Blackline – Final Energy Storage ISO Rule Amendments

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Applicability

1 The **ISO rules** are binding on:

(a) **market participants**; and

(b) the **ISO**.

Requirements

Interpretation

2 In the **ISO rules**:

(a) nothing in any way restricts or limits the powers, duties, and responsibilities of the **ISO** as set out in legislation;

(b) defined terms are in bold type, but otherwise, tables of contents, section headers, and the use of underlining, bolding and italicizing are not a part of the interpretation of the **ISO rules** and are inserted for convenience of reference only;

(c) words in the singular include the plural and words in the plural include the singular;

(d) words importing male persons include female persons, words importing female persons include male persons, and words importing either sex include corporations;

(e) the provisions of the **ISO rules** are to be construed as always speaking and applied to circumstances as they arise;

(f) "may" is to be construed as permissive and empowering, and "must", "shall" and "will" are to be construed as imperative;

(g) all references to a time of day in the **ISO rules** mean mountain standard or mountain daylight time in the Province of Alberta, whichever is in effect on the day in question;

(h) words and phrases in bold type have the meanings given to them in the definitions found in the Part 1 of the **ISO rules**;

(i) any schedule, table or appendix attached to an **ISO rule** forms a part of the **ISO rule** and are to be interpreted accordingly; and

(j) titles of documents are in italics.

3 Any **ISO** or **market participant** dispute concerning the application, interpretation or enforceability of any **ISO rule** is within the exclusive jurisdiction of the **Commission** or Courts of the Province of Alberta, as applicable, and any related legal proceedings must be commenced, heard and adjudicated within the applicable Alberta forum.

Revision History

Effective	Description
December 15, 2009	Supersedes October 1, 2009 Version

ISO Rules
Part 100 General
Division 103 Administration
Section 103.1 Confidentiality

Applicability

1 Section 103.1 applies to:

(a) a **market participant**, except where the **market participant** is the **legal owner** of a **transmission facility** where the person who is eligible to apply for the construction and operation of the **transmission facility** was determined by a competitive process developed by the **ISO** in accordance with the **Act**; and

(b) the **ISO**.

Requirements

Confidential Records

2(1) Any record that the **ISO** receives from a **market participant** which:

(a) is not in the public domain; or

(b) in the opinion of the **ISO** is commercially sensitive;

must be treated by the **ISO** as confidential, unless it is a record which fits into one of the exception categories set out in subsection 2(6).

(2) The **ISO** must treat as confidential any record described in subsection 2(1)(a) that identifies the **market participant**'s name or any of its facilities, unless the **ISO** gives the **market participant** written notice that such information will not be treated as confidential.

(3) If the **ISO** gives written notice as set out in subsection 2(2) above, the **market participant** has seven (7) business days from the date such notice is given to provide reasons to the **ISO** why the record should be treated as confidential, and the **ISO** will consider those reasons before making a final determination regarding the treatment of the record.

(4) Any record that a **market participant** receives from the **ISO** that is not in the public domain must be treated by the **market participant** as confidential, unless it is a record which fits into one of the exception categories set out in subsection 2(6).

(5) Notwithstanding subsection 2(1), the **ISO** may disclose a confidential record in order to fulfill its duties and responsibilities under the **Act** or other legislation, and in making such a disclosure will make reasonable efforts to ensure that a person receiving that confidential record does not further disclose the record.

(6) A record will not be treated as confidential to the extent it:

(a) must be disclosed, used or reproduced by law or by a lawful requirement of any government or governmental body, authority or agency having jurisdiction over the **ISO**, a **market participant** or their **affiliates**;

(b) is disclosed, used or reproduced:

(i) under the authority of the **ISO rules,** the **ISO tariff** or the **reliability standards**;

(ii) with the consent of the provider; or

(iii) as an unidentifiable component when aggregated or otherwise consolidated with another record; or

(c) is disclosed to protect the safety of personnel or equipment, or to protect or enhance the reliability of the **interconnected electric system**.

(7) The **ISO** and a **market participant** may share a confidential record with their respective **representatives** but only if those **representatives** are aware of the confidential nature of the record and agree to treat it as confidential.

Disclosure to Market Surveillance Administrator

3 In accordance with section 2(1) of the *Market Surveillance Regulation*, the **Market Surveillance Administrator** has the right to receive and the **ISO** will make available to the **Market Surveillance Administrator** confidential and other records relating to a **market participant** that are held or become available to the **ISO** pursuant to its mandate under the **Act**.

Revision History

Effective	Description
2016-11-29	Revisions to the Applicability section
	Supersedes October 1, 2009 Version

ISO Rules
Part 100 General
Division 103 Administration
Section 103.2 Dispute Resolution

Applicability

1 Section 103.2 applies to:

(a) a **market participant**, except where the **market participant** is:

(i) the **legal owner** of a **transmission facility** where the **person** who is eligible to apply for the construction and operation of the **transmission facility** was determined by a competitive process the **ISO** developed in accordance with the **Act**; or

(ii) the **legal owner** of a **generating unit** or an **aggregated generating unit** that is subject to a renewable electricity support agreement in connection with rounds 1, 2 or 3 of the Renewable Electricity Program in respect of a dispute that is subject to the terms of such renewable electricity support agreement; and

(b) the **ISO**.

Requirements

Informal Dispute Resolution

2(1) The first step a **market participant** must take to resolve a dispute with the **ISO** is to make reasonable efforts to informally resolve the dispute with the appropriate representative of the **ISO**.

(2) If a **market participant** is unsure of the appropriate representative of the **ISO** to contact about the dispute it may call the **ISO** main reception telephone number posted on the AESO website.

Submission of a Written Dispute

3(1) If a **market participant** does not receive a satisfactory or timely resolution to its informal dispute resolution efforts, it may proceed to the second step of the dispute resolution process and submit a written dispute to the **ISO**.

(2) The subject matter for a written dispute may include a concern about:

(a) an **ISO rule**, **reliability standard** or **ISO tariff** provision;

(b) the **ISO**'s interpretation or application of an **ISO rule**, **reliability standard** or **ISO tariff** provision;

(c) an **ISO** board decision relating to the **ISO**'s budget review process; or

(d) the operation and conduct of the **ISO** in carrying out its duties and responsibilities under the **Act** or other legislation where a **market participant** is concerned about:

(i) specific and measurable error by the **ISO**;

(ii) the **ISO** not having considered complete information in reaching a determination; or

(iii) an element of unfairness in the process used by the **ISO** in reaching a determination.

(3) A written dispute must:

(a) include the full legal name of the **market participant** directly affected by the matter and the contact information the **market participant** will use for receipt of all notices and communications;

(b) include the nature and basis of the dispute, a proposed solution to the dispute and any other material previously submitted to or received from the **ISO**;

(c) be signed by an officer of the **market participant** if it is a corporation, one of its partners if a

partnership, or by the **market participant** personally if an individual person;

(d) be submitted to the **ISO** at its head office, attention "ISO General Counsel"; and

(e) be submitted to the **ISO** within 30 **business days** of an **ISO** board decision, if the dispute is regarding a decision concerning the **ISO**'s budget review process.

Acknowledgement of Receipt

4 Within 10 **business days** of receiving the written dispute, the **ISO** general counsel must respond to the **market participant** in writing, acknowledging receipt of the written dispute and identifying the **ISO** vice president accountable for handling the dispute.

Review of a Written Dispute

5(1) In the case of a written dispute related to the budget review process, the **ISO** board must, within 30 **business days** of the **ISO** general counsel issuing the acknowledgment of receipt, review the dispute and advise the **market participant** in writing of its decision regarding the matter in dispute.

(2) In the case of all other written disputes, the **ISO** vice president accountable for the dispute must, within 30 **business days** of the **ISO** issuing the acknowledgment of receipt, review the dispute and advise the **market participant** in writing of the **ISO** decision, including reasons, regarding the matter in dispute.

(3) If a written dispute is not resolved to the **market participant**'s satisfaction, the **market participant** may:

(a) agree with the **ISO** to seek resolution through a mediation or arbitration process; or

(b) pursue any other remedies available to it under the law, including filing a complaint with the **Commission** or **Market Surveillance Administrator**, or commencing a court action.

Assumption of Resolution

6(1) If a **market participant** does not object to the **ISO**'s written decision regarding a dispute within 30 **business days** of the delivery of the written decision, the **ISO** may close the dispute file.

(2) The file closing does not prevent the **market participant** or the **ISO** from initiating discussions regarding the matter in the future.

No Delay

7 The initiation of a dispute resolution process under this Section 103.2 will not entitle a **market participant** to withhold or delay payment of any amounts due and owing to the **ISO**, nor will it stay the implementation of an **ISO** determination pending resolution of the dispute.

Record Retention

8 The **market participant** and the **ISO** must each create and maintain their own records in relation to a dispute.

Revision History

Date	Description
2020-09-16	Revised the Applicability section to create exception 1(a)(ii). Administrative amendments.

2016-11-29	Revised the Applicability section to create exception 1(a)(i).
2010-01-05	Supersedes October 1, 2009 Version

ISO Rules
Part 100 General
Division 103 Administration
Section 103.3 Financial Security Requirements

Applicability

1 Section 103.3 applies to:

(a) a **market participant** with any **financial obligation** to the **ISO**, except where the **market participant** is the **legal owner** of a **transmission facility** where the person who is eligible to apply for the construction and operation of the **transmission facility** was determined by a competitive process developed by the **ISO** in accordance with the **Act**; and

(b) the **ISO**.

Requirements

Provision of Financial Security

2(1) A **market participant** must provide to the **ISO**, or cause its guarantor to provide to the **ISO**, **financial security** equal to or greater than the total dollar amount of all **financial obligations** of the **market participant**, minus any unsecured credit limit granted to the **market participant** as determined in accordance with subsection 5.

(2) A **market participant** must ensure all **financial security** provided or caused to be provided to the **ISO** in accordance with this section 103.3, remains in force and in effect for so long as the **market participant** has any outstanding **financial obligations** to the **ISO**.

Determination of Financial Obligations Total Amounts

3(1) The **ISO** must calculate the total dollar amount of all **financial obligations** of a **market participant** to the **ISO**, including:

(a) subject to subsection 3(2) if the **market participant** is a **pool participant**, a dollar amount based upon a determination by the **ISO** of:

the energy the **pool participant** consumes for any 2 consecutive **settlement periods**, adjusted for any updated information and estimates

minus

the energy the **pool participant** purchases from another **pool participant** through any **net settlement instructions** during any 2 consecutive **settlement periods**

minus

the energy the **pool participant** produces during any 2 consecutive **settlement periods**

plus

the energy the **pool participant** sells to another **pool participant** through any **net settlement instructions** during any 2 consecutive **settlement periods**

multiplied by

a **pool price** the **ISO** estimates;

(b) if the **market participant** is receiving **system access service**, or if the **market participant** has applied for but not yet received **system access service** under any rate in the **ISO tariff**, a dollar amount equal to the estimate of the **ISO** of the charges for 2 **settlement periods**;

(c) if the **market participant** is required to provide **financial security** as counterparty to a *Construction Commitment Agreement* for a connection project under the **ISO tariff**, a dollar amount equal to the **financial security** as required under any such *Construction Commitment Agreement*;

(d) if a **market participant** is required to provide security as a counterparty to one or more agreements for **ancillary services** with the **ISO**, a dollar amount equal to the **financial security** as required under any such **ancillary services** agreements; and

(e) any other dollar amounts the **ISO** reasonably determines in respect of the requirement for **financial security** for any other services the **ISO** provides to the **market participant**.

(2) A **market participant** must provide to the **ISO** an estimate of the net energy that it will consume for 2 consecutive **settlement periods** using the **months** with the highest level of energy consumption, as a part of its application, if the **market participant** referred to in subsection 3(1)(a) is registering as a **pool participant** under Section 201.1 of the **ISO rules**, *Pool Participant Registration*.

(3) The **ISO** may deny an application or terminate any service the **ISO** provides to a **market participant**, if the **market participant** materially misrepresents the estimate of net energy to be consumed in subsection 3(2).

(4) The **ISO** may, for the purposes of calculating the **financial obligations** of a **market participant** to the **ISO** under subsection 3(1), establish a minimum amount that will be deemed to apply if the **financial obligations** calculated under subsection 3(1) otherwise fall below such minimum amount.

Unsecured Credit

4 A **market participant** may request that the **ISO** grant to the **market participant** an unsecured credit limit in accordance with subsection 5.

Unsecured Credit Limit for Rated Entities

5(1) The **ISO** may:

(a) grant an unsecured credit limit in an amount referred to in subsection 5(3) based on the long-term unsecured credit rating of the **market participant** or its guarantor from an acceptable credit rating agency, as determined by the **ISO**; or

(b) where the **ISO** has previously granted an unsecured credit limit based on a long-term unsecured proxy credit rating, grant twice the amount of such previous unsecured credit limit based on the long-term unsecured proxy credit rating of the **market participant** or its guarantor that the **ISO** issued prior to the effective date of this Section 103.3, which the **ISO** may, from time to time, revise or withdraw in accordance with the former provisions of this Section 103.3 that were in effect prior to the effective date of this Section 103.3.

(2) The **ISO** must establish the unsecured credit limit for the **market participant** based on the lowest credit rating, if the **market participant** or its guarantor has more than 1 credit rating in accordance with subsection 5(1)(a).

(3) The **ISO** may grant an unsecured credit limit to the **market participant** up to the maximum amount specified in the second column of the following Table 1, based on the long term unsecured credit rating for the **market participant** or its guarantor specified in the first column of Table 1, if a **market participant** or its guarantor has a credit rating from an acceptable credit rating agency.

Table 1

Subsection 5 Unsecured Credit Limit

Credit Rating	Unsecured Credit Limit
AA+/AAA	$50,000,000
AA	$45,000,000
AA-	$40,000,000

A+	$35,000,000
A	$30,000,000
A-	$25,000,000
BBB+	$20,000,000
BBB	$15,000,000
BBB-	$10,000,000
<BBB-	$0

(4) The **ISO** may not grant an unsecured credit limit to a **market participant**, its guarantor, or any company that is an affiliate of either the **market participant** or its guarantor if the **ISO** has already granted an unsecured credit limit to any of the **market participant**, its guarantor, or an affiliate of either of them.

(5) The **ISO** may, notwithstanding subsection 5(4), allocate the previously granted unsecured credit limit of a **market participant**, its guarantor, or any company that is an affiliate of either of them amongst those companies in a manner the **ISO** determines but which may not exceed the previously granted unsecured credit limit.

Acceptable Forms of Financial Security

6(1) A **market participant** must provide **financial security** to the **ISO** in the following form:

(a) a letter of credit issued from a Canadian chartered bank, or other acceptable and comparable financial institution, with at least an A minus rating from an acceptable credit rating agency, as determined by the **ISO**, and include provisions to the effect that it is an unconditional and irrevocable standby letter of credit, payable on demand with the **ISO** as beneficiary, and that is otherwise in form and substance satisfactory to the **ISO**;

(b) a cash collateral deposit together with a cash collateral agreement that is in form and substance satisfactory to the **ISO**; or

(c) a parent guarantee from an entity that qualifies for an unsecured rating under subsection 5, and that is in form and substance satisfactory to the **ISO**.

(2) The **ISO** may accept or reject a letter of credit, cash collateral agreement, or parent guarantee, referred to in subsection 6(1).

(3) A **market participant** may request that the **ISO** approve an alternative form of **financial security** to those specified under subsection 6(1).

(4) The **ISO** may accept or reject the alternative form of **financial security** requested in subsection 6(3).

(5) A **market participant** must ensure that the **ISO** is able to register its security interest in any cash collateral deposit the **market participant** provides as a first security interest under the *Personal Property Security Act* or other similar legislation.

(6) A **market participant** must provide the **ISO** with registerable written waivers or postponements in favour of the **ISO** provided by all third parties who have a registerable security interest in priority to the security interest the **ISO** may register, if requested by the **ISO**.

(7) The **ISO** may, at any time after initially approving the creditworthiness of a guarantor of the **market participant** and the maximum dollar amount under any approved form of guarantee, reassess and reduce that creditworthiness regardless of the credit rating of the guarantor.

(8) The **ISO** must notify the **market participant** and its guarantor, in writing, of the reduced creditworthiness following a reassessment and reduction made pursuant to subsection 6(7).

(9) The **market participant** must provide the **ISO** with additional or replacement **financial security,** which the **ISO** must receive no later than the close of business on the 2nd **business day** following the delivery of the notice from the **ISO,** in accordance with subsection 6(8).

The **ISO** may extend such deadline for the delivery of additional or replacement **financial security** as the **ISO** may determine.

ISO Review and Reassessment of Financial Security Adequacy

7(1) The **ISO** may, from time to time, review and reassess any **financial security**, unsecured credit limits, **financial information** and standing, creditworthiness and credit rating, and generally the ability of a **market participant** and its guarantor to meet the **financial obligations** of the **market participant** and other performance obligations to the **ISO**.

(2) The **ISO** may by written notice reduce any unsecured credit limit of the **market participant** or demand that the **market participant** provide replacement or additional **financial security**, upon completion of a review and reassessment.

(3) The **ISO** may demand, in writing, replacement or additional **financial security** from a **market participant** in a dollar amount sufficient to provide security for the calculated difference, if at any one time:

the total dollar amount of all **financial obligations** of the **market participant** calculated under subsection 3

exceeds

any unsecured credit limit granted to the **market participant** under subsection 5, plus the **financial security** the **market participant** or its guarantor provides to the **ISO** pursuant to subsection 2.

(4) A **market participant** must deliver the replacement or additional **financial security**, calculated in subsection 7(3), to the **ISO** no later than the close of business on the 2nd **business day** after the **business day** upon which the **ISO** issued its demand for such replacement or additional **financial security**.

The **ISO** may extend such deadline for the delivery of additional or replacement **financial security** as the **ISO** may determine.

(5) A **market participant** may request in writing that the **ISO** reduce the **financial security** required from and provided by the **market participant** to the **ISO**.

(6) The **ISO** may reduce the **financial security** of the **market participant**, upon receipt of a request made pursuant to subsection 7(5), if after review and reassessment the **ISO** determines that:

(a) any unsecured credit limit granted to the **market participant** plus the **financial security** the **market participant** provides exceeds all **financial obligations** of the **market participant** for 2 **settlement periods** as the **ISO** estimates; or

(b) the credit rating of the **market participant** or its guarantor, as the case may be, determined in accordance with subsection 5 has been upgraded.

Financial Information and Material Adverse Changes

8(1) A **market participant** must provide, or cause its guarantor to provide, the **ISO** with any **financial information** the **ISO** requests, following a request by the **ISO** for such **financial information**.

(2) A **market participant** must give notice in writing to the **ISO**, or cause its guarantor to give notice in writing to the **ISO,** if the **market participant** or its guarantor experiences a **material adverse change**, or

is aware of a likely **material adverse change** occurring, no later than the close of business on the 2nd **business day** after the **day** the **market participant** or its guarantor experiences, or becomes aware, of the likely occurrence of the **material adverse change**.

(3) The **ISO** must determine the impact of the **material adverse change** on any unsecured credit limit of the **market participant** and the overall creditworthiness of the **market participant** or its guarantor, upon receiving notice pursuant to subsection 8(1) or otherwise becoming aware of the **material adverse change** or that the **material adverse change** is likely to occur.

(4) The **ISO** may, after determining the impact of the **material adverse change**:

(a) make a written demand on the **market participant** specifying the dollar amount and form of replacement or additional **financial security**, if the **ISO** determines that replacement or additional **financial security** is required; or

(b) if the **ISO** determines that the **market participant** or its guarantor is, or is likely to become, insolvent or unable to pay its debts as they mature:

(i) exercise its rights to terminate or suspend the **market participant** in accordance with subsection 7 of Section 103.7 of the **ISO rules**, *Financial Default and Remedies*; or

(ii) make a written demand on the **market participant** that the **market participant** remit payment in advance to the **ISO** prior to incurring any **financial obligations** in accordance with such terms and conditions as determined by the **ISO**, without limiting any of the other rights or remedies of the **ISO** including the right to terminate or suspend the **market participant**.

(5) The **market participant** must deliver to the **ISO** any specified replacement or additional, **financial security** or prepayment, as applicable, demanded in accordance with subsection 8(4) no later than the close of business on the 2nd **business day** after the **business day** upon which the **ISO** delivered the demand.

The **ISO** may extend such deadline for the delivery of additional or replacement **financial security** as the **ISO** may determine.

Costs and Expenses Related to Financial Security

9 All costs and expenses of a **market participant** associated with the implementation of any **financial security** and any related obligations of the **market participant** under this Section 103.3 are the responsibility and to the sole account of that **market participant** and the **market participant** must pay the **ISO** for any such costs and expenses incurred by the **ISO**.

ISO Recourse to Section 103.7 *Financial Default and Remedies*

11 The failure of a **market participant** to comply with its obligations to provide **financial security** under this Section 103.3, or to keep the **financial security** in force and effect, is deemed to be a default event which will allow the **ISO** to have recourse to the rights and remedies of the **ISO** under Section 103.7 of the **ISO rules**, *Financial Default and Remedies.*

Discretionary Rights

12(1) All rights, powers, and remedies granted to the **ISO** under this Section 103.3 are for the sole benefit and protection of the **ISO** and the **ISO** may exercise any such right, power, or remedy at its option and in its sole and absolute discretion.

(2) The **ISO** may, if it is given 2 or more alternative courses of action, elect any alternative or combination of alternatives, at its option and in its sole and absolute discretion.

Revision History

Date	Description
2022-01-04	Revisions to include minimum level of financial security, increase unsecured credit limits, remove the process for assigning proxy credit ratings, clarify the forms of financial security, include rights to request financial information and clarify the rights of the ISO in the event of a material adverse change, include right for ISO to extend deadlines for the delivery of additional or replacement security, and other administrative revisions.
2016-11-29	Revisions to the Applicability section
2011-07-01	Initial Release

ISO Rules
Part 100 General
Division 103 Administration
Section 103.4 Power Pool Financial Settlement

Applicability

1 Section 103.4 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Currency

2 All payments, fees, charges, amounts and calculations under this Section 103.4 must be in Canadian dollars.

Source Asset Payment and Settlement Calculation

3(1) The **ISO** must pay a **pool participant**, for energy production from each of its **source assets** during a **settlement interval**, an amount calculated as follows:

energy production;

minus

the volumes of all **net settlement instructions** of the **pool participant** for the **source asset**;

multiplied by

the **pool price** in $/MWh;

where:

"energy production" in MWh for the **settlement interval** is, depending on the origins of the energy production, either the **metered energy** value for the output from the **source asset**, or the value of energy from the **interchange transaction** for the importing **pool asset**.

(2) A **pool participant**:

(a) is deemed to have purchased in MWh the net difference in energy from the **power pool**; and

(b) must pay to the **ISO** the amount calculated under subsection 3(1) to account for the cost of that net difference in energy,

if during a **settlement interval** the energy production in MWh of a **source asset** is less than the volumes of all **net settlement instructions** for the **source asset**.

Payment for Energy Production During a System Emergency

4 The **ISO** must calculate the payment to a **pool participant** for energy production during a system emergency caused by a transmission **delayed forced outage** or **automatic forced outage** based on the payment calculation under subsection 3(1), but such system emergency does not include one caused by a transmission **delayed forced outage** or **automatic forced outage** during a markets suspension event.

Payment for Energy from a Long Lead Time Asset

5(1) The **ISO** must calculate the payment to a **pool participant** for energy production related to **incremental generation costs** a **pool participant** incurs as a result of a **directive** for energy from a **long lead time asset**, excluding any such **directive** issued during a markets suspension event.

(2) The **ISO** must pay an additional amount to a **pool participant** to cover those residual costs, if any costs a **pool participant** incurs due to a **directive** for energy from a **long lead time asset** are not fully recovered under subsections 3 and 7, and those residual costs are referenced in and recoverable under

the definition of **incremental generation costs**.

Payment for Cancellation of an Outage

6(1) The **ISO** must, subject to subsection 11 of Section 306.5 of the **ISO rules**, *Generation Outage Reporting and Coordination*, pay a **pool participant** or **legal owner** of a ~~generating~~ **source asset**, excluding an import asset, for **incremental generation costs** a **pool participant** or **legal owner** incurs as a result of complying with a **directive** to cancel an outage.

(2) The **ISO** must calculate the payment referred to subsection 6(1) based on the information a claimant provides to the **ISO** in accordance with the provisions of subsection 11 of Section 306.5 of the **ISO rules**, *Generation Outage Reporting and Coordination*.

Payment to a Supplier on the Margin

7(1) The **ISO** must pay an uplift payment to a **pool participant** with a **source asset** that has delivered energy pursuant to a **dispatch** during a **settlement interval** if during the **settlement interval**:

(a) the **ISO** issues a **dispatch** for an **operating block** related to the **source asset**;

(b) the **offer** price for the **operating block** is greater than the **pool price**;

(c) the energy production of the **source asset** is greater than the sum of the energy that is included in a **dispatch** for all **operating blocks** with an **offer** price below the **offer** price of the **operating block** referred to in subsections 7(1)(a) and (b); and

(d) the **ISO** has not made a **transmission constraint rebalancing** payment to a **pool participant** for that **dispatch**.

(2) The **ISO** must, for each eligible **operating block**, calculate any uplift payment made under subsection 7(1) as follows:

(a) If A minus B is less than or equal to C minus B, then the uplift payment equals:

(A minus B) multiplied by (D minus the **pool price)**; or

(b) If A minus B is greater than C minus B, then the uplift payment equals:

(C minus B) multiplied by (D minus the **pool price)**;

where:

"A" is the energy production in MWh of the **source asset** in the **settlement interval**;

"B" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the **source asset** with **offer** prices less than the **offer** price of the **operating block** that is eligible for uplift payment;

"C" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the **source asset** up to and including that portion of an **operating block** eligible for uplift payment; and

"D" is the **offer** price associated with the MW level of energy provided by an **operating block** eligible for an uplift payment included in a **dispatch** in "C".

