



Market Manual 11: Reliability Compliance
Part 11.1: Applicability Criteria
for Compliance with NERC
Reliability Standards and
NPCC Criteria

Issue 5.0

GUIDE

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This document may contain a summary of a particular *market rule*. Where provided, the summary has been used because of the length of the *market rule* itself. The reader should be aware, however, that where a *market rule* is applicable, the obligation that needs to be met is as stated in the "*Market Rules*". To the extent of any discrepancy or inconsistency between the provisions of a particular *market rule* and the summary, the provision of the *market rule* shall govern.

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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

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Table of Changes

Reference (Section and Paragraph)	Description of Change
Section 7	<ul style="list-style-type: none">• Added applicability guidance information for NERC standards IRO-010-2, TOP-003-3, PRC-005-6, and VAR-002-4.• Removed paragraph from PRC-018-1 guidance information related to Ontario DDR capability, as this is no longer applicable under the newly revised BES definition.

– End of Section –

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*¹.
- 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.

– End of Section –

¹ 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’s 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>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 [Reliability Standards Compliance](#) 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 standards²:

- 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)

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

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 [Reliability Standards Compliance](#) page of the *IESO* website.

– End of Section –

Archive

5. Applicability for NPCC Criteria

In the *Northeast Power Coordinating Council (NPCC)*³ region, the Bulk Power System (BPS)⁴ 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 list⁵ 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* step-up and *station service* transformers), transmission circuits, shunt devices, circuit breakers and switches.⁶ 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 –

³ *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.

⁴ Bulk Power System is an *NPCC*-defined term. Bulk Electric System is a *NERC*-defined term.

⁵ 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*.

⁶ 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	
<p><i>Dispersed Power Producing Resources</i></p>	<p><i>NERC’s BES Definition</i> includes criterion I4 which addresses dispersed generation resources, and the NERC BES Reference Document 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"> • Wind • Solar • Geothermal • Run-of-river hydro • Energy storage, flywheels, micro-turbines, and fuel cells
<p><i>CIP-002.5.1:</i></p> <p><i>Cyber Security – BES Cyber System Categorization</i></p>	<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 <i>NERC Cyber Infrastructure and Protection (CIP) Reliability Standard CIP-002-5.1 R1</i>.</p> <p>As the Reliability Coordinator and Planning Coordinator, the <i>IESO</i> must identify certain categories of facilities identified in CIP-002-5.1 – Attachment 1 – Impact Rating Criteria as impactful to reliability.</p> <p>At least once per calendar year, the <i>IESO</i> 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"> • Criterion 2.3 – Facilities necessary to avoid an Adverse Reliability Impact in the planning horizon of more than one year, The <i>IESO</i> has not identified any facilities that meet this criterion. • Criterion 2.6 – Facilities critical to the derivation of IROLs. The <i>IESO</i> has not identified any <i>generation facilities</i> that meet this criterion.

NERC RELIABILITY STANDARD / NPCC DIRECTORY	
	<ul style="list-style-type: none"> • Criterion 2.9 – A Special Protection System (SPS), Remedial Action Scheme (RAS), 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. <p>The IESO has not identified any <i>Generator Owner</i> that meets this criterion.</p> <ul style="list-style-type: none"> • Criterion 3.4 – Facilities critical to system restoration <p>Please refer to EOP-005-2 below.</p>
<p><u>EOP-005-2:</u> <i>System Restoration from Blackstart Resources</i></p> <p><u>Directory #8:</u> <i>System Restoration</i></p>	<p><i>Market participants</i> that have <i>key facilities</i> are subject to NERC’s System Restoration from Blackstart Resources Reliability Standard (EOP-005-2), and the NPCC Directory #8 System Restoration.</p> <p>The IESO conducts an annual review of Ontario’s <i>key facilities</i> used to establish a basic minimum power system (BMPS) as defined in the NPCC Glossary of Terms and described in Market Manual 7.8: Ontario Power System Restoration Plan. The critical components in each <i>key facility</i> are the subject of periodic testing under the NPCC Directory #8.</p> <p>The IESO provides applicable <i>market participants</i> with their list of <i>key facilities</i> (subject to the IESO’s confidentiality provisions). <i>Market participants</i> can use this information to make the appropriate designations of “critical” facilities for their CIP evaluations.</p> <p>The IESO 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 NERC Reliability Standard EOP-005-2, the NPCC Directory #8, and section 11 in Chapter 5 of the <i>Market Rules</i> on Emergency Preparedness and System Restoration, and the associated Market Manual 7.10: Ontario Electricity Emergency Plan, Sections 4.5 and 4.6.</p>
<p><u>FAC-002-1:</u> <i>Facility Connection Requirements</i></p>	<p><i>Market participants</i> coordinate and cooperate with the IESO (as the Transmission Planner and Planning Authority) on assessments for integration of new facilities through the IESO’s Connection Assessment Process, as established in Section 4 of Chapter 4 of the <i>Market Rules</i>.</p>
<p><u>FAC-003-3:</u> <i>Transmission Vegetation Management</i></p>	<p>Applicability of FAC-003-3 includes transmission lines and <i>generation facilities</i> operated below 200kV identified as an element of an IROL by the Planning Coordinator.</p> <p>As the Planning Coordinator, the IESO has not identified any transmission lines or generation or facilities operated below 200 kV that are an element of an IROL.</p>

