

# Market Manual

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## **Market Manual 11: Reliability Compliance**

### **Part 0.11.1: Applicability**

### **Criteria for Compliance**

### **with NERC Reliability**

### **Standards and NPCC**

### **Criteria**

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**Issue 1.0**  
**April 4, 2025**

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## Document Change History

Issue	Reason for Issue	Date
Refer to Issue 8.0 (IESO-GDE-0364) for changes prior to Market Transition.		
1.0	Market transition	April 4, 2025

## Related Documents

Document ID	Document Title
N/A	NERC Reliability Standard Mapping Tool/Spreadsheet
N/A	NPCC Criteria Mapping Spreadsheet
N/A	IESO Transmitter Assignment of NERC Transmission Operator Accountabilities Matrix

# Table of Contents

<b>Table of Contents</b>	<b>i</b>
<b>Table of Changes</b>	<b>ii</b>
Market Transition	1
Market Manuals	2
Market Procedures	2
1 Introduction	3
1.1 Purpose	3
2 Applicability Criteria for NERC Reliability Standards	4
3 NERC's Approved Definition of Bulk Electric System (Part I)	5
3.1 Current Applicable Bulk Electric System Definition	5
3.2 Implementation Period for Newly-Included BES Elements	7
4 NERC's Functional Model (Part II)	8
4.1 Functional Model Entity Types	8
5 Applicability for NPCC Criteria	10
6 Additional Criteria as defined by the IESO (Part III)	11
7 IESO Applicability Guidance for NERC Reliability Standards and NPCC Criteria	12
References	19

## Table of Changes

Reference (Section and Paragraph)	Description of Change
Throughout	<p>Removed references to obsoleted NPCC Directories 9 and 10.</p> <p>References to IESO Market Manual 2.20 have been replaced with Market Manual 1.6.</p> <p>Removed references to obsoleted 'NPCC Compliance Guidance Statement 5 (CGS-5)'.</p> <p>Updated versioning of superseded NERC Standards.</p>

– End of Section –

## Market Transition

- A.1.1 This *market manual* is part of the *renewed market rules*, which pertain to:
- A.1.1.1 the period prior to a *market transition* insofar as the provisions are relevant and applicable to the rights and obligations of the *IESO* and *market participants* relating to preparation for participation in the *IESO administered markets* following commencement of *market transition*; and
  - A.1.1.2 the period following commencement of *market transition* in respect of all the rights and obligations of the *IESO* and *market participants*.
- A.1.2 All references herein to chapters or provisions of the *market rules* or *market manuals* will be interpreted as, and deemed to be references to chapters and provisions of the *renewed market rules*.
- A.1.3 Upon commencement of the *market transition*, the *legacy market rules* will be immediately revoked and only the *renewed market rules* will remain in force.
- A.1.4 For certainty, the revocation of the *legacy market rules* upon commencement of *market transition* does not:
- A.1.4.1 affect the previous operation of any *market rule* or *market manual* in effect prior to the *market transition*;
  - A.1.4.2 affect any right, privilege, obligation or liability that came into existence under the *market rules* or *market manuals* in effect prior to the *market transition*;
  - A.1.4.3 affect any breach, non-compliance, offense or violation committed under or relating to the *market rules* or *market manuals* in effect prior to the *market transition*, or any sanction or penalty incurred in connection with such breach, non-compliance, offense or violation; or
  - A.1.4.4 affect an investigation, proceeding or remedy in respect of:
    - (a) a right, privilege, obligation or liability described in subsection A.1.4.2; or
    - (b) a sanction or penalty described in subsection A.1.4.3.
- A.1.5 An investigation, proceeding or remedy pertaining to any matter described in subsection A.1.4.3 may be commenced, continued or enforced, and any sanction or penalty may be imposed, as if the *legacy market rules* had not been revoked.

## Market Manuals

The *market manuals* consolidate the market procedures and associated forms, standards, and policies that define certain elements relating to the operation of the *IESO-administered markets*. Market procedures provide more detailed descriptions of the requirements for various activities than is specified in the *market rules*. Where there is a discrepancy between the requirements in a document within a *market manual* and the *market rules*, the *market rules* shall prevail. Standards and policies appended to, or referenced in, these procedures provide a supporting framework.

