Appendix D - Explanation of Terms and Instructions for Data Preparation of NX-9D

ISO New England Transmission Equipment Rating, Characteristic, and Operational Data

Static Capacitor/Reactor

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I. EQUIPMENT REQUIREMENTS

Data for all static capacitors and reactors designated as part of the Bulk Electric System[1] (BES) or connecting to the New England Transmission System[2] at a voltage of 69 kV or greater shall be provided by the Transmission Owners and Market Participants who own the equipment.[3]

Data for static capacitors and reactors connected at voltages that are less than 69 kV may be required when ISO determines that the data is necessary for reliable operation of the New England Transmission System. When required by ISO, the TO or MP shall submit the data within thirty (30) calendar days of ISO's notification.

II. GENERAL DATA INSTRUCTIONS

The NX-9D form provides for entry of both ISO and MP/TO data. ISO fields cannot be modified by the MP or TO. The MP or TO is responsible for providing data for all non-ISO fields via the NX Application.

The circuit number shall initially be entered by the MP or TO for new equipment and thereafter maintained by ISO.

Select the terminals that reflect the connection points of the equipment. Terminals are created and maintained by ISO. The user should contact the ISO NX-9 Administrator (nx9admin@iso-ne.com) if terminal additions or changes are needed.

To remove equipment from service, select the Remove Equipment From Service checkbox. Equipment is removed from service either when the equipment is retiring from service or if new forms are being submitted as a replacement due to a change in configuration.

To assist in completing the NX-9D form, a completed sample NX-9D form is attached (Example 1).

III. CHARACTERISTIC AND OPERATIONAL DATA INSTRUCTIONS

Complete the following fields as instructed below:

Device Type – Indicate by selection whether the device is a capacitor or reactor.

Nominal Capability (MVAR) - Indicate capability of the device at nominal system voltage. Whenever the device nameplate voltage differs from the nominal

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[1] Bulk Electric System (BES) is defined in the NERC Glossary of Terms Used in NERC Reliability Standards.

[2] New England Transmission System is defined in the ISO Transmission, Markets, and Services Tariff, Section I.2.2.

[3] Generally, under Section I of Operating Procedure No. 16, data shall be provided by Transmission Owners (TOs) and Market Participants, *i.e.* Market Participants who own the equipment or Lead Market Participants for Generator Assets (collectively MPs).

system voltage, the nameplate MVAR capability shall be converted to the MVAR capability at the nominal system voltage.

Mode of Operation - Indicate the mode of operation of the device. The mode of operation selected should reflect the operational state that the device is expected to be in the majority of the time.

Manual - Switching of the device is performed locally at the substation.

- If protective settings exist for operation of the device, provide these settings in the Equipment Notes field.

SCADA - Switching of the device is typically performed via SCADA by an LCC System Operator[4] or a TO control room operator. Device controls are not normally operated in voltage sensing mode. Use voltage sensing mode when device controls are normally operated in voltage sensing, yet when typical device switching is performed via SCADA.

- Enter the voltages at which the device will be switched on and off (high and low) based upon operator practice, typical use and local training regime, in that order.

- Switching time delay: Enter 999 to indicate that time is variable and dependent on multiple factors.

- If protective settings exist for operation of the device, provide these settings in the Equipment Notes field.

Time Schedule - Device controls are normally operated via a pre-programmed time or load schedule.

- Enter the actual time/load schedule used for switching in the Equipment Notes field.

- If multiple schedules (i.e., weekday/weekend, light load/heavy load) apply, provide these schedules in the Equipment Notes field.

- If the device can be expected to be switched in/out by an LCC System Operator or a TO control room operator action with SCADA control, provide the voltage levels used to make switching decisions in the Equipment Notes field.

Voltage Sensing - Device controls are normally in an automatic, voltage sensing mode.

- Enter the automatic voltage settings at which the device will be switched on and off.

[4] System Operator is defined in the NERC Glossary of Terms Used in NERC Reliability Standards.

- Provide the switching time delay in seconds.

- If the device can be expected to be switched in/out by an LCC System Operator or a TO control room operator action with SCADA control, provide the minimum/maximum voltages used to make switching decisions in the Equipment Notes field.

- If protective voltage settings exist that differ from the automatic voltage settings, provide these protective voltage settings in the Equipment Notes field.