NERC RELIABILITY STANDARD / NPCC DIRECTORY	
<p><i>FAC-008-3:</i> <i>Facility Ratings</i></p>	<p>Requirement R7 of the <i>NERC Reliability Standard</i> FAC-008-3 requires each Transmission Owner and <i>Generator</i> Owner to provide its <i>facility</i> ratings to the <i>IESO</i>.</p> <p>The <i>IESO</i> maintains an on-line registration system whereby <i>market participants</i> register their facilities and equipment, and update their registration information, including <i>facility</i> ratings. The <i>IESO</i> will consider the <i>facility</i> ratings information on the on-line system as a fulfillment of Requirement R7.</p>
<p><i>IRO-010-2:</i> <i>Reliability Coordinator Data Specification and Collection</i></p> <p><i>TOP-003-3:</i> <i>Operational Reliability Data</i></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-010-2 and Requirements R1 to R4 of TOP-003-3 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 <i>IESO</i> to support the <i>IESO</i>'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"> • Appendix 4.15 – IESO Monitoring Requirements: Generators • Appendix 4.16 – IESO Monitoring Requirements: Transmitters <p>The format for the data and information is specified in Market Manual 6: Participant Technical Reference Manual.</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"> • Appendix 4.19 – IESO Monitoring Requirements: Generator Performance Standards • Appendix 4.20 – IESO Monitoring Requirements: Transmitter Performance Standards • Appendix 4.21 – IESO Monitoring Requirements: Transmitter Performance Standards <p>Outage information is specified in Market Manual 7.3: Outage Management.</p>