## Market Procedures

The “Reliability Compliance” Manual is Series 11 of the *market manuals*, where this document forms “Part 11.1: Applicability Criteria for Compliance with NERC Reliability Standards and NPCC Criteria”.

– End of Section –

# 1 Introduction

## 1.1 Purpose

To assist Ontario *market participants* in understanding how *NERC reliability standards* and *NPCC* criteria apply to their organizations, the *IESO* will:

- Outline the criteria for the applicability for compliance with *NERC reliability standards* and *NPCC* criteria, and
- Identify Ontario *market participants* and associated *facilities* that are subject to compliance with *NERC reliability standards* and *NPCC* criteria.

This document is limited to the applicability of *NERC reliability standards* and *NPCC* criteria for those *market participants* and associated *facilities* that meet the criteria as set out below.

– End of Section –



## 2 Applicability Criteria for NERC Reliability Standards

To identify *market participants* that are candidates for complying with *NERC* standards, the *IESO* uses the following criteria:

- I. Entities that own or operate elements of the bulk power system, as established by *NERC's* approved definition of bulk electric system<sup>1</sup>.
- II. Entities identified in Part I above will be categorized as one or more functional entity types based on the functions the entity normally performs in *NERC's* Functional Model definitions.
- III. Entities not otherwise identified in Part I or II above may be included by additional criteria as defined by the *IESO*.

We further elaborate on these criteria in the sections that follow.

**Note:** Capitalized terms in this document refer to terms defined by *NERC* or *NPCC*.

– End of Section –

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<sup>1</sup> Bulk Electric System is a *NERC*-defined term. Bulk Power System is an *NPCC*-defined term.

## 3 NERC's Approved Definition of Bulk Electric System (Part I)

### 3.1 Current Applicable Bulk Electric System Definition

Entities that own or operate elements of the bulk power system as established by *NERC's* approved definition of Bulk Electric System (BES), are owners, operators, and users of the bulk power system and candidates for complying with *NERC* standards and *NPCC* criteria. The current definition for BES is:

*"Bulk Electric System" or "BES" means unless modified by the lists shown below, all Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources connected at 100 kV or higher. This does not include facilities used in the local distribution of electric energy.*

#### 3.1.1 Inclusions

**I1** - Transformers with the primary terminal and at least one secondary terminal operated at 100 kV or higher unless excluded by application of Exclusion E1 or E3.

**I2** - Generating resource(s) including the *generator* terminals through the high-side of the step-up transformer(s) connected at a voltage of 100 kV or above with:

- a) Gross individual nameplate rating greater than 20 MVA. Or,
- b) Gross plant/*facility* aggregate nameplate rating greater than 75 MVA.

**I3** - Blackstart Resources identified in the Transmission Operator's restoration plan.

**I4** - Dispersed power producing resources that aggregate to a total capacity greater than 75 MVA (gross nameplate rating), and that are connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage of 100 kV or above. Thus, the *facilities* designated as BES are:

- a) The individual resources, and
- b) The system designed primarily for delivering capacity from the point where those resources aggregate to a greater than 75 MVA to a common point of connection at a voltage of 100 kV or above.

**I5** - Static or dynamic devices (excluding *generators*) dedicated to supplying or absorbing Reactive Power that are connected at 100 kV or higher, or through a dedicated transformer with a high-side voltage of 100 kV or higher, or through a transformer that is designated in Inclusion I1 unless excluded by application of Exclusion E4.

### 3.1.2 Exclusions

**E1** - Radial systems: A group of contiguous transmission Elements that emanates from a single point of connection of 100 kV or higher and:

- a) Only serves Load. Or,
- b) Only includes generation resources, not identified in Inclusions I2, I3, or I4, with an aggregate capacity less than or equal to 75 MVA (gross nameplate rating). Or,
- c) Where the radial system serves Load and includes generation resources, not identified in Inclusions I2, I3 or I4, with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).

**Note 1** – A normally open switching device between radial systems, as depicted on prints or one-line diagrams for example, does not affect this exclusion.

**Note 2** – The presence of a contiguous loop operated at a voltage level of 50 kV or less, between configurations being considered as radial systems, does not affect this exclusion.

