Operating Procedures

ISO New England Operating Procedure No. 14

Technical Requirements for Generators,Demand Resources and Asset Related Demands – Appendix A – Explanation of Terms and Instructions for Data Preparation of ISO New England Form NX-12, Generator Technical Data

Effective Date: December 15, 2010
Revision No. 6

APPENDIX A -

EXPLANATION OF TERMS AND INSTRUCTIONS FOR DATA PREPARATION OF ISO NEW ENGLAND FORM NX-12, GENERATOR TECHNICAL DATA

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GENERAL INFORMATION

The NX-12 Generator Technical Data form requests information needed by ISO New England (ISO) that is not a part of the bid information. All required data must be provided for each defined Generator, as per OP-14, Section II.A.

Once an initial NX-12 has been provided, any change in Generator data must be reported to ISO via a revised NX-12 form. All NX-12 submissions will be sent to opanx12@iso-ne.com.

In order for an NX-12 form to be approved by ISO, all required data must be provided without errors and without omissions. It is the responsibility of the Lead Market Participant to correct errors or omissions on an NX-12 form and re-submit the corrected form to ISO. ISO will be the sole judge of when an NX-12 form is complete and correct. The effective date for changes to data items on an NX-12 form must be at least seven (7) days from the date that such determination is made by the ISO that the NX-12 form is complete and without errors.

When requested to select from a list of items, please indicate your selection by entering an "x" in the appropriate space on the NX-12 form.

Revision – Form revision identification and date of revision.

Lead Market Participant – The Lead Participant of a Generator as defined in ISO New England Manual for Definitions and Abbreviations, Manual M-35.

Local Control Center – The Local Control Center (LCC) with Operating Responsibility and Authority of a Generator as defined in ISO New England Operating Procedure No. 1 - Central Dispatch Operating Responsibility and Authority of ISO New England, the Local Control Centers and the Market Participants (OP 1).

Generator Name – The name of the Generator must:

- Be unique to all Generators
- Length cannot exceed 30 characters

Unit # – The unit number supplied by the ISO, or combination thereof, which represents the *entire* Generator in the ISO Market System and Energy Management System (EMS). For example, a Generator Name and Unit # combination may be:

- Manchester 10/10A; or
- Montville 10 & 11,

Where, each of these combinations represents *one Generator Asset*.

Generator ID – The Generator (Asset) ID, as assigned to each Asset via ISO Market Support Services at the time of Asset Registration Procedure, as defined in ISO New England Manual for Market Rule 1 Accounting, Manual M-28

Designated Entity – Organization or company who has responsibility to respond to authorized dispatch instructions for the generator.

DE Location – Physical location of the Designated Entity (DE). Location examples could be the Generating Plant name, RIG Location, or working location of individual responding to dispatch instructions.

DE Contact Name – Name or work position of individual responsible for responding to dispatch instructions.

DE Phone Number – 24 Hour Contact phone number for individual responsible for responding to dispatch instructions.

DE E-Mail Address – E-Mail address of DE.

SPECIFIC INFORMATION

Section 1: Data Preparation Documentation

This information includes the Data Revision Number, date prepared, name of person who prepared the data, and requested effective date.

Data Revision No. – The first time an NX-12 is filed by a Lead Market Participant and approved by ISO, it must be assigned Data Revision Number 0. Each time revised data is submitted and approved by ISO, the Data Revision Number must be incremented. Please note that the revision number should only be incremented from one approved NX-12 to the next approved NX-12. In other words, if changes to an approved NX-12 are desired and a new NX-12 form is submitted for approval, the data revision number should be incremented. If, however, there are errors or missing data on that new NX-12 form, another corrected form must be submitted by the Lead Market Participant. This corrected form should have the errors corrected and/or missing data provided, but the Data Revision Number should be the same as on the previously submitted form. The Data Revision Number is incremented only from one approved NX-12 to the next approved NX-12.

Date Prepared – The date on which the NX-12 form is completed and submitted to ISO.

