacelle-level wind speed
    - Ambient temperature data
    - Elevation above sea level
    - Wind speed (cut-in; cut-out)
    - Wind turbine icing behavior
    - Other data



Wind generator projects require additional information related to wind turbine data, elevation, wind cut-in speed, etc. in addition to the generator technical data, voltage and reactive data, and transmission line information. The additional data is captured in the Wind Plant Static Data Form.

# Wind Generation Information Requirements

## Supplemental

- **Web Services**

- Wind forecasting data exchange between
  - Forecast provider
  - ISO-NE
  - Lead Market Participant- Asset
- Machine to machine (programmatic) interface
- Extensible Markup Language (XML)
- Digital certificate required
  - Participant ID (Authentication and Authorization)
  - Lead Market Participant- Asset
  - Sandbox
  - Production



- **Questions? Contact ISO-NE Customer Support**

- 413-540-4220
- [CustServ@iso-ne.com](mailto:CustServ@iso-ne.com)



Web services allows the Lead Market Participant- Asset (via machine to machine interface) to submit technical data for a wind generator to a service provider obtained by ISO-NE. The service provider uses the data to create an aggregate regional wind forecast for ISO-NE and can create a specific wind forecast for the Lead Market Participant- Asset for the given wind generator. Web services must be established and tested at least 45 days in advance of initial synchronization.

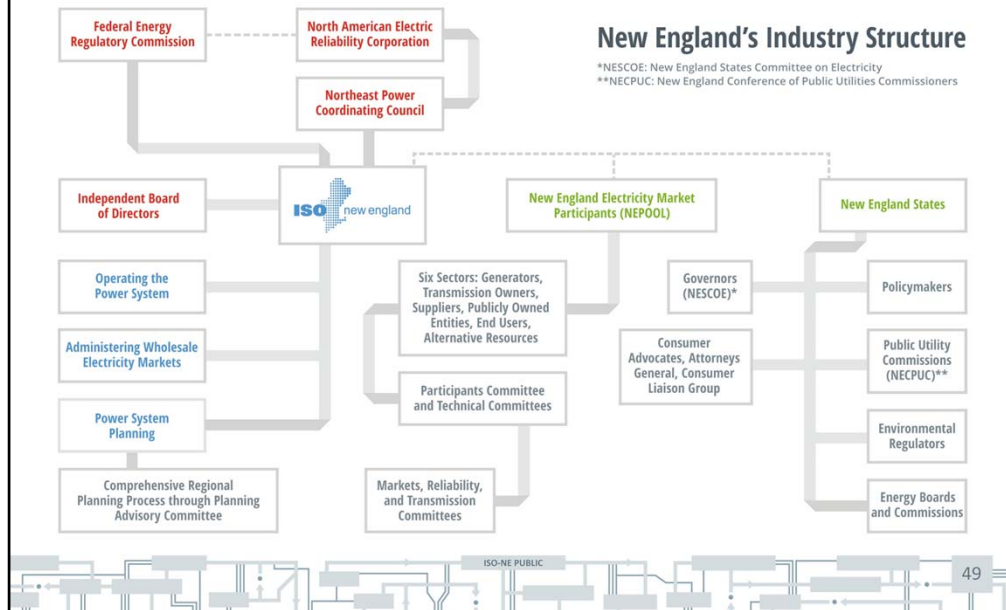
## APPENDIX: RESOURCES, DOCUMENTS, LINKS

*Additional Information*



## Appendix: Resources, Documents, Links

### Additional Information



ISO-NE is the independent, not-for-profit company authorized by FERC to operate the power system, provide power system planning, and administer the wholesale electricity markets serving Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.

## Appendix: Resources, Documents, Links

### *Additional Information*

- Maintain minute-to-minute reliable operation of region's generation and transmission system
- Objective- perform centralized economic dispatch of the bulk power system
- Coordinate and schedule maintenance outages
- Coordinate operations with neighboring power systems



ISO-NE's primary objective is to reliably and economically dispatch generation to meet load and coordinate with neighboring control areas to manage power flow between regions.

## Appendix: Resources, Documents, Links

### *Additional Information*

- New Generation Project Summary and Checklist
  - <http://www.iso-ne.com/participate/applications-status-changes/asset-registration>
- ISO-NE Transmission, Markets, and Services Tariff
  - <http://www.iso-ne.com/participate/rules-procedures/tariff>
- New Customer Registration (2-4 month process)
  - <http://www.iso-ne.com/participate/applications-status-changes/new-registration/registration-checklist>
- ISO-NE Planning Procedures (PP05-0, PP05-1)
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceds/ison\\_e\\_plan/pp05\\_0/pp5\\_0.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceds/ison_e_plan/pp05_0/pp5_0.pdf)
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceds/ison\\_e\\_plan/pp05\\_1/pp5\\_1.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceds/ison_e_plan/pp05_1/pp5_1.pdf)
- ISO-NE Manuals
  - <http://www.iso-ne.com/participate/rules-procedures/manuals>

New Generation Project Summary and Checklist- The tool used to track and facilitate project information submittal requirements and manage project deadlines.