Payment for Transmission Constraint Rebalancing

8 The **ISO** must, for each eligible **operating block**, make a payment to a **pool participant** with a **source asset** that has delivered additional energy for **transmission constraint rebalancing** as per 2(2)(b)(ii) of Section 302.1 of the **ISO rules**, *Real Time Transmission Constraint Management* during a **settlement interval**, calculated as follows:

(a) If A minus B is less than or equal to C minus B, then the **transmission constraint rebalancing** payment equals:

(A minus B) multiplied by (D minus the **pool price**); or

(b) If A minus B is greater than C minus B, then the **transmission constraint rebalancing** payment equals:

(C minus B) multiplied by (D minus the **pool price**);

where:

"A" is the energy production in MWh of the **source asset** in the **settlement interval**;

"B" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the **source asset** with **offer** prices less than the **offer** price of the **operating block** that is eligible for a **transmission constraint rebalancing** payment;

"C" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the source asset up to and including that portion of an **operating block** eligible for a **transmission constraint rebalancing** payment; and

"D" is the **offer** price associated with the MW level of energy provided by an **operating block** eligible for a **transmission constraint rebalancing** payment included in a **dispatch** in "C".

Payment for Dispatch Down Service

9 The **ISO** must pay a **dispatch down service** payment to a **pool participant** with a **source asset** that has provided **dispatch down service** during a **settlement interval**, calculated as follows:

dispatch down service price;

multiplied by

dispatch down service quantity;

multiplied by

dispatch down service time;

divided by

60 minutes;

where:

"**dispatch down service** price" is the system marginal price plus the **offer** price for the **dispatch down service**, the sum of which must be greater than or equal to zero for the **settlement interval**;

"**dispatch down service** quantity" is the amount of energy in MW included in the **dispatch** to a **pool participant** for **dispatch down service** in the **settlement interval**; and

"**dispatch down service** time" is the number of minutes set out in the **dispatch** for the **source asset** for **dispatch down service** in the **settlement interval**.

Dispatch Down Service Charge

10 A **pool participant** must, if the **ISO** makes any **dispatch down service** payments under subsection 9 for that **settlement interval**, pay the **ISO** a **dispatch down service** charge, calculated as follows:

energy production;

multiplied by

the sum of all **dispatch down service** payments;

divided by

the sum of all energy production;

where:

"**dispatch down service** payments" are the payments calculated and paid under subsection 8; and

"energy production" is denoted in MWh for a **settlement interval** and is the **metered energy** value for the output from the **source asset**.

Sink Asset Calculation and Payment

11(1) A **pool participant** with one or more **sink assets** must pay the **ISO** for the energy each **sink asset** consumes in a **settlement interval**, calculated as follows:

sink asset energy consumption;

minus

the volume of all **net settlement instructions** of a **pool participant** for the **sink asset**;

multiplied by

the **pool price**;

where:

"**sink asset** energy consumption" for the **settlement interval** is, depending on the origins of the energy consumption, either the **metered energy** ~~value~~ for ~~the pool~~a non-exporting **sink asset** ~~originating from load~~, or the value of energy from the **interchange transaction** for ~~the~~an exporting ~~pool~~**sink asset**.

(2) A **pool participant** is deemed to have sold the MWh net difference in energy to the **power pool** if, for the **settlement interval**, the **sink asset** energy consumption is less than the volumes of all **net settlement instructions**.

(3) The **ISO** must pay a **pool participant** the amount calculated under subsection 11(1) to account for the cost of that net difference in energy if, for the **settlement interval**, the **sink asset** energy consumption is less than the volumes of all **net settlement instructions**.

Adjustment for Load on the Margin

12(1) The **ISO** must make a charge adjustment to a **pool participant** with a **sink asset** that has reduced energy pursuant to a **dispatch** during a **settlement interval** if during the **settlement interval**:

(a) the **ISO** issues a **dispatch** for an **operating block** related to the **sink asset**;

(b) the **bid** price for the **operating block** is less than the **pool price**; and

(c) the energy consumption of the **sink asset** is greater than the sum of the energy that is included in a **dispatch** for all **operating blocks** with a **bid** price above the **bid** price of the **operating block** referred to in subsections 12(1)(a) and (b).

(2) The **ISO** must, for each eligible **operating block**, calculate any charge adjustment made under subsection 12(1) as follows:

(a) If A minus B is less than or equal to C minus B, then the charge adjustment equals:

(A minus B) multiplied by (**pool price** minus D); or

(b) If A minus B is greater than C minus B, then the charge adjustment equals:

(C minus B) multiplied by (**pool price** minus D);

where:

"A" is the energy consumption in MWh of the **sink asset** in the **settlement interval**;

"B" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the **sink asset** with **bid** prices greater than the **bid** price of the **operating block** that is eligible for charge adjustment;

"C" is the sum of the energy in MWh in the **settlement interval** included in the **dispatch** of all **operating blocks** of the **sink asset** up to and including that portion of an **operating block** eligible for charge adjustment; and

"D" is the bid price associated with the MW level of energy provided by an **operating block** eligible for a charge adjustment included in a dispatch in "C".

Charge for Cost of Energy from a Long Lead Time Asset

~~12~~13 The **ISO** must include as a line item in any **power pool** statement any charge to a **pool participant** under subsection 6 of Section 103.6 of the **ISO rules**, *ISO Fees and Charges* for the **ISO** to recover any costs associated with a **directive** for energy from a **long lead time asset**.

Allocation of Charges for Payments to a Supplier on the Margin

~~13~~14 A **pool participant** must, if, for any **settlement interval**, the **ISO** has paid a **pool participant** an uplift payment in accordance with subsection 7, pay the **ISO** a supplier on the margin charge, calculated as follows:

the sum in dollars of all uplift payments;

multiplied by

the energy consumption of a **pool participant**;

divided by

the sum of energy consumption of all **pool participants**.

Allocation of Charges for Adjustments for a Load on the Margin

15 A **pool participant** must, for any **settlement interval**, if the **ISO** has allocated a **pool participant** a charge adjustment in accordance with subsection 12, pay the **ISO** an adjustment for load on the margin charge, calculated as follows:

the sum in dollars of all adjustments made;

multiplied by

the energy consumption of a **pool participant**;

divided by

the sum of energy consumption of all **pool participants**.

Post Final Adjustments for Load Settlement

~~14~~16 The **ISO** must include post final adjustments in the final **power pool** statement for a **settlement period**, but if the **ISO** does not receive all information from a **load settlement agent** within the time periods set out in the post final adjustment schedule posted on the AESO website, then the **ISO** must include any remaining post final adjustments for that **settlement period** in the final **power pool** statement for the next **settlement period**.

Other Post Final Adjustments

~~15~~17**(1)** The **ISO** must make post final adjustments for any energy production or energy consumption calculations for a **settlement period** if there are adjustments to metering data required after the **month** of determination on a final basis.

(2) The **ISO** may charge a **pool participant** interest in calculating post final adjustments if the adjustments to metering data are a result of the **pool participant**'s failure to comply with applicable requirements relating to metering, calculated on a simple basis using a rate equal to the Bank of Canada's Bank Rate plus 1.5%.

Energy Market Trading Charge

~~16~~18 The **ISO** must include, as a line item in any **power pool** statement to a **pool participant**, the energy market trading charge.

Pool Statement

~~17~~19**(1)** The **ISO** must issue on the AESO website:

(a) a preliminary **power pool** statement on the ~~5th~~fifth **business day** after the last **day** of each **settlement period**; and

(b) a final **power pool** statement on the ~~15th~~fifteenth **business day** after the end of each **settlement period**, to each **pool participant**.

(2) The **ISO** must include the following line items on the preliminary and final **power pool** statements:

(a) the amount of energy a **pool participant** purchases and supplies and the payment calculation for that energy determined on:

(i) an initial basis for that **settlement period**;

(ii) an interim basis for the 2 **months** prior to that **settlement period**; and

(iii) a final basis for the 4 **months** prior to that **settlement period**;

(b) the energy market trading charge amount allocable to the **pool participant** as calculated in accordance with subsection 5 of Section 103.6 of the **ISO rules**, *ISO Fees and Charges*;

(c) any payment default charge amount allocable to the **pool participant** as calculated in accordance with subsection 7 of Section 103.6 of the **ISO rules**, *ISO Fees and Charges*, including details regarding the calculation of the payment default charge as allocated to that **pool participant**, or any refund of that default charge amount;

(d) any other **ISO fees** and charges under Section 103.6 of the **ISO rules**, *ISO Fees and Charges,* including the pool participation fee, digital certificate charges, and records and data provision charges;

(e) any interest, late payment or other costs or charges under Section 103.7 of the **ISO rules**, *Financial Default and Remedies*;

(f) the net amount either owing to or by the **pool participant**; and

(g) such other information as the **ISO** considers appropriate.

(3) The **pool participant** must contact the **ISO** to request the final **power pool** statement if the AESO website is not available on the ~~15th~~fifteenth **business day** referred to in subsection ~~17~~19(1).

Pool Settlement Date and Payment Obligations

~~18~~20**(1)** The **ISO** must use, as the settlement date for a **settlement period**, the ~~20th~~twentieth **business**

day following the last **day** of that **settlement period**.

(2) The **ISO** must, each January, publish on the AESO website the calendar dates which are settlement dates for the current and next calendar year, being the dates for the financial settlement for the final **power pool** statements and the **ISO tariff**.

(3) A **pool participant** must, subject to subsection ~~19~~21, pay to the **ISO** the net dollar amount it owes no later than the specified settlement date for a **settlement period**.

(4) The **ISO** must, if the **ISO** owes a net dollar amount to a **pool participant**, as set out in the final **power pool** statement for the **settlement period**, pay a **pool participant** that amount by the settlement date.

(5) A **pool participant** must make full payment of the net amount a **pool participant** owes as set out in the final **power pool** statement, whether or not any such amounts are under dispute.

(6) A **pool participant** may provide early payment for a **settlement period**:

(a) if authorized by the **ISO** in its sole discretion;

(b) in the manner the **ISO** specifies; and

(c) if the early payment is received no later than the date and time the **ISO** specifies.

(7) The **ISO** may, notwithstanding subsection ~~18~~20(4), withhold payment associated with erroneous metering data to a **pool participant** if the **ISO** determines an error in metering data is the result of the **pool participant**'s failure to comply with applicable requirements relating to metering, until such error is corrected by a **pool participant** to the satisfaction of the **ISO**.

Acceleration in Pool Settlement Dates Due to Payment Default

~~19~~21**(1)** The **ISO** may require that a **pool participant** pay the **ISO** 1 day early for the next 6 **settlement periods** if a **pool participant** has:

(a) in its first calendar year of **pool participant** registration, defaulted in the payment for a **settlement period** 1 time; or

(b) after its first calendar year of **pool participant** registration, defaulted in the payment for any **settlement period** 2 times over 12 **settlement periods**.

(2) A **pool participant** that is required to pay early under subsection ~~19~~21(1) may return to using the regular settlement date after the end of the 6 **settlement periods** if the **pool participant** does not commit any further default in payment during the 6 **settlement periods** referred to in subsection ~~19~~21(1).

(3) The **ISO** may require that a **pool participant** pay the **ISO** 2 days early for the next 12 settlement dates if a **pool participant** that is already required to pay 1 day early commits another default in payment during the time it is required to pay early.

(4) A **pool participant** that is required to pay early under subsection ~~19~~21(3) may return to using the regular settlement date after the end of the 12 **settlement periods** if the **pool participant** does not commit any further default in payment during the 12 **settlement periods** referred to in subsection ~~19~~21(3).

(5) The **ISO** may implement the accelerated payment obligations under this subsection ~~19~~21 in addition to any other rights and remedies of the **ISO** in accordance with Section 103.7 of the **ISO rules**, *Financial Default and Remedies*, with regard to any payment default by a **pool participant**.

Interest and Other Late Payment Costs and Charges

~~20~~22 A **pool participant** must pay interest, a late payment charge, and any other costs and charges in accordance with the provisions of Section 103.7 of the **ISO rules**, *Financial Default and Remedies*, if a

pool participant fails to pay on or before a settlement date any outstanding **financial obligation** dollar amount owing to the **ISO** as set out in any of the **pool participant**'s final **power pool** statements.

Payment

~~2123~~ A **pool participant** must, notwithstanding subsection ~~1820~~(6) or any written dispute submitted pursuant to subsection ~~2325~~(1), pay to the **ISO** any net dollar amount the **pool participant** owes, as set out in its final **power pool** statement, and do so in the manner the **ISO** specifies.

Prepayment Procedures

~~2224~~**(1)** A **pool participant** may prepay in the manner the **ISO** specifies.

(2) The **ISO** may apply any prepayment amount, in whole or in part, against any outstanding **financial obligations** of that **pool participant**.

Disputes

~~2325~~**(1)** A **pool participant** may submit a written dispute notice to the **ISO** if a **pool participant** determines that there is an error the content of a final **power pool** statement that the **ISO** has issued in accordance with subsection ~~17~~19(1)(c).

(2) A **pool participant** must submit any written dispute notice pursuant to subsection ~~2325~~(1) in accordance with the timelines posted on the AESO website.

(3) A **pool participant** and the **ISO** must make reasonable efforts to resolve any written dispute submitted pursuant to subsection ~~2325~~(1).

Power Pool Statement Adjustments for Resolved Disputes

~~2426~~ The **ISO** must, if a dispute is resolved under subsection ~~2325~~(1), include resolved line item adjustments and the adjusted net amount payable by or to a **pool participant** in the next final **power pool** statement after the resolution.

ISO Recourse to Section 103.7 *Financial Default and Remedies*

~~2527~~ The failure of a **pool participant** to pay any dollar amount under this Section 103.4 is deemed to be a **financial obligation** default event which will allow the **ISO** to have recourse to the rights and remedies of the **ISO** under Section 103.7 of the **ISO rules**, *Financial Default and Remedies.*

Revision History

~~Effective~~Date	Description
20xx-xx-xx	
2021-09-14	Added subsections 15(2) and 18(7) related to errors in metering data Revised power pool statement requirements Revised dispute resolution process Method of payment amended in subsections 18(6), 18(8), 21 and 22(1) Administrative amendments
2015-11-26	Added subsection 7, "Payment for Transmission Constraint Rebalancing", and related amendments to subsection 6. Updated section 18(2)(h) to refer to "pool

	participation fee.”
2014-07-02	Update subsection 4(1) based on changes to the definitions for “outages”; unbolded “system emergency”; and added new subsection 5 related to payment for cancellation of an outage. Provided pool participants the option to pay their power pool or transmission statements early based on their preliminary statement.
2013-01-08	Previously defined terms have been un-defined, therefore words have been un-bolded; “long lead time energy” has been replaced with “energy from a **long lead time asset**”.
2011-07-01	Initial release

ISO Rules
Part 100 General
Division 103 Administration
Section 103.5 Net Settlement Instruction

Applicability

1 Section 103.5 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Net Settlement Instruction

2 The **ISO** must net out the **net settlement instruction** volumes against metered energy volumes when calculating any **power pool** settlement for **pool participants**, if 2 **pool participant** counterparties enter into a form of bilateral agreement, one acting as a buyer and the other acting as a seller, and complete all of the requirements under this Section 103.5 for electronically registering a **net settlement instruction** with the **ISO**.

Electronic Registration of Net Settlement Instruction

3(1) A **pool participant** may electronically register a **net settlement instruction** through the Energy Trading System if the following criteria are satisfied:

(a) the counterparties to the **net settlement instruction** are registered and have digital certificates under Section 201.1 of the **ISO rules**, *Pool Participant Registration*;

(b) the initiating **pool participant** electronically submits the **net settlement instruction** to the **ISO** through the Energy Trading System not less than 20 minutes before the beginning of the **settlement interval** in which the **net settlement instruction** is to take effect;

(c) the **source asset** and **sink asset** are metered **pool assets**, or either the **source asset** or the **sink asset** is a metered **pool asset**;

(d) the submitted **net settlement instruction** information includes:

(i) the name of the **net settlement instruction**;

(ii) the name of the **pool participant** as seller;

(iii) the **source asset** the seller designates;

(iv) the name of the **pool participant** as buyer;

(v) the **sink asset** the buyer designates;

(vi) the MWh volume or percentage output of the **net settlement instruction**;

(vii) the commencement date and **settlement interval** of the **net settlement instruction**; and

(viii) the expiry date and **settlement interval** of the **net settlement instruction**; and

(e) the **pool participant** counterparty accepts the **net settlement instruction** through the Energy Trading System not less than 20 minutes before the beginning of the **settlement interval** in which the **net settlement instruction** is to take effect.

(2) The **ISO** may, subject to subsection 6, reject the electronic registration or de-registration of a **net settlement instruction** if it does not satisfy the criteria under this Section 103.5 for electronic registration or de-registration .

Request for De-registration of a Net Settlement Instruction

4(1) Either of the **pool participant** counterparties may request to de-register the **net settlement instruction** in subsection 3(1) by delivering a written request to the **ISO** which:

(a) the **ISO** receives:

(i) no less than 3 **business days** prior to the requested date for de-registration, if the **pool participant** counterparties currently have adequate **financial security** in place for their **financial obligations** post de-registration, or

(ii) no less than 15 **business days** prior to the requested date for de-registration, if the **pool participant** counterparties currently do not have adequate **financial security** in place for their **financial obligations** post de-registration; and

(b) includes the following information:

(i) a statement that the **net settlement instruction** is to be de-registered;

(ii) the **net settlement instruction** registration number;

(iii) the name of the **pool participant** as seller;

(iv) the designated **source asset**;

(v) the name of the **pool participant** as buyer;

(vi) the designated **sink asset**; and

(vii) the desired effective date and **settlement interval** for which the de-registration is to take effect.

(2) The **ISO** must de-register any **net settlement instruction** that is the subject of the request, on the effective date specified in the request, if

the **ISO** receives a request that complies with the requirements of subsection 4(1).

(3) A **pool participant** must register a new **net settlement instruction** replacing the one requested for de-registration if the initiating **pool participant** submits a new **net settlement instruction** in accordance with this Section 103.5 and the non-initiating counterparty, through the Energy Trading System, accepts the new **net settlement instruction**.

(4) The **ISO** must notify the non-requesting **pool participant** counterparty, no later than the close of business on the 1st **business day** after receiving the de-registration request under subsection 4(1), that the **net settlement instruction** is being de-registered in accordance with this subsection 4.

Mandatory De-registration of a Net Settlement Instruction

5(1) A **pool participant** must provide notice to the **ISO** to de-register a **net settlement instruction** if there is:

(a) a change in the registered **pool participant** for any **pool asset** that is the subject of the **net settlement instruction**; or

(b) a voluntary termination of the registration of the **pool participant** under subsection 9 of Section 201.1 of the **ISO rules**, *Pool Participant Registration*.

(2) The **pool participant** must provide notice to the **ISO** of the de-registration of the **net settlement instruction** at least 3 **business days** in advance of an event referred to in subsection 5(1).

ISO Initiated De-registration

6 The **ISO** may, in addition to the right to suspend any **net settlement instruction** under Section 103.7 of the **ISO rules**, *Financial Default and Remedies*, de-register one (1) or more **net settlement instructions** if:

(a) the **ISO** suspends or terminates the registration of the **pool participant** in accordance with subsection 8 of Section 201.1 of the **ISO rules**, *Pool Participant Registration*;

(b) a **pool participant** voluntarily terminates its registration in accordance with subsection 9 of Section 201.1 of the **ISO rules**, *Pool Participant Registration*; or

(c) a **pool participant** fails to de-register the **net settlement instruction** as required under subsection 5.

Revision History

Effective	Description
2022-05-07	Updated subsection 4(2) to require the delivery of financial security before cancelling a net settlement instruction and the ISO's satisfaction of no adverse effects. Other minor updates to align with AESO drafting principles.
2011-07-01	Initial release

ISO Rules
Part 100 General
Division 103, Administration
Section 103.6 ISO Fees and Charges

Applicability

1 Section 103.6 applies to:

(a) a **market participant**;

(b) a **pool participant**;

(c) a load settlement agent; and

(d) the **ISO**.

Requirements

Schedule of ISO Fees

2 The **ISO** must publish the *Schedule of ISO Fees* on the AESO website.

Fee for Records Requests

3(1) A **market participant** may make a request to the **ISO** for a copy of any records of the **market participant** which may be in the **ISO**'s possession.

(2) A **market participant** must pay a fee for any request for records made in accordance with subsection 3(1).

Fee for a Digital Certificate

4 A **pool participant** must pay an annual fee to obtain a digital certificate that enables the **pool participant** to access the Energy Trading System.

Energy Market Trading Charge Payment

5(1) The **ISO** must calculate, on or before January of each calendar year, an energy market trading charge, as follows:

the energy market related cost and expenses for the **ISO** and the **Commission**, and the costs and expenses of the **Market Surveillance Administrator**;

divided by

the total estimated number of MWhs of energy forecast to be traded in the **power pool** in the calendar year.

(2) The **ISO** may, notwithstanding the timing requirements in subsection 5(1), amend the energy market trading charge during the calendar year.

(3) The **ISO** must notify **market participants** of any amendments pursuant to subsection 5(2) no less than 30 **days** in advance of the amended energy market trading charge coming into effect.

(4) A **pool participant** must pay the **ISO** the energy market trading charge for each MWh of energy the **pool participant** purchases or sells through the **power pool** in a **settlement period**, that is equal to:

the energy market trading charge calculated under subsection 5(1)

multiplied by

the total MWh of energy for the hour for each **pool asset** of the **pool participant**, which is the greater of:

(a) the **metered energy** the **pool participant** exchanged through the **power pool** for a **settlement period**; and

(b) the volumes of any registered **net settlement instructions** of the **pool participant**.

Charge for Energy from a Long Lead Time Asset Net Costs

6(1) A **pool participant** must pay to the **ISO** a pro rata charge to recover any **incremental generation costs**, net of energy receipts revenue paid by the **ISO** in accordance with subsection 5 of Section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*, if:

(a) the **ISO** must pay any **pool participant** for energy from a **long lead time asset** in accordance with subsection 5 of Section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*; and

(b) the **pool participant** has energy consumption during the applicable **settlement interval**.

(2) The **ISO** must, for any **settlement interval** where the energy from a **long lead time asset** was actually required, or was forecasted but not actually required, calculate an **incremental generation costs** pro rata charge for every **pool participant** with energy consumption during the **settlement interval**, as follows:

the net **incremental generation costs** amount paid in accordance with subsection 5 of Section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*, to the **pool participant** issued the **directive** for energy from a **long lead time asset**;

divided by

the total energy consumption of every **pool participant** during the **settlement interval** where the energy from a **long lead time asset** was actually required or was forecasted to be required.

Pool Participant Payment Default Charge

7(1) The **ISO** may, if the **ISO** does not receive full payment of any outstanding **financial obligation** amount owed by a **pool participant** by the close of business on the 10th **business day** following the date the **financial obligation** was due, then after realizing on any **financial security** of the **pool participant**, calculate a payment default charge as follows:

the outstanding **financial obligation** amount, net of any realized **financial security** amounts, of the defaulting **pool participant** for the applicable **settlement period**

divided by

the total amount of energy exchanged through the **power pool** by all **pool participants** during the applicable **settlement period**

(2) The **ISO** must allocate the payment default charge to all **pool participants** on a pro rata basis to each MWh of energy that **pool participants** exchanged through the **power pool** during the **settlement period** for which the **ISO** did not receive full **financial obligation** payment from the defaulting **pool participant**, as outlined in subsection 7(1).

(3) The **ISO** must include the payment default charge as a payment obligation for the **pool participants** referred to in subsection 7(2) in the next **power pool** statement the **ISO** publishes following the calculation and allocation of the payment default charge under this subsection 7.

(4) The **ISO** must apply the payment default charge amounts the **ISO** receives from the **pool participants** to settle any outstanding **financial obligation** amount that remains owing from the defaulting **pool participant**.

(5) The **ISO** must credit and refund that recovered amount on a pro rata basis to the **pool participants** who paid the **ISO** as referenced under subsection 7(4), if the **ISO** has received payment default charge amounts from **pool participants** under subsection 7(4) and the **ISO** is successful in recovering any outstanding **financial obligation** amount from the defaulting **pool participant** referred to in subsection 7(1).

(6) The **ISO** must credit the recovered amount to the applicable **pool participants** as a line item in the next successive final **power pool** statement of those **pool participants** after the date the **ISO** recovers that amount, but the pro rata recovered amount credited and paid to a **pool participant** must not exceed the pro rata amount the **pool participant** originally paid.

(7) The calculation, allocation and payment of payment default charges under this subsection 7 does not release, discharge, limit or otherwise affect any outstanding **financial obligations** of the defaulting **pool participant**, and is in addition to any other legal or equitable remedies available to the **ISO** under Section 103.7 of the **ISO rules**, *Financial Default and Remedies.*

Recovery of Load Settlement Costs

8 A load settlement agent must pay as a **financial obligation** to the **ISO**, the amount the **ISO** invoices to recover the **ISO**'s costs for administering provincial load settlement, which amount is based on the load settlement agent's percentage share of the aggregate annual load volumes.

ISO Recourse to Section 103.7 *Financial Default and Remedies*

9 The failure of a **pool participant** to pay any fees or charges dollar amount under this Section 103.6 is deemed to be a **financial obligation** default event which will allow the **ISO** to have recourse to the rights and remedies of the **ISO** under Section 103.7 of the **ISO rules**, *Financial Default and Remedies.*

Revision History

Date	Description
2021-09-14	Updates to the Applicability section Removed subsection 3 in its entirety Administrative amendments
2018-09-03	Amended subsection 6(3) to allow for the trading charge to be amended throughout the year, if appropriate.
2015-12-07	Updated header of subsection 3 to refer to "pool participation fee".
2013-01-08	"long lead time energy" changed to "energy from a **long lead time asset**" Updated to refer to subsection 5 of section 103.4 of the **ISO** rules, *Power Pool Financial Settlement*.
2011-07-01	Initial Release

ISO Rules
Part 100, General
Division 103 Administration
Section 103.7 Financial Default and Remedies

Applicability

1 Section 103.7 applies to:

(a) a **market participant** with any **financial obligation** to the **ISO**, except where the **market participant** is the **legal owner** of a **transmission facility** where the person who is eligible to apply for the construction and operation of the **transmission facility** was determined by a competitive process developed by the **ISO** in accordance with the **Act**; and

(b) the **ISO**.