Prepared By – The name of the authorized person who prepared the NX-12 form. Authorizations for NX-12 preparations are designated by the "NX – 12 Prepared by" selection in the Customer Asset Management System (CAMS) under "Contact Type" for the Lead Market Participant.

E-Mail Address – E-mail address of individual who prepared the NX-12 form.

Requested Effective Date – The date that the new NX-12 is to become effective. For a new unit, the effective date is to be at least One Hundred Twenty (120) days following the day that the designated recipient at ISO receives the NX-12 (assuming that the NX-12 form and all other required data are complete and without errors). For an existing unit, the effective date is to be at least seven (7) days following the day that the designated recipient at ISO receives the data (assuming that the form is complete and without errors). Please note that if there are errors or omissions on an NX-12 form, subsequent submittals of corrected NX-12 forms must have a Requested Effective Date that is at least seven (7) days from the date that the corrected NX-12 form is received by ISO.

Section 2: Basic Information

This information indicates the generator type, predominate (primary) fuel type, secondary (alternate) fuel type, startup fuel type, heat rate, metering domain (ID), status, capabilities and fuel switch of a Generator.

Generator Type – Select the type of Generating Unit from the choices listed below and on the NX-12 Form.

1. CC - Combined Cycle Total Unit
2. GT - Combustion (Gas) Turbine
3. FC - Fuel Cell - Electrochemical
4. HDP - Hydraulic Turbine - Conv Daily Pondage
5. HDR - Hydraulic Turbine - Conv Daily ROR
6. HW - Hydraulic Turbine - Conv Weekly Pondage
7. PS - Hydraulic Turbine - Reversible (pumped storage)
8. IG - Integrated Coal Gasification Comb Cycle
9. IC - Internal Combustion Engine
10. OT - Other
11. PV - Photovoltaic
12. PB - Pressurized Fluidized Bed Combustion
13. ST - Steam Turbine
14. WT - Wind Turbine

Startup Fuel Type – Select the Generating Startup Fuel Type from the choices listed below and on the NX-12 Form.

1. AB - Agricultural Crop Byproducts/Straw/Energy Crops
2. BIT - Anthracite Coal and Bituminous Coal
3. BLQ - Black Liquor
4. BFG - Blast Furnace Gas
5. SC - Coal Synfuel
6. FO1 - Distillate Fuel Oil. Including Diesel, No. 1
7. FO2 - Distillate Fuel Oil. Including Diesel, No. 2
8. FO4 - Distillate Fuel Oil. Including Diesel, No. 4
9. PG - Gaseous Propane
10. JF - Jet Fuel
11. KER - Kerosene
12. LFG - Landfill Gas
13. LIG - Lignite Coal
14. MSW - Municipal Solid Waste
15. NG - Natural Gas
16. NUC - Nuclear Uranium, Plutonium, Thorium
17. OBG - Other Biomass Gas. Includes digester gas, methane, and other biomass gasses.

18. OBL - Other Biomass Liquids.
19. OBS - Other Biomass Solids
20. PC - Petroleum Coke
21. PUR - Purchased Steam
22. BKRC - Residual Fuel Oil Bunker C
23. FO6 - Residual Fuel Oil No. 6
24. SLW - Sludge Waste
25. SUN - Solar
26. SUB - Subbituminous Coal
27. TDF - Tire-derived Fuels
28. WC - Waste/Other Coal.
29. WO - Waste/Other Oil.
30. WAT - Water
31. WND - Wind
32. WDL - Wood Waste Liquids excluding Black Liquor.
33. WDS - Wood/Wood Waste Solids.

Predominate (Primary) Fuel Type – Select the Generating Fuel Type from the choices listed below and on the NX-12 Form.