**E2** - A generating unit or multiple generating units on the customer's side of the *retail meter* that serve all or part of the retail Load with electric *energy* if: (i) the net capacity provided to the BES does not exceed 75 MVA, and (ii) standby, back-up, and maintenance power services are provided to the generating unit or multiple generating units or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a *Generator Owner* or *Generator Operator*, or under terms approved by the applicable regulatory authority.

**E3** - Local networks (LN): A group of contiguous transmission Elements operated at less than 300 kV that *distribute* power to Load rather than transfer bulk power across the interconnected system. LN's emanate from multiple points of connection at 100 kV or higher to improve the level of service to *retail* customers and not to accommodate bulk power transfer across the interconnected system. The LN is characterized by all of the following:

- a) Limits on connected generation: The LN and its underlying Elements do not include generation resources identified in Inclusions I2, I3, or I4 and do not have an aggregate capacity of non-retail generation greater than 75 MVA (gross nameplate rating),
- b) Real Power flows only into the LN and the LN does not transfer *energy* originating outside the LN for delivery through the LN, and
- c) Not part of a Flowgate or transfer path: The LN does not contain any part of a permanent Flowgate in the Eastern *Interconnection*, a major transfer path within the Western *Interconnection*, or a comparable monitored *Facility* in the ERCOT or Quebec *Interconnections*, and is not a monitored Facility included in an Interconnection Reliability Operating Limit (IROL).

**E4** - Reactive Power devices installed for the sole benefit of a *retail* customer(s).

**Note** - Elements may be included or excluded on a case-by-case basis through the Rules of Procedure exception process.

## 3.2 Implementation Period for Newly-Included BES Elements

*NERC's* current *BES* definition came into effect on July 1, 2014. Elements that were classified as *BES* elements prior to the currently effective definition will continue to be deemed *BES* and comply with *NERC* standards. For existing *facilities* registered in the *IESO-administered market* that are newly-identified as *BES* elements by application of the currently effective definition, compliance with applicable *NERC* standards will begin July 1, 2016. Newly commissioned assets that fall within the current *BES definition* must be compliant with *NERC* standards upon synchronization.

In order to assist *market participants* to bring any newly identified *BES* elements into compliance with the *BES* definition over the 24-month implementation period, the *IESO* provided, on an annual basis, the affected owners with a list of their existing *BES* and newly-included *BES* elements.

**– End of Section –**

## 4 NERC's Functional Model (Part II)

### 4.1 Functional Model Entity Types

*NERC's Reliability Functional Model* is also used to determine the applicability criteria for compliance with *NERC reliability standards* and *NPCC* criteria. Entities identified in Part I above are categorized under one or more of the functional entity types in the model based on a comparison of the functions the entity normally performs against the function types listed in [NERC Rules of Procedure, Appendix 5B-Statement of Compliance Registry Criteria](#). *NERC* assigns each requirement in the *NERC reliability standards* to the applicable functional model entity. *NPCC* criteria requirements are similarly assigned to the applicable functional model entity.

The classes of *market participants* in the Ontario *market rules* do not clearly align with the *NERC* functional model entity types. Therefore, the *IESO*, in consultation with stakeholders, mapped the Ontario *market participant* classes to the *NERC* Functional Model Entities and by extension, mapped the *NERC Reliability Standard* and *NPCC* criteria requirements to *market participant* classes.

The following is a list of Ontario *market participant* classes cross-referenced to *NERC* Functional Model Entity types:

Ontario Market Participant Class	NERC Functional Model Entity
<i>Generator</i>	<i>Generator Owner</i>
<i>Electricity Storage Participant</i>	<i>Generator Operator</i>
<i>Transmitter</i>	Transmission Owner

The *IESO* has also developed spreadsheets to assist *market participants* to identify those standard and criteria requirements that are applicable to them based on the functions they perform and can be accessed on the [Applicability Criteria for Compliance with Reliability Requirements](#) page of the *IESO* website.