NERC RELIABILITY STANDARD / NPCC DIRECTORY	
<p><u>MOD-025-2:</u> Real and Reactive Power Capability Verification</p> <p><u>Directory #9:</u> Verification of Generator Gross and Net Real Power Capability</p> <p><u>Directory #10:</u> Real and Reactive Power Capability Verification</p>	<p>The <i>IESO</i> aligns the <i>NPCC</i> Directories #9 and #10 with the <i>NERC</i> standard MOD-025-2 requirements, and with the <i>IESO</i> requirements in Appendix 4.2 – Generation Facility Requirement of Chapter 4 in the <i>Market Rules</i>, so that the <i>Generator</i> Owners or <i>Transmission</i> Owners can meet all four sets of requirements for <i>generator</i> capability verification.</p> <p>Please refer to Sections 3.4 and 3.5 in Market Manual 2.20: Performance Validation for more detailed information on the active and reactive power <i>generator</i> requirements.</p> <p>The <i>IESO</i> requires that a <i>generation facility</i> directly connected to the <i>IESO-Controlled Grid</i> should verify its <i>generator</i> capability every 5 years (i.e., with a 5 year rolling window). As such, the lower threshold (of 10 MW as per the <i>IESO</i> 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 IESO Active and Reactive Power Capability Verification Form contains the relevant instructions and forms for <i>markets participants</i> to use to complete the <i>NERC</i> standard MOD-025-2 and <i>NPCC</i> Directory #9 and #10 and the <i>IESO Market Rule generator</i> capability testing.</p>
<p><u>MOD-026-1:</u> Verification of Models and Data for Generator Excitation Control System or Plant Volt/VAR Control Functions</p> <p><u>MOD-027-1:</u> Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions</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 in Appendix 4.2 – Generation Facility Requirement of Chapter 4 in the <i>Market Rules</i>, so that the <i>Generator</i> Owners or <i>Transmission</i> Owners can meet all three sets of requirements.</p> <p>Please refer to Section 3.7 in Market Manual 2.20: Performance Validation for more detailed information on excitation system requirements.</p> <p>The <i>IESO</i> requires that a <i>generation facility</i> directly connected to the <i>ICG</i> should perform model data validation using acceptable dynamic models listed in Section 5.7 of <i>Market Manual 2.20</i>.</p>
<p><u>PRC-002-NPCC-01:</u> Disturbance Monitoring</p> <p><u>PRC-018-1:</u> Disturbance Monitoring Equipment</p>	<p>As per NPCC Compliance Guidance Statement 5 (CGS-5), the regional disturbance monitoring standard requirements for PRC-002-NPCC-01 (and for PRC-018-1) will apply on only those system elements that are identified as <i>NPCC Bulk Power System</i> elements.</p> <p>Requirement R13 of the <i>NERC Reliability</i> Standard PRC-002-NPCC-01 requires each <i>Transmission</i> Owner and <i>Generator</i> Owner that receives a request from the <i>Reliability Coordinator</i> to install a <i>Dynamic Disturbance Recording (DDR)</i> shall acquire and install the <i>DDR</i> in accordance with</p>

NERC RELIABILITY STANDARD / NPCC DIRECTORY	
<i>Installation and Data Reporting</i>	<p>Requirement R12.</p> <p>Sub-Requirement R.1.2.1 refers to HV synch breaker (where a synch breaker is utilized).</p>
<i>PRC-005-6: Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance</i>	<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. 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>
<i>PRC-006-2: Automatic Under-Frequency Load Shedding</i> <i>PRC-006-NPCC-1: Automatic Under-Frequency Load Shedding</i> <i>Directory #12: Under-Frequency Load Shedding Program Requirements</i>	<p>Compliance with the automatic under-frequency load shedding (UFLS) requirements in <i>NERC</i> standards PRC-006-2 and PRC-006-NPCC-1 and <i>NPCC</i> are based on the <i>NPCC's</i> Directory #12 Automatic UFLS Implementation Plan.</p> <p>These requirements are also aligned with <i>Section 4.5 on Demand Control – Under Frequency Load Shedding</i> of the Market Manual 7.4: IESO-Controlled Grid Operating Policies.</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 3rd 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>
<i>PRC-023-3: Transmission Relay Loadability</i>	<p>As required by PRC-023-3 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>

NERC RELIABILITY STANDARD / NPCC DIRECTORY	
<i>Under-Voltage Load Shedding</i>	<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"> • EOP-003-2 – Load Shedding Plans • PRC-010-0 – Assessment of the Design and Effectiveness of UVLS Program • PRC-011-0 – UVLS System Maintenance and Testing • PRC-021-1 UVLS Program Data • PRC-022-1 UVLS Program Performance <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>
<i>VAR-002-4: Generator Operation for Maintaining Network Voltage Schedules</i>	<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 Quick Take: Automatic Voltage Control for methods and procedures which <i>Generator Owners</i> and <i>Operators</i> can implement to ensure that their generating equipment is in voltage control mode as per the <i>NERC Reliability Standard VAR-002-4</i>.</p>

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References

Document ID	Document Name
	Quick Take: Automatic Voltage Control
IESO_REQ_0028	Market Manual 2.20: Performance Validation
IMO_MAN_0024	Market Manual 6: Participant Technical Reference Manual
IMP_PRO_0035	Market Manual 7.3: Outage Management
IMP_POL_0002	Market Manual 7.4: IESO-Controlled Grid Operating Policies
IMO_PLAN_0001	Market Manual 7.8: Ontario Power System Restoration Plan
IMO_PLAN_0002	Market Manual 7.10: Ontario Electricity Emergency Plan

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