Market Rule Amendment Proposal Form

Part 1 - Market Rule Information

Identification No.:	MR-00471-R00
Subject:	Updates to Synchrophasor Monitoring Requirements
Title:	Updates to Synchrophasor Monitoring Requirements
Nature of Proposal:	☒ Alteration ☐ Deletion ☒ Addition
Chapter:	11
Appendix:	4.15, 4.16
Sections:	Na
Sub-sections proposed for amending:	Na
Current Market Rules Baseline:	46.1

Part 2 - Proposal History

Version	Reason for Issuing	Version Date
1.0	Draft issued for Technical Panel Review	March 15, 2022
2.0	Submitted for Technical Panel Vote	April 12, 2022
3.0	Recommended by Technical Panel	April 21, 2022
4.0	Approved by IESO Board	June 1, 2022

Approved Amendment Publication Date: June 2, 2022

Approved Amendment Effective Date: December 31, 2024

Part 3 - Explanation for Proposed Amendment

Provide a brief description that includes some or all of the following points:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

The IESO is proposing market rule amendments to require synchrophasor data from generation facilities and transmitters. The proposed changes are intended to align with requirements in other North American ISOs and RTOs.

Access to synchrophasor data will enhance the IESO's situational awareness which is critical to maintaining reliability and resiliency with an increasingly dynamic power system. Across North America, there are increasing applications of synchrophasor data in off-line, near-term and real-time systems.

Background

Additional information on the project can be found on the engagement webpage.

Discussion

Chapter 11

Added the following defined terms:

phasor measurement unit or (PMU)

synchrophasor

supervisory control and data acquisition or (SCADA)

Appendix 4.15

Added synchrophasor data requirements to the list of monitoring requirements for generation facilities.

Appendix 4.16

Added synchrophasor data requirements to the list of monitoring requirements for transmitters.

Part 4 - Proposed Amendment

Chapter 11

phasor measurement unit or *(PMU)* is a device used to measure *synchrophasor* data. It can be a dedicated device, a protective relay or other device that is capable of providing *synchrophasor*

data.

synchrophasor is a phasor representing the fundamental of an AC signal whose magnitude is the root mean square (RMS) value of the fundamental amplitude and angle is the difference between the signal fundamental angle and the phase angle of a cosine at the nominal signal frequency that is synchronized to the Coordinated Universal Time (UTC) time.

supervisory control and data acquisition or (*SCADA*) is a computer system for gathering and analyzing real time data.

Appendix 4.15 – IESO Monitoring Requirements: Generators

The following information, as a minimum, shall be available on a continual basis to the *IESO* from:

(a) any *generator* (i) whose *generation facility* is *connected* to the *IESO-controlled grid*, or (ii) that is participating in the *IESO-administered markets*; and

(b) any *embedded generator* (i) that is not a *market participant* or whose *embedded generation facility* is not a *registered facility;* (ii) whose *embedded generation facility* includes a *generation unit* rated at greater than 20 MVA or that comprises *generation units* the ratings of which in the aggregate exceeds 20 MVA; and (iii) that is designated by the *IESO* for the purposes of section 7.3.1 of this Chapter as being required to provide such data in order to enable the *IESO* to maintain the *reliability* of the *IESO-controlled grid*.

Equipment Type	Voltage Level	Monitored Status	Monitored SCADA Quantities

Type	Synchrophasor Data Requirements
Generation facility	The following are required unless otherwise specified by the IESO: (1) For *generation units* rated greater than or equal to 100 MVA (name-plate rating), each *generation unit* shall provide positive sequence voltage phasor, positive sequence current phasor and frequency from generator terminal. (2) For *generation units* connected to the IESO-controlled grid through a common connection point, whose aggregated rated size is greater than or equal to 100 MVA (aggregate name-plate rating), positive sequence voltage phasor, aggregated positive sequence current phasor and frequency shall be provided from the generation facility side of the connection point to the grid. (3) For *generation units*, regardless of rated size, whose output power flow is a part of an Interconnection Reliability Operating Limit (IROL) definition, positive sequence voltage phasor, positive sequence current phasor and frequency shall be provided at the terminals defining the IROL.

Unless otherwise specified by the IESO, synchrophasor data requirements shall comply with the corresponding Market Manual.

Appendix 4.16 – IESO Monitoring Requirements: Transmitters

The following information regarding the *IESO-controlled grid*, as a minimum, shall be available on a continual basis to the *IESO* from *transmitters*. Needs of the state estimation process or other reasons may result in additional requirements. The direction of all real and reactive power flows shall be indicated measurements.

TYPE	SCADA INFORMATION REQUIREMENTS

Equipment Type	Voltage Level	Monitored Syncrophasor Quantities
Station Buses (a) 500 kV station (b) *Bulk Power System (BPS)* Required to restore IESO-controlled grid from generating facilities providing *black-start capability*.	50 kv and higher	Positive sequence voltage phasor magnitude Positive sequence voltage phasor angle
		Frequency
Circuits defining Interconnection Reliability Operating Limits (IROL) and interties	50 kv and higher	Positive sequence current phasor magnitude measured at terminals Positive sequence current angle magnitude measured at terminals
		Positive sequence voltage phasor magnitude measured at terminals Positive sequence voltage phasor angle measured at terminals
		Frequency
Static Var Compensators (SVCs), Synchronous condensers, and Static synchronous compensators (STATCOMs)	Below 50 kv	Positive sequence current phasor magnitude measured at terminals Positive sequence current angle magnitude measured at terminals
		Positive sequence voltage phasor magnitude measured at terminals Positive sequence voltage phasor angle measured at terminals
		Frequency

Unless otherwise specified by the IESO, *synchrophasor* data requirements shall comply with the corresponding Market Manual.