1. AB - Agricultural Crop Byproducts/Straw/Energy Crops
2. BIT - Anthracite Coal and Bituminous Coal
3. BLQ - Black Liquor
4. BFG - Blast Furnace Gas
5. SC - Coal Synfuel
6. FO1 - Distillate Fuel Oil. Including Diesel, No. 1
7. FO2 - Distillate Fuel Oil. Including Diesel, No. 2
8. FO4 - Distillate Fuel Oil. Including Diesel, No. 4
9. PG - Gaseous Propane
10. JF - Jet Fuel
11. KER - Kerosene
12. LFG - Landfill Gas
13. LIG - Lignite Coal
14. MSW - Municipal Solid Waste
15. NG - Natural Gas
16. NUC - Nuclear Uranium, Plutonium, Thorium
17. OBG - Other Biomass Gas. Includes digester gas, methane, and other biomass gasses.
18. OBL - Other Biomass Liquids.
19. OBS - Other Biomass Solids
20. PC - Petroleum Coke
21. PUR - Purchased Steam

22. BKRC - Residual Fuel Oil Bunker C
23. FO6 - Residual Fuel Oil No. 6
24. SLW - Sludge Waste
25. SUN - Solar
26. SUB - Subbituminous Coal
27. TDF - Tire-derived Fuels
28. WC - Waste/Other Coal.
29. WO - Waste/Other Oil.
30. WAT - Water
31. WND - Wind
32. WDL - Wood Waste Liquids excluding Black Liquor.
33. WDS - Wood/Wood Waste Solids.

Secondary (Alternate) Fuel Type – Select the Generating Secondary Fuel Type from the choices listed below and on the NX-12 Form. Note: that the Secondary Fuel is Not the Startup Fuel.

1. AB - Agricultural Crop Byproducts/Straw/Energy Crops
2. BIT - Anthracite Coal and Bituminous Coal
3. BLQ - Black Liquor
4. BFG - Blast Furnace Gas
5. SC - Coal Synfuel
6. FO1 - Distillate Fuel Oil. Including Diesel, No. 1
7. FO2 - Distillate Fuel Oil. Including Diesel, No. 2
8. FO4 - Distillate Fuel Oil. Including Diesel, No. 4
9. PG - Gaseous Propane
10. JF - Jet Fuel
11. KER - Kerosene
12. LFG - Landfill Gas
13. LIG - Lignite Coal
14. MSW - Municipal Solid Waste
15. NG - Natural Gas
16. NUC - Nuclear Uranium, Plutonium, Thorium
17. OBG - Other Biomass Gas. Includes digester gas, methane, and other biomass gasses.
18. OBL - Other Biomass Liquids.
19. OBS - Other Biomass Solids
20. PC - Petroleum Coke
21. PUR - Purchased Steam
22. BKRC - Residual Fuel Oil Bunker C
23. FO6 - Residual Fuel Oil No. 6
24. SLW - Sludge Waste

25. SUN - Solar
26. SUB - Subbituminous Coal
27. TDF - Tire-derived Fuels
28. WC - Waste/Other Coal.
29. WO - Waste/Other Oil.
30. WAT - Water
31. WND - Wind
32. WDL - Wood Waste Liquids excluding Black Liquor.
33. WDS - Wood/Wood Waste Solids.

Heat Rate – For all fossil fueled generating units (gas/oil/coal) the measure of the units thermal efficiency at full load (Eco Max) at the units SCC nominal temperature rating. The heat rate is the ratio of fuel energy input as heat per unit net work output expressed as Btu per net kilowatt-hour (Btu/kWh). Btu/kWh can be rounded to the nearest 100 Btu's.

Metering Domain (ID) – Metering Domains are connection points created within the Settlement Power System Model that facilitate the calculation of the Unmetered Load Asset value to ensure that all generation and load is accounted for within the ISO New England Reliability Coordinator Area/Balancing Authority Area (RCA/BAA). Each Node modeled for pricing purposes in the State Estimator must be associated with a single Metering Domain. All Load Assets receiving Zonal Price treatment in settlement must be connected to a Metering Domain. {Manual 35}.

Status – Select the operating status of the Generating Unit:

1. Active Unit (data change to item other than Lead Market Participant)
2. Retired Unit
3. Deactivated Reserve Unit
   - 3.a Deactivated Reserve Unit
   - 3.b Deactivated Effective Date
     The date the unit actually shut down (deactivation).

