

# ISO Rules

## Part 500 Facilities

### Division 503 Technical & Operating Requirements

#### Section 503.13 Synchrophasor Measurement System



#### Applicability

- 1 Section 503.13 applies to:
  - (a) the **legal owner** of a **generating unit, aggregated facility, or energy storage resource**:
    - (i) that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat, including a **generating unit, aggregated facility, or energy storage resource** situated within an industrial complex that is directly connected to the **transmission system**; and
    - (ii) implementing a synchrophasor measurement;
  - (b) the **legal owner** of a **transmission facility** implementing a synchrophasor measurement unit;  
and
  - (c) the **ISO**.

#### Requirements

#### Verification

- 2 The **legal owner** must verify to the **ISO** that the facility meets the requirements of this Section 503.13 during **commissioning** and energization of the new facility.

#### Synchrophasor Measurement Locations

- 3(1) The **legal owner** of a **generating unit, aggregated facility, or energy storage resource** must equip the **generating unit, aggregated facility, or energy storage resource** with a synchrophasor measurement system.
- (2) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must design the synchrophasor measurement system referenced in subsection 3(1) to record at the following locations:
  - (a) at the stator winding terminal of the **generating unit** or synchronous **energy storage resource** for all 3 phase-to-ground voltages and all 3 phase currents; and
  - (b) at the high side of the **transmission system** step-up transformer of the **generating unit** or synchronous **energy storage resource** for all 3 phase-to-ground voltages and all 3 phase currents.
- (3) The **legal owner** of an **aggregated facility** must design the synchrophasor measurement system referenced in subsection 3(1) to record at the following locations:
  - (a) at the low side of the **transmission system** step-up transformer of the **aggregated facility** all 3 phase-to-ground voltages and all 3 phase currents; and
  - (b) at the high side of the **transmission system** step-up transformer of the **aggregated facility**, for all 3 phase-to-ground voltages and all 3 phase currents.
- (4) Each applicable **legal owner** must, if a **generating unit** or **aggregated facility** has a common **point of connection** with an **energy storage resource**, ensure that the synchrophasor measurement

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system has dedicated voltage and current channels for the feeder to the **energy storage resource** at the low side of the **transmission system** step-up transformer; and

(5) Each applicable **legal owner** may, if the **generating unit** or **aggregated facility** has a common **point of connection** with an **energy storage resource**, use common voltage and current channels at the high side of the **transmission system** step-up transformer for the synchrophasor measurement system.

#### Synchrophasor Measurement Unit Functionality

4 The **legal owner** must meet the functionality requirements, data requirements, data format requirements and communication requirements set out in the Institute of Electrical and Electronics Engineers *C37.118.1a-2014 – IEEE Standard for Synchrophasor Measurements for Power Systems* and *IEEE Standard C37.118.2-2011 – IEEE Standard for Synchrophasors Data Transfer for Power Systems* specific to a synchrophasor measurement unit.

#### Synchrophasor Measurement Unit Signal Names

5 The **ISO** must provide a **legal owner** with the Institute of Electrical and Electronics Engineers *C37.118.2-2011 – IEEE Standard for 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

6(1) The **legal owner** must collect and continuously store the synchrophasor measurement unit data for 1 year from the date the synchrophasor measurement unit data was collected, unless the data is being streamed to the **ISO** pursuant to subsection 6(2).

(2) The **legal owner** must, as determined by the **ISO**, stream the data to the **ISO**.

(3) The **legal owner** 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 6(3), provide the data to the **legal owner** within 10 **business days**.

(5) The **ISO** must store any data streamed pursuant to subsection 6(2) for one year.

#### Suspected Failure or Malfunction of a Synchrophasor Measurement Unit

7(1) A **legal owner** 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 one **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** as soon as practicable, but not later than one **business day**, after identifying the suspected failure.

(3) The applicable **legal owner** 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 7(2), must be within 2 **business days** of receiving the **ISO**'s notification.

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- (4) The **legal owner** must, if it is unable to test the synchrophasor measurement unit or any of its components on the expected date provided under subsection 7(3), provide the **ISO** with the revised date.
- (5) The **legal owner** 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** 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 **legal owner** expects to repair or replace the synchrophasor measurement unit.
- (7) The **legal owner** must, if the synchrophasor measurement unit or any of its components are not repaired or replaced by the date provided under subsection 7(6), provide the **ISO** with a revised date.
- (8) The **legal owner** must notify the **ISO** when the synchrophasor measurement unit or any of its components have been repaired or replaced.

#### As-Built Drawing

- 8 A **legal owner** 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
2024-04-01	Amended, as approved in <b>Commission</b> Decision 28176-D01-2023 issued on June 13, 2023.  See <i>Table of Concordance for the Transition from Division 502 to Division 503</i> on <a href="http://www.aeso.ca">www.aeso.ca</a> for further information regarding the change from Division 502 – Technical Requirements to Division 503 – Technical and Operating Requirements.
2022-03-01	Updated references to IEEE Standards in subsections 5 and 6.  Amended subsection 2 to clarify the applicability of Section 502.9 to facilities with functional specifications issued after March 1, 2022.  Amended subsection 3 to exempt facilities built prior to March 1, 2022 from compliance with updated IEEE Standards.
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

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Date	Description
	replaced the word "Effective" in the Revision History to "Date".
2013-02-28	Initial release