IV. EXPLANATION OF DATA CHANGES

Any time an NX-9D form is modified or created, a brief description of the reason(s) for the entry shall be provided in the Revision Comments field. It will provide a written record of the change and clearly identify the equipment changes made in the field and/or other reasons that necessitated the update of the NX-9D form. For example: Cap bank upgraded to add voltage sensing capability.

This data is utilized by ISO in the NX-9D form review and approval process.

V. EQUIPMENT NOTES

The Equipment Notes field is used to provide explanations of data or other pertinent or operational information. For example: This cap bank is switched on and off together with Station A C1.

Fields are provided for both ISO and MP/TO notes. An additional private field is available to the MP or TO for internal notes that can be edited and viewed only by the MP or TO owning the record.

Equipment notes are carried forward when an NX-9D form is updated. MPs and TOs should review and modify or delete any MP or TO note that is no longer pertinent. ISO is responsible for maintaining ISO notes.

EXAMPLE 1, NX-9D STATIC CAPACITOR/REACTOR

ISO New England Equipment Rating, Characteristic, and Operational Data Implementation Form
Capacitor / Reactor (NX-9D)

Reference	1404030025	**Participant ID**	Station1 C2
Participant	Test	**ISO ID**	STATION1 C2
Form State	Approved	**Ckt**	1

Station	Station115kV	**Bus #**	111222	**EMS**	STATION1
Device Type	Capacitor	**Nominal System Voltage (kV)**	115		
Nominal Capability (MVAR)	63	**On Voltage (kV)**	115		
Mode of Operation	VoltageSensing	**Off Voltage (kV)**	123		
		Switching Time Delay (Sec)	300		

Revision Comments Cap bank upgraded to add voltage sensing capability

Equipment Notes Bank normally controlled by System Operator via SCADA with LCC permission.

Data Revision Number	2	**Date Created**	04/03/2014	**Prepared By**	Participant Username
Requested Effective Date	05/19/2014	**Date Received**	04/16/2014	**Approved By**	ISO Username
Actual Effective Date	05/09/2014	**ISO EMS Implementation Date**			

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VI. OP-16 APPENDIX D 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	09/06/02	
Rev 2	02/01/05	Updated to conform to RTO terminology
Rev 3	08/05/05	Clarified terminology and added reference to new "Reason for Revision" field to aid NX-9 administration and conform to PP7
Rev 4	02/24/09	Update screen shots and example for consistency of formatting.
Rev 5	05/04/12	Biennial review by procedure owner; Global language clarifications and changes to improve readability and user comprehension of requirements Section I: clarify responsibility for reporting data; Section II; remove list of specific ISO fields Section V: add identification of comment author Example: remove screen shot of NX-9 Application entry form
Rev 6	12/09/13	Biennial review by procedure owner; General language changes to accommodate new web-based NX Application for NX-9 and NX-12D data; Globally change the term "Participant' to "Market Participant or Transmission Owner"; Define Market Participant as MP and use throughout document; Define Transmission Owner as TO as use throughout document; Sections I+II: renamed and reorganized. Some instructions moved from Section I to Section II; Section III: Provided definitions for operational modes and clarified requirements for associated data; Section V: renamed to match new application and clarified the desired information and purpose of the field; Replaced example with report from new application;
Rev 7	11/06/15	Biennial review by procedure owner; Clarify equipment requirement by specifying that the NX-9D form is intended for static capacitors and reactors; Add instructions for use of the Remove Equipment From Service field; Remove Rating from Section III heading - rating data does not apply to capacitor/reactor devices; Add instructions for selecting Device Type; Remove instructions for entry of System voltage – this field is now derived from the terminal voltage; Enhance instructions for entering voltage schedule information; Update example titles; Replace example: label change from system voltage to nominal system voltage; Adjust paragraph spacing format to match other OP-16 appendices;
Rev 8	08/05/16	Globally all footers, added the required corporate document identity; Update equipment requirements to include BES equipment;
Rev 9	11/03/17	Biennial review by procedure owner; Globally, made editorial changes to be consistent with current practices and management expectations (e.g., grammar changes from "must" to "shall"' and "which" to "that" as appropriate; and remove capitalization from non-defined terms; Clarify circumstance for ISO to require reporting of equipment connected at voltages under 69 kV is because it is needed for reliable operation of the New England Transmission System; Update language for nominal capability to provide clarity to instructions.
Rev 9.1	06/06/19	Annual review by procedure owner requiring no changes; Made administrative changes required to publish the Minor Revision;