Requirements

Interest Charge

2(1) If a **market participant** fails to pay in full any **financial obligation** to the **ISO** on or before a specified due date for that **financial obligation**, then the **market participant** must pay an amount of interest on the outstanding balance calculated in accordance with subsection 2(2), commencing from the due date and up to and including the **business day** the **ISO** receives payment.

(2) Subject to subsection 2(3), the **ISO** must calculate interest at the Bank of Montreal Canadian prime rate plus six percent (6%).

(3) If the **ISO** determines under subsection 21 of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement* that a **settlement date** for a **pool participant** must be either the eighteenth (18^{th}) or nineteenth (19^{th}) **business day** following a **settlement period**, then the **ISO** must calculate the amount of interest for that **pool participant** at the Bank of Montreal Canadian prime rate plus twelve percent (12%), for so long as the **pool participant** has an accelerated settlement date in accordance with that subsection 21 of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*.

Late Payment Charge

3 If a **market participant** fails to pay in full any **financial obligation**, then the **market participant** must pay a late payment charge equal to two (2) days interest on the outstanding balance, calculated on the day following the payment due date at the applicable interest rate determined under subsection 2.

Other Charges

4 If a **market participant** fails to pay in full any **financial obligation**, then the **market participant** must pay to the **ISO** any additional fees, costs and charges the **ISO** incurs in the course of collecting or litigating to recover the outstanding balance, including:

(a) any enforcement and litigation costs on a solicitor and client basis for legal services; and

(b) the recovery of any bank charges billed to the **ISO** related to the payment default of the **market participant**, including overdraft bank processing fees or any other fee the bank of the **ISO** charges as a result of the payment default.

ISO Right to Realize on Financial Security

5 If:

(a) a **market participant** or its guarantor fails to pay in full any **financial obligation**; or

(b) in the opinion of the **ISO**, the **market participant** or its guarantor:

(i) becomes insolvent or is unable to meet its debts as they mature;

(ii) files a voluntary petition in bankruptcy or seeks reorganization or to effect a plan or other arrangement with creditors;

(iii) files an answer or other pleading admitting, or fails to deny or contest, the material allegations of an involuntary petition filed against it pursuant to any applicable statute relating to bankruptcy, arrangement or reorganization;

(iv) is adjudicated a bankrupt or makes an assignment for the benefit of its creditors generally;

(v) applies for, consents to, or acquiesces in the appointment of any receiver or trustee for all or a substantial part of its property, and any such receiver or trustee is appointed and is not to be discharged within thirty (30) **days** after the date of such appointment; or

(vi) generally is unable to pay its debts as such debts become due;

then subject to the terms of any form of **financial security**, **system access service** agreement, **ancillary services** agreement or any other agreement between the **ISO** and the **market participant** or its guarantor, the **ISO** may by written notice immediately realize upon any form of **financial security** provided to the **ISO** by the **market participant** or its guarantor, in partial or full satisfaction of the amount of outstanding indebtedness, including any interest and any other charges referred to in this section 103.7.

Restoration of Financial Security

6(1) If the **ISO** realizes upon any form of **financial security** against a defaulting **market participant** or its guarantor and:

(a) the **ISO** has not issued a notice of termination in accordance with subsection 7; and

(b) the **market participant** has any outstanding residual **financial obligation**;

then the **ISO** may at its sole discretion deliver written notice to the **market participant** to replace the form of **financial security**.

(2) The **market participant** receiving notice under subsection 6(1) must replace the form of **financial security** no later than the close of business on the second (2nd) **business day** after the delivery of the notice.

(3) If after delivery of the notice the **market participant** fails to replace the form of **financial security** in accordance with subsection 6(2), then the **ISO** may exercise any or all of the remedies specified in this section 103.7 against the **market participant**.

Suspension or Termination

7 For any default referred to in subsection 5 and subject to the terms of any form of **financial security** or any agreement referenced in that subsection, the **ISO** may by written notice suspend or terminate any service or all services the **ISO** provides to the **market participant**, including its:

(a) registration as a **pool participant**, and any related validation, authorization or acceptance of any of its **bids** or **offers** or other form of transactional activity in the **power pool** under the **ISO rules**;

(b) registration of any **net settlement instruction** and related activity under section 103.5 of the **ISO rules**, *Net Settlement Instruction*;

(c) unsecured credit limit granted under section 103.3 of the **ISO rules**, *Financial Security Requirements*; and

(d) **system access service** or any other **ISO tariff** agreements or services under the **ISO tariff**.

ISO Termination Final Statement

8 The **ISO** must make final determinations of all **ISO** outstanding amounts and financial losses as at the date and time of a termination under subsection 7, and on the **business day** when the **ISO** delivers the notice of termination, or as soon after as is reasonable, provide to the **market participant** a statement showing all final calculations.

Failure to Provide Additional Financial Security by Non Rated Entity

9 If a **market participant** has been granted an unsecured credit limit under section 103.3 of the **ISO rules**, *Financial Security Requirements* and it fails to provide an additional or replacement form of **financial security** as demanded by the **ISO** by notice under subsection 6(6) of section 103.3 of the **ISO rules**, *Financial Security Requirements*, then the **ISO** may exercise any or all of the remedies set out in this section 103.7 against the **market participant**.

Other Remedies

10(1) The remedies set out in this section 103.7 are in addition to any other legal or equitable remedies available to the **ISO**.

(2) A suspension or termination of any or all services under subsection 7 does not release, discharge, limit or otherwise affect any outstanding **financial obligation** of the **market participant** or its guarantor.

Revision History

Effective	Description
2016-11-29	Revisions to the Applicability section
2015-11-26	Amendments to numbering references in subsection 2(3)
2011-07-01	Initial release

ISO Rules
Part 100 General
Division 103 Administration
Section 103.12 Compliance Monitoring

Applicability

1 Section 103.12 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

Application of Other Remedies

2 The **ISO** may pursue the actions and remedies authorized under this section 103.12 in addition to any other action or remedies that may be available to it elsewhere in the **ISO rules** or under law, regulation or order and nothing in this section 103.12 limits the right of the **ISO** to take action or seek remedies otherwise available to it, and such action or remedies may be pursued in lieu of or in addition to the action or remedies specified in this section 103.12.

Extent of Compliance Monitoring

3(1) The **ISO** must use the provisions of this section 103.12 as the basis for determining whether it suspects a contravention of the **ISO rules** or **reliability standards** or an infraction of the **Commission's** load settlement rules.

(2) The **ISO** must undertake such compliance monitoring of **market participants** as it considers appropriate, including establishing monitoring programs, processes and procedures.

Information Requests

4(1) The **ISO** may, itself or based upon input from either the **Commission** or **Market Surveillance Administrator**:

(a) determine that additional information is required from **market participants** in order to monitor compliance with **ISO rules**, **reliability standards** or load settlement rules; and

(b) make a written request, including an explanation of the need for such information, to a **market participant** possessing such information to provide it to the **ISO**.

(2) The **ISO** must work with the **market participant** to set a reasonable time within which to provide any information requested pursuant to subsection 4 and to address any concerns regarding the need for the information.

(3) The **ISO** may, to the extent that a request for information relates to load settlement rules, provide the **Commission** with a copy of such request, but in any event, must provide a copy upon the request of the **Commission**.

(4) The **ISO** may, to the extent that a request for information relates to **ISO rules** or **reliability standards**, provide the **Market Surveillance Administrator** with a copy of such request, but in any event, must provide a copy upon the request of the **Market Surveillance Administrator**.

Requirement to Comply with an Information Request

5 A **market participant** that receives a request pursuant to subsection 4(1) must provide the **ISO** with all information that the **ISO** requests and must do so in the time period set out in the request.

Confidentiality

6(1) The **ISO** must, subject to section 103.1 of the **ISO rules**, *Confidentiality*, conduct compliance monitoring on a confidential basis, including:

(a) treating information, recommendations and referrals the **ISO** provides to the **Commission** or the **Market Surveillance Administrator** as confidential and

(b) treating the source of any complaint to the **ISO** regarding compliance as confidential.

(2) The **ISO** must, notwithstanding subsection 6(1) and section 103.1 of the **ISO rules**, *Confidentiality*, make information obtained pursuant to this section 103.12 available to either or both of the **Commission** and the **Market Surveillance Administrator** as part of a referral under subsections 11 and 12 or as part of a report under subsection 10.

(3) The **ISO** must limit its use of information obtained in accordance with this section 103.12 to purposes related to compliance with applicable **ISO rules**, **reliability standards** and load settlement rules.

Complaints

7(1) A **market participant** or other interested **person** may submit a complaint to the **ISO** regarding compliance with the **ISO rules**, **reliability standards** or load settlement rules and if it does, the **market participant** or other interested party must provide sufficient information to allow the **ISO** to initiate an assessment of the complaint and to maintain communication with the complainant, which such information may include the following:

(a) the name, address, telephone number and, if available, email address of the party making the complaint;

(b) the particulars of the complaint;

(c) any facts or information that support the complaint; and

(d) the signature of the individual or authorized representative of the party making the complaint.

(2) The **ISO** may, except as required by the **Act** or related regulations, by a regulatory authority with jurisdiction, or by applicable **ISO rules**, **reliability standards** or load settlement rules, decline to act with respect to any specific complaint if the **ISO** considers:

(a) the complaint is frivolous, vexatious, trivial or otherwise does not warrant action on the part of the **ISO**; or

(b) the subject matter is under the jurisdiction of another authority.

(3) The **ISO** must, as soon as reasonably practical, provide a written response to a complainant notifying the complainant of the **ISO**`s decision regarding the course of action the **ISO** is taking in response to a complaint and the outcome of the related assessment, if any.

Assessments

8(1) The **ISO** may:

(a) in response to a complaint relating to compliance with **ISO rules**, **reliability standards** or load settlement rules; or

(b) as initiated by the **ISO**;

conduct an assessment in order to determine whether it suspects that a **market participant** may have contravened **ISO rules**, **reliability standards** or load settlement rules,

(2) The **ISO** may, if conducting the assessment referred to in subsection 8(1), include consideration of the following:

(a) the alleged failure of a **market participant** to comply with applicable **ISO rules**, **reliability standards** and load settlement rules**;**

(b) any representations made by a **market participant** that is the subject of an alleged failure to comply with applicable **ISO rules**, **reliability standards** and load settlement rules;

(c) whether there is a reasonable basis or reasonable evidence to suspect that a **market participant** contravened the **ISO rules**, **reliability standards** or committed an infraction of the load settlement rules; and

(d) any mitigating factors as identified in subsection 13.

Compliance Monitoring Audits

9(1) The **ISO** may, as part of an assessment set out in subsection 8(1), determine that a compliance monitoring audit of a **market participant** is required in order to more fully review the **market participant**'s compliance with **ISO rules**, **reliability standards** or load settlement rules.

(2) The **ISO**, and its appointed third party, if any, must, with respect to the conduct of any compliance monitoring audit, work with the **market participant** to set a reasonable time for the conduct and completion of the audit.

(3) The **ISO** or its appointed third party, if any, must develop a report for each compliance monitoring audit which must include the following:

(a) a description of the objective, scope and methodology of the audit;

(b) any suspected or potential contraventions with **ISO rules**, **reliability standards** or load settlement rules;

(c) any mitigation or remedial action measures which have been completed or are pending by the **market participant**; and

(d) the nature of any confidential information provided.

(4) The **ISO** must provide a draft of the compliance monitoring audit report to the **market participant** for comment before the **ISO** completes the report.

Reports to the Commission

10(1) The **ISO** must:

(a) in accordance with section 11 of **Commission** *Rule 021 Settlement System Code Rules*; and

(b) to the extent that the **ISO** conducts an investigation regarding compliance with load settlement rules;

at the conclusion of the investigation, submit a written report to the **Commission** detailing:

(c) the original complaint reference;

(d) a summary of the investigation carried out;

(e) a list of requests for information from **market participants**;

(f) the findings resulting from the investigation; and

(g) any recommendation arising from the investigation or findings.

(2) The **ISO** may only provide the report identified in subsection 10(1) to the **Commission**, the **market participant** that is the subject of the report, and the complainant, if any.

Referral to the Market Surveillance Administrator

11(1) The **ISO** must, subject to provisions in the **Act** or related regulations and if the **ISO** suspects that a **market participant** has contravened the **ISO rules** or **reliability standards**, refer the matter, in writing, to the **Market Surveillance Administrator**.

(2) The **ISO** must provide written notice to the **market participant** whose compliance is in question when a matter is referred to the **Market Surveillance Administrator** in accordance with subsection 11(1).

Referral to the Commission

12(1) The **ISO** must, subject to provisions in the **Act** and any rules the **Commission** makes respecting load settlement and if the **ISO** suspects that an infraction of the load settlement rules has occurred, refer the matter, in writing, to the **Commission.**

(2) The **ISO** must provide written notice to the **market participant** whose compliance is in question when a matter is referred to the **Commission** in accordance with subsection 12(1).

Compliance Exceptions

13 A **market participant** is not required, notwithstanding any other provision in the **ISO rules**, to comply with a provision of the **ISO rules** to the extent the **market participant**'s action or inaction is caused by any one (1) or more of the following:

(a) an event of **force majeure** but only if the **market participant** gives written notice to the **ISO** of the **force majeure** in reasonable detail no later than two (2) **business days** after it knows of the event or condition and makes all reasonable efforts to cure, mitigate or remedy the **force majeure**;

(b) a circumstance related to the operation of a **pool asset**, **transmission facility** or **electric**

distribution system which if it operated could reasonably be expected to affect the immediate safety of equipment, the environment, staff or the public;

(c) actions or omissions that are consistent with **good electric industry practice** in a **system emergency**;

(d) actions or omissions specifically required under the **Act** or related regulations, other applicable legislation or related regulations, or by a regulatory authority with jurisdiction; or

(e) actions or inactions in response to a **directive**.

Return of Information to a Market Participant

14(1) The **ISO** may maintain in its possession information obtained pursuant to this section 103.12 for as long as the **ISO**, in its sole discretion, deems necessary.

(2) The **ISO** must, notwithstanding subsection 14(1), return original, hard copy information obtained pursuant to this section 103.12 to the **market participant** that submitted the information within a reasonable time period following the **ISO**'s receipt of a written request from that **market participant** for the same.

Revision History

Effective	Description
2012-12-14	Initial Release

ISO Rules
Part 100 General
Division 103 Administration
Section 103.14 Waivers and Variances

Applicability

1 Section 103.14 applies to:

(a) a **market participant**, including:

(i) a **legal owner**;

(ii) an **operator**; and

(iii) a **pool participant**; and

(b) the **ISO**.

Requirements

Applicable ISO rules

2(1) The **ISO** must consider a request for either one or both of a waiver and variance to any requirement in the following:

(a) Section 304.3 of the **ISO rules**, *Wind and Solar Power Ramp Up Management*;

(b) Section 304.9 of the **ISO rules**, *Wind and Solar Aggregated ~~Generating~~ Facility Forecasting*;

(c) any Section in Division ~~502~~503, *Technical*_& Operating_ *Requirements* of Part 500, *Facilities* of the **ISO rules**; and

(d) any predecessor document to the **ISO rules** set out in subsections 2(a) through (c).

(2) The **ISO** may either grant, in whole or in part, or deny a request for a waiver or variance submitted in accordance with this Section 103.14.

Grounds for requesting a waiver or variance

3(1) A **market participant** may request either one or both of a waiver and variance to any of the requirements set out in the **ISO rules** or predecessor documents listed in subsection 2.

(2) A **market participant** must provide grounds for requesting a waiver or variance which must be the grounds specified in the applicable **ISO rule** or predecessor documents or, where the grounds are not specified, must include one or more of the following circumstances where compliance with the requirements of the subject **ISO rule**:

(a) is not technically possible or is precluded by technical limitations;

(b) is operationally infeasible;

(c) is operationally unnecessary to achieve the intended purpose or outcome of the **ISO rule**;

(d) cannot be achieved by the required compliance date regardless of good faith efforts by the **market participant** which does not include a failure to appropriately plan;

(e) would pose a safety risk or safety issue;

(f) would conflict with a separate statutory or regulatory requirement that is applicable and cannot be waived or exempted;

(g) would require the incurrence of costs that significantly outweigh the benefits achieved or would result in severe economic hardship;

(h) could be achieved in an alternate timeframe that is reasonable to consider in light of other relevant factors, including upcoming scheduled maintenance, and anticipated facility upgrades;

(i) would have suboptimal results compared with the use of alternate technology that would meet or exceed the objectives of the subject **ISO rule**; and

(j) does not allow for testing the application of technology that was not considered during the development of the requirements.

Criteria for evaluating a request

4 The **ISO** must be satisfied that the grounds provided are sufficient and use one or more of the following criteria to evaluate any request for a waiver or variance:

(a) criteria already specified in the applicable **ISO rule**;

(b) technical feasibility;

(c) operational feasibility and burden;

(d) safety;

(e) economic impacts;

(f) material impacts on a fair, efficient, and openly competitive market;

(g) whether appropriate mitigation measures, mitigation plans, or remediation plans can be or are put in place; and

(h) the **reliability** of the **interconnected electric system**.

Submission of Information

5 A **market participant** must:

(a) make a request for a waiver or variance to the **ISO** in writing in the form the **ISO** specifies;

(b) respond to requests from the **ISO** for additional information or for the submission of a revised request; and

(c) notify the **ISO** as soon as practicable upon becoming aware of a material change in the facts or circumstances underlying a request.

Evaluation Process

6 The **ISO** must:

(a) acknowledge receipt of a request for a waiver or variance;

(b) request any additional information it requires to complete the evaluation of the request;

(c) provide updates on progress;

(d) provide a written decision to the **market participant**; and

(e) if it denies the request, give reasons.

Content of a waiver or variance

7 The **ISO** must include the effective date in an approved waiver or variance and any of the following as applicable:

(a) expiry date;

(b) mitigation or remediation plans, including milestones;

(c) reporting requirements; and

(d) any other terms and conditions the **ISO** considers necessary.

Ongoing management of a waiver or variance

8(1) A **market participant** must, as soon as practicable, notify the **ISO** of any material change to the facts or circumstances underlying the approval of a waiver or variance.

(2) A **market participant** may transfer a waiver or variance with the **ISO**'s written consent which consent will not be unreasonably withheld.

(3) The **ISO** may amend or revoke a waiver or variance upon reasonable notice if:

(a) there is a material change to the facts or circumstances underlying the approval of the waiver or variance; or

(b) the **market participant** does not fulfill the terms or conditions of the approval.

Revision History

Date	Description
20xx-xx-xx	
2023-03-31	Updated to align with current AESO drafting principles.
2019-12-11	Initial release.

ISO Rules
Part 200 Markets
Division 201 General
Section 201.1 Pool Participant Registration

Applicability

1 Section 201.1 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

Mandatory Registration as a Pool Participant

2 In order to exchange electric energy through the **power pool** or provide **ancillary services**, a **market participant** must be registered with the **ISO** as a **pool participant**.

Application by a Market Participant

3 A **market participant** seeking to register as a **pool participant** must provide the **ISO** with the following:

(a) a completed **pool participant** application form, available on the AESO website; and

(b) at the time of submitting the application, the non-refundable pool participation fee as set out in the *Schedule of ISO Fees.*

Registration Eligibility Criteria

4 The **ISO** must process a **pool participant** application from a **market participant** who has submitted the application form and fee referred to in subsection 3 and satisfied the following eligibility criteria:

(a) has provided any **financial information** and **financial security**, and has the ability to meet any **financial obligations** under the **ISO rules** as applicable to a **pool participant**;

(b) has an agreement with a **meter data manager**, **load settlement agent** or any other such **agent** or **person** the **ISO** otherwise approves to provide **metered energy** data to the **ISO** or, if the **market participant** intends to act as an importer, an exporter or both, has a valid **system access service** agreement with the **ISO**;

(c) has satisfied any outstanding **financial obligations** attributable to any previous **pool participant** registration; and

(d) in the case of an application to facilitate the provision of **ancillary services**, has entered into a contract to trade such products, either with the **ISO** or with an approved **agent** of trading services or both, and has met the technical requirements the **ISO** has set for the provision of **ancillary services**.

Receipt and Approval or Rejection of an Application

5(1) The **ISO** must acknowledge in writing the receipt of a **pool participant** application, including any supporting documents and the non-refundable pool participation fee within 5 **business days** of the **ISO** receiving them.

(2) The **ISO** must review the **pool participant** application and any supporting documents to ensure completeness, and may request additional clarification or information from the **market participant**.

(3) Within 20 **business days** of receiving the application, the **ISO** must process it and provide written notification to the **market participant** of approval or rejection of the application, or of any

requested clarification or information deficiencies in the application, including any deficiencies regarding **financial information**, **financial security** or supporting documents.

(4) The 20 **business day** review deadline date will be extended while the **ISO** is waiting for the **market participant** to provide any further information or clarification, or to remedy any deficiencies referenced in subsection 5(3), if applicable.

(5) If, in the **ISO's** opinion, the application is complete and the **market participant** has satisfied the eligibility requirements, then the **ISO** must approve the application.

(6) If the application is deficient, then the **ISO's** remedy is to reject it.

(7) If the **ISO** approves the application, then on the condition that the **pool participant** continues to meet the eligibility criteria set out in subsection 4, the registration remains in force and effect until December 31 of that same calendar year.

ISO Requirement to Maintain Lists

6 The **ISO** must maintain one or more lists containing current **pool participant** information including all **pool assets**, the status of such **pool assets**, the names of the **pool participant** associated with **pool assets** and any **agents**, and must make the lists available on the AESO website.

Pool Participant Registration Updates

7(1) A **pool participant** must provide updated information regarding its **pool participant** registration, its **agents** and its **pool assets** by following the procedures set out on the AESO website.

(2) The **ISO** must process updates to registration information:

(a) within 20 **business days** of receiving such information, if the update is one that requires the **pool participant** to meet additional technical requirements; or

(b) within 10 **business days** of receiving such information if the update is not one that requires the **pool participant** to meet additional technical requirements.

Failure of a Pool Participant to Continue to Meet Registration Requirements

8(1) At any point in time after initial registration, if the **ISO** has reason to believe that a **pool participant** has ceased to meet any eligibility criteria set out in subsection 4, then the **ISO** must notify the **pool participant** in writing of the matter and provide the **pool participant** an opportunity to explain the circumstances in writing.

(2) After reviewing the explanation, if the **ISO** continues to have reason to believe that the **pool participant** has ceased to meet the requirements of subsection 4, then the **ISO** may suspend or terminate the **pool participant's** registration, and may realize on any **financial security** to the extent of any **ISO** outstanding financial exposure which results from the suspension or termination of the registration.

(3) A **pool participant** who has had its registration suspended or terminated under this subsection 8 may dispute the **ISO**'s decision under the dispute resolution provisions of Section 103.2 of the **ISO rules**, *Dispute Resolution* with ultimate recourse to the **Commission** or the **Market Surveillance Administrator** as provided for in Section 103.2 of the **ISO rules**, *Dispute Resolution*.

(4) Notwithstanding Section 103.2 of the **ISO rules**, *Dispute Resolution*, the initiation of a dispute resolution process will stay the suspension or termination of the **pool participant's** registration pending the outcome of such dispute resolution process unless the **pool participant** is in default under Section 103.7 of the **ISO rules**, *Financial Default and Remedies*.

Voluntary Termination of Registration by a Pool Participant

9 A **pool participant** who wishes to terminate its registration may do so by completing all of the following:

(a) notifying the **ISO** in writing that it wishes to terminate its registration;

(b) requesting in writing that the **ISO** retire any of its **pool assets** identified on the **ISO** list of **pool assets**;

(c) specifying in the notice a date upon which it will cease to be a **pool participant**; and

(d) satisfying any outstanding **financial obligations** to the **ISO**.

Effect of Termination

10(1) A **pool participant** that is or may become liable under these **ISO rules** in connection with its activities as a **pool participant** remains liable after the date of termination of its registration and despite ceasing to be a **pool participant**.

(2) After the **ISO** has terminated a **pool participant** registration, it must release any related **financial security** to the **pool participant** no later than 30 **days** after the date the last **financial obligations** of such **pool participant** are satisfied and to the extent there is no additional outstanding **financial obligation** exposure for or to the **ISO**.

Reinstatement of Registration

11 If the **ISO** terminates a **pool participant** registration or if a **market participant** previously has voluntarily terminated its registration under subsection 9, then the **market participant** must submit a new application for registration under this Section 201.1 in order to once again become a **pool participant**.

Renewal of Registration

12 The **ISO** must renew a **pool participant's** registration effective each January 1st but, in addition to the provisions of subsection 8(2), may suspend or terminate it if the **pool participant** fails to pay the applicable non-refundable pool participation fee as invoiced on its December **power pool** statement issued in January.

Revision History

Date	Description
2020-09-16	Administrative amendments
2015-12-07	Update to add non-refundable to subsections 3, 5 and 12
2011-09-30	Supersedes September 16, 2010 version

Applicability

1 Section 201.2 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Appointment of Agent

2(1) A **pool participant** may, with the approval of the **ISO** in accordance with this section 201.2, appoint an **agent** to act on behalf of the **pool participant**.

(2) A **pool participant** wishing to appoint an **agent** under subsection (1) must complete and submit to the **ISO** an *Agent Appointment Request Form* as posted by the **ISO** on the AESO website.

(3) The completed *Agent Appointment Request Form* must include a representation and warranty by the **pool participant** that all information provided is true and correct to the best of its knowledge, and that the **pool participant** will be bound by and fully responsible for all acts or omissions of the **agent**.

(4) If the **ISO** is satisfied that the **agent** appointment is duly authorized and that the authority of the **agent** to act on behalf of and bind the **pool participant** is clearly approved of by the **pool participant**, then subject to the other provisions of this section 201.2 the **ISO** must approve the appointment of the **agent**.

