NOVEMBER 19, 2026

Updates: Technical Requirements for Large Computational Loads in Ontario's Power System

Fang Gao Lead Power System Engineer, Connection Assessments, IESO
Phil Huisser Lead Power System Engineer, Performance Validation, IESO

ieso
Connecting Today. Powering Tomorrow.

Disclaimer

This presentation and the information contained herein is provided for informational purposes only.

The IESO has prepared this presentation based on information currently available to the IESO and reasonable assumptions associated therewith, including relating to electricity supply and demand. The information, statements and conclusions contained in this presentation are subject to risks, uncertainties and other factors that could cause actual results or circumstances to differ materially from the information, statements and assumptions contained herein.

The IESO provides no guarantee, representation, or warranty, express or implied, with respect to any statement or information contained herein and disclaims any liability in connection therewith. In the event there is any conflict or inconsistency between this document and the IESO market rules, any IESO contract, any legislation or regulation, or any request for proposals or other procurement document, the terms in the market rules, or the subject contract, legislation, regulation, or procurement document, as applicable, govern.

Territory Acknowledgement

The IESO acknowledges the land from where we are delivering today's webinar is the traditional territory of many nations including the Mississaugas of the Credit, the Anishinaabeg, the Chippewa, the Haudenosaunee and the Wendat peoples, and is now home to many diverse First Nations, Inuit and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit First Nation.

As we have attendees from across Ontario, the IESO would also like to acknowledge all the traditional territories across the province, which include those of the Algonquin, Anishinaabeg, Ojibwe, Cree, Oji-Cree, Huron-Wendat, Haudenosaunee, Métis, and Inuit peoples.

Engagement Principles

This engagement is conducted in accordance with the IESO's External Engagement Framework, which includes the following principles:

- **Purposeful** – Initiate meaningful conversations that move the sector forward
- **Inclusive** – Invite many voices and diverse perspectives to the table
- **Timely** – Seek input and insight when it can have the most impact
- **Accessible** – Ensure we meet people where they are on their energy journey
- **Traceable** – Allow everyone to follow the path that is being taken
- **Transparent** – Show how engagement helped shape the final outcome

Shared Commitment to Respectful Participation

To support a focused and constructive discussion:

- We will take questions one at a time; please use the raise-hand feature to enter the speaking queue
- We encourage concise and focused comments to allow time for multiple perspectives
- Participants are encouraged to raise relevant points during the discussion and provide more detailed feedback through the written submission process
- We ask that all participants maintain a respectful and professional tone throughout the session
- Facilitators will guide the discussion and manage participation to stay aligned with today's focus and agenda
- Where necessary, we may disable a participant's microphone to manage participation

Outline

- Review: Why New Reliability Requirements Are Needed
- Review: New Reliability Requirements Roadmap
- Stakeholder Engagement Before Today
- Changes to Technical Requirements Since Last Stakeholder Session
- Amendments to Market Rules and Market Manuals
- Next Steps and Key Takeaways

ieso
Connecting Today. Powering Tomorrow.

Review: Why Are New Technical Requirements Needed?

- Large computational loads are expected to represent a growing share of Ontario demand.
- Their unique load characteristics can adversely impact grid reliability during normal operations and system disturbances.
- Existing Market Rules and Market Manuals do not adequately address these characteristics, creating a reliability gap.
- New requirements are needed to proactively manage these risks and reflect lessons learned from recent industry events.
- New requirements are aligned with NERC directions on large computational loads.

Review: Roadmap to Establish New Reliability Requirements



In collaboration with:

- Industrial Working Groups
- Utilities, OEMs, Developers, Applicants
- IESO Internal Teams

IESO Stakeholder Engagement Website:
Technical Requirements for Large Computational Loads Connecting to the Ontario Power System

ieso
Connecting Today. Powering Tomorrow.

Stakeholder Engagement before Today

- The Technical Requirements document (V1) was initially posted on May 1.
- One-on-one sessions were held between May 1 and July 15 to discuss the requirements and obtain feedbacks.
- The IESO posted a revised version (V2) of the Technical Requirements document on July 15, addressing stakeholder feedback.
- A stakeholder engagement session was held on July 23.
- The IESO posted a V3 of the Technical Requirements document on September 3, addressing further stakeholder feedback.
- The IESO posted amended Market Rules and Market Manuals for stakeholder review and comment on November 13, 2026.

