

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.10 Revenue Metering System

Technical ~~and Operating~~ & Operation Requirements



Applicability

1 Section 502.10 applies to:

(a) ~~the following legal owners that own a revenue metering system:~~

~~(b)(a) the legal owner of a transmission facility; revenue meter~~

~~(i) the legal owner of an electric distribution system;~~

~~(ii) the legal owner of a generating unit or an aggregated generating facility that is:~~

~~(A) directly connected to the transmission system;~~

~~(B) a distributed generation as defined in the Act; or~~

~~(C) deemed a large micro-generation as defined in the *Micro-generation Regulation of Alberta*;~~

~~(iii) the legal owner of an energy storage facility that is directly connected to the transmission system;~~

~~(iv) the legal owner of an industrial system that has been designated as such by the Commission; and~~

~~(v) the legal owner of an industrial complex who has entered into an arrangement directly with the ISO for the provision of system access service; and~~

~~(e)(b) the ISO.~~

Requirements

~~Effective Date and Variance~~

~~2(1) On Successor to Prior Requirements~~

~~2(1) This section 502.10 succeeds and replaces the *Measurement System Standard*, which came into effect as of September 18, 2007.~~

~~2(2) The *Measurement System Standard* referred to in subsection 2(1), together with any other prior standards or drafts of standards on the subject matter, will no longer will be in force and after effect as of the effective date of this section 502.10, the legal owner.~~

~~Functional Specification~~

~~3(1) The ISO must approve of a functional specification containing further details, work requirements and specifications for the design, construction and operation of a revenue metering system must comply meter for a facility.~~

~~2(2) The functional specification referred to in subsection 3(1) must be generally consistent with the provisions of this section Section 502.10.~~

~~2(2) Notwithstanding subsection 2(1), but may contain material variances the ISO may approve written variance request by a legal owner approves of a revenue metering system based upon its discrete analysis of any one (1) or more of the technical, economic, safety, operational and reliability~~

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.10 Revenue Metering System

Technical ~~and Operating~~ & Operation Requirements



requirements of the interconnected electric system related to the specific ~~revenue metering system~~ facility.

Measurement Point Definition Record

~~34(1)~~ The ~~ISO~~ legal owner of a revenue meter must ~~develop and maintain the~~, where such legal owner requires a new measurement point definition records for all record or an amendment to an existing measurement points.

~~(2)~~ The ~~legal owner of a revenue metering system~~ must submit to the ~~ISO~~ the necessary information to create a metering point definition record, apply to the ISO no later than ~~thirty (30) days~~ prior to the ~~proposed date~~ first day of energization the month in which the legal owner of the revenue meter proposes to energize the new or altered revenue metering system, unless for the ~~ISO~~ specifies otherwise ~~first time~~.

~~(3)~~ The ~~ISO~~, in developing a ~~metering point~~ ~~(2)~~ The legal owner of a revenue meter must submit to the ~~ISO~~ the information prescribed by the ~~ISO~~ when applying for a new or amended measurement point definition record as ~~in~~ accordance within subsection 4(1).

~~(3(2))~~ The ~~ISO~~ must ~~ensure that~~ issue a metering measurement point definition record, for a measurement point to the maximum extent possible, legal owner of the revenue meter, or to a person designated by the legal owner of the revenue meter, if the information submitted in accordance with subsection 4(2):

- (a) is complete;
- (b) allows for the proper measurement of metered energy, metered demand and metered apparent power in accordance with ISO rules and the ISO tariff, as applicable; and
- (c) avoids a metering configuration that results in a deductive totalizing calculation for the measurement point.

~~(4)~~ A metering point definition record developed in accordance with subsection 3(2) must comply with all and any ~~ISO tariff~~ requirements.

~~(5)~~ The ~~legal owner~~ ~~(3)~~ The legal owner of a revenue metering system meter must install and operate a revenue metering system meter in accordance with measurement point definition record issued by the ~~ISO~~ in accordance with subsection 4(3).