(5) The **ISO** must not approve the appointment of an **agent** if the subject matter of the agency extends, in whole or in part, to the preferential sharing of records in violation of or noncompliance with the provisions of section 3(1) of the *Fair, Efficient and Open Competition Regulation,* unless there is an exception to the prohibition against the sharing of records as specified in section 3(2) of that Regulation.

(6) The **ISO** must post on the AESO website a list of all **agents** appointed under this section 201.2.

Appendices

None.

Revision History

Effective	Description
2011-12-31	Initial Release

ISO Rules
Part 200 Markets
Division 201 General
Section 201.3 Offer Control Information

Applicability

1 Section 201.3 applies to:

(a) a **pool participant**.

Requirements

Offer Control Information

2(1) A **pool participant** who submits:

(a) an **offer**; or

(b) a **bid** for an export **interchange transaction**

must also submit to the **ISO** the **offer control information** in accordance with subsection 2(2).

(2) A **pool participant** must submit **offer control information**:

(a) for a final **offer** or **bid** that has a quantity greater than zero (0) MW;

(b) for each **settlement interval**, subsequent to any restatements or **pool asset** substitutions made prior to or during the **settlement interval**;

(c) in the case of energy or **dispatch down service**, for each **operating block** that is available to receive a **dispatch**; and

(d) in the case of **operating reserve**, for all **offers** or **bids** which the **ISO** accepts.

Deadline for Submitting Offer Control Information

3 A **pool participant** must submit **offer control information** to the **ISO** no later than thirty (30) **days** after the **settlement interval** to which the **offer control information** applies.

Revision History

Effective	Description
2012-12-03	Initial release
2013-11-08	Restructured to aid in compliance.

ISO Rules
Part 200 Markets
Division 201 General
Section 201.4 Submission Methods and Coordination of Submissions

Applicability

1 Section 201.4 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Submission Method

2(1) Unless otherwise set out in the **ISO rules**, a **pool participant** must submit any information required under Sections 201 through 206 of the **ISO rules**, including **offers**, **bids**, operating constraints, **net settlement instructions**, **acceptable operational reasons** and reasons for restatements, through the Energy Trading System in accordance with the *Pool Participant Manuals* published on the AESO website.

(2) The **ISO** must make submission procedures available and give reasonable notice regarding any changes to the Energy Trading System.

Unable to Submit through the Energy Trading System

3(1) The **pool participant** must, if a **pool participant** is unable to submit information through the Energy Trading System in accordance with subsection 2 because the **pool participant**'s computer systems are unavailable, submit mandatory restatements to the **ISO** by telephone.

(2) If a **pool participant** submits information by telephone in accordance with subsection 3(1), the following conditions apply:

(a) the **ISO** will not enter the information into the Energy Trading System on behalf of the **pool participant**; and

(b) the **pool participant** must resubmit all restatements for current and future **settlement intervals** submitted under subsection 3(1) as soon as it is possible to do so.

(3) The **ISO** must:

(a) not use information received by telephone to determine the energy market **merit order**; but

(b) use such information to satisfy the requirements that a **pool participant** advise the **ISO** as soon as practicable that a **dispatch** or **directive** will not be complied with and to provide operational information to the **ISO**.

Extension of Time

4(1) **The** ISO **may extend the time set for submitting an** offer **or** bid **if there is a system-wide unavailability of the Energy Trading System and the** ISO **determines the length of the unavailability warrants such extension.**

(2) The ISO **may not extend the time for submitting** offers **or** bids **longer than 1** settlement interval **following the** settlement interval **the Energy Trading System is back in service.**

(3) The **ISO** must notify **pool participants** of any extension of time and its duration.

Coordination of Submissions

5 A **pool participant** must coordinate its submissions in a manner that ensures the **pool participant** is able to comply with all **dispatches** related to those submissions.

Revision History

Date	Description
2020-09-16	Administrative amendments.
2014-07-02	Replaced the word “outage” with “unavailability” in subsection 4(1).
2013-01-08	Initial Release.

ISO Rules
Part 200 Markets
Division 201 General
Section 201.5 Block Allocation

Applicability

1 Section 201.5 applies to:

(a) the **ISO**

when managing the energy market and **dispatch down service**.

Requirements

Operating Block Allocation

2(1) The **ISO** must allocate to each **pool participant** one (1) **pool ID** per **pool asset**.

(2) The **ISO** must allocate to each **source asset**:

(a) that is not an import, seven (7) **operating blocks** for energy and one (1) **operating block** for **dispatch down service**; and

(b) that is an import, one (1) **operating block** for energy with a zero dollar ($0.00) **offer** price.

(3) The **ISO** must allocate to each **sink asset**:

(a) that is not an export, seven (7) **operating blocks** for energy; and

(b) that is an export, one (1) **operating block** for energy with a nine hundred and ninety-nine dollar and ninety-nine cent ($999.99) **bid** price.

Revision History

Effective	Description
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 201 General
Section 201.6 Pricing

Applicability

1 Section 201.6 applies to:

(a) the **ISO**.

Requirements

Setting Marginal Price

2 The **ISO** must set the **pool asset** marginal price referenced in subsection 3 and the system marginal price referenced in subsection 4 for each minute of the **settlement interval**.

Pool Asset Marginal Price

3(1) The **ISO** must, subject to subsection 2 and 3(2), for each **pool asset**, set the **pool asset** marginal price at the price specified for the highest priced **operating block** in the **offer** or **bid** which has received a **dispatch**.

(2) The **ISO** must, in setting the **pool asset** marginal price, not use that portion of an **operating block** in the **offer** or **bid** for a **pool asset** that has received a **dispatch** that results in a payment for **transmission constraint rebalancing**.

System Marginal Price

4(1) The **ISO** must, subject to subsections 2 and 4(2), set the system marginal price as:

(a) the highest **pool asset** marginal price, excluding imports and exports, in accordance with subsection 3;

(b) $1000 per MWh if, to maintain the reliable operation of the system, the **ISO** has issued a **directive** to the **legal owner** of an **electric distribution system** to shed **firm load** in accordance with subsection 5(1) of Section 202.2 of the **ISO rules**, *Supply Shortfall and Short Term Adequacy*; or

(c) as prescribed in Section 202.7 of the **ISO rules**, *Markets Suspension or Limited Markets Operations*.

(2) The **ISO** must, notwithstanding subsection 4(1)(a), not use the reference price as calculated in subsection 6 to set the system marginal price.

Pool Price

5 The **ISO** must set the **pool price** for each **settlement interval** as the time weighted average of the one-minute system marginal price values for that **settlement interval**.

Reference Price

6(1) The **ISO** must, subject to subsection 6(3), calculate the reference price as follows:

reference price = (12.5 gigaJoules) multiplied by (the gas price)

Where:

the gas price is the monthly Canadian natural gas price for the month in Canadian $/gigaJoule at AECO C and Nova Inventory Transfer, the Alberta Bidweek Spot Price, as published on theice.com/ngx website, in the “Canadian Gas Price Reporter”, or otherwise.

(2) The **ISO** must use reasonable efforts to use the current **month**'s gas price beginning at midnight on the 2nd **business day** of the same **month** but until the **ISO** can update the gas price for the current **month**, the **ISO** must continue to use the previous **month**'s Alberta Bidweek Spot Price.

(3) The **ISO** must, if the gas price in subsection 6(1) is not available, use a reasonably equivalent gas price for the purpose of calculating the reference price and must, if such unavailability becomes permanent, subsequently update this Section 201.6 to indicate the new source for obtaining the gas price.

(4) The **ISO** must, if the **ISO** uses a price other than the gas price identified in subsection 6(1) to calculate the reference price,

(i) revert to using the gas the price identified in 6(1) as soon as practicable; but

(ii) not modify the **pool price** due to any errors in the reference price.

Forecast Dispatch Price and Forecast Pool Asset Marginal Price

7(1) The **ISO** must use reasonable efforts to publish a forecast **dispatch** price for each **settlement interval** on the AESO website no later than 70 minutes prior to the start of such **settlement interval**.

(2) The **ISO** must set the forecast **dispatch** price for a **settlement interval** at the highest **pool asset** marginal price of all **pool assets** forecast to be required to meet the forecast load requirement, using the expected energy market **merit order** for the **settlement interval** including importer **operating blocks** and the **ISO**-expected import **available transfer capability** for the **interconnections** for the **settlement interval**.

(3) The **ISO** must set the forecast **pool asset** marginal price for a **pool asset** for each **settlement interval** at the price specified for the **operating block** in the **offer** or **bid** which corresponds to the forecast energy market **dispatch** level of the **pool asset** to meet the forecast load requirement.

Revision History

Date	Description
2021-08-08	Conducted administrative amendments to align with AESO drafting principles, fixed typographical errors, and removed and consolidated some provisions of Section 201.6 in order to improve clarity, reduce repetition, and reduce overall requirements.
2015-11-26	Added subsection 2(2) and related revisions to subsection 2(1).
2014-07-02	Added new subsection 6 for subject matter and drafting consistency.
2013-09-24	Updated to bold the term "firm load".
2013-01-08	Initial Release

ISO ~~Rules~~Rule
Part 200 Markets
Division 201 General
Section 201.7 Dispatches

Applicability

1 Section 201.7 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Issuing Dispatches

2(1) The **ISO** may issue a **dispatch** to a **pool participant**.

(2) The **ISO** may issue a **dispatch** verbally or electronically.

Requirement to Comply

3(1) A **pool participant** must comply with a **dispatch** it receives subject to any other **ISO rule** or **reliability standard** and the exceptions in subsections 3(2).

(2) A **pool participant** that is a **legal owner** ~~of a generating source asset~~ or ~~an~~ **operator** of a ~~generating source~~ **pool asset**, must comply with a **dispatch** it receives subject to the following exceptions:

(a) it considers that a real and substantial risk of damage to its ~~generating source~~**pool asset** could result if it complied with the **dispatch**;

(b) it considers that a real and substantial risk to the safety of its employees or the public could result if it complied with the **dispatch**;

(c) it considers that a real and substantial risk of undue injury to the environment could result if it complied with the **dispatch**;

(d) it has received verbal authorization from the **ISO** to vary the requirements of the **dispatch** during **commissioning** and testing in accordance with any one or all of ~~section~~Section 504.3 of the **ISO rules**, *Coordinating Energization, Commissioning and Ancillary Services Testing*, section 504.4 of the **ISO rules**, *Coordinating Operational* Testing, ~~section~~Section 505.3 of the **ISO rules**, *Coordinating Synchronization, Commissioning, WECC Testing and Ancillary Services Testing*, and ~~section~~Section 505.4 of the **ISO rules**, *Coordinating Operational Testing*; or

(e) those exceptions set out in subsections 5 and 6 of ~~section~~Section 203.4 of the **ISO rules**, *Delivery Requirements for Energy*.

(f) those exceptions set out in subsection 4 of Section 203.5 of the **ISO rules**, *Consumption Requirements for Bids.*

Report Inability to Acknowledge a Dispatch

4(1) If a **pool participant** is unable to acknowledge a **dispatch** electronically due to an unavailability at its facilities of the Automated Dispatch and Messaging System or other electronic or communication systems, then the **pool participant** must verbally notify the **ISO** of the unavailability immediately after becoming aware of the unavailability and as soon as practicable, must also:

(a) provide the reasons for the unavailability;

(b) provide an estimate of the duration of the unavailability;

(c) provide the details of an action plan to resolve the unavailability; and

(d) notify the **ISO** when the unavailability is over.

(2) A **pool participant** must, if the unavailability is longer than expected, keep the **ISO** updated with current information regarding the expected duration of the unavailability.

Acknowledging Dispatches

5 A **pool participant** must acknowledge receipt of a **dispatch**:

(a) in the case of an automated message and unless the **pool participant** has notified the **ISO** of an unavailability in accordance with subsection 4(1)(a) by responding via the Automated Dispatch and Messaging System within ~~two (~~2~~)~~ minutes for an intra-Alberta transaction;

(b) in the case of a contract **load shed service** for imports, within the time frame set out in the contract; or

(c) in the case of a voice **dispatch**, by repeating the **dispatch** to the **ISO**.

Revision History

Date	Description
20xx-xx-xx	
2023-03-31	Updated to align with current AESO drafting principles.
2014-07-02	Updated the references in subsection 3(2)(d) to the energization, commissioning and testing sections of the ISO rules; deleted the word “outages” in subsections 4 and 5 and replaced it with “unavailability”.
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 201 General
Section 201.8 Requirements for the Balancing Pool

Applicability

1 Section 201.8 applies to:

(a) the Balancing Pool, established by section 75(1) of the **Act**, when:

(i) the Balancing Pool holds a **power purchase arrangement** for a **generating unit** that is subject to a **power purchase arrangement** for which the Balancing Pool has verified termination and, as a result, is held by the Balancing Pool in the capacity of a buyer in accordance with section 96(3) of the **Act**; and

(ii) the Balancing Pool does not have an agreement for **system access service** for the **generating unit**; and

(b) the **ISO**.

Requirements

Compliance with Pool Participant and Market Participant Obligations

2 The Balancing Pool must, for a **generating unit** that is subject to a **power purchase arrangement** for which the Balancing Pool has verified termination and, as a result, is held by the Balancing Pool in the capacity of a buyer in accordance with section 96(3) of the **Act** and for which the Balancing Pool does not have an agreement for **system access service**, comply with all obligations arising from being a **pool participant** and **market participant**, as if the Balancing Pool had an agreement for **system access service** for the **generating unit**.

Financial Settlement Matters Related to the Balancing Pool

3 The **ISO** must, for a **generating unit** that is subject to a **power purchase arrangement** for which the Balancing Pool has verified termination and, as a result, is held by the Balancing Pool in the capacity of a buyer in accordance with section 96(3) of the **Act** and for which the Balancing Pool does not have an agreement for **system access service**, pay or charge the Balancing Pool for the following amounts arising from the first of the **month** in which the Balancing Pool has verified the termination of the **power purchase arrangement**:

(a) all amounts arising under the **ISO tariff**, as if the Balancing Pool were receiving **system access service** under Rate STS of the **ISO tariff**, *Supply Transmission Service*, at the **point of supply** for the **generating unit**; and

(b) all amounts arising from the Balancing Pool being a **pool participant** and **market participant**, as if the Balancing Pool had an agreement for **system access service** in respect of the **generating unit**.

Revision History

Date	Description
2017-12-04	Initial release

ISO Rules
Part 200 Markets
Division 201 General
Section 201.9 Requirements for a Generating Unit Subject to a Power Purchase Arrangement

Applicability

1 Section 201.9 applies to:

(a) the **legal owner** of a **generating unit** that was subject to a **power purchase arrangement**, which has been terminated by the Balancing Pool, when the **legal owner** does not have an agreement for **system access service** for the **generating unit**; and

(b) the **ISO**.

Requirements

Compliance with Pool Participant and Market Participant Obligations

2 The **legal owner** of a **generating unit** that was subject to a **power purchase arrangement**, which has been terminated by the Balancing Pool, and for which the **legal owner** does not have an agreement for **system access service**, must comply with all obligations arising from being a **pool participant** and **market participant**, as if the **legal owner** had an agreement for **system access service** for the **generating unit**.

Financial Settlement Matters Related to the Legal Owner

3 The **ISO** must, for a **generating unit** that was subject to a **power purchase arrangement**, which has been terminated by the Balancing Pool, and for which the **legal owner** does not have an agreement for **system access service**, pay or charge the **legal owner** for the following amounts arising from the first day of the **month** following the **month** in which the Balancing Pool terminated the **power purchase agreement**:

(a) all amounts arising under the **ISO tariff**, as if the **legal owner** were receiving **system access service** under Rate STS of the **ISO tariff**, *Supply Transmission Service*, at the **point of supply** for the **generating unit**; and

(b) all amounts arising from the **legal owner** being a **pool participant** and **market participant**, as if the **legal owner** had an agreement for **system access service** in respect of the **generating unit**.

Revision History

Date	Description
2018-03-28	Initial release

ISO Rules
Part 200 Markets
Division 202 ~~Non-Routine Market Conditions~~Dispatching the Markets
Section 202.2 Short-Term Adequacy and Supply Shortfall

Applicability

1 Section 202.2 applies to:

(a) a **pool participant**;

(b) the **legal owner** of an **electric distribution system**; and

(b) the **ISO**.

Requirements

Short Term Adequacy Determinations and Supply Shortfall

2 If the **ISO** forecasts that the interconnected electric system will experience a state of supply shortfall, as evidenced by the **firm load** and minimum **regulating reserves** requirement exceeding the available supply and curtailable demand, and determined in accordance with the ~~**short term**~~real-time **adequacy** assessment conducted pursuant to ~~**subsection 3 of section**~~Section 202.6 of the **ISO rules**, *Adequacy of Supply*, then the **ISO** must manage the state of supply shortfall in accordance with the provisions set out in subsections 3, 4 and 5 below.

Managing Supply Shortfall

3(1) The **ISO** must, if it forecasts a state of supply shortfall, issue a message to **pool participants** warning of an upcoming state of supply shortfall.

(2) The **ISO** must, if a state of supply shortfall persists after issuing the message in subsection 3(1), attempt to manage the state of supply shortfall by issuing **directives** which may include **directives**:

(a) instructing available ~~generating~~ **source assets** ~~to deliver energy~~, including **long lead time assets** but excluding import assets, to deliver energy;

(b) curtailing **demand opportunity service**; and

(c) maximizing the import capability of the **interties**.

(3) The **ISO** must not issue a **directive** instructing a **long lead time asset** to start if the required start-up time of the **long lead time asset** is greater than the time the supply shortfall condition is expected to last.

(4) The **ISO** must, once the short term adequacy assessment referred to in subsection 2 indicates there is an adequate supply of energy or curtailable demand to meet **firm load** and minimum **regulating reserves** in subsequent **settlement intervals**, cancel **directives** that instructed **long lead time assets** to start.

Operating Exceptions During Supply Shortfall

4(1) The **ISO** may, during a state of supply shortfall, issue a **directive** to a **pool participant** instructing it to provide energy in excess of the **maximum capability** of the **source asset**.

(2) The **ISO** must cancel a **directive** issued under subsection 4(1) when the energy provided above **maximum capability** is no longer required.

(3) ~~Notwithstanding~~The **ISO** may, notwithstanding any other provision of the **ISO rules** or **reliability**

standards, ~~the ISO may~~, if required to manage a state of supply shortfall, approve valid **e-tags** submitted for the current or next **settlement interval** for import energy that do not have a corresponding **offer**, up to the posted **available transfer capability** limit.

Firm Load Shed

5(1) The **ISO** may, if:

(a) a state of supply shortfall persists; and

(b) **firm load** and minimum **regulating reserve** cannot be met after completing the procedures in subsection 3(2)

issue **directives** to some or all **legal owners** of an **electric distribution system** instructing them to shed **firm load**.

(2) The **ISO** must allocate the shedding of **firm load** among the **legal owners** of **electric distribution systems** on a pro rata basis.

(3) The **legal owner** of an **electric distribution system** must develop and maintain a plan for shedding **firm load**.

(4) The **legal owner** of an **electric distribution system** must ensure that its plan for shedding **firm load** takes into account the following:

(a) shedding of industrial and large commercial loads before residential loads;

(b) **system operating limit** violations;

(c) the need to maintain the integrity of **remedial action schemes** and the **under frequency load shedding** scheme;

(d) public safety and environmental impact; and

(e) **ISO** discretion to adjust curtailments as required to account for unforeseen circumstances.

Revision History

Effective	Description
~~2013-01-08~~2023-xx-xx	~~Initial Release~~
~~2013-09-24~~	~~Updated to clarify priority of industrial and commercial loads in load shedding~~
2013-12-20	Updated to reflect the move of the “short term adequacy assessment” from subsection 2(2) to section 202.6 of the ISO rules.
2013-09-24	Updated to clarify priority of industrial and commercial loads in load shedding
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 202 Dispatching the Markets
Section 202.3 Issuing Dispatches for Equal Prices

Applicability

1 Section 202.3 applies to:

(a) the **ISO**

when operating the energy market and managing **dispatch down service**.

Requirements

Equally-Priced Operating Blocks

2(1) The **ISO** must, if the price of ~~an **operating block** in an **offer** or **bid** for a **pool asset** is identical to the price of one (1)~~ one or more **operating blocks** in an **offer** ~~or **bid** in respect of another **pool asset** for~~for a **pool asset** and the price of one or more **operating blocks** in a **bid** for a **pool asset** are identical during the same **settlement interval**, issue **dispatches** ~~on a pro rata basis amongst~~ for all of the ~~**flexible blocks** within~~equally-priced **offers** first, followed by **dispatches** for all of the equally-priced **bids**.

(2) The **ISO** must, when **dispatching** equally-priced **operating blocks** from 2 or more **offers** during the same settlement **interval**, issue **dispatches** for the **operating blocks** on a pro rata basis.

~~**(2)** The **ISO** must, if one (1)~~**(3)** The **ISO** must, when **dispatching** equally-priced **operating blocks** from 2 or more **bids**, issue **dispatches** for the **operating blocks** on a pro rata basis.

(4) The **ISO** must, notwithstanding subsections 2(1), 2(2) and 2(3), if one or more of the equally-priced **operating blocks** is an **inflexible block**, attempt to accommodate the **inflexible blocks** and minimize the issuing of **dispatches** for **operating blocks** higher in the energy market **merit order**.

~~**(3)** Notwithstanding~~**3** The **ISO** must, notwithstanding subsection 2~~(1), the **ISO** must~~:

(a) determine **dispatch** volumes for a **pool asset** that is an import asset or an export asset in accordance with the procedures set out in ~~*OPP 301, Alberta - BC Interconnection Scheduling* and *OPP 302, Alberta-Saskatchewan Interconnection Scheduling*; and~~Section 203.6 of the ISO rules, *Available Transfer Capability and Transfer Path Management*; and

(b) issue **dispatches** for equally priced ~~zero dollar ($~~$0~~)~~ **offers** in accordance with section 202.5 of the **ISO rules**, *Supply Surplus*.

Revision History

~~Effective~~Date	Description
2023-XX-XX	
2013-01-08	Initial release

ISO Rules
Part 200 Markets
Division 202 Dispatching the Markets
Section 202.4 Managing Long Lead Time Assets

Applicability

1 Section 202.4 applies to:

(a) a **pool participant**; and

(b) the **ISO**,

when providing or procuring energy from a **long lead time asset**.

Requirements

Start-Up Time

2 A **pool participant** must enter a start-up time of no greater than thirty-six (36) hours in the Energy Trading System.

3 Notwithstanding subsection 2, a **pool participant** that has a start-up time of greater than thirty-six hours (36) in the Energy Trading System on **June 7, 2016**, must reduce the start-up time to thirty six (36) hours or less within a period of no more than four (4) **months** from **June 7, 2016**.

4 A **pool participant** to whom subsection 3 applies may submit notification of a **mothball outage** in accordance with subsection 3(1) of section 306.7 of the **ISO rules**, *Mothball Outage Reporting*.

Voluntarily Providing Energy from a Long Lead Time Asset that is not Synchronized

5(1) A **pool participant** must, if it wishes to have a **long lead time asset** that is not synchronized participate in the energy market, enter a start time for the **long lead time asset** prior to two (2) hours before the start of the **settlement interval**.

(2) A **pool participant** must enter a start time in the Automated Dispatch and Messaging System.

(3) A **pool participant** must enter a start time which indicates when the **pool participant** anticipates the **long lead time asset** will synchronize to the **interconnected electric system**.

(4) A **pool participant** may:

(a) prior to two (2) hours before the start of the **settlement interval**, submit a restated start time for the **long lead time asset**; and

(b) within two (2) hours before the start of the **settlement interval**, submit a restated start time for the **long lead time asset** if it has an **acceptable operational reason**.

(5) A **pool participant** must ensure that a restated start time submitted in accordance with subsection 5(4) represents the current physical condition of the **long lead time asset**.

(6) A **pool participant** must verbally notify the **ISO** before synchronizing a **long lead time asset** to the **interconnected electric system**.

Voluntarily Providing Additional Energy from a Long Lead Time Asset that is Synchronized

6(1) A **pool participant** must, if the **ISO** makes a request, declare the additional energy it would be able to provide from a **long lead time asset** that is synchronized.

(2) Notwithstanding subsection 6 of section 203.1 of the **ISO rules**, *Offers and Bids for Energy*, a **pool**

participant that has a **long lead time asset** that is synchronized must have the **available capability** submitted for the **long lead time asset** equal the **maximum capability** of the **long lead time asset** less that portion of its energy that it is not currently delivering.

(3) A **pool participant** must, if it wants a **long lead time asset** that is synchronized to be eligible to receive a **dispatch** for the energy it is not currently delivering:

(a) reflect the availability of such energy by appropriately adjusting the **available capability** of the **long lead time asset**; and

(b) do so prior to two (2) hours before the start of the **settlement interval**.

(4) A **pool participant** must ensure that the adjustment to **available capability** referenced in subsection 6(3)(a) represents the current physical condition of the **long lead time asset**.

Cancelling a Directive for Energy from a Long Lead Time Asset

7(1) Notwithstanding subsection 3 of section 301.2 of the **ISO rules**, *Directives*, a **pool participant** may refuse a **directive** to provide energy from a **long lead time asset** if it chooses instead to receive a **dispatch** in the energy market.

(2) If a **pool participant** chooses to receive a **dispatch** as allowed in subsection 7(1), the **pool participant** must:

(a) in the case of a **long lead time asset** that is not synchronized, enter a start time in accordance with subsection 5(1); and

(b) in the case of a **long lead time asset** that is synchronized, adjust **available capability** in accordance with subsection 6(3); and

meet the time and MW requirements of the original **directive**.

(3) The **ISO** must, if a **pool participant** chooses to receive a **dispatch** in accordance with subsection 7(2), cancel the **directive** to provide energy from a **long lead time asset**, as applicable, and issue a **dispatch** according to the energy market **merit order**.

Payment for Incremental Generation Costs

8(1) Subject to subsection 8(2) below, subsections 5(1) and (2) of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement* and the definition of **incremental generation costs,** a **pool participant** that has complied with a **directive** to provide energy from a **long lead time asset**, and with the cancellation of such **directive** may be eligible to receive payment for **incremental generation costs** from the **ISO**.