Changes after Last Stakeholder Session (1)
Clarify: applicability point

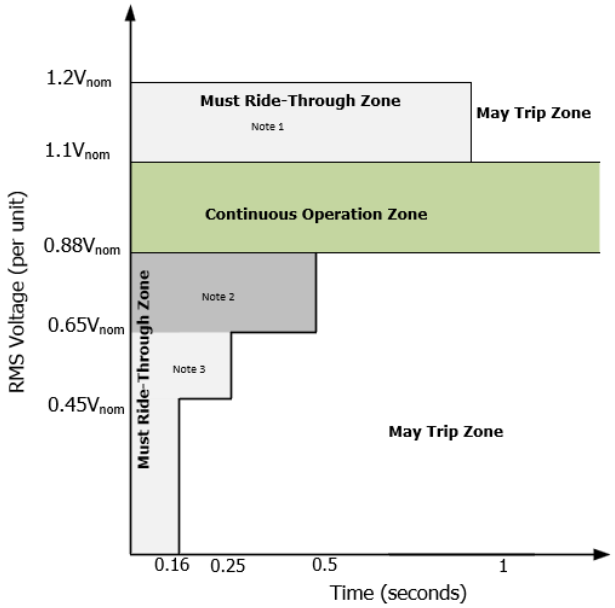
The technical requirements are generally applied at the **connection point** for transmission-connected projects and at the **embedded connection point** for distribution-connected projects.

- **Connection point** means a point of connection between the IESO-controlled grid and a load facility;
- **Embedded connection point** means the point of connection between a load facility and a distribution system.

ieso
Connecting Today. Powering Tomorrow.

Changes after Last Stakeholder Session (2)

Add: Voltage Ride-through for Distribution-Connected Projects



Note 1: UPS loads shall not reduce active power consumption from the system. They should not start switching to UPS supply.
Note 2: UPS loads can reduce active power consumption from the system only to a level proportional to voltage sag at POI. Partial load may switch to UPS supply.
Note 3: UPS loads may cease to withdraw active power from the system and full load can switch to UPS supply.

- Considered distribution system characteristics corresponding to faults on the transmission system.
- UPS loads may reduce active power consumption in proportion to the voltage sag at the embedded connection point when the voltage is between 0.65 pu and 0.88 pu. UPS loads may cease drawing power only when the voltage at the embedded connection point falls below 0.65 pu.
- All other requirements applicable to UPS loads are the same as those for transmission-connected projects.

ieso
Connecting Today. Powering Tomorrow.

Changes after Last Stakeholder Session (3)
Other Changes

Volts per Hz (V/Hz) Ride-Through

The connection applicant shall ensure the project has the capability to meet both voltage and frequency ride-through requirements simultaneously except grid disturbances with V/Hz, measured at the (embedded) connection point~~POI~~, exceeding ~~1.1~~1.21 per unit for 45 seconds or ~~1.18~~ 1.3 per unit for 2 seconds.

Modelling

The connection applicant must submit a PSS/E composite model + PERC/UDM, and an EMT model. The EMT model is used for fine-tuning the PSS/E model.

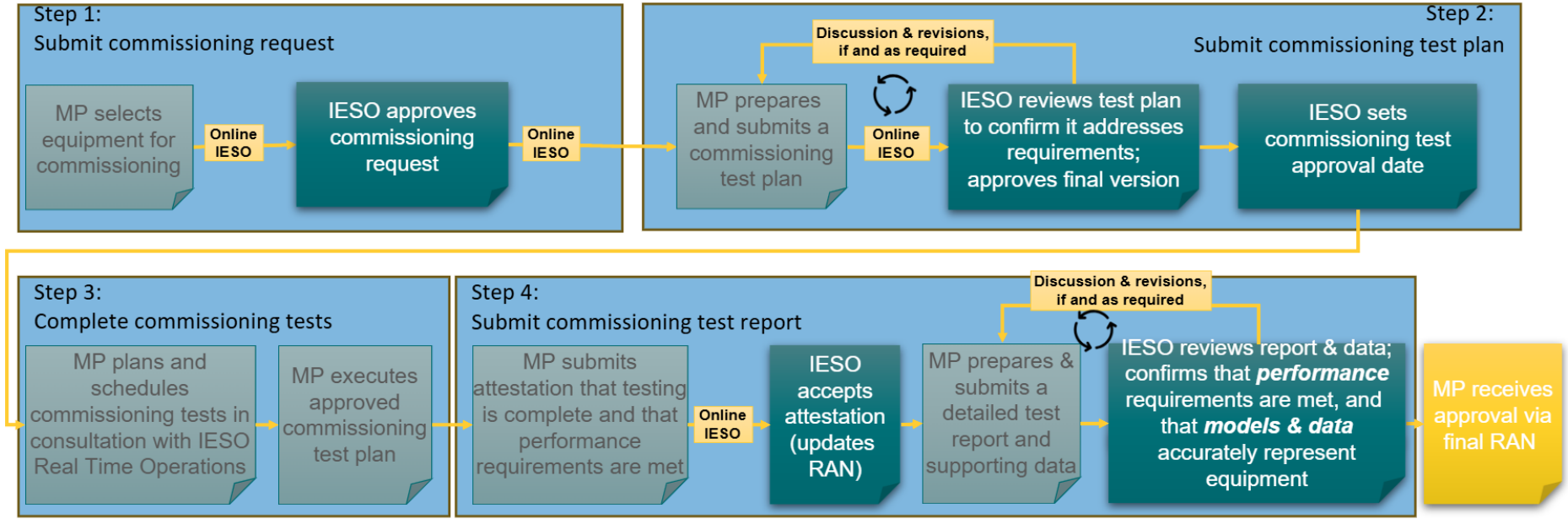
ieso
Connecting Today. Powering Tomorrow.