Revenue Meter

~~5(1)~~ The legal owner of a revenue meter must ensure that the revenue meter is approved, verified, sealed, re-verified and sealed, as applicable, in accordance with the Electricity and Gas Inspections Act, RSC 1985 c E-4, as amended.

~~(2)~~ The legal owner of a revenue meter must ensure that the revenue meter has an accuracy class rating that is less than or equal to 0.2% for Watthour measurement if:

- (a) the capacity of the metering point of the revenue meter is greater than or equal to 1.0 MVA; and
- (b) the revenue meter is not the subject of a dispensation under the Electricity and Gas Inspection Act, RSC 1985 c E-4, as amended.

ISO Rules
Part 500 Facilities
Division 502 Technical Requirements
Section 502.10 Revenue Metering System
Technical and Operating & Operation Requirements



(3) The legal owner of a revenue meter must ensure that the revenue meter has an accuracy class rating that is less than or equal to 0.5% for Varhour measurement if:

- (a) the capacity of the metering point of the revenue meter is greater than or equal to 1.0 MVA; and
- (b) the revenue meter is not the subject of a dispensation under the *Electricity and Gas Inspection Act*, RSC 1985 c E-4, as amended.

Measurement Transformer

6(1) The legal owner of a revenue meter must ensure that the measurement transformer has an accuracy class rating less than or equal to 0.3% if:

- (a) the capacity of the metering point of the revenue meter is greater than or equal to 1.0 MVA; and
- (b) the revenue meter is not the subject of a dispensation under the *Electricity and Gas Inspection Act*, RSC 1985 c E-4, as amended.

(2) The legal owner of a revenue meter must, unless the ISO approves otherwise, ensure that the measurement transformer:

- (a) is located and connected without compensation methods;
- (b) produces a real metering point; and
- (c) has a dedicated current transformer core for measurement.

Metering Data Services

7(1) The legal owner of a revenue meter must retain metering data from the revenue metering system, including a record of final estimates and adjustments and the method used to perform the estimates or adjustments, in the electronic format specified in the *Commission's Rule 021: Settlement System Code Rules* for a period of at least 8 years.

(2) The legal owner of a revenue meter must process metering data for each measurement point in accordance with the algorithm in the measurement point definition records-record issued in accordance with subsection 4(3).

(3) The legal owner of a revenue meter must, within 30 days of energizing the revenue meter for the first time, validate the metering equipment and the metering data using reasonable methods and alternative data sources.

Revenue Meter Testing and Reporting

8(1) NOTE TO DRAFT: The AESO is continuing to assess the minimum requirements for in-situ testing for proposed new Section 502.10. At the upcoming December 11, 2019 Stakeholder consultation session, the AESO will be seeking specific input from stakeholders on:

- the methodology for determining MW class;
- the in-situ test frequency for each MW class; and
- the requirements and process for test frequency change when the MW class is changed for a meter.

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.10 Revenue Metering System

Technical and Operating & Operation Requirements



Prior to the Stakeholder consultation meeting, stakeholders are encouraged to review section 6.4.3 and Appendix 5 of the Measurement System Standard, and the June 29, 2017 Working Group Meeting Notes.

(2) The legal owner of a revenue meter must provide the results of the in-situ test performed in subsection 8(1) to ISO if the test resulted in an error measurement of +/- 3%.

(3) The legal owner of a revenue meter must, at the request of the ISO:

(a) undertake and complete in-situ tests for the metering equipment within a mutually agreed time frame; and

(b) report the results to the ISO within 30 days of receiving the ISO's request.

Measurement Data Corrections

49(1) The legal owner of a revenue metering system must, if the legal owner discovers after monthly settlement an inaccuracy or an error in previously submitted measurement data which that has been submitted to the ISO uses for financial settlement, notify the ISO, of the error as soon as practical but not later than final settlement, in writing of the reasons of the inaccuracy and practicable in the form the ISO specifies.