(2) A **pool participant** that elects to participate in the energy market:

(a) before receiving a **directive** for energy from a **long lead time asset** that is not synchronized and by entering a start time in accordance with subsection 5;

(b) before receiving a **directive** to provide energy from a **long lead time** asset that is synchronized and by adjusting **available capability**; or

(c) after receiving a **directive** to provide energy from a **long lead time asset** but before complying with it and choosing instead to receive a **dispatch** in accordance with subsections 4(1) and (2),

Financial Settlement

9(1) A **pool participant** that has complied with a **directive** to provide energy from a **long lead time asset** must, within forty (40) **business days** after the end of the **settlement period** in which such **directive** was issued, issue to the **ISO** a statement showing the amount owing or owed as calculated in accordance with the definition of **incremental generation costs** and this subsection 9 along with supporting documentation.

(2) The **pool participant** must provide to the **ISO** the supporting information used to determine the amount specified in any statement provided pursuant to this subsection 9, including all information necessary to confirm the costs, charges and other items specified in the definition of **incremental generation costs** and such other information as the **ISO** considers appropriate and may request.

(3) The **ISO** must, if it approves the statement the **pool participant** issues, pay such statement on or before forty (40) **business days** following receipt by **ISO** of the statement and supporting information specified in this subsection 9.

Reporting

10 If the **ISO** issues a **directive** to provide energy from a **long lead time asset**, the **ISO** must prepare a report and post it on the AESO website which report must include:

(a) an explanation of the circumstances that caused and are related to the issuance of the **directive**;

(b) chronological events and material market impacts; and

(c) any other matters the **ISO** deems appropriate.

Revision History

Effective	Description
2013-01-08	Initial release
2016-06-07	Amended to include subsection 2 “Start-Up Time”.

ISO Rules
Part 200 Markets
Division 202 Dispatching the Markets
Section 202.5 Supply Surplus

Applicability

1 Section 202.5 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

State of Supply Surplus and Multiple ~~Zero Dollar ($0)~~$0 Offers

~~**2(1)** If~~**2(1)** The **ISO** may curtail next hour import **interchange transactions** to balance system supply and **system load**, if during a current hour the **ISO** forecasts that the **interconnected electric system** will experience a state of supply surplus in the next hour, as evidenced by the **in merit** electricity supply consisting of only multiple $0 **offers** ~~and the supply of electricity available from these **offers** exceeds the **system load**, then the **ISO** may curtail next hour import **interchange transactions** to balance system supply and **system load**~~.

(2) ~~Subject~~The **ISO** must, subject to subsection 2(3), if ~~during a current hour the **ISO**~~it determines that a state of supply surplus is imminent in the current hour or already exists, ~~then the **ISO** must comply with the~~balance system supply and **system load** using following procedures, as ~~may be~~ required, and in the following sequence~~, to balance system supply and **system load**~~:

(a) initiate curtailment of import **interchange transactions**;

(b) allow **pool participants** to submit **bids** to increase export **interchange transactions** within ~~two (~~2~~)~~ hours of the start of a **settlement interval**;

(c) allow **pool participants** to submit **offers** to decrease import **interchange transactions** within ~~two (~~2~~)~~ hours of the start of a **settlement interval**;

(d) allow **pool participants** to submit restatements reducing **generating unit** ~~and~~, **aggregated** ~~generating~~ **facility**, and **energy storage resource**, output within ~~two (~~2~~)~~ hours of the start of a **settlement interval**;

(e) issue, on a pro rata basis ~~:~~

~~(i)~~ **dispatches** to **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources**, for partial volumes of **flexible blocks** of the $0 **offers**;

(f) if there are **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources**, with $0 **offers** for **inflexible blocks** stating volumes greater than their declared **minimum stable generation**, then issue **directives** to curtail those **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources,** to their declared **minimum stable generation**, starting with the **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** having the greatest difference in MW between the then current **dispatch** level and **minimum stable generation** and continuing in descending order until all those **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** have received **directives**; and

(g) issue **directives** for any other necessary actions, including shutting down **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources,** to ensure system **reliability**.

(3) ~~If the **ISO**~~The **ISO** may, as part of the effective execution of the procedures set out in subsection 2(2), if it determines that a **generating unit** ~~or~~, **aggregated** ~~**generating** **facility**~~, or **energy storage resource** is running at ~~a generation~~an output level higher than its **minimum stable generation** in order to provide **regulating reserve**, ~~then the **ISO** may, as part of the effective execution of the procedures set out in subsection 2(2),~~ issue a **dispatch**:

(a) to curtail delivery of **regulating reserve** from that **generating unit** ~~or~~, **aggregated** ~~**generating** **facility**~~, or **energy storage resource**; and ~~issue a **dispatch**~~

(b) for **regulating reserve** to another **generating unit** ~~or~~, **aggregated** ~~**generating** **facility**~~, or **energy storage resource** which can provide **regulating reserve** while operating at a lower ~~generation~~output level at or above **minimum stable generation**.

(4) ~~If~~The **ISO** may alter the procedural sequence set out in subsections 2(2) and 3, if during a current hour, the ~~present,~~**ISO** determines that real-time operating conditions ~~change~~are such that ~~the **ISO** determines that following the~~ procedural sequence ~~set out in subsections 2(2) and 3~~ would put the **ISO** in contravention of ~~any~~a **reliability standard** ~~requirement by failing to achieve compliance within the operating limits or required response time specified in that **reliability standard**, then the **ISO** may alter the procedural sequence.~~.

(5) ~~If the~~The **ISO** must, if it alters the procedural sequence as set out in subsection 2(4), ~~then~~recommence the procedural sequence set out in subsections 2(2) and 3 once ~~the **ISO**~~it is assured that the **interconnected electric system** is operating in a safe and reliable mode~~, the **ISO** must recommence the procedural sequence set out in subsections 2(2) and 3~~.

Transitioning Out of a State of Supply Surplus

3 ~~When the~~The **ISO** must, when it determines that the **interconnected electric system** is transitioning out of a state of supply surplus, ~~the **ISO** must~~ reverse any actions taken under subsection 2(2), in reverse order, to balance system supply and **system load**.

Revision History

~~Effective~~Date	Description
2023-XX-XX	
2018-09-01	Revised “source asset” to “generating unit or aggregated generating facility”; clarified subsections 2 and 3; and administrative revisions.
2012-03-28	Initial release

ISO Rules
Part 200 Markets
Division 202 ~~Non-Routine Conditions in~~ Dispatching the Markets
Section 202.6 Adequacy of Supply

Applicability

1 Section 202.6 applies to:

(a) the **ISO**.

Requirements

Supply Adequacy Forecast

2 The **ISO** must forecast supply **adequacy** in accordance with a prescribed methodology.

Real-time Adequacy Assessments

3 The **ISO** must assess and report on the short-term **adequacy** of supply by, at a minimum, completing a real-time **adequacy** assessment.

Long Term Adequacy Metrics and Reporting

4 The **ISO** must report on the following **long term adequacy** metrics on a quarterly basis:

(a) a metric listing Alberta electrical generation projects and retirements;

(b) a 5-year forecast reserve margin metric;

(c) a supply cushion metric which provides a 2-year forecast of available daily generation capacity and peak demand; and

(d) a 2-year probability of supply **adequacy** shortfall metric.

Publications and Provision of Notice

5(1) The ~~AESO~~**ISO** must publish:

(a) the forecasts and reports set out in subsections 2, 3, and 4; and

(b) details of the calculations and methodologies underlying the forecasts and reports referenced in subsection 5(1)(a).

(2) The **ISO** must:

(a) give 60 **days**' notice of any proposed changes to the calculations and methodologies referenced in subsection 5(1)(b); and

(b) provide an opportunity for **market participants** to provide feedback on the proposed changes.

Long Term Adequacy Threshold Determination and Use

6(1) The **ISO** must, for the 2-year probability of supply **adequacy** shortfall metric model set out in subsection 4(d), use a **long term adequacy** threshold which:

(a) represents the equivalent impact of the probability of having a system supply shortfall occur once every 10 years; and

(b) is calculated as the 1 hour average **Alberta internal load** for a year divided by 5;

being the level which, if exceeded, would indicate a need for the **ISO** to consider taking preventative action.

(2) The **ISO** must, using the 2-year probability of supply **adequacy** shortfall metric, estimate on a quarterly basis the expected total system MWh not served in a subsequent 2-year period.

(3) The **ISO** must, if the estimated total system MWh not served exceeds the **long term adequacy** threshold established at the time, undertake further studies to verify the likely cause, magnitude, and

timing of the potential **adequacy** issue.

Long Term Adequacy Threshold Actions

7(1) The **ISO** may, if the **long term adequacy** threshold is exceeded and the **ISO** deems that a potential **adequacy** issue requires preventative action, procure services to address the potential **adequacy** issue, including:

(a) load shed;

(b) self-supply, back-up generation, and back-up ~~generation~~energy storage that would not otherwise be available to participate in the energy market; or

(c) emergency portable generation or emergency portable energy storage.

(2) The **ISO** must, prior to procuring services in accordance with subsection 7(1), publish a report on the potential **adequacy** issues requiring preventative action.

Revision History

Date	Description
20xx-xx-xx	
2023-01-01	Revised subsection 2 by adding a reference to a prescribed methodology; subsection 3 by removing the detailed calculations for short-term adequacy assessments; added requirements in subsection 5 to publish forecasts, assessments, and associated calculations and methodologies, and to provide notice of potential changes and opportunity for feedback; added a requirement in subsection 7 to publish a report on potential adequacy issues requiring preventative action; and other minor administrative amendments, including amendments to align with the AESOs drafting principles
2018-09-01	Revised references to “wind aggregated generating facilities” to “aggregated generating facilities”; replaced “wind” with “wind and solar generation”; administrative revisions.
2014-10-01	Amendment to the short term adequacy assessments calculation to include the ISO’s spinning reserve requirement.
2013-12-20	Initial release

ISO Rules
Part 200 Markets
Division 202 Dispatching the Markets
Section 202.7 Markets Suspension or Limited Markets Operations

Applicability

1 Section 202.7 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

State of Limited Markets Operations

2 If, due to:

(a) the unavailability of **ISO** merit order related tools; or

(b) the **ISO** being required to completely evacuate **ISO** personnel from the **ISO**'s System Coordination Centre due to an emergency or disaster event, resulting in the **ISO** using its Back Up Coordination Centre;

the **ISO** cannot access the ordinary course energy market **merit order**, which lack of access materially impedes the **ISO**'s ability to accurately and substantially issue **dispatches** and operate any one or all of the **merit orders**, then the **ISO** may, by the issuance of a declaration in accordance with subsection 3:

(c) declare that a state of limited markets operations is in effect; and

(d) invoke the limited markets operations procedures set out in this section 202.7.

Declaration Invoking a State of Limited Markets Operations

3(1) The **ISO** must issue a declaration if it is invoking a state of limited markets operations.

(2) The declaration must include:

(a) the reasons that the **ISO** is invoking the state of limited markets operations;

(b) the commencement date and time of the state of limited markets operations; and

(c) a reasonable estimate of the anticipated date and time of termination of the state of limited market operations, and the return to ordinary course markets operations.

(3) The **ISO** must use all reasonable efforts to issue the declaration as simultaneously as is possible to **market participants** who may reasonably be anticipated to be affected by the state of limited markets operations.

(4) The **ISO** from time to time may issue a subsequent declaration updating **market participants** on limited markets operations developments as the circumstances warrant.

(5) The **ISO** may select one or more of the following methods to issue a declaration, depending on which is the most practical and effective method under the circumstances:

(a) the real time AIES Event Log or other message communications posted on the AESO website;

(b) Automated Dispatch and Messaging System communications; or

(c) pre-recorded telephone notifications, followed up by written confirmations.

Dispatches During a State of Limited Markets Operations

4 During a state of limited markets operations:

(a) the **ISO** must use the most current and reasonably accurate **merit orders** then available to the **ISO** under the circumstances, to continue to issue **dispatches** in a manner which is as close as possible to ordinary course operations;

(b) subject to subsection 4(c), the **ISO** must use all reasonable efforts to ensure that any **dispatches** the **ISO** has issued for **dispatch down services** and **ancillary services** at the commencement of the state of limited markets operations remain in effect until termination of the state of limited markets operations; and

(c) if the system marginal price exceeds the reference price during the state of limited markets operations, then the **ISO** may determine that any one or all of the **dispatch down services** must be terminated until the termination of the state of limited markets operations.

Energy Market Pricing During a State of Limited Markets Operations

5(1) During a state of limited markets operations and subject to subsection 5(2), the **ISO** must determine the energy market **pool price** as the system marginal price at each minute, which must be the highest eligible **pool asset** marginal price of all **pool assets** to meet **system load** in the energy market **merit order** referred to in subsection 4(a).

(2) The system marginal price during a state of limited markets operations must be one thousand dollars ($1,000) per MWh under the circumstances set out in subsection 3(1)(b) of section 201.6 of the **ISO rules***, Pricing*.

Other Pricing During a State of Limited Markets Operations

6 During a state of limited markets operations:

(a) the **ISO** must make **dispatch down service** payments based on the system marginal price in each minute, in accordance with subsection 8 of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*;

(b) the **ISO** must make **ancillary services** payments based on the **pool price**, which such price is determined in accordance with subsection 4 of section 201.6 of the **ISO rules**, *Pricing*;

(c) the **ISO** may suspend uplift payments under subsection 6 of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*; and

(d) the **ISO** may suspend payments for **transmission constraint rebalancing** required under subsection 7 of section 103.4 of the **ISO rules**, *Power Pool Financial Settlement*.

Termination of a State of Limited Markets Operations

7(1) The **ISO**, by issuing a declaration, must terminate a state of limited markets operations as soon as it restores ordinary course access to the merit orders.

(2) The **ISO** must use the most practical and effective communication method referenced in subsection 3(5) to issue a declaration to **market participants** that the **ISO** has terminated a state of limited markets operations and ordinary course merit order operations are to recommence by the date and time specified in the declaration.

State of Markets Suspension

8(1) If:

(a) the **interconnected electric system** is experiencing a **blackout**;

(b) the **interconnected electric system** is breaking up into two (2) or more **electrical islands** causing **transmission constraints** that significantly limit or prohibit markets operations; or

(c) the **ISO** is unable to continue in a state of limited markets operations under this section 202.7 because:

(i) the **ISO** no longer can use the most current and reasonably accurate energy market **merit order** due to material variances between that energy market **merit order** and the energy production capabilities of the **pool assets** associated with the energy market **merit order**; or

(ii) the **ISO** no longer can perform and operate merit order functions at the Back Up Coordination Centre as referenced in subsection 2(b);

then once an approval is granted under subsection 8(2), the **ISO** may issue a declaration in accordance with subsection 9 invoking a state of markets suspension for the energy market, the **ancillary services** market and the **dispatch down service** market, and implementing the markets suspension procedures set out in this section 202.7.

(2) The **ISO** may not issue a declaration invoking a state of markets suspension without the approval of the Chief Executive Officer of the **ISO** or a designee, but if the **interconnected electric system** is experiencing a **blackout** as referenced under subsection 8(1)(a), then the **ISO** may, by declaration in accordance with subsection 9, invoke a state of markets suspension without Chief Executive Officer approval.

Declaration Invoking a State of Markets Suspension

9(1) The **ISO** must issue a declaration if it is invoking a state of markets suspension.

(2) The declaration must include:

(a) the reasons that the **ISO** is invoking the state of markets suspension;

(b) the commencement date and time of the state of markets suspension; and

(c) a reasonable estimate of the anticipated date and time of the termination of the state of markets suspension, and the return to ordinary course markets operations.

(3) The **ISO** must use all reasonable efforts to issue the declaration as simultaneously as is possible to **market participants** who may reasonably be anticipated to be affected by the state of markets suspension.

(4) The **ISO** from time to time may issue a subsequent declaration updating **market participants** on markets suspension developments as the circumstances warrant.

(5) The **ISO** may select one or more of the following methods to issue the declaration, depending on which is the most practical and effective method under the circumstances:

(a) the real time AIES Event Log or other message communications posted on the AESO website;

(b) Automated Dispatch and Messaging System communications; or

(c) pre-recorded telephone notifications, followed up by written confirmation.

Effect of a State of Markets Suspension

10 During the period of time a state of markets suspension is in effect, the **ISO**:

(a) is not required to follow the **merit orders**; and

(b) must determine the system marginal price in accordance with subsection 11.

System Marginal Pricing during a State of Markets Suspension

11(1) During a state of markets suspension and subject to subsection 11(2), the **ISO** must determine the system marginal price at each minute, which price must be either the prior thirty (30) **day** average **on peak** price or **off peak** price, depending on the hour of **day** the state of markets suspension is in effect.

(2) The system marginal price during a state of markets suspension must be one thousand dollars ($1,000) per MWh under the circumstances set out in subsection 3(1)(b) of section 201.6 of the **ISO rules***, Pricing*.

Operating Costs Recovery for Certain Market Participants

12(1) If for a state of markets suspension a **market participant** does not recover from energy receipts revenue all operating costs, as specified in subsection 12(2) below, for any **pool asset** that operated during that state of market suspension, then the **ISO** must pay to the **market participant** an additional amount up to, but not in excess of, those operating costs, net of the energy receipts revenue.

(2) Subject to subsection 12(3), the operating costs referred to in subsection 12(1) may include:

(a) variable **supply transmission service** charges which are the actual cost of all variable charges from *Rate Schedule STS* of the **ISO tariff**, including the applicable **loss factor** charge or credit;

(b) variable operating and maintenance charges;

(c) fuel cost to operate the **pool asset**; and

(d) other related reasonable costs the **ISO** approves.

(3) If during a state of markets suspension a **market participant** incurs start-up costs for a **pool asset** as the result of receiving a **directive** to start-up the **pool asset**, and then subsequently the **market participant**:

(a) receives a **directive** to shut down the same **pool asset**; or

(b) receives a **dispatch** to terminate energy delivery or consumption for the same **pool asset** upon the termination of the markets suspension and the return to ordinary course operations;

then the **market participant** may include those start-up costs in the operating costs to be recovered in accordance with subsection 12(2).

(4) The **ISO** must include as a line item in a **power pool** statement any charge to a **pool participant** under subsection 8 of section 103.6 of the **ISO** rules, *ISO Fees and Charges* for the **ISO** to recover any costs associated with the payment of operating costs net of energy receipts revenue due to a markets suspension under this section 202.7.

Termination of a State of Markets Suspension

13(1) The **ISO**, by issuing a declaration, must terminate a state of markets suspension as soon as it restores ordinary course markets operations.

(2) The **ISO** must use the most practical and effective communication methods referenced in subsection 9(5) to issue a declaration to **market participants** that the **ISO** has terminated a state of markets suspension and ordinary course markets operations are to recommence by the date and time specified in the declaration.

(3) The **ISO** must publish a preliminary report on the AESO website, no later than five (5) **business days** following the last **day** of a state of markets suspension, containing a summary of events and circumstances which led to the **ISO** invoking the state of markets suspension.

(4) The **ISO** must publish a final report on the AESO website, no later than twenty (20) **business days** following the termination of a state of markets suspension, containing details on how the **ISO** managed the markets suspension situation and the **interconnected electric system** during the state of markets suspension**,** and the efforts the **ISO** undertook to return the markets to ordinary course markets operations.

Revision History

Effective	Description
2011-10-13	Initial release
2013-01-08	Previously defined terms have been un-defined and so the words have been un-bolded. Updated to refer to section 201.6 *Pricing*.
2015-11-26	Addition of subsection 6(d) to refer to new subsection 7 of section 103.4 of the ISO rules.

ISO Rules
Part 200 Markets
Division 203 Energy Market
Section 203.1 Offers and Bids for Energy

Applicability

1 Section 203.1 applies to:

(a) a **pool participant**; and

(b) the **ISO**,

when participating in the energy market.

Requirements

Submission Method and Timing

2(1) A **pool participant** may only submit an **offer** or a **bid** to the **power pool** in respect to an active **pool asset** listed opposite their name in the **ISO** list of **pool assets**.

(2) A **pool participant** submitting an **offer** or **bid** must submit such **offer** or **bid**:

(a) before 12:00 hours on the **day** before the **day** that the **offer** or **bid** is effective, subject to any extension of time granted pursuant to subsection 3 of Section 201.4 of the **ISO rules**, *Submission Methods and Coordination of Submissions*; and

(b) no earlier than 00:00, ~~seven (~~7~~)~~ **days** prior to the **day** that the **offer** or **bid** is effective.

Obligation to Offer and Offer Content

3(1) A **pool participant** must, for each **settlement interval**, submit an **offer** for each of its **source assets** with a **maximum capability** of ~~five (5) MW or~~ greater than or equal to 5 MW.

(2) A **pool participant** must not, notwithstanding subsection 3(1), submit an **offer** for ~~:~~

~~(a) any of its **source assets** with a **maximum capability** of less than five (5) MW; and~~

~~(b)~~ capacity that is committed under a contract for long term adequacy.

(3) A **pool participant** must include in each **operating block** in an **offer**;

(a) a price in $/MWh to the nearest cent per MWh which:

(i) in the case of **source asset** that is not an import asset, is greater than or equal to ~~zero dollars ($~~$0~~)~~ per MWh and less than ~~one thousand dollars ($~~$1000~~)~~ per MWh; and

(ii) in the case of an import, is ~~zero dollars ($~~$0~~);;~~

(b) a quantity in MW; and

(c) an indication of whether the **operating block** is a **flexible block** or an **inflexible block**; and

must also include in the **offer** the **minimum stable generation** for **the source asset**.

(4) A **pool participant** that submits an **offer** must ensure that:

(a) the cumulative total MW, as entered for the highest priced **operating block** in the **offer** for the **settlement interval**, equals the **maximum capability** of the **source asset**; and

(b) the **minimum stable generation** submitted for the **source asset** does not exceed the MW of the **operating block** with the lowest **offer** price for the **source asset** and a quantity greater

than zero ~~(0),~~, including when submitted as part of a restatement under subsection 5(2) of section 203.4, *Energy Restatements*.

Offers During Commissioning and Testing

4 ~~Notwithstanding subsection 3(3)(a)(i), a~~A **pool participant** that submits an **offer** for a ~~generating~~ **source asset**, excluding an import asset, which is undergoing **commissioning** and testing under section 505.3 of the **ISO rules**, *Coordinating Synchronization, Commissioning, WECC Testing and Ancillary Services Testing* must, notwithstanding subsection 3(3)(a)(i) and until the **ISO** otherwise authorizes in writing, submit a price for the **offer** of ~~zero dollars ($~~$0~~)~~..

Available Capability

5 A **pool participant** that submits an **offer** must also submit the **available capability**, in MW, for each **source asset** which such **available capability** must equal the **maximum capability** of the **source asset** unless the **pool participant** has submitted an **acceptable operational reason** with the **offer**.

Operating Constraints for Offers and Bids

6(1) A **pool participant** that submits an **offer** or **bid** must also submit the following operating constraints:

(a) **ramp rate**; and

(b) the initial start-up time.

(2) A **pool participant** must submit to the **ISO** any changes to the operating constraints of a ~~source~~**pool asset** as soon as ~~reasonably~~ practicable.

Option to Bid and Bid Content

7(1) A **pool participant** may, for a **settlement interval**, submit a **bid** for any of its **sink assets**.

(2) A **pool participant** must include in each **operating block** in a **bid**:

(a) a price in $/MWh to the nearest cent per MWh which:

(i) in the case of a **sink asset** that is not an export asset, is greater than or equal to ~~zero dollars ($~~$0~~)~~ per MWh and less than ~~one thousand dollars ($~~$1000~~)~~ per MWh; and

(ii) in the case of an export asset, is ~~nine hundred and ninety-nine dollars and ninety-nine cents ($~~$999.99~~);~~; and

(b) a quantity in MW.

(3) A **pool participant** that submits a **bid** must ensure that the total MW in the **bid** do not exceed the ~~peak load~~**maximum capability** of the **sink asset**.

Standing Submission

8(1) A **pool participant** may create a standing submission, being an **offer** or **bid** that remains in place until the **pool participant** changes it.

(2) The **ISO** must use the data contained in the standing submission for the **pool asset** for the **day** following the **forecast scheduling period**.

Validation

9 The **ISO** must, as soon as reasonably practicable following the receipt of an **offer** or **bid**, send to the **pool participant** who submitted the **offer** or **bid**:

(a) acknowledgment of receipt of the **offer** or **bid**;

(b) notification that the **offer** or **bid** is either valid or invalid with respect to this section 203.1 of the **ISO rules**; and

(c) if an **offer** or **bid** is invalid, an explanation as to why the **offer** or **bid** is not accepted.

Revision History

~~Effective~~**Date**	**Description**
~~2013-01-08~~20xx-xx-xx	~~Initial Release~~
2013-12-20	Updated subsections 3(1) and 3(2) to clarify offers in the context of capacity that is committed under a contract for long term adequacy.
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 203 Energy Market
Section 203.2 Issuing Dispatches for Energy

Applicability

1 Section 203.2 applies to:

(a) the **ISO**

when operating the energy market.

Requirements

Dispatch Considerations

2 During normal system conditions, the **ISO** must, when a change in demand or supply requires a **dispatch** in order to balance the system, issue **dispatches** for the next **operating block** in the **merit order**, subject to any restrictions created by **inflexible blocks**.

Revision History

Effective	Description
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 203 Energy ~~Markets~~Market
Section 203.3 Energy Restatements

Applicability

1 Section 203.3 applies to:

(a) a **pool participant**~~;~~ that submits an **offer** or **bid**

when participating in the energy market.

Requirements

Available Capability Restatements for Offers

2(1) A **pool participant** must only submit an **available capability** restatement revising the **available capability** of a **source asset** if such revision is:

(a) as a result of an **acceptable operational reason**;

(b) in relation to an **operational deviation** and required under subsection 5(3) of ~~section~~Section 203.4 of the **ISO rules**, *Delivery Requirements for Energy*; or

(c) in order to reflect the output of the **source asset** which is restricted during either one ~~(1)~~ or both of **commissioning** and testing under ~~section~~Section 505.3 of the **ISO rules**, *Coordinating Synchronization, Commissioning, WECC Testing and Ancillary Services Testing* or under ~~section~~Section 505.4 of the **ISO rules**, *Coordinating Operational Testing*.