Capabilities – Check all that apply:

1. Black Start resource
   - 1A - Black Start Enabled resource (BSEr)
     Indicates that a resource has the physical ability to Black Start (starting without outside electrical supply). All resources with this capability must select this indicator in the NX-12 Generator Technical Data Form. Note that this is an indication of physical capability only and does not imply or convey approval, acceptance or contractual obligation for supply or compensation under Schedule 16 of the OATT and described in Manual 27 - Tariff Accounting

1B - Black Start Restoration Plan resource (BSRPr)

The indicator that a BSEr is incorporated in a LCC restoration plan that meets the criteria of OP-11, has been identified in OP11, Appendix A, and is qualified by the ISO for compensation eligibility under Schedule 16 of the OATT.

2. ICAP Resource:

   As defined in Market Rule 1, a generating unit that meets the requirements of this Market Rule and has been designated as an ICAP Resource by a Market Participant, in accordance with the ISO New England Manuals (refer to Manual 20 for ICAP).

3. Biddable:

   The Generator is able to submit Offers into the eMKT application (this excludes those generating unites that are less than 5 MW, which lack the instantaneous metering/telemetering required for real-time dispatch by ISO).

4. Dispatchable:

   A fully (or partially, in the case of partial self-schedule) dispatchable Generator available to be dispatched by ISO based on hourly price structure and operating limits. A Dispatchable Generator must be able to receive and respond to Desired Dispatch Points (DDPs).

5. Claim 10 Capable:

   The generation output level, expressed in MW, which can be reached by a Generator (from an off-line state) within ten minutes after receiving a Dispatch Instruction from ISO.

6. Claim 30 Capable:

   The generation output level, expressed in MW, which can be reached by a Generator (from an off-line state) within thirty minutes after receiving a Dispatch Instruction from ISO.

7. Fast Start Capable:

   A generating unit that ISO may dispatch within the hour through electronic dispatch and that meets the following criteria: (i) minimum run time does not exceed one hour; (ii) minimum down time does not exceed one hour; (iii) time to start does not exceed 30 minutes; (iv) available for dispatch and manned or has automatic remote dispatch capability; (v) capable of receiving and acknowledging a start-up or shut-down dispatch instruction electronically (vi); and has satisfied its minimum down time.

Fuel Switch:

1. Online Fuel Switch Capable:

   Defines whether a generation unit/station can perform the fuel switching operation, from primary to secondary fuel source, while online and synchronized to the grid.

   - Yes would indicate that the fuel switch could be done while the unit is online and synchronized, even if a slight reduction in output is necessary to perform the fuel switch.
   - No would indicate that the unit must reduce power output, be taken offline (non-synchronized to the grid), perform the fuel switch, and then be resynchronized to the grid to resume power output.

2. Preparation Time:

   Identify the advance notice time (in Hours) necessary to perform the fuel switching operation including the swap time.

   This time value can be entered regardless of whether the unit can or cannot perform an online fuel switch.

Section 3: Seasonal Claimed Capability (SCC)

Capabilities are determined in accordance with ISO New England Manual for Installed Capacity, Manual M-20

Note: all Capability values should be reported in MW, to three decimal places.

For all units except Daily Cycle Hydro and Wind:

Winter Claimed Capability – Winter Capability of an electric generating unit or combination of units is the maximum dependable load carrying ability in Megawatts of such unit or units (exclusive of capacity required for station use) during the Winter period, as determined by ISO New England Manual for Installed Capacity, Manual M-20. Winter Claimed Capabilities are used for the Winter Capability Period (October through May).

Summer Claimed Capability – Summer Capability of an electric generating unit or combination of units is the maximum dependable load carrying ability in Megawatts of such unit or units (exclusive of capacity required for station use) during the Summer period, as determined by ISO New England Manual for Installed Capacity, Manual M-20. Summer Claimed Capabilities are used for the Summer Capability Period (June through September).

For Daily Cycle Hydro and Wind units ONLY:

Daily cycle conventional hydro and wind capability ratings are based on monthly average river flow or wind conditions and, therefore, may differ from month to month. Claimed Capability ratings are determined on a monthly basis for daily cycle conventional hydro and wind units by ISO through studies conducted every five years. Lead Market Participants must submit NX-12 forms for such units with the capabilities developed by ISO for each month listed.