(2) The legal owner of a revenue meter must include the following information in the notice referred to in subsection 9(1):

(a) the reason for the error; and

(b) the correct measurement data.

(3) The ISO must review the information it receives pursuant submitted in the notice referred to in subsection 49(1) and notify the legal owner of a revenue metering system, in writing, of the results of its review as soon as practical confirm whether the previously submitted measurement data is erroneous.

(34) The legal owner of a revenue metering system must resubmitsubmit the correct daily system measurement data to the ISO as soon as practicable if the ISO's review in subsection 4(2) indicates9(3) confirms that the previously submitted measurement data was inaccurateerroneous.

Metering Data Services

5(1) The legal owner of a revenue metering system must provide all metering data services as specified in the Commission's Rule 021: Settlement System Code Rules.

(2) The legal owner of a revenue metering system must retain metering data from the revenue metering system including the record of any estimates and adjustments, and the method used to perform the estimates or adjustments, in electronic format for a period of at least eight (8) years.

(3) The legal owner of a revenue metering system must process metering data in accordance with any associated measurement point definition record algorithms for each measurement point.

(4) The legal owner of a revenue metering system must check the metering data against any available SCADA data at the commissioning date to ensure reasonable match between them.

Measurement Transformer

6 The legal owner of a revenue metering system must ensure that any current or potential instrument transformer for a revenue metering system:

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.10 Revenue Metering System

Technical and Operating & Operation Requirements



- ~~(a) is Measurement Canada approved under sections 9(1), 9(2), 9(3) or 9(4) of the *Electricity and Gas Inspection Act* of Canada, if the measurement transformer has not been previously dispensed by Measurement Canada;~~
- ~~(b) is located and connected without compensation methods and produces a real metering point, unless the ISO otherwise approves;~~
- ~~(c) has an accuracy class rating for measurement transformers that equals or exceeds the values specified in Table 1 if they are non-dispensated; and~~
- ~~(d) complies with the Measurement Canada dispensation agreement if the measurement transformer has been previously dispensed by Measurement Canada.~~

Table 1

Metering Point Capacity (MVA)	Wathour Meter Accuracy Class	Varhour Meter Accuracy Class	Measurement Transformer Accuracy Class
1.0 and above	0.2%	0.5%	0.3%

Meter

~~7 The legal owner of a revenue metering system must ensure that the meter for a revenue metering system:~~

- ~~(a) is Measurement Canada approved, verified, re-verified and sealed in accordance with the *Electricity and Gas Inspections Act* of Canada subject to the terms and conditions of any applicable dispensation agreement;~~
- ~~(b) has an accuracy class rating for Wathour and Varhour measurement that equals or exceeds the values specified in Table 1 if they are non-dispensated; and~~
- ~~(c) complies with the Measurement Canada dispensation agreement if the meter has been previously dispensed by Measurement Canada.~~

Revenue Metering System Information

~~8 The legal owner of a revenue metering system must provide the following metering system information to the ISO:~~

- ~~(a) the single line diagram with revenue metering locations; and~~
- ~~(b) information in writing of any modification to the metering system for any metering point associated with a measurement point that would result in changes to the associated measurement point definition record.~~

Meter Testing

~~9 The legal owner of a revenue metering system must:~~

- ~~(a) ensure that each meter and recorder are tested and sealed as per Measurement Canada requirements;~~
- ~~(b) perform an in-situ test at the applicable intervals set out in Table 2, for all revenue metering systems;~~

ISO Rules

Part 500 Facilities

Division 502 Technical Requirements

Section 502.10 Revenue Metering System

Technical ~~and Operating~~ & Operation Requirements



- ~~(c) provide written test results to the ISO for any test required in subsection 9 (a) or (b) that demonstrates an error of measurement exceeding 3%;~~
- ~~(d) at the request of the ISO, undertake and complete in-situ tests on the metering equipment and report to the ISO within thirty (30) business days, or within a mutually agreed time frame, of receiving such a request; and~~
- ~~(e) file with the ISO an annual report of outstanding un-tested meters in the previous year, annual failures tests, and a mitigation plan, within the first quarter of the next year.~~