(2) A **pool participant** that submits an **offer** must, if there is a change to the **available capability** of the **source asset** as a result of any of the circumstances outlined in subsections 2(1)(a), (b) or (c), submit an **available capability** restatement revising the **available capability** for the applicable hours, as soon as ~~reasonably~~ practicable.

(3) A **pool participant** must submit the reason or reasons for submitting an **available capability** restatement for a **source asset**.

Price Restatements for Offers

3 A **pool participant** that submits an **offer** may submit a price restatement but must only do so prior to ~~two (~~2~~)~~ hours before the start of a **settlement interval**.

MW Restatements for Offers

4(1) A **pool participant** that submits an **offer** may submit a MW restatement prior to ~~two (~~2~~)~~ hours before the start of a **settlement interval**.

(2) A **pool participant** that submits an **offer** must submit a MW restatement redistributing the MW to represent the operating state of the **source asset**, as soon as ~~reasonably~~ practicable, if the **source asset** cannot comply with the current **offer** as a result of:

(a) either

(i) an **acceptable operational reason**; or

(ii) an **operational deviation** and such restatement is required under subsection 5(3) of ~~section~~Section 203.4 of the ISO rules, *Delivery Requirements for Energy*; and

an **available capability** restatement under subsection 2 cannot reasonably accommodate the **source asset**'s operating state; or

(b) carrying out either one ~~(1)~~ or both of **commissioning** and testing under ~~section~~Section 505.3 of the **ISO rules**, *Coordinating Synchronization, Commissioning, WECC Testing and Ancillary Services Testing* or under ~~section~~Section 505.4 of the **ISO rules**, *Coordinating Operational Testing*.

(3) A **pool participant** must submit the reason or reasons for submitting a MW restatement in accordance with subsection 4(2)(a) if such MW restatement is submitted within ~~two (~~2~~)~~ hours of the start of the **settlement interval** or within the current **settlement interval**.

~~**(4)** If a **pool participant** is responding to the **ISO** under subsection 2(2)(c) of section 202.5 of the **ISO rules**, *Supply Surplus*, then the~~**(4)** A **pool participant** must submit a restated **offer** for its **source asset** within the current hour which reduces the quantity of only the ~~zero dollar ($~~$0~~)~~ **operating block** of the **source asset** if the **pool participant** is responding to the **ISO** under subsection 2(2)(d) of Section 202.5 of the **ISO rules**, *Supply Surplus*.

Minimum Stable Generation Restatements for Offers

5(1) A **pool participant** that submits an **offer** must, if there is a change to the **minimum stable generation** as a result of any **acceptable operational reason**, submit a **minimum stable generation** restatement for the **source asset** for the applicable hours, as soon as ~~reasonably~~ practicable.

(2) ~~If~~A **pool participant** must not restate the MW of the **operating block** with the lowest **offer** price for the **source asset** if the restated **minimum stable generation**:

(a) is lower than the previously submitted **minimum stable generation**; and

(b) the restatement is submitted within ~~two (~~2~~)~~ hours of the start of the **settlement interval**~~,~~.

~~then the **pool participant** is prohibited from restating the MW of the **operating block** with the lowest **offer** price for the **source asset**.~~

~~**(3)** If the restated **minimum stable generation**:~~

~~(a) is higher than the previously submitted **minimum stable generation**; and~~

~~(b) the restatement is submitted within two (2) hours of the start of the **settlement interval**,~~

~~then the~~**(3)** A **pool participant**, when restating an increase to the MW of the **operating block** with the lowest **offer** price for the **source asset** in order to comply with subsection 3(4)(b) of ~~section~~Section 203.1 of the **ISO rules**, *Offers and Bids*, must take any such additional MW from the **operating blocks** with the next highest **offer** price in ascending order~~.~~, if the restated **minimum stable generation**:

(a) is higher than the previously submitted **minimum stable generation**; and

(b) the restatement is submitted within 2 hours of the start of the **settlement interval**.

(4) A **pool participant** must submit the reason or reasons for submitting a **minimum stable generation** restatement under subsection 5(1).

Price Restatements for Bids

6 A **pool participant** that submits a **bid** may submit a price restatement but must only do so prior to ~~two (~~2~~)~~ hours before the start of a **settlement interval**.

MW Restatements for Bids

7(1) A **pool participant** that submits a **bid** may submit a MW restatement prior to ~~two (~~2~~)~~ hours before the start of a **settlement interval**.

(2) A **pool participant** that submits a **bid** must submit a MW restatement redistributing, or in the case of exports reducing, the MW to represent the operating state of the **sink asset**, as soon as ~~reasonably~~ practicable, if the **sink asset** cannot comply with the current **bid** as a result of an **acceptable operational reason**.

(3) A **pool participant** must submit the reason or reasons for submitting a MW restatement under subsection 7(2) if such MW restatement is submitted within ~~two (~~2~~)~~ hours of the start of the **settlement**

interval or within the current **settlement interval**. **(4)** If a **pool participant** is responding to the **ISO** under subsection 2(2)(b) of ~~section~~Section 202.5 of the **ISO rules**, *Supply Surplus*, then the **pool participant** must submit a MW restatement for its **bid** for the applicable **sink asset** in the current hour, increasing the MW of the export **interchange transaction**.

Revision History

~~Effective~~**Date**	**Description**
~~2013-01-08~~20xx-xx-xx	~~Initial Release~~
2014-07-02	Corrected typos in subsection 2(1)(b) by updating the references to be "section 203.4" of the ISO rules instead of "section 203.3".
2013-11-08	Amended subsection 4(2), added clarity to "the operating block" in subsections 5(2) and 5(3), and corrected a subsection reference.
~~2014-07-02~~2013-01-08	~~Corrected typos in subsection 2(1)(b) by updating the references to be "section 203.4" of the ISO rules instead of "section 203.3".~~Initial Release

Applicability

1 Section 203.4 applies to:

(a) a **pool participant** with a ~~generating~~ **source asset**, excluding an import asset, that has an associated current **offer** when participating in the energy market; and

(b) the **ISO**.

Requirements

Compliance Responsibilities

2(1) A **pool participant** may only deliver energy to the **interconnected electric system** pursuant to a **dispatch** or a **directive** the **ISO** issues.

(2) A **pool participant** must:

(a) operate its ~~generating~~ **source** ~~**assets**~~**asset** or cause ~~them~~it to be operated; and

(b) respond to **dispatches** from the **ISO**,

using **good electric industry practice**, including the design, implementation and use of reasonable **dispatch** protocols, together with personnel and software systems designed to detect and address errors or omissions in a timely fashion.

Generating Asset Steady State Compliance

3(1) A **pool participant** must not, during **generating asset steady state**, vary the average MW it delivers from a ~~generating~~ **source asset** in any **10 minute clock period** outside the **allowable dispatch variance**.

(2) A **pool participant** that is supplying **regulating reserve** from a ~~generating~~ **source asset** must~~, notwithstanding subsection 3(1),~~ ensure that the average MW delivered in any **10 minute clock period** is not outside the **allowable dispatch variance** plus the **regulating reserve**.

Ramping Compliance

4(1) A **pool participant** must move the output of a ~~generating **source asset** which is:~~**source asset**, which is the subject of a **dispatch**, towards the MW level indicated in that **dispatch** within 10 minutes of, but not prior to, the time specified in the **dispatch**.

~~(a) the subject of a **dispatch**; and~~

~~(b) **ramping**~~

~~towards the MW level indicated in that **dispatch** within 10 minutes of the time specified in the **dispatch** but not prior to the time specified in the **dispatch**.~~

(2) A **pool participant** must ensure that each ~~generating~~ **source asset** reaches **generating asset steady state** in:

(a) no longer than the period of time calculated as follows:

(i) divide the change in **dispatch** MW by the **ramp rate** the **pool participant** submits;

(ii) add 40% of the time calculated in subsection 4(2)(a)(i) or 5 minutes, whichever is greater; and

(iii) add the 10 minutes referred to in subsection 4(1);

and

(b) no sooner than the period of time calculated as follows:

(i) divide the change in **dispatch** MW by the **ramp rate** the **pool participant** submits; and

(ii) subtract 40% of the time calculated in subsection 4(2)(b)(i) or 5 minutes, whichever is greater.

Operational Deviation

5(1) A **pool participant** must, if a ~~generating~~ **source asset** experiences an **operational deviation**, verbally inform the **ISO** as soon as ~~practical~~practicable of the occurrence of the **operational deviation** and provide a description of the cause if known.

(2) A **pool participant** must inform the **ISO** of the information required under subsection 5(1) on a telephone line the **ISO** designates, which must contain a voice recording system.

(3) A **pool participant** must, if an **operational deviation** extends for 20 minutes or longer, submit an **available capability** restatement or MW restatement for the~~generating~~ **source asset** that represents the operational capability of the ~~generating~~**source asset** and must do so no later than 20 minutes after the commencement of the **operational deviation**.

Exceptions to Non-Compliance

6(1) Notwithstanding the provisions set out in subsections 3, 4 and 5, the **ISO** must not determine that a **pool participant** is non-compliant with a **dispatch** for a ~~generating~~ **source asset** if the **pool participant** has met its responsibilities as set out in subsection 2 and one or more of the following circumstances occur:

(a) the~~generating~~ **source asset** is ramping into position to provide **operating reserve** in response to a **dispatch** in the 15 minutes before the time indicated in that **dispatch**;

(b) the ~~generating~~**source asset** is operating below the **minimum stable generation** level indicated in the Energy Trading System, but only if that ~~generating~~ **source asset** is:

(i) synchronizing and its **available capability** the **pool participant** submitted is equal to its **minimum stable generation** and it has received a **dispatch** for that quantity, in MW;

(ii) going off line and its **available capability** the **pool participant** submitted is equal to 0 MW and it has received a **dispatch** for that quantity, in MW;

(iii) unable to follow the **ramp rate** the **pool participant** submitted when its output is being increased to its **minimum stable generation** and the **pool participant** has submitted a verbal plan to the **ISO** indicating a proposal for ramping to **minimum stable generation**, which verbal plan must ~~be~~ provide an estimate of the time required to achieve the **ramp rate** and be updated for deviations of greater than 30 minutes or 50 MW; or

(iv) stopped at an output level not identified in the verbal plan referenced in subsection 6(1)(b)(iii) above, but which is below **minimum stable generation** for more than 30 minutes for an operational reason and the **pool participant** has submitted a restatement of the **available capability** accordingly;

(c) the ~~generating~~ **source asset** is responding to abnormal frequency through automatic **governor** or **governor system** action;

(d) an **operational deviation** has occurred and the **pool participant** has complied with subsection 5; and

(e) energy is being delivered to the **interconnected electric system** from a ~~generating~~ **source asset** while it is being tested or commissioned or both, in accordance with applicable provisions of the **ISO rules**.

Concurrent Energy and Operating Reserve Requirements

7(1) The **ISO** must, when assessing a **pool participant**'s compliance with subsections 4(3) through 4(6) of Section 205.2 of the **ISO rules**, *Issuing Dispatches and Directives for Operating Reserve* in a situation where there are concurrent energy and **spinning reserve** requirements or energy and **supplemental reserve** requirements, consider the time of the energy **dispatch** to be:

(a) 15 minutes after the **directive** for **spinning reserve** or **supplemental reserve** in the case of subsection 4(3); and

(b) the time the **pool asset** is providing the amount of **real power** described in subsection 10(1) of Section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards,* or subsection 6(1) of Section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, in the case of subsection 4(4);

(c) the later of 15 minutes after the **directive** for **spinning reserve** or **supplemental reserve** or the time of the **dispatch** in the case of subsection 4(5); and

(d) the time the **pool asset** is providing the amount of **real power** described in subsection 10(1) of Section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards,* or subsection 6(1) of Section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, in the case of subsection 4(6).

(2) The **ISO** must, when assessing a **pool participant**'s compliance with subsections 4(3) through 4(6) of Section 205.2 of the **ISO rules**, *Issuing Dispatches and Directives for Operating Reserve* in a situation where there are concurrent energy and **spinning reserve** requirements or energy and **supplemental reserve** requirements, consider the MW quantity to be the energy **dispatch** quantity plus the **spinning reserve** or **supplemental reserve** quantity while the **directive** remains in effect.

Revision History

~~Effective~~**Date**	**Description**
2023-XX-XX	
2020-09-16	Amended Section 3(1) and 3(2) to clarify generating asset steady state compliance. Administrative amendments.
2014-12-23	Added subsection 7 to address requirements in section 205.2 of the ISO rules related to concurrent energy and operating reserve.
2013-01-08	Initial release

ISO Rules
Part 200 – Markets
Division 203 Energy Market
Section 203.5 Consumption Requirements for Bids

Applicability

1 Section 203.5 applies to:

(a) a **pool participant** with a **sink asset**, excluding an export asset, that has an associated current **bid** in the energy market; and

(b) the **ISO**.

Requirements

Compliance Responsibilities

2(1) A **pool participant** who submits **bids** may only consume the **bid** energy from the **interconnected electric system** pursuant to a **dispatch** the **ISO** issues.

(2) A **pool participant** must, using **good electric industry practice**:

(a) operate its **sink assets**, or cause them to be operated; and

(b) respond to **dispatches** from the **ISO**.

Dispatch Compliance

3(1) A **pool participant** must reduce the consumption of a **sink asset**, which is the subject of a **dispatch**, towards the MW level indicated in the **dispatch** within 10 minutes of, but not prior to, the time specified in the **dispatch**. **(2)** A **pool participant** that modifies energy consumption associated with a **bid** that is subject to a **dispatch** must reach the MW level indicated in the **dispatch** in a time that is:

(a) not longer than the time calculated as follows:

(i) divide the change in **dispatch** MW by the **ramp rate** the **pool participant** submits;

(ii) add 40% of the time calculated in subsection 3(2)(a)(i) or 5 minutes, whichever is greater; and

(b) not shorter than the time calculated as follows:

(i) divide the change in **dispatch** MW by the **ramp rate** the **pool participant** submits; and

(ii) subtract 40% of the time calculated in subsection 3(2)(b)(i) or 5 minutes, whichever is greater.

(3) A **pool participant** must, when reducing the consumption of a **sink asset** that is **controllable** in accordance with subsection 3(1), maintain the following **dispatch** variance as measured from the **dispatch** quantity:

(a) plus or minus five (5) MW for a **sink asset** with a **maximum capability** of two hundred (200) MW or less; or

(b) plus or minus ten (10) MW for a **sink asset** with a **maximum capability** of greater than two hundred (200) MW.

Exceptions to Non-Compliance

4 The **ISO** must, notwithstanding subsection 3, not determine that a **pool participant** is non-compliant with a **dispatch** for a **sink asset** if the pool participant has met its responsibilities as set out in subsection 2 and one or more of the following circumstances occur:

(a) the **bid** energy is being consumed from the **interconnected electric system** from a **sink asset** while undergoing **commissioning** or testing in accordance with applicable **ISO rules**;

(b) the **sink asset** is moving into position to provide **operating reserve** in response to a **dispatch** in the 15 minutes before the time indicated in that **dispatch**; or

(c) the **sink asset** is responding to abnormal frequency through automatic **governor** or **governor system** action.

Revision History

Date	Description
	Initial release

ISO Rules
Part 200 Markets
Division 203 Energy Markets
Section 203.6 Available Transfer Capability and Transfer Path Management

Applicability

1 Section 203.6 applies to:

(a) a **pool participant** seeking to exchange or transact an import or export **interchange transaction**; and

(b) the **ISO**.

Capability Limits Determinations by the ISO

2(1) The **ISO** must determine and post on the AESO website the following capability limits in MW prior to each **settlement interval**, and also on an as required basis when **interconnected electric system** operating conditions change:

(a) the **Alberta interchange capability**;

(b) the import and export capability of the combined British Columbia and Montana transfer paths; and

(c) the import **available transfer capability** and export **available transfer capability** for each of the British Columbia, Montana and Saskatchewan transfer paths.

(2) Once the **ISO** has determined the limits under subsection 2(1), it must ensure that:

(a) the amount in MW of all transmission service for all import and export **interchange transactions** for all transfer paths does not exceed the **Alberta interchange capability** limit referenced in subsection 2(1)(a);

(b) the amount in MW of all transmission service for all import and export **interchange transactions** for the combined British Columbia and Montana transfer paths does not exceed the combined limit referenced in subsection 2(1)(b); and

(c) the amount in MW of all transmission service for all import and export **interchange transactions** for an individual transfer path does not exceed the limit for that transfer path referenced in subsection 2(1)(c).

Total Transfer Capability Determinations by the ISO

3(1) The **ISO** must determine the import **total transfer capability** and the export **total transfer capability** for an individual transfer path, in order to determine the import **available transfer capability** and the export **available transfer capability** for that transfer path.

(2) The **ISO** must make the determinations under subsection 3(1) with reference to the applicable provisions of any related **reliability standards**.

Available Transfer Capability Determinations by the ISO for a Transfer Path

4(1) The **ISO** must use the import **available transfer capability** and the export **available transfer capability** limits as referenced under subsection 2(1)(c) for an individual transfer path, as the maximum capability for scheduling **interchange transactions** on that transfer path.

(2) The **ISO** must post on the AESO website the import **available transfer capability** and the export **available transfer capability** as determined for an individual transfer path.

(3) The **ISO** must post on the AESO website as soon as is reasonably practical any change to the import **available transfer capability** or the export **available transfer capability** for an individual transfer path.

Submission of Interchange Transaction Bids and Offers by a Pool Participant

5(1) Notwithstanding subsection 3.5.2 of the **ISO rules**, *Submission Timing*, a **pool participant** with an import or export energy **interchange transaction** must submit through the **Energy Trading System** the import **offer** or export **bid** for the **interchange transaction**, as applicable, no later than two (2) hours prior to the start of the **settlement interval** in order for the **interchange transaction** to be included in the **energy market merit order**.

(2) A **pool participant** with any form of **interchange transaction** must use all reasonable efforts to procure transmission service from applicable transmission service providers in an amount in MW at least equal to the **available capability** of the **interchange transaction**, which reasonable efforts must include:

(a) determining whether there is transmission service posted by the applicable transmission service providers and available for that **interchange transaction**; and

(b) submitting a request to the applicable transmission service providers to procure the transmission service, if it has been posted and is available.

(3) If after complying with subsection (2):

(a) the **pool participant** is unable to procure all or a portion of the requested transmission service for an energy **interchange transaction**; or

(b) the transmission service for an energy **interchange transaction** is curtailed after procurement either by any transmission service provider or the **ISO**;

then such a circumstance is a reason the **pool participant** must submit a restatement of **available capability**, and may be the basis for the determination of an **acceptable operational reason** under subsection (iv) of that definition.

(4) For any **pool participant** with an **interchange transaction**, if due to a determination by the **ISO** under subsection 10 the amount in MW of the **interchange transaction** on an individual transfer path exceeds the individual transfer path **available transfer capability** allocation as determined under that subsection, then that circumstance is a reason the **pool participant** may submit a restatement of **available capability** to the level of the allocation, and may be the basis for the determination of an **acceptable operational reason** under subsection (iv) of that definition.

Submission of E-tags by Pool Participants

6(1) **Pool participants** with any import or export **interchange transactions** who have acquired transmission service must submit **e-tags** to the **ISO** for the **interchange transactions**.

(2) The **ISO** must receive **e-tags** no later than twenty (20) minutes prior to the start of the **settlement interval** in order for the energy components of the **interchange transactions** to be included in an **interchange schedule** referenced in subsection 8.

(3) A **pool participant** must submit one (1) or more **e-tags** for an energy **interchange transaction** such that the final total amount in MW agrees with the **available capability** of the

single **source asset**:

(a) as stated two (2) hours prior to the start of the **settlement interval**; or

(b) as may be restated in accordance with the provisions of this section 203.6, but in any event the final total amount in MW must not exceed the **available capability** of the single **source asset** as stated at two (2) hours prior to the start of the **settlement interval**.

(4) If:

(a) the **pool participant** is unable to procure transmission service, or the transmission service is curtailed by any transmission service provider or the **ISO**, as referenced under subsection 5(3); or

(b) there is any other change in the **available capability** for the **sink asset** or the **source asset**, as applicable;

then the **pool participant** must submit, as applicable:

(i) an energy restatement in accordance with either subsection 3.5.3.2 or subsection 3.5.4.2 of the **ISO rules**, *Mandatory Energy Restatements*; or

(ii) an **ancillary services** restatement in accordance with subsection 3.6.3 of the **ISO rules**, *Restatements.*

Validation of E-Tags by the ISO

7(1) The **ISO** must validate **e-tags** for **interchange transactions** in accordance with the provisions of this subsection 7.

(2) An **e-tag** must be validated by the **ISO** prior to the **e-tag** being included in an **interchange schedule**.

(3) The **ISO** must validate an **e-tag** with reference to the provisions of the **reliability standards**, INT-006-AB-2 *Response to Interchange Authority*.

(4) The **ISO** must reject an **e-tag**:

(a) if the **interchange transaction** is not being transacted by a **pool participant**;

(b) for an import **interchange transaction** if the source **balancing authority** is in the **WECC** and the sink **balancing authority** is the **ISO**, and the source **balancing authority** is not carrying reserves allocated for that import **interchange transaction**; or

(c) if the **e-tag** is not fully completed.

(5) If the provisions of this subsection 7 otherwise are complied with, then the **ISO** may validate and include in the **interchange schedule** any **e-tags** that are submitted after the twenty (20) minute deadline set out in subsection 6(2).

Interchange Schedules and Dispatches by the ISO

8(1) Subject to the provisions of this section 203.6, the **ISO** must include in the **interchange schedule** the energy components of **interchange transactions** if the **e-tags** for the **interchange transactions** have been:

(a) received by the submission deadline set out in subsection 6(2); and

(b) validated under subsection 7.

(2) The **ISO** must determine the **interchange schedule** for each transfer path before the start of the **settlement interval**, taking into account the allocation and constraint management procedures and sequencing set out in subsection 10 and subsection 11.

(3) Each **interchange schedule** period must be equal to the **settlement interval**, unless the **ISO** has an agreement with an adjacent **balancing authority** specifying an alternative **interchange schedule** start and end time for an individual transfer path, and in that event the timing of the **interchange schedule** for the transfer path must be governed by the form of agreement.

(4) The **ISO** must treat the energy component of a scheduled **interchange transaction** as a **dispatch** in accordance with the applicable **energy market merit order**.

(5) The **ISO** must not make any changes to an **interchange schedule** for a transfer path except if required to accommodate:

(a) the delivery of external **supplemental reserves**, **spinning reserves** or **contingency reserves**;

(b) a matter of **reliability** on the **interconnected electric system**, or a similar matter which may occur in any other **balancing authority area**;

(c) an emergency or a **system emergency** on the **interconnected electric system** or in any other **balancing authority area**;

(d) a **supply shortfall** or supply surplus matter; or

(e) any curtailments resulting from the procedures and sequencing set out in subsection 10 and subsection 11.

(6) If the **ISO** is required to accommodate any matter referred to in subsection 8(5), then the **ISO** must issue the resulting **interchange schedule** changes.

Saskatchewan Inadvertent Energy Management

9 If the **ISO** is required to manage an amount of **inadvertent energy** on the Saskatchewan transfer path, then:

(a) the **inadvertent energy** is not eligible to set the **pool price**; and

(b) **inadvertent energy** payback on the Saskatchewan transfer path must not exceed twenty-five (25) MW.

Available Transfer Capability Allocations for Transfer Paths

10(1) At approximately eighty-five (85) minutes prior to a **settlement interval**, the **ISO** must determine whether the capability limits under subsection 2 may be exceeded, and if so then the **ISO** must determine the individual transfer path **available transfer capability** allocations in accordance with the following procedures:

(a) the **ISO** must calculate the net **interchange transaction** amount in MW, at each potential **system marginal price**, taking into account:

(i) the energy **interchange transaction** amounts in MW, and the prices for **bids** and **offers**;

(ii) the **interchange transaction** amount in MW for **ancillary services**; and

(iii) applicable counterflows; and

(b) the **ISO** may exclude any **wheel through transaction** amounts in MW if those amounts will not result in any limits or allocations under this section 203.6 being exceeded.