#### 4.1.1 Applying Transmission Owner/Operator Requirements to the Generator Owner/Operator

*Generator connection facilities* (tie-lines) whose sole purpose is to connect the *generator* to the grid will not be subject to any requirements applicable to the

Transmission Owner and Transmission Operator functional categories. Applicability for *generator connection facilities* is limited to the following specific standards<sup>2</sup>:

- Facility Connection Requirements (FAC-001)
- Transmission Vegetation Management (FAC-003)
- Analysis and Mitigation of Transmission and Generation Protection System Misoperations (PRC-004)
- Transmission and Generation Protection System Maintenance and Testing (PRC-005)

#### 4.1.2 Assignment of Transmission Operator Matrix

Based on the unique relationship between the *IESO* and Ontario Transmission Owners that own and operate *BES* elements, the *IESO* has developed a matrix intended to appropriately assign the Transmission Operator accountabilities associated with the applicable *NERC reliability standards*. This matrix can be found on the [Applicability Criteria for Compliance with Reliability Requirements](#) page of the *IESO* website.

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<sup>2</sup> Refer to [FERC Order 785 on Generator Requirements at the Transmission Interface](#), issued September 19, 2015.

## 5 Applicability for NPCC Criteria

In the *Northeast Power Coordinating Council (NPCC)*<sup>3</sup> region, the Bulk Power System (BPS)<sup>4</sup> is defined in accordance with *NPCC* documents A-10 and [D-1](#). Therefore, in Ontario, those elements that have been identified as part of the *NPCC*-defined Bulk Power System must be designed, operated, and maintained in accordance with *NPCC* criteria.

Each year the *IESO* develops the Ontario Bulk Power System list<sup>5</sup> which lists the busses that are part of the *NPCC*-defined *bulk power system*. Accordingly, elements that are directly-connected to these busses must comply with *NPCC* criteria. These elements are all transformers (including *generator* and *electricity storage unit* step-up and *station service* transformers), transmission circuits, shunt devices, circuit breakers and switches.<sup>6</sup> Since these elements are deemed critical to the *reliability* of the *BES*, they are also classified as *BES* elements and must also comply with *NERC reliability standards*.

The *IESO* provides, on an annual basis, the affected owners with a list of their *BPS* facilities.

– End of Section –

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<sup>3</sup> *NPCC* is the Regional Reliability Organization for the north-eastern part of the United States and Canada. It includes the State of New York and the six New England states (Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, Maine) as well as the Canadian provinces of Ontario, Quebec and the Maritime provinces of New Brunswick, Nova Scotia, and Prince Edward Island.

<sup>4</sup> Bulk Power System is an *NPCC*-defined term. Bulk Electric System is a *NERC*-defined term.

<sup>5</sup> The Ontario Bulk Power System list is developed based on the *IESO*'s annual planning assessment of the Ontario power system and reflects changes and assumptions available to the *IESO* at the time of the assessment. The list is approved by *NPCC*.

<sup>6</sup> The following elements do not constitute *BPS* elements: main *generator*, unit service transformer, standby/diesel generator, as these elements are not directly connected to the *BPS* busses.

## 6 Additional Criteria as defined by the IESO (Part III)

The applicability criteria above are general criteria only. The *IESO* may develop additional criteria for complying with *NERC* standards and *NPCC* criteria if the *IESO* determines that a *market participant's facilities* or the functions it performs are material to the *reliability* of the bulk power system. Similarly, the *IESO* may limit the compliance obligations of a given *market participant* for a particular function or similarly situated class of entities, as warranted based on the particular facts and circumstances, to a sub-set list of *NERC* standards and *NPCC* criteria (which may specify requirements and sub-requirements).

In addition, some *NERC* standards introduce additional specific criteria, such as different threshold criteria, that expand the applicability of *NERC* standards beyond those stated above, while some others may limit applicability to a subset of functional entities (e.g., nuclear plant *generator* operators) or *facilities*.

– End of Section –



## 7 IESO Applicability Guidance for NERC Reliability Standards and NPCC Criteria

The following provides applicability guidance for certain NERC Reliability Standards and NPCC Criteria for Ontario *market participants*:

NERC RELIABILITY STANDARD / NPCC DIRECTORY	APPLICABILITY GUIDANCE
<b><i>Dispersed Power Producing Resources</i></b>	<p>NERC's BES Definition includes criterion I4 which addresses dispersed generation resources, and the <a href="#">NERC BES Reference Document</a> includes a description of what constitutes dispersed generation resource:</p> <p><i>"Dispersed power producing resources are small-scale power generation technologies using a system designed primarily for aggregating capacity providing an alternative to, or an enhancement of, the traditional electric power system."</i></p> <p>Examples could include but are not limited to:</p> <ul style="list-style-type: none"> <li>• Wind</li> <li>• Solar</li> <li>• Geothermal</li> <li>• Run-of-river hydro</li> <li>• <i>Energy</i> storage, micro-turbines, and fuel cells</li> </ul>
<b><u>CIP-002.5.1a:</u></b> <b><i>Cyber Security – BES Cyber System Categorization</i></b>	<p><i>Market participants</i> need certain information for them to identify and categorize BES Cyber Systems and their associated BES Cyber Assets in accordance with the NERC Cyber Infrastructure and Protection (CIP) Reliability Standard CIP-002-5.1 R1.</p> <p>As the Reliability Coordinator and Planning Coordinator, the IESO must identify certain categories of <i>facilities</i> identified in CIP-002-5.1 – Attachment 1 – Impact Rating Criteria as impactful to reliability.</p> <p>At least once per calendar year, the IESO notifies those <i>market participants</i> who own assets identified under the following criteria listed in the attachment:</p> <ul style="list-style-type: none"> <li>• <b>Criterion 2.3</b> – <i>Facilities</i> necessary to avoid an Adverse Reliability Impact in the planning horizon of more than one year,</li> </ul>

<b>NERC RELIABILITY STANDARD / NPCC DIRECTORY</b>	<b>APPLICABILITY GUIDANCE</b>
	<p>The <i>IESO</i> has not identified any <i>facilities</i> that meet this criterion.</p> <ul style="list-style-type: none"> <li>• <b>Criterion 2.6</b> – <i>Facilities</i> critical to the derivation of IROLs.</li> </ul> <p>The <i>IESO</i> has not identified any <i>generation facilities or electricity storage facilities</i> that meet this criterion.</p> <ul style="list-style-type: none"> <li>• <b>Criterion 2.9</b> – A Special Protection System (<i>SPS</i>), Remedial Action Scheme (<i>RAS</i>), or automated switching System that operates BES Elements, that, if destroyed, degraded, misused or otherwise rendered unavailable, would cause one or more IROL violations for failure to operate as designed or cause a reduction in one or more IROLs if destroyed, degraded, misused, or otherwise rendered unavailable.</li> </ul> <p>The <i>IESO</i> has not identified any <i>Generator Owner</i> that meets this criterion.</p> <ul style="list-style-type: none"> <li>• <b>Criterion 3.4</b> – <i>Facilities</i> critical to system restoration</li> </ul> <p>Please refer to EOP-005-3 below.</p>
<p><b><u>EOP-005-3:</u></b> <b><i>System Restoration from Blackstart Resources</i></b></p> <p><b><u>Directory #8:</u></b> <b><i>System Restoration</i></b></p>	<p><i>Market participants</i> that have key <i>facilities</i> are subject to <i>NERC's</i> System Restoration from Blackstart Resources Reliability Standard (EOP-005-2), and the <i>NPCC</i> Directory #8 System Restoration.</p> <p>The <i>IESO</i> conducts an annual review of Ontario's key <i>facilities</i> used to establish a basic minimum power system (BMPS) as defined in the <i>NPCC</i> Glossary of Terms and described in <a href="#">Market Manual 7.8: Ontario Power System Restoration Plan</a>. The critical components in each key <i>facility</i> are the subject of periodic testing under the <i>NPCC</i> Directory #8.</p> <p>The <i>IESO</i> provides applicable <i>market participants</i> with their list of key <i>facilities</i> (subject to the <i>IESO's</i> confidentiality provisions). <i>Market participants</i> can use this information to make the appropriate designations of "critical" <i>facilities</i> for their CIP evaluations.</p> <p>The <i>IESO</i> also requires <i>restoration participants</i> to review, on an annual basis, their <i>emergency preparedness plan</i> and submit their <i>restoration participant attachment</i> for emergency restoration planning through FORMS 1608 and 1609. These forms align the obligations of <i>restoration participants</i> with the <i>NERC Reliability Standard</i> EOP-005-2, the <i>NPCC</i> Directory #8, and section 11 in Chapter 5 of the <i>Market Rules</i> on Emergency Preparedness and System Restoration, and the associated <a href="#">Market Manual 7.10: Ontario Electricity Emergency Plan</a>, Sections 4.5 and 4.6.</p>