Changes after Last Stakeholder Session (4)
New: Establishing a Commissioning Process

The process is established for the technical requirement of performance and model validation.

- A market participant may apply to register a commissioning large computational load.
- Detailed commissioning test plans shall be submitted to the *IESO* for approval and shall be scheduled per the *outage* coordination process (MM7.3) as applicable.
- A *commissioning large computational load* that is greater than 20 MWs in size shall follow the normal *outage* scheduling process for *wholesale customers*.
- All transmission-connected *commissioning large computational loads* are required to submit a *planned outage* request that includes a detailed test plan.

Overview of Commissioning Process



Market Rules and Manuals

- Rule amendments and market manual changes will be required to integrate large computational loads into our system while avoiding the potential adverse impacts on reliability that they may cause.
- The rule and manual changes reflects the content of the Technical Requirements document (Version 3), plus amendments to establish a commissioning process.
- The rules and manuals can be found on the stakeholder engagement page.

Market Rule Amendments

Rule	Description	Reason
Ch.4 s.7.2.1	The existing provision requires the installation of synchrophasor equipment for certain customers and facilities.	The amendment expands these requirements to explicitly include large computational loads.
Appendix 4.3	Appendix outlines the performance requirements for directly connected wholesale customers and distributors.	Amendments are proposed to introduce additional technical performance requirements specific to large computational loads.
Appendix 4.17	Appendix outlines the synchrophasor data requirements that wholesale customers must provide to the IESO.	A new section is proposed to establish specific synchrophasor data requirements for large computational loads.
Ch.7 s.2.2B	A new section is proposed to establish a commissioning process for large computational loads.	This amendment addresses a gap in the market rules which do not include a commissioning process for wholesale customers.
Ch. 11	Two new defined terms are proposed.	New terms are required to enable rules specific to large computational loads.

Market Manual Changes

Market Manual	Description
1.6: Performance Validation	New section 4 is added to provide more detailed description and clarify the technical requirements for large computational load facilities. Subsequent sections are renumbered accordingly. Additional figures are included in section 4, requiring renumbering of all subsequent figures and the corresponding cross references.
1.7: Synchrophasor Data Requirements	New section 5 is added to establish detailed requirements for large computational loads. Subsequent sections are re-numbered accordingly.
7.3: Outage Management	New section (5.2.5) is proposed that outlines commissioning process for large computational loads.

Next Steps

Timing	Engagement Activity
~~May 1, 2026~~	~~Technical Requirements document posted~~
~~July 23, 2026~~	~~First public engagement session~~
November 19, 2026	Second public engagement session
December 4, 2026	Written feedback deadline on amended MR/MM
January 6, 2027 (TBD)	TP Vote to Post
February 2, 2027 (TBD)	TP Vote to Recommend
March 12, 2027	IESO Board Consideration
Q2, 2027	Target Implementation

Key Takeaways

- Following extensive stakeholder consultation, the IESO is proposing market rule and market manual amendments that codify technical requirements for large computational loads that are aligned with NERC foundational standards.
- The IESO has posted the proposed amendments to the Market Rules and Market Manuals on its stakeholder website Technical Requirements for Large Computational Loads Connecting to the Ontario Power System.
- Stakeholders are encouraged to provide written feedback by **December 4, 2026**.

Questions?

ieso
Connecting Today. Powering Tomorrow.

Thank You

ieso.ca

1.888.448.7777

customer.relations@ieso.ca

engagement@ieso.ca

@OntarioIESO

linkedin.com/company/IESO

ieso
Connecting Today. Powering Tomorrow.