(2) The **ISO** must comply with the following additional procedures in the following sequence to determine the allocation of each of the individual transfer path **available transfer capability** allocations:

(a) the net amount in MW of all **interchange transactions** for the individual transfer path must be compared to the limit determined for that individual transfer path as referenced in subsection 2(1)(c), and:

(i) if that net amount is equal to or greater than the limit, then the allocation must be set at that limit; and

(ii) if that net amount is less than the limit, then the allocation must be set at that net amount;

(b) for the British Columbia and Montana transfer paths, the sum in MW of their individual transfer path allocations calculated under subsection 10(2)(a) must be compared to the combined British Columbia and Montana transfer path limit referenced in subsection 2(1)(b);

(c) if the combined transfer path limit of subsection 2(1)(b) is not exceeded, then the allocations must remain as determined in accordance with subsection 10(2)(a), but if it is exceeded, then a further allocation must be done in accordance with the following sequence in order to ensure the combined transfer path limit as determined under subsection 2(1)(b) is not exceeded:

(i) first, the British Columbia, or the Montana, or both the British Columbia and the Montana transfer path allocations must be reduced as necessary by the applicable **ancillary services** type **interchange transaction** amounts in MW;

(ii) second, the British Columbia, or the Montana, or both the British Columbia and the Montana transfer path allocations must be reduced as necessary by the applicable energy **interchange transaction** amounts in MW, with the reduction being in reverse merit order based on **bid** and **offer** prices; and

(iii) third, if there are equally priced British Columbia and Montana energy **interchange transactions**, then the British Columbia and Montana allocations must be reduced on a pro rata basis using the following formula:

the MW allocation for each of the Montana and British Columbia transfer paths as determined in accordance with subsection 10(2)(a), as may be reduced under subsections 10(2)(c)(i) and 10(2)(c)(ii);

divided by

the sum in MW calculated under in subsection 10(2)(b) as may be

reduced under subsections 10(2)(c)(i) and 10(2)(c)(ii);

multiplied by

the amount by which that sum exceeds the combined British Columbia and Montana transfer path limit referenced in subsection 2(1)(b);

(d) the allocation resulting from subsection 10(2)(c) plus the Saskatchewan transfer path allocation calculated under subsection 10(2)(a) must then be compared to the **Alberta interchange capability** limit referenced in subsection 2(1)(a); and

(e) if the **Alberta interchange capability** limit is not exceeded, then the allocations must remain as determined in accordance with subsections 10(2)(a) and 10(2)(c), but if that limit is exceeded, then a further allocation of **available transfer capability** must be done in accordance with the following sequence in order to ensure that the **Alberta interchange capability** limit as determined under subsection 2(1)(a) is not exceeded:

(i) first, any individual one (1), or any combination of the British Columbia, Montana, and Saskatchewan transfer path allocations must be reduced as necessary by the applicable **ancillary service** type **interchange transaction** amount in MW;

(ii) second, any individual one (1), or any combination of the British Columbia, Montana, and Saskatchewan transfer path allocations must be reduced as necessary by the applicable energy **interchange transaction** amounts in MW, with the reduction being in reverse merit order based on **bid** and **offer** prices; and

(iii) third, if there are equally priced British Columbia, Montana and Saskatchewan energy **interchange transactions,** then the British Columbia, Montana and Saskatchewan allocations must be reduced on a pro rata basis using the following formula:

the MW allocation for each of the Montana and British Columbia transfer paths as determined in accordance with subsection 10(2)(c) and the Saskatchewan transfer path allocation under subsection 10(2)(a), as may be reduced under subsections 10(2)(e)(i), and 10(2)(e)(ii);

divided by

the sum in MW referred to in subsection 10(2)(d), as may be reduced under subsections 10(2)(e)(i) and 10(2)(e)(ii);

multiplied by

the amount by which that sum exceeds the **Alberta interchange capability** limit referenced in subsection 2(1)(a);

(3) At approximately eighty-five (85) minutes prior to a **settlement interval**, the **ISO** must post on the AESO website:

(a) the total in MW of all energy import **offers** and export **bids** received for each transfer path and the combinations of transfer paths referenced under subsection 2, at two (2) hours prior to the start of the **settlement interval** in accordance with subsection 5(1);

(b) the limits referenced under subsection 2; and

(c) all allocations made under this subsection 10.

(4) If, after eighty-five (85) minutes prior to a **settlement interval**, any of the limits referenced in subsection 2 have decreased, then the **ISO** must curtail **interchange transactions** in accordance with the procedures and sequence set out in subsection 11.

Transfer Path Constraint Management

11(1) If, after carrying out the procedures set out in subsection 10, within fifteen (15) minutes prior to the start of the **settlement interval** and based on the **e-tags** submitted under subsection 6 the limits referenced in subsection 2 are still exceeded, then the **ISO** must curtail **interchange transactions** in accordance with the sequential procedures set out in this subsection 11.

(2) The **ISO** must determine the effective **interchange transactions** for mitigating a constraint caused by limits being exceeded at the **Alberta interchange capability** level, the combined Montana and BC transfer path capability level, or at each individual transfer path level.

(3) The **ISO** may determine that any **wheel through transaction** is not effective in mitigating a constraint, based on its analysis under subsection 11(2).

(4) The **ISO** must comply with the following procedures in the following sequence to mitigate the remaining constraint:

(a) assess all **interchange transactions** for transmission services against the limits referenced under subsection 2 and allocations made under subsection 10, and determine the **interchange transactions** that will be effective in mitigating the constraint;

(b) curtail the transmission service of **interchange transactions** under the sequencing set out in subsection 11(4)(c), mitigating the constraint in the following order at the following levels, where effective:

(i) an individual transfer path limit level;

(ii) the combined Montana and British Columbia transfer path level; or

(iii) the **Alberta interchange capability** level; and

(c) curtail at the effective level:

(i) **inadvertent energy** payback **interchange transactions**, prior to the curtailment of any **interchange transactions** on the Saskatchewan transfer path;

(ii) transmission services of any effective **interchange transactions** for **ancillary services**;

(iii) transmission services of any effective energy **interchange transactions** based on **bid** and **offer** prices in reverse merit order; and

(iv) transmission services of any effective energy **interchange transactions** on a pro rata basis in accordance with the following formula:

scheduled amount of each effective **interchange transaction**;

multiplied by

total amount necessary to mitigate the constraint;

divided by

total scheduled amount of all effective **interchange transactions**.

Revision History

Effective	***Description***
2013-08-13	Initial release

ISO Rules
Part 200 Markets
Division 204 Dispatch Down Service Market
Section 204.1 Offers for Dispatch Down Service

Applicability

1 Section 204.1 applies to:

(a) a **pool participant**

when providing **dispatch down service**.

Requirements

Submission Method and Timing

2(1) A **pool participant** may only submit an **offer** for **dispatch down service** in respect to a **source asset** listed opposite their name in the **ISO** list of **pool assets**.

(2) A **pool participant** submitting an **offer** for **dispatch down service** must submit such **offer**:

(a) prior to two (2) hours before the start of the **settlement interval**; and

(b) no earlier than 00:00, seven (7) **days** prior to the **day** that the **offer** is effective.

Option to Offer and Offer Content

3(1) A **pool participant** with a **source asset** may submit an **offer** for **dispatch down service**.

(2) A **pool participant** must include in its **offer** for **dispatch down service**:

(a) a negative price in $/MWh to the nearest cent per MWh which is not lower than minus nine hundred and ninety nine dollars and ninety-nine cents (-$999.99) and not higher than zero dollars ($0);

(b) a quantity in MW which is not less than ten (10) MW; and

(c) an indication that the **operating block** is a **flexible block**.

(3) A **pool participant** submitting an **offer** for **dispatch down service** must ensure that the MW does not total more than the **available capability** less the **minimum stable generation** of the **source asset**.

Revision History

Effective	Description
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 204 Operating Reserves Market
Section 204.2 Issuing Dispatches for Dispatch Down Service

Applicability

1 Section 204.2 applies to:

(a) the **ISO**

when procuring **dispatch down service**.

Requirements

Eligibility

2 The **ISO** must not issue a **dispatch** for **dispatch down service** to a **source asset** if:

(a) **transmission must-run** is already in use in the area in which the **source asset** is located unless such **transmission must-run** is in use solely for voltage and reactive support;

(b) the **dispatch** would cause **transmission must-run** to be required in the area in which the **source asset** is located; or

(c) the **dispatch** would be in an area where one (1) or more **source assets** have been constrained down, meaning they have received **directives** to reduce production to a lower MW output than the **in merit** MW output level.

Conditions for Dispatch Down Service

3(1) The **ISO** must issue a **dispatch** instructing a **source asset** to reduce energy delivery for any **operating block** that is **in merit** if that **source asset** is the subject of an **offer** for **dispatch down service** which is eligible to receive a **dispatch** under subsection 2 and one (1) or both of the following conditions exist:

(a) with respect to a **dispatch** for the provision of **dispatch down service** that is issued in response to **transmission must-run** conditions:

(i) the system marginal price is less than or equal to the reference price;

(ii) a **source asset** has received a **dispatch** or **directive** for **transmission must-run**; and

(iii) the calculation in subsection 5(1) results in a positive number;

(b) with respect to a **dispatch** for the provision of **dispatch down service** that is issued in response to a **directive** for energy from a **long lead time asset**:

(i) a **pool participant** has received a **directive** for energy from a **long lead time asset**;

(ii) a **long lead time asset** is delivering its energy in accordance with such **directive**; and

(iii) **dispatches** have not been issued for all of the **operating blocks** that are **in merit** in the energy market for the current **settlement interval**.

Equally-Priced with the Reference Price

4 The **ISO** must, if an **operating block** in an **offer** or **bid** for MW in the energy market is priced equally with the reference price, consider such energy **operating block** to be **in merit** before issuing **dispatches** for **dispatch down service**.

MW in Response to a Transmission Must-Run Condition

5(1) The **ISO** must calculate the MW to include in a **dispatch** for the provision of **dispatch down service** that is issued in response to a **transmission must-run** condition as follows:

MW of out of merit energy for **transmission must-run**;

plus

MW of out of merit energy issued a **directive** for energy from a **long lead time asset**;

minus

MW of energy included in a **directive** instructing the **source asset** to reduce energy production.

(2) Notwithstanding subsection 5(1), the **ISO** must not deduct the quantity of energy included in a **directive** instructing a **source asset** to reduce energy production if the system is in a state of **supply surplus**.

MW in Response to a Directive for Energy from a Long Lead Time Asset

6 The **ISO** must calculate the MW to include in a **dispatch** for the provision of **dispatch down service** that is issued in response to a **directive** for energy from a **long lead time asset** as follows:

MW of out of merit energy issued a **directive** for energy from a **long lead time asset**;

minus

MW in a constrained down **directive**.

Issuing Dispatches for Lesser Quantities of Dispatch Down Service

7 Notwithstanding subsections 5 and 6, the **ISO** may issue a **dispatch** for **dispatch down service** in a quantity less than the MW determined in such subsections during the following periods:

(a) the period of time from when the **ISO** has issued **dispatches** for **operating blocks** with **offer** prices up to the reference price, instructing **source assets** to terminate the provision of **dispatch down service** but prior to issuing **dispatches** for **operating blocks** that are greater than the reference price; and

(b) the period of time from when the **ISO** has issued **dispatches** for **operating blocks** with **offer** prices down to the reference price instructing **source assets** to provide **dispatch down service**.

Terminating Dispatch Down Service

8(1) The **ISO** must, in the case of a **source asset** that has received a **dispatch** for termination of the provision of **dispatch down service** in response to a **transmission must-run** condition, issue a **dispatch** instructing the **source asset** to deliver energy prior to issuing a **dispatch** for any **operating block** with an **offer** price that is greater than the reference price.

(2) The **ISO** must, in the case of a **source asset** that has received a **dispatch** for termination of the provision of **dispatch down service** in response to a **directive** for energy from a **long lead time asset**, issue a **dispatch** instructing the **source asset** to deliver energy following the issuance of a **dispatch** for the highest priced **operating block** that is **in merit** for the current **settlement interval**.

Revision History

Effective	Description
2013-01-08	Initial release
2014-03-27	Amended subsection 2(a) and 3(1)(a)(iii) to correct inadvertent errors made during the Transition of Authoritative Document project.

ISO Rules
Part 200 Markets
Division 204 Dispatch Down Service Market
Section 204.3 Dispatch Down Service Restatements

Applicability

1 Section 204.3 applies to:

(a) a **pool participant**

when providing **dispatch down service**.

Requirements

Price Restatements

2 A **pool participant** that submits an **offer** for **dispatch down service** may submit a price restatement but must only do so prior to two (2) hours before the start of a **settlement interval**.

MW Restatements

3(1) A **pool participant** that submits an **offer** for **dispatch down service** may submit a MW restatement prior to two (2) hours before the start of a **settlement interval**.

(2) A **pool participant** must, within two (2) hours of the start of the **settlement interval** or in the current **settlement interval**, submit a MW restatement as soon as reasonably practicable, if the **source asset** cannot comply with the current **offer** for **dispatch down service** or with a **dispatch** for **dispatch down service** as a result of an **acceptable operational reason**.

(3) A **pool participant** must submit the reason or reasons for submitting a MW restatement in accordance with subsection 3(2).

Revision History

Effective	Description
2013-01-08	Initial Release

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.1 Offers for Operating Reserve

Applicability

1 Section 205.1 applies to:

(a) a **pool participant**; and

(b) the **ISO**,

when providing or procuring **operating reserve** in either one (1) or both of the active and standby **operating reserve** markets.

Requirements

Submission Method and Timing

2(1) A **pool participant** may only submit an **offer** for **operating reserve** in respect to an active **pool asset** or an approved virtual asset for which they have authority to submit **offers** for **operating reserve**.

(2) A **pool participant** must, if it submits an **offer** for **operating reserve**, do so via the electronic trading platform the **ISO** specifies.

(3) A **pool participant** must, in order to be paid for **operating reserve**, if it submits an **offer** for an approved virtual asset that is accepted, designate one (1) or more of its **pool assets** to deliver the **operating reserve** associated with the **offer** and do so:

(a) if the **ISO** is procuring for one (1) **day**, by 11:30 a.m.; or

(b) if the **ISO** is procuring for multiple **days**, by 1:00 p.m.;

on the **day** the **pool participant** submits such **offer**.

Option to Submit an Offer and Offer Content

3(1) A **pool participant** may for:

(a) each **on peak**, **off peak** and **super peak** period; and

(b) each of its **pool assets** or approved virtual assets described in subsection 2(1);

submit an **offer** for **operating reserve**.

(2) A **pool participant** must include in each **offer** for **operating reserve**:

(a) for active **operating reserve**, a price in $/MWh to the nearest cent per MWh which does not exceed the **bid** price of the **ISO** and is a premium or discount to the **pool price**;

(b) for standby **operating reserve**:

(i) a premium price, which must not exceed ninety-nine dollars per MWh ($99.00/MWh), being the price at which the **pool participant** is prepared to put the **pool asset** in a position to be able to provide the **operating reserve** capacity; and

(ii) an activation price, being a price in $/MWh to the nearest cent per MWh which is the price at which the **pool participant** is prepared to provide the **operating reserve** capacity;

(c) a quantity in MW which:

(i) in the case of the first **offer** in an **on peak**, **off peak** or **super peak** period, is a minimum of five (5) MW per **pool asset** or approved virtual asset in each **hour ending** and for each type of **operating reserve** service;

(ii) consists of the same quantity in MW for each **hour ending** in each of the **on peak**, **off peak** and **super peak** periods;

(iii) includes a quantity in MW for each **hour ending** in each **on peak**, **off peak** and **super peak** period in which they have made an **offer**; and

(iv) does not include a quantity in MW the **ISO** has already procured in an earlier **offer**.

(d) the type of **operating reserve** service, being **spinning reserve**, **supplemental reserve** for load or for generation, **regulating reserve**, or such other types as the **ISO** allows;

(e) whether it is for active or standby **operating reserve**; and

(f) whether it is for the **on peak**, **off peak** or, if applicable, **super peak** period.

(3) A **pool participant** must, if it submits an **offer** for a quantity in MW that exceeds the amount the **ISO** qualified the **pool asset** or approved virtual asset to provide, update such **offer** to reflect a quantity in MW that does not exceed the qualified amount and must do so by the timelines set out in subsection 2(3).

Alternative Submission Methods

4 A **pool participant** must:

(a) notwithstanding any other method or timing requirement in this section 205.1; and

(b) if there is a problem with the electronic trading platform;

submit an **offer** for **operating reserve** in accordance with the protocol the electronic trading platform establishes or the **ISO** specifies which may include an over-the-counter trading process.

Acceptance of Offers

5 The **ISO** must, to the extent there are sufficient **offers**, procure **operating reserve** for all quantities in MW it requires at the close of the trading session for each type of **operating reserve** by accepting as many of the **offers** that are in merit as are required to meet the **ISO**'s forecasted requirements for each type of **operating reserve** service.

Revision History

Effective	Description
2014-12-23	Initial release

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.2 Issuing Dispatches and Directives for Operating Reserve

Applicability

1 Section 205.2 applies to:

(a) a **pool participant**; and

(b) the **ISO**,

during normal market conditions when providing and utilizing **operating reserve** that the **ISO** has procured.

Requirements

Issuing Dispatches and Directives

2(1) The **ISO** must issue **dispatches** for all available active **operating reserve**.

(2) The **ISO** must, when active **operating reserve** is not sufficient to meet requirements, use the **merit order** to issue **dispatches** for standby **operating reserve**.

(3) The **ISO** must, if it determines that the delivery of additional **real power** from **operating reserve** is required to ensure the safe and reliable operation of the **interconnected electric system** or to meet reserve sharing group requirements, issue a **directive** to a **pool participant** that has accepted a **dispatch** for **supplemental reserve** or **spinning reserve**, as applicable.

Dispatch and Directive Quantities

3(1) The **ISO** may only issue a **dispatch** or **directive** for a quantity of **operating reserve** that is equal to or less than the MW indicated in the corresponding **offers** in the Energy Trading System.

(2) The **ISO** may, notwithstanding subsection 3(1), issue a **directive** for the required additional quantity of **operating reserve** if it has:

(a) issued **dispatches** for quantities represented in all **offers** for **operating reserve**; and

(b) determined that it requires additional **operating reserve** to ensure the safe and reliable operation of the **interconnected electric system**.

Concurrent Energy and Operating Reserve

4(1) A **pool participant** must, in order to be paid for **operating reserve**, comply with subsections 4(2) and 4(3).

(2) A **pool participant** must, if it receives an energy market **dispatch** while it is responding to a **dispatch** for **operating reserve**, continue to provide the **operating reserve**.

(3) A **pool participant** must, if it receives a **directive** for **spinning reserve** or **supplemental reserve** while responding to a **dispatch** to decrease the **real power** output of the **pool asset** in the energy market:

(a) cease responding to the **dispatch** in the energy market;

(b) provide the **spinning reserve** quantity in accordance with section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or the **supplemental reserve** quantity in accordance with section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, as applicable; and

(c) commence or resume response to the **dispatch** in the energy market fifteen (15) minutes after the receipt of the **directive** for **spinning reserve** or **supplemental reserve**.

(4) A **pool participant** must, if it receives a **directive** for **spinning reserve** or **supplemental reserve** while responding to a **dispatch** to increase the **real power** output of the **pool asset** in the energy market:

(a) provide the **spinning reserve** quantity in accordance with section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or the **supplemental reserve** quantity in accordance with section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, as applicable; and

(b) commence or resume the response to the **dispatch** in the energy market after first achieving the **spinning reserve** or **supplemental reserve** quantity.

(5) A **pool participant** must, if it receives a **dispatch** to decrease the **real power** output of the **pool asset** any time after a **directive** for **spinning reserve** or **supplemental reserve** and while the **directive** remains in effect:

(a) not respond to the **dispatch** in the energy market for fifteen (15) minutes after receiving the **directive** for **spinning reserve** or **supplemental reserve**;

(b) continue to provide the **spinning reserve** quantity in accordance with section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or the **supplemental reserve** quantity in accordance with section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, as applicable; and

(c) start responding to the **dispatch** in the energy market the later of fifteen (15) minutes after the receipt of the **directive** for **spinning reserve** or **supplemental reserve** or the time of the **dispatch**.

(6) A **pool participant** must, if it receives a **dispatch** to increase the **real power** output of the **pool asset** any time after a **directive** for **spinning reserve** or **supplemental reserve** and while the **directive** remains in effect:

(a) continue to provide the **spinning reserve** quantity in accordance with section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or the **supplemental reserve** quantity in accordance with section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, as applicable; and

(b) start responding to the **dispatch** in the energy market after first achieving the **spinning reserve** or **supplemental reserve** quantity.

Concurrent Transmission Must-Run and Operating Reserve

5(1) A **pool participant** must, if it receives a **dispatch** for contracted **transmission must-run** while under a **dispatch** or **directive** for **operating reserve**, provide the **transmission must-run** and any **operating reserve** that was the subject of a **dispatch** or **directive**.

(2) A **pool participant** must, if it is unable to provide the entire **transmission must-run** and **operating reserve** referenced in subsection 5(1), provide the **transmission must-run** first and submit a restatement for the **operating reserve** in accordance with subsection 3 of Section 205.3 of the **ISO rules**, *Restatements for Operating Reserve*.

Concurrent Dispatch Down Service and Operating Reserve

6(1) A **pool participant** must, if it receives a **dispatch** for **operating reserve** capacity while it is participating in the **dispatch down service** market, comply with both the **dispatch** for **dispatch down service** and any other **dispatch** or **directive** for energy or **operating reserve**.

(2) A **pool participant** must, if it is unable to provide the entire **dispatch down service** and **operating reserve** referenced in subsection 6(1), provide **operating reserve** first.

Revision History

Effective	Description
2014-12-23	Initial release

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.3 Restatements for Operating Reserve

Applicability

1 Section 205.3 applies to:

(a) a **pool participant**,

when providing **operating reserve** pursuant to an **offer** the **ISO** accepts.

Requirements

General

2 A **pool participant** must submit all restatements and substitutions referred to in this Section 205.3 via the Energy Trading System.

Restatements for Offers

3(1) A **pool participant** that submits an **offer** for **operating reserve** may only submit a restatement for a quantity higher than the most recent offer quantity prior to thirty (30) minutes before the start of the hour.

(2) A **pool participant** that submits an **offer** for **supplemental reserve** or **spinning reserve** may submit a restatement for a quantity lower than the most recent **offer** quantity prior to receiving a **directive** to provide **supplemental reserve** or **spinning reserve**.

(3) A **pool participant** that submits an **offer** for **regulating reserve** may submit a restatement for a quantity lower than the most recent **offer** quantity at any time.

(4) A **pool participant** that submits an **offer** must, as soon as reasonably practicable, submit a restatement to represent the operating state of the **pool asset** if:

(a) the **pool asset** is no longer able to deliver the MW set out in the **offer**; or

(b) the **pool participant** is not able to meet the requirements set out in Section 205.4 of the **ISO rules**, *Regulating Reserve Technical Requirements and Performance Standards*, Section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or Section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards*, as applicable.

(5) A **pool participant** that submits a restatement must restate to zero (0) or to no less than five (5) MW for each **pool asset**.

(6) Notwithstanding subsection 3(1) of this Section 205.3 and subsection 2 of Section 205.2 of the **ISO rules**, *Issuing Dispatches and Directives for Operating Reserve*, the **ISO** may, if a **pool participant** submits a restatement for a quantity higher than the original **offer** quantity, choose not to issue a **dispatch** for a quantity representing the incremental higher amount.

Pool Asset Substitutions

4 A **pool participant** may substitute one (1) or more **pool assets** to provide **operating reserve** for another **pool asset**, if:

(a) the **ISO** pre-approves the **pool participant** to make such substitutions and enables the Electronic Trading System as required;

(b) such substitutions are submitted no later than one (1) hour before the start of the delivery hour;

(c) the **pool participant** is substituting among **pool assets** that the **ISO** has qualified to provide the same type of **operating reserve** pursuant to subsection 4 of Section 205.4 of the **ISO rules**, *Regulating Reserve Technical Requirements and Performance Standards* , subsection 4 of Section 205.5 of the **ISO rules**, *Spinning Reserve Technical Requirements and Performance Standards* or subsection 4 of Section 205.6 of the **ISO rules**, *Supplemental Reserve Technical Requirements and Performance Standards* ; and

(d) such substitutions result in a minimum of five (5) MW of **operating reserve** for each **pool asset**.

Revision History

Date	Description
2018-02-01	Revisions to subsection 4(c) to be technology agnostic; and Administrative revisions.
2014-12-23	Initial release

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.4 Regulating Reserve Technical Requirements and Performance ~~Standards~~ Standard

Applicability

1 Section 205.4 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Application for Qualification to Provide Regulating Reserve

2(1) A **pool asset** must be qualified by the **ISO** in order to provide **regulating reserve**.

(2) A **pool participant** seeking to have the **ISO** qualify a **pool asset** ~~qualified by the **ISO**~~ to provide **regulating reserve** must provide the **ISO** with:

(a) a completed application form, available on the AESO website; and

(b) the data and records that the **ISO** specifies in the application form.

Eligibility to Provide Regulating Reserve

3(1) A **pool participant** seeking to have the **ISO** qualify its **pool asset** ~~qualified by the **ISO**~~ to provide **regulating reserve** must ensure that its **pool asset** has at least one ~~(1)~~ **regulating reserve resource** that is:

(a) at a minimum, capable of providing:

(i) 15 MW of **regulating reserve**;

(ii) the amount of **real power** applied for, at either the high limit or the low limit of the **regulating reserve** range, for a period of up to ~~sixty (60) minutes~~1 hour;

(iii) without manual intervention, **real power** movement in the direction of the latest **automatic generation control** signal within no more than:

A. ~~twenty-eight (~~28~~)~~ seconds of receiving an **automatic generation control** signal; and

B. ~~forty (~~40~~)~~ seconds of receiving an **automatic generation control** signal reversal; and

(b) equipped with a **governor** or **governor system** that:

(i) is responsive to both over frequency and under frequency events;

(ii) has a total deadband of ~~equal to or~~ less or equal to than 0.036 Hz;

(iii) has a droop setting ~~equal to or~~ greater than or equal to 3% but less than or equal to 5% based on the maximum operating range of the **regulating reserve resource**, as

specified by the **ISO**;

(iv) has no time delays, ramp characteristics or other control settings that prevent the **regulating reserve resource** from providing an immediate, automatic and sustained response to frequency deviations;

(v) has a sample rate of at least 20 samples per second;

(vi) has a resolution of at least 0.004 Hz;

(vii) is not acting as a **governor** or **governor system** for more than one ~~(1)~~ **regulating reserve resource**; and

(viii) continues to be responsive to **automatic generation control** signals during frequency deviations between 58.9 Hz and 61 Hz.

(2) The requirements set out in subsections 3(1)(b)(v) and (vi) do not apply to a **pool asset** that provides **regulating reserve** from a **generating unit** that is equipped with an analog **governor**, as of December 23, 2014, until such time as the **governor** is replaced.

Qualification of a Pool Asset to Provide Regulating Reserve

4(1) The **ISO** may qualify a **pool asset** to provide **regulating reserve** if one ~~(1)~~ or more **regulating reserve resources** of the **pool asset** meet the eligibility criteria set out in subsection 3.

(2) The **ISO** must, after qualifying a **pool asset** under subsection 4(1), determine the **real power** quantity in MW that each **regulating reserve resource** of the **pool asset** is capable of providing, with consideration given to the following:

(a) whether the **regulating reserve resource** is capable of a minimum **ramp rate** in MW per minute equal to 10% of the **real power** applied for under subsection 2(2);

(b) whether the **regulating reserve resource** participates in a **remedial action scheme**;

(c) the total **operating reserve** that could be lost during a single **contingency**;

(d) the maximum **real power** capability and minimum **real power** capability of each **regulating reserve resource** of the **pool asset**; and

(e) any other factors that the **ISO** considers relevant.

