

# Final Engagement Summary Report

## Date: June 30, 2021

### Updates to Performance Requirements: Market Rules 4.2 and 4.3

Engagement Initiated: June, 2019

#### Engagement Description

Despite increased penetration levels of distributed energy resources (DERs), the Market Rules in Ontario had no specific performance requirements for DERs or load displacement units (LDUs) units with an installed capacity less than 10 MW, or facilities with total aggregate generation of less than 50 MW. That meant these generation units may connect to the electricity system without having the ability to provide the necessary support for reliability, in particular, following transmission system disturbances.

The IESO's [2019 Operability Assessment](#) identified potential concerns related to increased penetration of DERs and made recommendations to improve the performance of DERs to support reliability during and immediately following specific transmission system disturbances. The assessment also showed a need to clarify performance requirements for inverter-based generation units, as existing requirements were tailored for conventional generators.

The engagement was launched with stakeholders to discuss and seek feedback on proposed updates to Appendices 4.2 and 4.3 to improve the performance of DERs and mitigate the concerns identified in the Operability Assessment, to clarify the performance requirements for inverter-based resources, and to ensure the IESO Market Rules are consistent with the newly released NERC PRC-024-3 and CSA 22.3 no.9 standards.

#### Engagement Objective

The objective of this engagement was to seek stakeholder feedback on the proposed updates, clarify performance requirements, and to ensure consistency between IESO Market Rules and NERC and CSA standards.

The IESO sought feedback from stakeholders on:

- The proposed updates to the performance requirements in Market Rule Appendices 4.2 and 4.3

## Engagement Approach

This stakeholder engagement was a public engagement process and was conducted in accordance with the IESO's approved [engagement principles](#). The approach for this engagement initiative included opportunities to provide input through various channels such as webinars, and written feedback.

Industry stakeholders were consulted on the updates in the following engagements:

- June 2019: Market Operation Spring Awareness Session
- July 2019: Public webinar delivered at the Energy Storage Advisory Group
- August 2019: Technical Panel Discussion
- March 2020: Public webinar titled "Updates to Performance Requirements: Market Rule Appendices 4.2 and 4.3"
- June 2020: Technical Panel vote to post
- August 2020: Technical Panel recommendation to IESO Board
- August 2020: IESO Board Approval

## Conclusion

A definition of 'storage' was originally included in one of the appendices, and so the IESO began by engaging with stakeholders via the Energy Storage Advisory Group. The storage definition was subsequently removed from the proposed amendments, and it was determined stakeholder engagement specific to the performance requirement updates would be required.

The IESO stakeholdered this proposed amendment through the Updates to Performance Requirements: Market Rule Appendices 4.2 and 4.3 engagement forum. Ontario Power Generation (OPG) and TC Energy submitted feedback in response to the March 33, 2020 engagement meeting. In general, the feedback was supportive of the proposed amendments, with some specific feedback that was addressed by the IESO. TC Energy also noted that the implementation cost for this amendment would likely be low for most market participants because only a software update would be required for most inverter based resources.

In response to the broader call for stakeholder comment, one submission was received by the IESO. OPG submitted an evaluation of the proposed amendment providing recommendations to the IESO.

OPG recommendation #1:

- OPG believes that the reactive power requirements need to be explicitly defined at particular voltage conditions.

The IESO agreed with this recommendation and revised the proposed amended category #5– Reactive Power, to state:

- Continuously (i.e., dynamically) inject or withdraw reactive power at the high-voltage terminal of the main output transformer up to 33% of rated active power at all levels of active power output, and at the typical *transmission system* voltage, except where a lesser continually available capability is permitted with the *IESO's approval*. A conventional synchronous unit with a power factor range of 0.90 lagging and 0.95 leading at rated active power connected via a main output transformer impedance not greater than 13% based on *generation unit* rated apparent power is acceptable. Reactive power losses or charging between the high-voltage terminal of the main output transformer and the *connection point* shall be addressed in a manner permitted by *IESO* approval.

OPG recommendation #2:

- OPG contends that the IESO does need to retain the rated field current definition, or at least a similar definition, somewhere in the Market Rules or Manuals.

The IESO agreed with this recommendation and added the following information into [Market Manual 1.6 - Performance Validation](#) (formerly 2.20):

- Rated field voltage is defined as the product of field current at rated terminal voltage, rated active power and the required maximum continuous reactive power, with the field resistance at nominal operating temperature.
- The nominal operating temperatures are specified in the [Register Facility Help File](#) as 75 °C for hydro units and 100 °C for thermal units.

At the June 23, 2020 Technical Panel meeting, a member of the panel recommended that categories 11 and 12 in appendix 4.3 be reordered to improve clarity. The IESO accepted this recommendation and reordered the categories so that Voltage Ride-Through is now category 11 and Generation Units is category 12.

The Updates to Performance Requirements engagement was concluded with updates to rules coming into effect September 21, 2020. Thank you to all stakeholders for your participation. All materials will continue to be available on the IESO website under [Completed Engagements](#).