Table 2

Average MW Range	Testing Interval
≥ 5 and ≤ 20	4 years
higher than 20	2 years

Note: Average MW Range is defined as the previous 12-month's MWh divided by 8760(hour);

Restoration

10(1) The legal owner of a revenue ~~metering system meter~~ must ~~notify the ISO, in writing, upon becoming aware of a failure or a suspected failure of the revenue metering system that may result in a restatement of measurement data that has been submitted to the ISO, notify the ISO in writing of the failure.~~

~~(2)~~ The legal owner of a revenue ~~metering system meter~~ must, within ~~thirty (30) business days~~ of providing ~~a notice the notification~~ under subsection 10(1):

- ~~(a) investigate and determine the nature and extent of a revenue metering system the failure; and~~
- ~~(b) provide the ISO with written notification detailing the nature and extent of the failure as well as; and~~
- ~~(b)(c) submit to the ISO a plan to restore the revenue metering system.~~

(3) The ISO must ~~review:~~

- ~~(a) approve the restoration plan provided pursuant to submitted in accordance with subsection 10(2)(b) and, c) if the ISO is satisfied with the plan, approve it that the restoration plan will resolve the failure within a reasonable amount of time; or~~
- ~~(b) direct the legal owner of the revenue meter to amend the restoration plan in a manner that will resolve the failure within a reasonable amount of time.~~

(4) The legal owner of a revenue ~~metering system meter~~ must, ~~if the ISO advises that it is not satisfied amend the restoration plan in accordance with the plan to restore the revenue metering system ISO's direction provided under in subsection 10(23)(b), amend the plan to the ISO's satisfaction.~~

(5) The legal owner of a revenue ~~metering system meter~~ must, ~~in response to the failure of a revenue metering system, restore the failed revenue metering system to meet the requirements of this section 502.10 and must do so either: restore the revenue metering system in accordance with:~~

ISO Rules
Part 500 Facilities
Division 502 Technical Requirements
Section 502.10 Revenue Metering System
Technical ~~and Operating~~ & Operation Requirements



- ~~(a) within a time frame the ISO approves and during which the legal owner of a revenue metering system may operate without a functioning revenue metering system; or~~
- ~~(b) as soon as otherwise practical, in which case, the legal owner of a revenue metering system must provide an alternate metering system that meets the ISO's approval until restoration of the failed revenue metering system is completed.~~
- (a) the restoration plan approved by the ISO pursuant to subsection 10(3)(a); or
- (b) the restoration plan amended in accordance with subsection 10(4).

Revision History

Date	Description
	<u>Initial release</u>

ISO Rules
Part 500 Facilities
Division 502 Technical Requirements
Section 502.10 Revenue Metering System
Technical ~~and Operating~~ & Operation Requirements



~~New terms to be introduced to the AESO's Consolidated Authoritative Document Glossary:~~

~~“**measurement point**” means, for the purpose of financial settlement with the ISO, either:~~

- ~~(a) a real measurement point where active energy and reactive energy are physically measured; or~~
- ~~(b) a virtual measurement point where active energy and reactive energy are deemed to have been measured from an algorithmical manipulation of the active energy and reactive energy interval data of 1 or more real measurement points.~~

~~“**measurement point definition record**” means a specification that defines the physical arrangement of a **revenue metering system** as well as any algorithms used to manipulate the interval data associated with a **metering point** to produce the interval data associated with the **measurement point** to which the specification applies.~~

~~“**revenue metering system**” means all metering equipment required for the measurement of the active energy and reactive energy interval data for a single **metering point** used for financial transaction and, if applicable, remote storage of that interval data.~~