Emergency Min – The lowest MW level at which a Generating Unit can physically operate, below which the unit must turn off.

Black Start Emergency Min – The absolute claimed low limit MW level of stable unit operation during islanding or total restoration activities. This is a reliability declaration for Black Start resource only, not a Market declaration and will not be considered or utilized for market operations. A Black Start Enabled resource (BSEr) could supply this information voluntarily. It is mandatory for a Black Start Restoration Plan resource (BSRPr) to provide this value.

Section 4: Regulation Market Status

Regulation Market Capable – This indicates that a Generator has the appropriate telecommunications, control and response capability to increase or decrease its output in response to an electronic regulating control signal, in accordance with the specifications in the ISO Manuals and Administrative Procedures. The valid entries are "x" for Yes or "x" for No.

Section 5: Staffing

From Time – The time from which the Unit is staffed on a particular day (weekday, Saturday or Sunday).

To Time – The time to which the Unit is staffed on a particular day (weekday, Saturday or Sunday).

Call in Time – The number of hours required to get staff to the Unit during normally unstaffed hours on a particular day (weekday, Saturday or Sunday).

Section 6: Contact Information

Dedicated Bell Line Number – The assigned public switching network phone number for the asset.

Auto Ring Down Number – The assigned phone number for the asset auto ring down circuit. Circuit used for instantaneous voice communication between ISO and generating plant personnel in the event of RIG failure, contingency operations, or manual dispatching.

Operations Phone Numbers – 24 Hour Contact Phone Number(s) for generating plant Control Room Operator and/or Watch Engineers

Forecast Phone Numbers

Short Term Outages – Contact phone number for individual responsible for short term outage scheduling at generation plant.

Unit Commitment – Contact phone number for individual responsible for scheduling generator.

Lead Market Participant Contact – Single point of contact data for all issues related to the Lead Market Participant status of the generating unit.

Operations Management Contact - Single point of contact data for all issues related to the Operations Management of the generating facility. i.e. Plant Manager.

Operations Training Contact - Single point of contact data for all issues related to plant Operator Training, i.e., Training Manager

Operations Technical Contact - Single point of contact data for all issues related to the technical operation of the RIG, Auto Ring Down Line, and Dedicated Bell Line.

Section 7: Additional Information Required for Internal Combustion and Combined Cycle Units ONLY

For Claimed Capability Audit (CCA) purposes, ISO must adjust or normalize the output of an internal combustion and gas turbine/jet engine component of a combined cycle unit to the standard 90° (summer) and 20° (winter) temperatures upon which Claimed Capability for such a unit is based. Market Participants submitting an NX-12 for such a unit must include a table reflecting the full range (100° - 0°F, in one degree increments) of temperature versus MW output for that unit. The MW output values in this table must be reported to three decimal places.

The table of temperature versus output MW values in Section 7 should be representative of the expected relationship between ambient (or inlet) temperature and MW output of the Generator. The table values are expected to reflect the nameplate relationship between temperature and output for the Generator. The MW output values at 90°F and 20°F do not necessarily have to match the current respective summer and winter SCC values. All temperature adjustments made to demonstration values to normalize MW output to the standard at 90°F and 20°F temperatures will be performed using current approved Table 6 values on the NX-12 form.

Section 8: Additional Information

List any additional information regarding the Generator that is not previously detailed in this form or the Bid Parameters

Additional Information Required for Nuclear Power Plants ONLY - Market Participants submitting an NX-12 for Nuclear Power Plants (NPP) must include information regarding the Nuclear Plant Interface Requirements (NPIR) which are based on Nuclear Plant Licensing Requirements and Bulk Electric System requirements. The ISO reserves the right to request documentation of how each requirement in (a) through (f) below corresponds to one or more Nuclear Plant Licensing Requirements. The NPIRs that pertain to ISO and the LCCs include data and requirements relative to both generation and transmission. The NPIRs to which the ISO has agreed are entirely contained in the approved ISO Form NX-12 for generation data.

