

Updates to Performance Requirements for Generation, Load and Electricity storage

Technical Panel

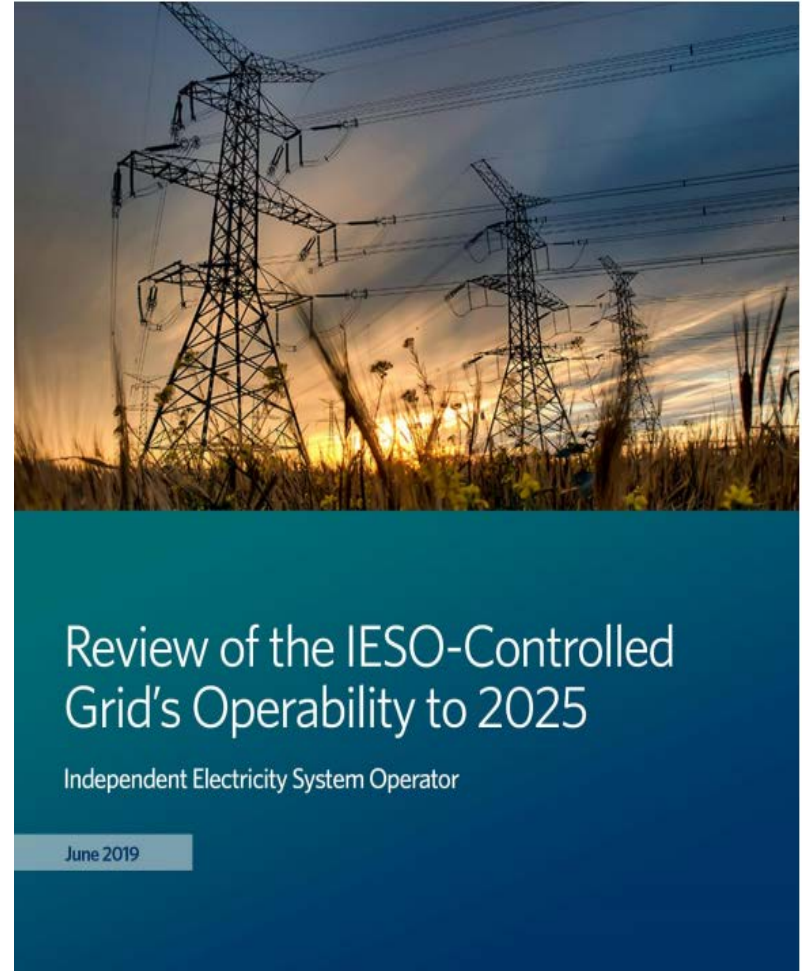
August 13, 2019

Agenda

- IESO's 2019 Operability Assessment
- Needs identified
- Current status of performance requirements
- Recommended amendments to performance requirements
- Stakeholder engagement
- Next Steps

IESO's 2019 Operability Assessment

- Penetration level of Distributed Energy Resources (DERs) is increasing and are displacing transmission-connected generation facilities that support grid reliability
- IESO identified potential concerns related to increase penetration of DER and made recommendations to improve performance of DER to support reliability during and immediately following transmission system disturbances