ISO-NE Transmission, Markets, and Services Tariff- The primary governance document that outlines ISO-NE roles and responsibilities. Details the rates, terms, and conditions for services provided. Describes the rights and responsibilities of the Market Participants.

New Customer Registration- Application materials for entities that desire to become a Market Participant and/or NEPOOL member.

ISO New England Planning Procedure No. 5: Procedure For Reporting Notice of Intent To Construct Or Change Facilities In Accordance With Section I.3.9 Of The ISO New England Tariff (Proposed Plan Application Procedure)

ISO New England Planning Procedure 5-1: Procedure For Review Of Governance Participant's Proposed Plans (Section I.3.9 Applications: Requirements, Procedures And Forms)

ISO-NE Manuals- Governing documents that outline wholesale market interactions and settlement.

## Appendix: Resources, Documents, Links

### *Additional Information*

- ISO-NE Operating Procedures (OP1, 12, 14, 16, 18, 23)
  - <http://www.iso-ne.com/participate/rules-procedures/operating-procedures>
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op1/op1\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op1/op1_rto_final.pdf)
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op12/op12\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op12/op12_rto_final.pdf)
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op14/op14\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op14/op14_rto_final.pdf)
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  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op18/op18\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op18/op18_rto_final.pdf)
  - [http://www.iso-ne.com/static-assets/documents/rules\\_proceeds/operating/isonone/op23/op23\\_rto\\_final.pdf](http://www.iso-ne.com/static-assets/documents/rules_proceeds/operating/isonone/op23/op23_rto_final.pdf)
- Generator Asset Registration
  - <http://www.iso-ne.com/participate/applications-status-changes/asset-registration>
  - <http://www.iso-ne.com/static-assets/documents/2014/10/generator-asset-registration-options.pdf>
- ISO-NE Training
  - <http://www.iso-ne.com/participate/training>



ISO-NE Operating Procedures- Outline certain steps the ISO takes to control and manage the high-voltage power system in the six-state New England area. This is the ISO's responsibility as the Regional Transmission Organization designated by the Federal Energy Regulatory Commission.

Although a few key Procedures are listed in this presentation, all Operating Procedures listed on the ISO-NE website should be reviewed in their entirety.

ISO-NE Operating Procedure 1: Central Dispatch Operating Responsibilities and Authority

ISO-NE Operating Procedure 12: Voltage and Reactive Control

ISO-NE Operating Procedure 14: Technical Requirements For Generators, Demand Resources, Asset Related Demands, and Alternative Technology Regulation Resources

ISO-NE Operating Procedure 16: Transmission System Data

ISO-NE Operating Procedure 18: Metering and Telemetry Criteria

ISO-NE Operating Procedure 23: Generator Resource Auditing

Generator Asset Registration: Review the documents to determine how the generator facility should be registered.

ISO-NE Training: Presentation materials and access to login into the training platform.

## Appendix: Resources, Documents, Links

### *Additional Information*

- ISO-NE Electronic Dispatch – Circuit and Router Order Form (if applicable)
  - Order at least 90+ days in advance of initial synchronization
  - Lead Market Participant coordinates with the ISO-NE New Generation Coordinator
  - Submit via Ask ISO – OR –
  - [NewGenCoord@iso-ne.com](mailto:NewGenCoord@iso-ne.com)
- Forward Capacity Market
  - <http://www.iso-ne.com/markets-operations/markets/forward-capacity-market>
- Transmission Service Applications (review with the interconnecting utility)
  - <http://www.iso-ne.com/participate/applications-status-changes/transmission-service-applications>
- Wind Integration Data Exchange Specification (Web services)
  - <http://www.iso-ne.com/participate/support/user-guides>



ISO-NE Electronic Dispatch – Circuit and Router order Form (if applicable): Required for generators that (1) want to receive 5-minutes electronic dispatch signals or (2) required to receive electronic dispatch instructions as a Do Not Exceed (DNE) dispatch point. A wind unit is an example of a generator that would be required to receive DNE dispatch.

Forward Capacity Market: Material and information related to the Forward Capacity Market.

Transmission Service Applications: Transmission services offered through the Open Access Transmission Tariff (OATT). Should be reviewed with the interconnection Transmission Owner.

Wind Integration Data Exchange Specification: Applicable to wind generators. Should be reviewed with ISO-NE Customer Support @ 413-540-4220 or [CustServ@iso-ne.com](mailto:CustServ@iso-ne.com).

### Additional Information

- [illegible]

Contact: ISO-NE contact information for new generator projects via email, phone, or issue management through the ISO-NE Standard Market Design portal (secure access that requires a Digital Certificate).

## Appendix: Resources, Documents, Links

### Additional Information

- Subscribe to the **ISO Newswire**
  - [ISO Newswire](#) is your source for regular news about ISO New England and the wholesale electricity industry within the six-state region
- Log on to **ISO Express**
  - [ISO Express](#) provides real-time data on New England's wholesale electricity markets and power system operations
- Follow the ISO on **Twitter**
  - [@isonewengland](#)
- Download the **ISO to Go App**
  - [ISO to Go](#) is a free mobile application that puts real-time wholesale electricity pricing and power grid information in the palm of your hand



Additional information related to news about ISO-NE and real-time market data.