

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.9 Synchrophasor Measurement Unit Technical Requirements



Applicability

- 1 Section 502.9 applies to:
 - (a) a **legal owner** of a **generating unit** implementing a synchrophasor measurement unit;
 - (b) a **legal owner** of an **aggregated generating facility** implementing a synchrophasor measurement unit;
 - (c) a **legal owner** of a **transmission facility** implementing a synchrophasor measurement unit; and
 - (d) the **ISO**.

Requirements

Facility with Functional Specifications Issued on or After February March 01, 2022

2 A **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** who is a **legal owner** of a **generating unit**, an **aggregated generating facility** or **transmission facility** for which the **ISO** issues a functional specification on or after March 01, 2022, must design and construct its facility in accordance with the minimum synchrophasor measurement unit requirements of this Section 502.9, and verify to the **ISO** that the facility meets the requirements during **commissioning** and energization of the new facility.

Facilities Built Prior to March 01, 2022

- 3(1) Subject to subsection 3(3), the provisions of this Section 502.9 do not apply to a facility:
 - (a) that was built in accordance with a technical requirement, technical standard, or a functional specification the **ISO** issued prior to February 28, 2013; or
 - (b) that was built in accordance with a version of Section 502.9 in effect between February 28, 2013 and March 01, 2022 and for which the **ISO** issued a functional specification.
- (2) Each of the **legal owner** of a **generating unit**, the **legal owner** of an **aggregated generating facility**, and the **legal owner** of a **transmission facility** must, notwithstanding subsection 3(1) keep such facility in compliance with the any applicable technical requirement, technical standard, functional specification, or version of Section 502.9 in effect at the time of:
 - (a) issuing the functional specification; or
 - (b) energization and **commissioning** if the **ISO** did not issue a functional specification.
- (3) The **ISO** may, notwithstanding subsection 3(1), require a **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility**, or **legal owner** of a **transmission facility** to comply with any specific or all of the provisions of this Section 502.9, if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.

Functional Specification

4 The **ISO** must, in accordance and generally consistent with this Section 502.9, approve a written functional specification containing details, work requirements and specifications for the implementation of a synchrophasor measurement unit for a facility.

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Synchrophasor Measurement Unit Functionality

5 Each of the **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** and **legal owner** of a **transmission facility** implementing a synchrophasor measurement unit, must meet the functionality requirements, data requirements, data format requirements and communication requirements set out in the Institute of Electrical and Electronics Engineers *IEEE Standard C37.118.1a-2014 – Synchrophasors measurements for Power Systems* and *C37.118.2-2011 - Synchrophasors Data Transfer for Power Systems* specific to a synchrophasor measurement unit.

Synchrophasor Measurement Unit Signal Names

6 The **ISO** must provide each **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** and **legal owner** of a **transmission facility** with the Institute of Electrical and Electronics Engineers *IEEE Standard C37.118.2-2011 – Synchrophasors Data Transfer for Power Systems* compliant synchrophasor measurement unit signal names and the appropriate data format, including the company identifier, device identifier and the necessary formatting.

Data Storage and Streaming

7(1) Subject to subsection 7(2), each of the **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** and **legal owner** of a **transmission facility** must collect and continuously store the synchrophasor measurement unit data for 1 year from the date the synchrophasor measurement unit data was collected.

(2) A **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility**, required to implement a synchrophasor measurement unit, as determined by the **ISO**, must stream the data to the **ISO**.

(3) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** may, within 1 year of streaming the data to the **ISO**, obtain the data from the **ISO** upon written request.

(4) The **ISO** must, if it receives a request as set out in subsection 7(3), provide the data to the **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** within 10 **business days**.

(5) The **ISO** must store any data streamed pursuant to subsection 7(2) for 1 year.

Suspected Failure or Malfunction of a Synchrophasor Measurement Unit

8(1) A **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must, if it identifies or suspects a failure or malfunction of a synchrophasor measurement unit or any of its components, notify the **ISO** as soon as practicable but not later than 1 **business day** after identifying the suspected malfunction or failure.

(2) The **ISO** must, if it identifies or suspects a failure or malfunction of a synchrophasor measurement unit or any of its components, notify the applicable **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** as soon as practicable, but not later than 1 **business day**, after identifying the suspected failure.

(3) Each of the **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** and **legal owner** of a **transmission facility** must provide the **ISO** with the date it expects to investigate the suspected failure or malfunction of the synchrophasor measurement unit or any of its components which, in the case of an investigation in response to a notification under subsection 8(2), must be within 2

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business days of receiving the **ISO**'s notification.

(4) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must, if it is unable to test the synchrophasor measurement unit or any of its components on the expected date provided under subsection 8(3), provide the **ISO** with the revised date.

(5) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must, after testing the synchrophasor measurement unit or any of its components, confirm if there is a failure or malfunction with the synchrophasor measurement unit or not and notify the **ISO** with the results of the test.

(6) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must, if the results of the test indicated that the synchrophasor measurement unit or any of its components have failed, provide the **ISO** with the date that the **market participant** expects to repair or replace the synchrophasor measurement unit.

(7) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must, if the synchrophasor measurement unit or any of its components are not repaired or replaced by the date provided under subsection 8(6), provide the **ISO** with a revised date.

(8) The **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** must notify the **ISO** when the synchrophasor measurement unit or any of its components have been repaired or replaced.

As-Built Drawing

9 A **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** or **legal owner** of a **transmission facility** implementing a synchrophasor measurement unit, or required by the **ISO** to implement a synchrophasor measurement unit, must provide the **ISO** with an as-built engineering stamped 3 line drawing or a record representing the as-built installation, indicating:

- (a) the voltage transformer and current transformer connections through to the synchrophasor measurement unit; and
- (b) the voltage transformer and current transformer accuracy class.

Revision History

Date	Description
202x-xx-xx	Amended subsection 2 to include requirements for facilities with a functional specification issued on or after March 01, 2022. Updated subsection 3(1) and (2) to include requirements for facilities built between February 28, 2013 and March 01, 2022. Updated IEEE reference in subsections 5 and 6.
2020-09-16	Administrative revisions.
2019-12-11	Removed duplication with new Section 103.14, <i>Waivers and Variances</i> ; standardized functional specifications language; capitalized references to "Section".
2015-03-27	Replaced "effective date" with the initial release date in sections 2 and 3(1); and replaced the word "Effective" in the Revision History to "Date".

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Date	Description
2013-02-28	Initial release