<b>NERC RELIABILITY STANDARD / NPCC DIRECTORY</b>	<b>APPLICABILITY GUIDANCE</b>
<p><b><u>FAC-002-3:</u></b></p> <p><b>Facility Connection Requirements</b></p>	<p><i>Market participants</i> coordinate and cooperate with the <i>IESO</i> (as the Transmission Planner and Planning Authority) on assessments for integration of new <i>facilities</i> through the IESO’s Connection Assessment Process, as established in Section 4 of Chapter 4 of the <i>Market Rules</i>.</p>
<p><b><u>FAC-003-4:</u></b></p> <p><b>Transmission Vegetation Management</b></p>	<p>Applicability of FAC-003-4 includes transmission lines, <i>generation facilities</i> and <i>electricity storage facilities</i> operated below 200kV identified as an element of an IROL by the Planning Coordinator.</p> <p>As the Planning Coordinator, the <i>IESO</i> has <b>not</b> identified any transmission lines, <i>generation facilities</i> or <i>electricity storage facilities</i> operated below 200 kV that are an element of an IROL.</p>
<p><b><u>IRO-010-3:</u></b></p> <p><b>Reliability Coordinator Data Specification and Collection</b></p> <p><b><u>TOP-003-4:</u></b></p> <p><b>Operational Reliability Data</b></p>	<p>The <i>IESO</i> performs reliability functions for Ontario (Reliability Coordinator (RC), Balancing Authority (BA), and Transmission Operator (TOP), as defined by NERC. Requirements R1 and R2 of <i>NERC Reliability Standard</i> IRO-010-3 and Requirements R1 to R4 of TOP-003-4 require the RC, BA, TOP to specify the data it needs from Generator and Transmission Owners/Operators to perform these functions.</p> <p>The list of required data and information that must be available on an continual basis to the IESO to support the IESO’s Operational Planning Analyses, Real-time Monitoring, and Real-time Assessments is specified in Market Rule Chapter 4: Grid Connection Requirements:</p> <ul style="list-style-type: none"> <li>• Appendix 4.15 – IESO Monitoring Requirements: Generators</li> <li>• Appendix 4.16 – IESO Monitoring Requirements: Transmitters</li> <li>• Appendix 4.24 – IESO Monitoring Requirements: Electricity Storage Participants</li> </ul> <p>The format for the data and information is specified in <a href="#">Market Manual 6: Participant Technical Reference Manual</a>.</p> <p>The timeframe and periodicity for providing data and information is specified in Market Rule Chapter 4: Grid Connection Requirements:</p> <ul style="list-style-type: none"> <li>• Appendix 4.19 – IESO Monitoring Requirements: Generator Performance Standards</li> </ul>