Needs Identified

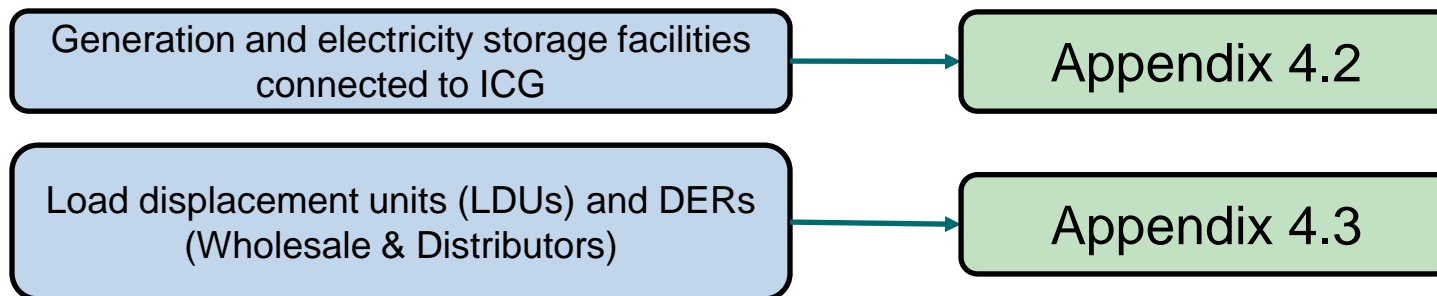
- Inverter-based units (whether transmission or distribution connected) could disconnect prematurely or enter into momentary cessation (i.e., stay connected but cease injections following disturbances)
 - No support to the grid during and immediately after the fault
 - Can adversely impact the reliability of the IESO-controlled grid
- Other ISOs have already experienced problems related to this issue.
- NERC formed an industry task force to examine these risks and to propose improvements to reliability standards.

Current status of performance requirements

- “Electricity storage” is not currently defined in the market rules
- Performance requirements are defined in Appendices to *Chapter 4 - Grid Connection Requirements*:
 - *Appendix 4.2 – Generation Facilities*: addresses mainly traditional synchronous generation, has no specific performance requirements for DER units < 10 MW and DER facilities < 50 M
 - *Appendix 4.3 – Connected Wholesale Customers and Distributors connected to the IESO-controlled grid*: has no provisions for “behind-the-meter” load displacement generation or electricity storage

Recommended Amendments - Overview

- The amendments are intended to:
 - Explain what performance requirements specifically apply to electricity storage
 - Clarify some performance requirements that apply to all generation and electricity storage
 - Define *electricity storage unit* only within these appendices
- Located in *Chapter 4 Grid Connection Requirements – Appendices 4.2 and 4.3*:



Recommended Amendments - Definition

- A definition for *electricity storage unit* to be added only to appendices 4.2 and 4.3. This will clarify what is considered an *electricity storage unit* for the application of performance requirements
- The definition focuses on the following abilities:
 - withdraw electrical energy at a controlled rate,
 - store this energy for a controlled period of time, and
 - inject back this energy (minus reasonable losses) at a controlled rate, at the location from where it was originally withdrawn

Recommended Amendments

- Apply performance requirements of Appendix 4.2: Generation Facility Requirements, to electricity storage units connecting directly to the IESO-controlled grid (*reviewed draft language with ESAG on July 23, feedback was requested by August 6*)
- Clarify that inverter-based units should not trip or enter into momentary cessation during routine switching events and design criteria transmission system contingencies
- Extend the application of the following requirements to all generation and electricity storage units regardless of their size or connection point:
 - **Off-nominal frequency operation:** ride-through frequency excursions
 - **Frequency control:** change active power in response to frequency variations
 - **Voltage ride-through:** ride-through voltage excursions

Next Steps

- IESO is continuing to develop draft market rule appendices
- IESO will incorporate changes to draft market rule appendices based on feedback, where applicable
- Additional engagement on the draft updates and impacted Market Rule sections may be required

Relevant Information

Market Rules Chapter 4 Appendices:

<http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-rules/mr-chapter4appx.pdf?la=en>

2019 Operability Assessment:

<http://ieso.ca/Sector-Participants/System-Reliability/Operability-Assessment>

Implementation Plan for the Governance and Decision-Making Recommendations Report:

<http://ieso.ca/-/media/Files/IESO/Document-Library/engage/igdm/igdm-20190328-implementation-plan-governance-and-decision-making-report.pdf?la=en>

Innovation and Sector Evolution White Paper Series:

<http://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Innovation-and-Sector-Evolution-White-Paper-Series>