Specific NPIR information included on the NX-12 form is as follows:

a. Based on licensing requirements, the minimum voltage required at the transmission switchyard after the nuclear unit has tripped and time (optional) within which the voltage must be provided.

b. NPP station service load details. Additional information regarding AC power requirements of the NPP during and after transients such as a unit trip, restoration during and after a station blackout, etc. Note that normal station service load is documented in Form NX-12D.

c. Specific NPP systems that require ISO and/or LCCs to coordinate operations and maintenance with the NPP. For example, systems at the NPP that should not be scheduled to be out of service simultaneously with the outage of a transmission line (i.e., emergency diesel generators, critical cooling systems, startup or shutdown transformers, etc.).

d. Transmission facilities that require ISO and/or LCCs to coordinate operations and maintenance with the NPP. For example, transmission lines which provide off-site sources of power.

e. Operating scenarios based on licensing requirements that require communication from the NPP to ISO and/or LCC. For example, the NPP may be required to notify ISO and the LCC when the NPP enters a shutdown Limiting Condition of Operation (shutdown LCO) or when critical equipment is removed from service.

f. Operating scenarios based on licensing requirements that require communication from ISO and/or LCC to the NPP Operator: For example, the NPP may require notification when ISO and the LCC lose the ability to analyze post trip voltage at the switchyard or when one of the off-site sources of power to the NPP is unavailable.

OP 14 Appendix A Revision History

Document History (This Document History documents action taken on the equivalent NEPOOL Procedure prior to the RTO Operations Date as well revisions made to the ISO New England Procedure subsequent to the RTO Operations Date.)

Rev. No.	Date	Reason
Rev 1	01/05/05	
Rev 2	02/01/05	Updated to conform to RTO terminology
Rev 3	10/01/06	Updated for ASM Phase 2
Rev 4	10/10/08	Various editorial and terminology changes to be consistent with current used terminology, defined acronyms and correct reference procedure titles. Changes to include Fuel Type and add more Generator Types to be consistent with changes to NX-12. In GENERAL INFORMATION Section: Added new term - Revision and its definition. Added Market to Lead Participant. In Unit# added "supplied by ISO" after "The unit number…" Added the following terms and explanation in Section 2 – Basic Information: Heat Rate: 1) Added to the end of the first sentence "(EcoMax) at the units SCC nominal temperature rating." 2) Added sentence to end stating "Btu/kWh can be rounded up to the nearest 100 Btu's. Status: Added 3.Deactivated Reserves; 3.a Deactivated Reserve Unit; and 3.b Deactivated Effective Date (and definition) Capabilities: Black Start Enabled resource (BSEr) Black Start Restoration Plan resource (BSRPr) Heat Rate Fuel Switch: 1) Changed "Notification Time:" to "Preparation Time:" Added "including swap time" to the end of the first paragraph. Added the following term and explanation in Section 3: Seasonal Claimed Capability (SCC) In both **Winter Claimed Capability –** and **Summer Claimed Capability -** changed **"Kilowatts" to "Megawatts"** • Black Start Emergency Min Changed the title in the first paragraph of Section 4 to "Regulation Market Capable"
Rev 5	03/05/10	Added a new Additional Information Required for Nuclear Power Plants sub-section to Section 8 to SPECIFIC INFORMATION to update for NUC-001
Rev 6	12/15/10	Global editorial & format changes: font to Arial, added Table of contents, added uncontrolled disclaimer to 1st page footer, added "Hard Copy is Uncontrolled" to all page footers and changed page numbering format to Page X of Y; Replaced Control Area/Balancing Authority Area (CA/BAA) with Reliability Coordinator Area/Balancing Authority Area and defined new acronym RCA/BAA Added detail to description of "Prepared by" field in "Section 1: Data Preparation Documentation" to define authorization requirements; updated description for "PS" in "Generator Type" in "Section 2: Basic Information" to match the "PS" description found in the Capacity, Energy, Loads And Transmission (CELT) report.