NERC RELIABILITY STANDARD / NPCC DIRECTORY	APPLICABILITY GUIDANCE
	<ul style="list-style-type: none"> <li>• Appendix 4.20 – IESO Monitoring Requirements: Transmitter Performance Standards</li> <li>• Appendix 4.21 – IESO Monitoring Requirements: Transmitter Performance Standards</li> <li>• Appendix 4.25 – IESO Monitoring Requirements: Electricity Storage Performance Standards</li> </ul> <p>Outage information is specified in <a href="#">Market Manual 7.3: Outage Management</a>.</p>
<p><b><u>MOD-025-2:</u></b></p> <p><b><i>Real and Reactive Power Capability Verification</i></b></p>	<p>The <i>IESO</i> aligns the <i>NERC</i> standard MOD-025-2 requirements, and with the <i>IESO</i> requirements in Appendix 4.2 – Requirements for Generation and Electricity Storage <i>Facilities</i> Connected to the IESO-Controlled Grid –of Chapter 4 Appendices in the <i>market rules</i>, so that the <i>Generator</i> or Transmission Owners can meet all four sets of requirements for <i>generation facility</i> and <i>electricity storage facility</i> capability verification.</p> <p><a href="#">Market Manual 11: Reliability Compliance Part 11.5: Model Validation of Generation Facilities, Electricity Storage Facilities and Other Devices</a> consolidates the obligations of applicable market participants related to model verification of <i>generation facilities</i>, <i>electricity storage facilities</i>, synchronous condensers or other voltage-compensating devices contained within the <i>market rules</i> and applicable NERC reliability standards.</p> <p>Please refer to Sections 3.4 and 3.5 in '<a href="#">Market Manual 1: Connecting to Ontario's Power System Part 1.6: Performance Validation</a>' for more detailed information on the active and reactive power generator requirements.</p> <p>The IESO requires that a generation facility or electricity storage facility directly connected to the <i>IESO-Controlled Grid</i> should verify its capability every 5 years (i.e., with a 5 year rolling window). As such, the lower threshold of 10 MW as per the IESO requirement should be no new burden for meeting the <i>NERC</i> standard requirements and <i>NPCC</i> criterion for real and reactive power capability verification.</p> <p>The <a href="#">IESO Active and Reactive Power Capability Verification Form</a> contains the relevant instructions and forms for <i>market participants</i> to use to complete the <i>NERC</i> standard MOD-025-2, and the <i>IESO Market Rule generation facility</i> and <i>electricity storage facility</i> capability testing.</p>
<p><b><u>MOD-026-1:</u></b></p> <p><b><i>Verification of Models and Data for Generator Excitation Control System or Plant</i></b></p>	<p>The <i>IESO</i> aligns the <i>NERC</i> standards MOD-026-1 and MOD-027-1 requirements with the <i>IESO</i> requirements Appendix 4.2 – Requirements for Generation and Electricity Storage <i>Facilities</i> Connected to the IESO-Controlled Grid of Chapter 4 in the <i>Market Rules</i>, so that the <i>Generator</i> Owners or Transmission Owners can meet all three sets of requirements.</p> <p>Please refer to Section 3.7 in <a href="#">Market Manual Part 1.6: Performance Validation</a> for more detailed information on excitation system requirements.</p>

<b>NERC RELIABILITY STANDARD / NPCC DIRECTORY</b>	<b>APPLICABILITY GUIDANCE</b>
<p><b><i>Volt/VAR Control Functions</i></b></p> <p><b><u>MOD-027-1:</u></b></p> <p><b><i>Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions</i></b></p>	<p>The <i>IESO</i> requires that <i>generation facilities</i> and <i>electricity storage facilities</i> directly connected to the <i>ICG</i> should perform model data validation using acceptable dynamic models listed in Section 5.7 of Market Manual 1.6.</p> <p>As noted above, Market Manual 11: Reliability Compliance Part 11.5: Model Validation of Generation <i>Facilities</i>, Electricity Storage <i>Facilities</i> and Other Devices consolidates the obligations of applicable <i>market participants</i> related to model verification of <i>generation facilities</i>, <i>electricity storage facilities</i>, synchronous condensers or other voltage-compensating devices contained within the <i>market rules</i> and applicable <i>NERC reliability standards</i>.</p>
<p><b><u>PRC-002-2:</u></b></p> <p><b><i>Disturbance Monitoring</i></b></p>	<p>As per Requirement 5 of NERC Reliability Standard PRC-002-2, as Planning Coordinator, the IESO will notify Transmission Owners and Generator Owners who will need to install Dynamic Disturbance Recorder equipment as part of the 5-year review.</p>
<p><b><u>PRC-005-6:</u></b></p> <p><b><u>Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance</u></b></p>	<p>Maintenance activities on L/R and UFLS control circuitry:</p> <p>A majority of distributed UFLS relays will directly trip the trip coil of non-BES interrupting devices. There is no required maintenance for UFLS control circuitry in this case, as per <i>NERC Reliability Standard</i> PRC-005-6. Similarly, there may be L/R schemes in Remedial Action Schemes for extreme events that perform an analogous function with the non-BES interrupting devices tripped by UFLS schemes.</p> <p>Accordingly, the DC trip circuitry from these relays to any non-BES interrupting devices is not required to perform the required maintenance as per the <i>NERC Reliability Standard</i> PRC-005-6. However, entities must maintain their own schedules for this portion of the DC trip circuitry.</p>

<b>NERC RELIABILITY STANDARD / NPCC DIRECTORY</b>	<b>APPLICABILITY GUIDANCE</b>
<p><b><u>PRC-006-5:</u></b> <b><i>Automatic Under-Frequency Load Shedding</i></b></p> <p><b><u>PRC-006-NPCC-2:</u></b> <b><i>Automatic Under-Frequency Load Shedding</i></b></p>	<p>These requirements are also aligned with <i>Section 4.4.1 Automatic Under Frequency Load Shedding</i> of the <a href="#">Market Manual 7.4: IESO-Controlled Grid Operating Policies</a>.</p> <p>The <i>IESO</i> will conduct an annual survey to verify compliance with these requirements. Each Transmission Owner shall select load for UFLS based on their load distribution for the 3<sup>rd</sup> Tuesday in July (which approximates system peak). The <i>IESO</i> will issue the form on or about June of each year requesting data sufficient to perform analysis of compliance with the requirements.</p> <p>Based on the annual survey information, the <i>IESO</i> will also monitor whether there is adequate load shedding for the loss of <i>generator</i> due to early tripping, and notify the Transmission Owner if any changes are required to maintain compliance with these standard requirements and criteria.</p>
<p><b><u>PRC-023-4:</u></b> <b><i>Transmission Relay Loadability</i></b></p>	<p>As required by PRC-023-4 Requirement R6, the <i>IESO</i> conducts an annual assessment to determine the circuits for which Transmission Owners and <i>Generator</i> Owners must comply with PRC-023-3 Requirements R1 through R5 to prevent phase protective relay settings from limiting <i>transmission system</i> loadability while maintaining reliable protection of the <i>BES</i> for all fault conditions.</p> <p>The <i>IESO</i> maintains a list of these identified circuits, and provides this list of circuits to the respective owners. The <i>IESO</i> has not identified any <i>Generator</i> Owners that must comply with PRC-023-3 Requirements R1 through R5.</p> <p>If and when this list changes, the <i>IESO</i> would notify the applicable owners.</p>
<p><b><i>Under-Voltage Load Shedding</i></b></p>	<p>Although there are Under-Voltage Load Shedding (UVLS) programs existing within the <i>IESO Controlled Grid</i>, none are intended to mitigate the risk of voltage collapse or voltage instability of the <i>BES</i> and provide local protection only.</p> <p><i>NERC Reliability Standards</i> pertaining to UVLS program do not apply within the <i>IESO-Controlled Grid</i>:</p> <ul style="list-style-type: none"> <li>• PRC-010-2 – Undervoltage Load Shedding</li> <li>• PRC-011-0 – UVLS System Maintenance and Testing</li> </ul> <p>A “NPCC Assessment of Under-Voltage Load Shedding (UVLS)” report was published on November 29, 2005 and did not recommend general use of UVLS schemes. On January 31, 2007 the NPCC <i>Task Force on System Studies</i> (TFSS) recommended not to pursue further generic studies of UVLS.</p>

<b>NERC RELIABILITY STANDARD / NPCC DIRECTORY</b>	<b>APPLICABILITY GUIDANCE</b>
<p><b><u>VAR-002-4.1:</u></b></p> <p><b><i>Generator Operation for Maintaining Network Voltage Schedules</i></b></p>	<p>The <i>IESO</i> does not specifically review and request Generator Step Up (GSU) transformer tap changes for voltage/reactive control in real time. Generator Owners are given a voltage range to maintain on the <i>transmission system</i>.</p> <p>Please refer to <a href="#">Quick Take: Automatic Voltage Control</a> for methods and procedures which <i>Generator</i> Owners and Operators can implement to ensure that their equipment is in voltage control mode as per the <i>NERC Reliability Standard VAR-002-4.1</i>.</p>

– End of Section –

## References

Document ID	Document Name
	<a href="#">Quick Take: Automatic Voltage Control</a>
<a href="#">MAN-130</a>	Market Manual Part 1.6: Performance Validation
<a href="#">MAN-163</a>	Market Manual 11.5 - Model Validation of Generation and Energy Storage <i>Facilities</i> and other Devices
<a href="#">IMO MAN 0024</a>	Market Manual 6: Participant Technical Reference Manual
<a href="#">MAN-123</a>	Market Manual 7.3: Outage Management
<a href="#">MAN-124</a>	Market Manual 7.4: IESO-Controlled Grid Operating Policies
<a href="#">MAN-157</a>	Market Manual 7.8: Ontario Power System Restoration Plan
<a href="#">MAN-158</a>	Market Manual 7.10: Ontario Electricity Emergency Plan

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