(3) The **ISO** must advise a **pool participant** whether its **pool asset** is qualified to provide **regulating reserve** within ~~sixty (~~60~~)~~ **days** of the **ISO** receiving a completed application under subsection 2(2).

Performance Requirements when under Dispatch to Provide Regulating Reserve

5(1) A **pool participant** must ensure that, following the receipt of a **dispatch** to provide **regulating reserve**, one ~~(1)~~ or more **regulating reserve resources** of the **pool asset** are positioned for the **regulating reserve** range indicated in the **dispatch**.

(2) A **pool participant** must ensure that each **regulating reserve resource** being used to provide

regulating reserve meets the requirements set out in subsection 5(1) beginning at:

(a) the time stated in the **dispatch**, for a **dispatch** with a time more than ~~fifteen (~~15~~)~~ minutes from the time the **pool participant** receives the **dispatch**; or

(b) the time stated in the **dispatch** or as soon as possible thereafter, but in any event, not more than ~~fifteen (~~15~~)~~ minutes after receiving the **dispatch**, for a **dispatch** with a time ~~fifteen (~~15~~)~~ minutes or less from the time the **pool participant** receives the **dispatch**.

(3) A **pool participant** must ensure that, after positioning each **regulating reserve resource** being used to provide **regulating reserve** in accordance with subsection 5(1), the **regulating reserve** control status is sent to the **ISO**:

(a) indicating that the **regulating reserve resource** is enabled to provide **regulating reserve**; and

(b) identifying the high and low limits of the **regulating reserve** range.

(4) The **ISO** may issue an **automatic generation control** signal to a **pool asset** or a **regulating reserve resource** any time after the **regulating reserve resource** being used to provide **regulating reserve** has met the requirements set out in subsection 5(3).

(5) A **pool participant** must ensure that the **automatic generation control** signal ~~issued by~~ the **ISO** issues in accordance with subsection 5(4) can move each **regulating reserve resource** being used to provide **regulating reserve** within the **regulating reserve** range.

(6) A **pool participant** must ensure that each **regulating reserve resource** being used to provide **regulating reserve** responds to an **automatic generation control** signal change:

(a) with a minimum **ramp rate** in MW per minute of 10% of the **real power** quantity qualified for under subsection 4(2); and

(b) in accordance with time delays set out in subsection 3(1)(a)(iii).

(7) A **pool participant** must ensure that the **regulating reserve resources** being used to provide **regulating reserve** maintain a output level equal to the latest **automatic generation control** signal within a total tolerance of plus or minus:

(a) 1 MW of the **regulating reserve** range for a **regulating reserve** range less than or equal to 20 MW; or

(b) 5% of the **regulating reserve** range for a **regulating reserve** range greater than 20 MW.

(8) A **pool participant** will not be paid for **regulating reserve** unless the **pool participant** ensures that the **regulating reserve resources** being used to provide **regulating reserve** meet the requirements set out in subsections 5(1), 5(2), 5(3), 5(5), 5(6) and 5(7) for as long as the **dispatch** is in effect.

Frequency Response Requirements when under Dispatch to Provide Regulating Reserve

6(1) A **pool participant** must ensure that, while its **pool asset** is under **dispatch** to provide **regulating**

reserve, the **governor** or **governor system** of each **regulating reserve resource** providing **regulating reserve** is operating such that ~~it is~~:

(a) it is in service at all times;

(b) it is operating without load limiters or other control systems including outer control loops that would prevent the **governor** or **governor system** from achieving the maximum frequency response; and

(c) the response of the **governor** or **governor system** and the **automatic generation control** signal of the **regulating reserve resource** is coordinated to provide both primary frequency control and response to the **automatic generation control** signal.

(2) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **regulating reserve**, the change in **real power** output of each **regulating reserve resource** being used to provide **regulating reserve** is:

(a) continuously proportional to the measured frequency;

(b) in accordance with the droop setting set out in subsection 3(1)(b)(iii); and

(c) limited to the maximum **real power** capability of the **regulating reserve resource** that is available at the time of the frequency event

for any change in frequency where the frequency goes outside the deadband set out in subsection 3(1)(b)(ii).

(3) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **regulating reserve**, each **regulating reserve resource** being used to provide **regulating reserve** sustains the change in **real power** set out in subsection 6(2) for any change in frequency where the frequency is outside of the deadband set out in subsection 3(1)(b)(ii).

(4) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **regulating reserve**, for any change in frequency where the frequency is outside the deadband set out in subsection 3(1)(b)(ii), other resources within the **pool asset** do not change their **real power** load level as a result of the change in **real power** of the **regulating reserve resource**, unless such a change does not negatively impact frequency response of the **pool asset**.

(5) A **pool participant** must ensure that, for the applicable minimum time period set out in Appendix 1, each **regulating reserve resource** being used to provide **regulating reserve** will not trip as a result of under frequency or over frequency deviations while the **pool asset** is under a **dispatch** to provide **regulating reserve**.

Maintaining Connection when under Dispatch to Provide Regulating Reserve

7 A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **regulating reserve**, the **regulating reserve resource** remains connected to the **interconnected electric system** and remains frequency responsive in accordance with the requirements set out in subsection 6.

Measuring Frequency Response when under Dispatch to Provide Regulating Reserve

8 For the purpose of subsection 6, frequency response performance is measured at:

(a) the stator winding terminals of a **generating unit**~~;~~ or synchronous **energy storage resource**;

(b) the circuit breaker or disconnection device that is electrically closest to each load;

(c) the alternating current terminal closest to each inverter based ~~technology~~resource;

(d) the **collector bus** for **aggregated** ~~generating~~ **facilities**; or

(e) a point ~~designated by~~ the **ISO** designates.

Other Facility Arrangements

9 The **ISO** may, for the purposes of evaluating frequency response performance, consider other facility arrangements if the combined change in **real power** demonstrates in aggregate that they meet the performance requirements set out in subsection 6 for a single **regulating reserve resource**.

Test Requirements

10 The **ISO** may request a **pool participant** to test a **regulating reserve resource**:

(a) prior to allowing the **regulating reserve resource** to provide **regulating reserve**;

(b) if the **ISO** provides evidence that the **regulating reserve resource** exhibits behaviour that is inconsistent with the requirements of this Section 205.4; or

(c) if the **ISO** otherwise determines that such testing is necessary.

Maintaining Eligibility to Provide Regulating Reserve

11(1) The **ISO** may issue a notice suspending the ability of a **pool participant** to provide **regulating reserve** if the **pool participant** does not comply with:

(a) a testing request pursuant to subsection 10;

(b) any other provision of this Section 205.4; or

(c) other **ISO rules** that affect the provision of **regulating reserve**.

(2) A **pool participant** that has received a suspension notice issued pursuant to subsection 11(1) ~~may~~must not submit an **offer** for **regulating reserve** until the **ISO** confirms that the **pool participant** is compliant with this Section 205.4 and all other **ISO rules** that affect the provision of **regulating reserve**.

Appendices

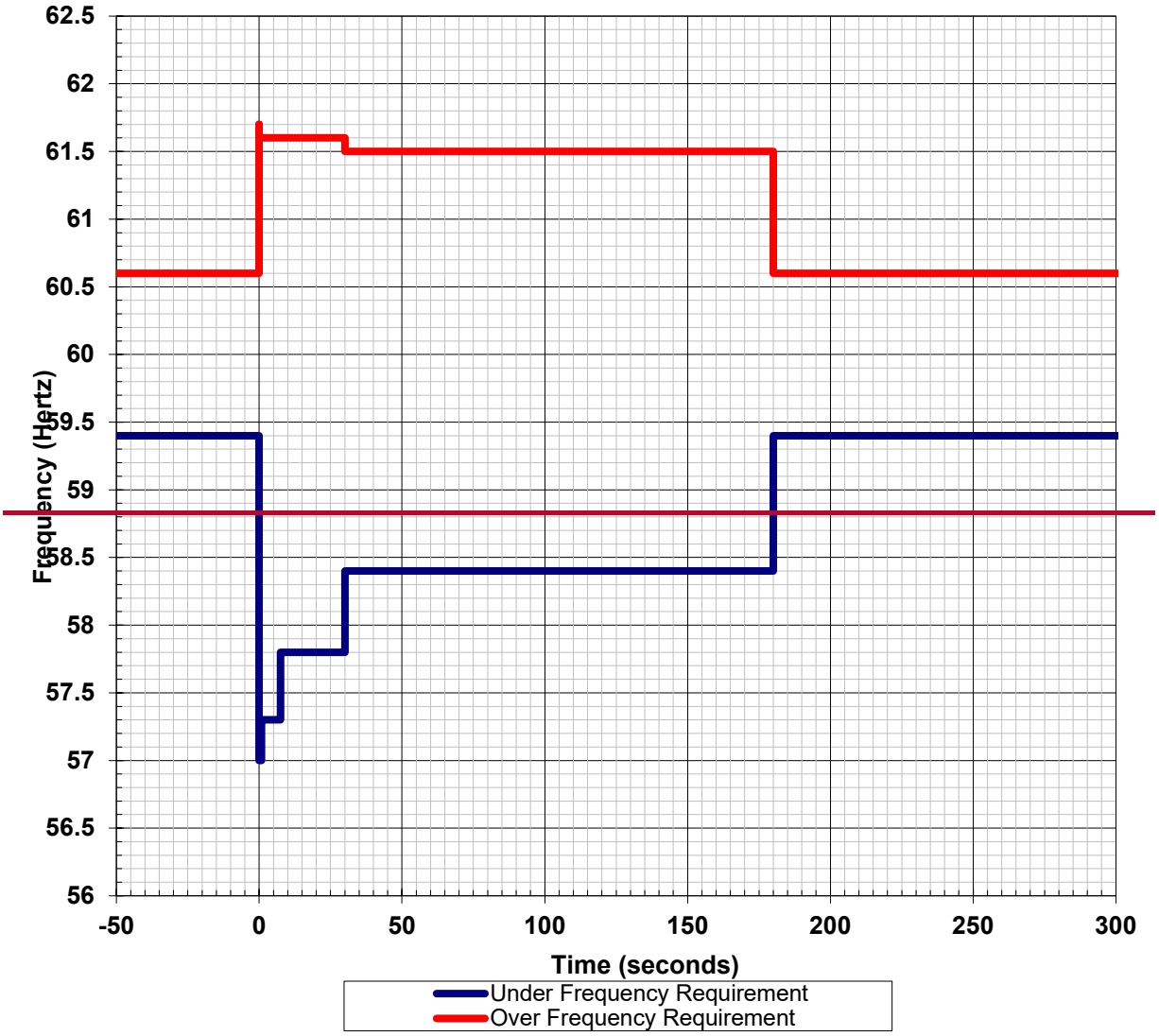
Appendix 1 – *Frequency Ranges*

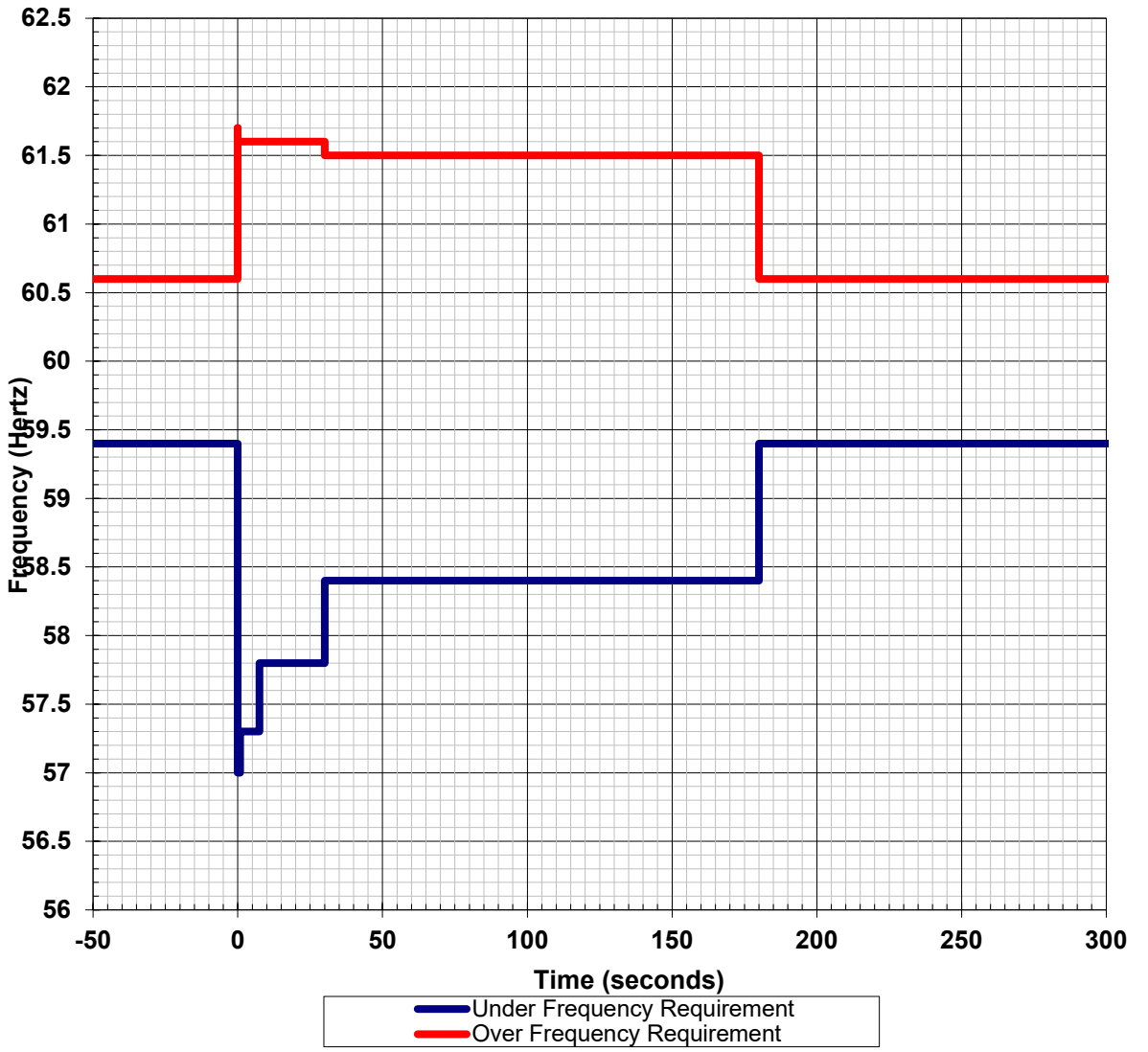
Revision History

Date	Description
20xx-xx-xx	
2018-02-01	Revised requirements to be technology agnostic, added new requirements to define clarify proper frequency response, removed prohibition against assets located outside the ISO's balancing authority providing regulating reserve.
2014-12-23	Initial Release

Appendix 1
Frequency Ranges

High Frequency Duration		Low Frequency Duration	
Frequency (Hz)	**Time (seconds)**	**Frequency (Hz)**	**Time (seconds)**
≥ 61.7	Instantaneous trip	≤57.0	Instantaneous trip
≥61.6	30	≤57.3	0.75
≥60.6	180	≤ 57.8	7.5
<60.6	Continuous operation	≤ 58.4	30
		≤ 59.4	180
		> 59.4	Continuous operation


62.5
62
61.5
61
60.5
60
59.5
59
58.5
58
57.5
57
56.5
56
Frequency (Hertz)
-50
0
50
100
150
200
250
300
Time (seconds)
Under Frequency Requirement
Over Frequency Requirement


62.5
62
61.5
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60.5
60
59.5
59
58.5
58
57.5
57
56.5
56
Frequency (Hertz)
-50
0
50
100
150
200
250
300
Time (seconds)
Under Frequency Requirement
Over Frequency Requirement

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.5 Spinning Reserve Technical Requirements and Performance Standards

Applicability

1 Section 205.5 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Application for Qualification to Provide Spinning Reserve

2(1) A **pool asset** must be qualified by the **ISO** in order to provide **spinning reserve**.

(2) A **pool participant** seeking to have the **ISO** qualify a **pool asset** ~~qualified by the **ISO**~~ to provide **spinning reserve** must provide the **ISO** with:

(a) a completed application form, available on the AESO website; and

(b) the data and records that the **ISO** specifies in the application form.

Eligibility to Provide Spinning Reserve

3(1) A **pool participant** seeking to have the **ISO** qualify its **pool asset** qualified ~~by the **ISO**~~ to provide **spinning reserve** must ensure that its **pool asset** has at least one ~~(1)~~ **spinning reserve resource** that is:

(a) at a minimum, capable of providing:

(i) 10 MW of **spinning reserve**; and

(ii) the amount of **real power** applied for under subsection 2(2) for a period of ~~sixty (60) minutes~~1 hour.

(b) equipped with a **governor** or **governor system** that:

(i) is responsive to both over frequency and under frequency events;

(ii) has a total deadband of ~~equal to or~~ less than or equal to 0.036 Hz;

(iii) has a droop setting ~~equal to or~~ greater than or equal to 3% but less than or equal to 5% based on the maximum operating range of the **spinning reserve resource**, as specified by the **ISO**;

(iv) has no time delays, ramp characteristics or other control settings that prevent the **spinning reserve resource** from providing an immediate, automatic and sustained response to frequency deviations;

(v) has a sample rate of at least 20 samples per second;

(vi) has a resolution of at least 0.004 Hz; and

(vii) is not acting as a **governor** or **governor system** for more than one ~~(1)~~ **spinning reserve resource**.

(2) The requirements set out in subsections 3(1)(b)(v) and (vi) do not apply to a **pool asset** that provides **spinning reserve** from a **generating unit** that is equipped with an analog **governor**, as of December 23, 2014, until such time as the **governor** is replaced.

Qualification of a Pool Asset to Provide Spinning Reserve

4(1) The **ISO** may qualify a **pool asset** to provide **spinning reserve** if one ~~(1)~~ or more **spinning reserve resources** of the **pool asset** meet the eligibility criteria set out in subsection 3.

(2) The **ISO** must, after qualifying a **pool asset** under subsection 4(1), determine the **real power** quantity in MW that each **spinning reserve resource** of the **pool asset** is capable of providing, with consideration given to the following:

(a) whether the **spinning reserve resource** participates in a **remedial action scheme**;

(b) the total **operating reserve** that could be lost during a single **contingency**;

(c) the maximum **real power** capability and minimum **real power** capability of each **spinning reserve resource** of the **pool asset**; and

(d) any other factors that the **ISO** considers relevant.

(3) The **ISO** must advise a **pool participant** whether its **pool asset** is qualified to provide **spinning reserve** within ~~sixty (~~60~~)~~ **days** of the **ISO** receiving a completed application under subsection 2(2).

Performance Requirements when under Dispatch to Provide Spinning Reserve

5(1) A **pool participant** must ensure that, following the receipt of a **dispatch** to provide **spinning reserve**, one ~~(1)~~ or more **spinning reserve resources** of the **pool asset** are positioned to provide the **real power** set out in the **dispatch**~~,~~ within a total tolerance of minus:

(a) 1 MW for a **dispatch** of less than or equal to 20 MW; or

(b) 5% of the **dispatch** quantity for a **dispatch** greater than 20 MW.

(2) A **pool participant** must ensure that each **spinning reserve resource** being used to provide **spinning reserve** meets the requirements set out in subsection 5(1) beginning at:

(a) the time stated in the **dispatch**~~,~~ for a **dispatch** with a time more than ~~fifteen (~~15~~)~~ minutes from the time the **pool participant** receives the **dispatch**; or

(b) the time stated in the **dispatch**, or as soon as possible thereafter~~,~~ but ~~in any event,~~ not more than ~~fifteen (~~15~~)~~ minutes after receiving the **dispatch**, for a **dispatch** with a time ~~fifteen (~~15~~)~~ minutes or less from the time the **pool participant** receives the **dispatch**.

(3) A **pool participant** will not be paid for **spinning reserve** unless the **pool participant** ensures that the **spinning reserve resources** being used to provide **spinning reserve** meet the requirements set out in subsections 5(1) and 5(2).

Frequency Response Requirements when under Dispatch to Provide Spinning Reserve

6(1) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **spinning reserve**, the **governor** or **governor system** of each **spinning reserve resource** providing **spinning reserve** is operating such that it is:

(a) in service at all times; and

(b) operating without load limiters or other control systems including outer control loops that would prevent the **governor** or **governor system** from achieving the maximum frequency response.

(2) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **spinning reserve**, the change in **real power** of each **spinning reserve resource** being used to provide **spinning reserve** is:

(a) continuously proportional to the measured frequency;

(b) in accordance with the droop setting set out in subsection 3(1)(b)(iii); and

(c) limited to the maximum **real power** capability of the **spinning reserve resource** that is available at the time of the frequency event

for any change in frequency where the frequency goes outside the deadband set out in subsection 3(1)(b)(ii).

(3) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **spinning reserve**, each **spinning reserve resource** being used to provide **spinning reserve** sustains the change in **real power** set out in subsection 6(2) for any change in frequency where the frequency is outside the deadband set out in subsection 3(1)(b)(ii).

(4) A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **spinning reserve**, for any change in frequency where the frequency is outside the deadband set out in subsection 3(1)(b)(ii), other resources within the **pool asset** do not change their **real power** load level as a result of the change in **real power** of the **spinning reserve resource**, unless such a change does not negatively impact frequency response of the **pool asset**.

(5) A **pool participant** must ensure that, for the applicable minimum time period set out in Appendix 1, each **spinning reserve resource** being used to provide **spinning reserve** will not trip as a result of under frequency or over frequency deviations while the **pool asset** is under a **dispatch** to provide **spinning reserve**.

Maintaining Connection when under Dispatch to Provide Spinning Reserve

7 A **pool participant** must ensure that, while its **pool asset** is under a **dispatch** to provide **spinning reserve**, the **spinning reserve resource** remains connected to the **interconnected electric system** and remains frequency responsive in accordance with the requirements set out in subsection 6.

Measuring Frequency Response when under Dispatch to Provide Spinning Reserve

8 For the purpose of subsection 6, frequency response performance is measured at:

(a) the stator winding terminals of the **generating unit**~~;~~ or synchronous **energy storage resource**;

(b) the circuit breaker or disconnection device that is electrically closest to each load;

(c) the alternating current terminal closest to each inverter based ~~technology~~resource;

(d) the **collector bus** for **aggregated** ~~**generating** **facilities**~~; or

(e) a point ~~designated by~~ the **ISO** designates.

Other Facility Arrangements

9 The **ISO** may, for the purposes of evaluating frequency response performance, consider other facility arrangements if the combined change in **real power** demonstrates in aggregate that they meet the technical requirements set out in subsection 6 for a single **spinning reserve resource**.

Performance Requirements when Responding to a Directive to Provide Spinning Reserve

10(1) A **pool participant** must, within ~~ten (~~10~~)~~ minutes following receipt of a **directive** to provide **spinning reserve**, ensure that its **pool asset** is providing a quantity of **real power** equal to the instantaneous amount of **real power** of the **pool asset** at the time of the **directive** and the amount of **real power** set out in the **directive**~~.~~

(2) A **pool participant** must ensure that, from the first time its **pool asset** achieves the response set out in subsection 10(1) to the time ~~fifteen (~~15~~)~~ minutes following receipt of the **directive**, the **pool asset** is providing an average response equal to or greater than the amount of **real power** set out in the **directive**.

(3) A **pool participant** must ensure that, for each consecutive ~~ten (~~10~~)~~ minute interval beginning ~~fifteen (~~15~~)~~ minutes following receipt of a **directive**, the average response from the **pool asset** equals the amount of **real power** set out in the **directive**, within a tolerance of plus or minus:

(a) 5 MW for a **pool asset** with a **maximum capability** of 200 MW or less; or

(b) 10 MW for a **pool asset** with a **maximum capability** of greater than 200 MW.

(4) Where a **pool asset** does not have a **maximum capability**, the tolerances set out in subsection 10(3) will be measured against the maximum qualified facility capacity ~~of~~the **ISO** prescribes for the **pool asset** ~~prescribed by the **ISO**~~.

(5) A **pool participant** must ensure that its **pool asset** continues to meet the requirements set out in subsection 10(3) for as long as the **directive** to provide **spinning reserve** is in effect.

(6) A **pool participant** must ensure that its **pool asset** is in the position set out in subsection 5(1) as soon as possible ~~or, in any event,~~but not more than ~~fifteen (~~15~~)~~ minutes after receiving cancellation of the **directive** for **spinning reserve**.

Measuring Response to a Directive

11 A **pool participant** must ensure that each **pool asset** complies with the requirements set out in subsection 10 as measured at:

(a) the stator winding terminals of each **generating unit**~~;~~ or synchronous **energy storage resource**;

(b) the circuit breaker or disconnection device that is electrically closest to each load;

(c) the alternating current terminal closest to each inverter based ~~technology~~resource;

(d) the **collector bus** for **aggregated ~~generating~~ facilities**; or

(e) a point ~~designated by~~ the **ISO** designates.

Test Requirements

12 The **ISO** may request a **pool participant** to test a **spinning reserve resource**:

(a) prior to allowing the **spinning reserve resource** to provide **spinning reserve**;

(b) if the **ISO** provides evidence that the **spinning reserve resource** exhibits behaviour that is inconsistent with the requirements of this Section 205.5; or

(c) if the **ISO** otherwise determines that such testing is necessary.

Maintaining Eligibility to Provide Spinning Reserve

13(1) The **ISO** may issue a notice suspending the ability of a **pool participant** to provide **spinning reserve** if the **pool participant** does not comply with:

(a) a testing request pursuant to subsection 12;

(b) any other provision of this Section 205.5; or

(c) other **ISO rules** that affect the provision of **spinning reserve**.

(2) A **pool participant** that has received a suspension notice issued pursuant to subsection 13(1) ~~may~~must not submit an **offer** for **spinning reserve** until the **ISO** confirms that the **pool participant** is compliant with this Section 205.5 and all other **ISO rules** that affect the provision of **spinning reserve**.

Appendices

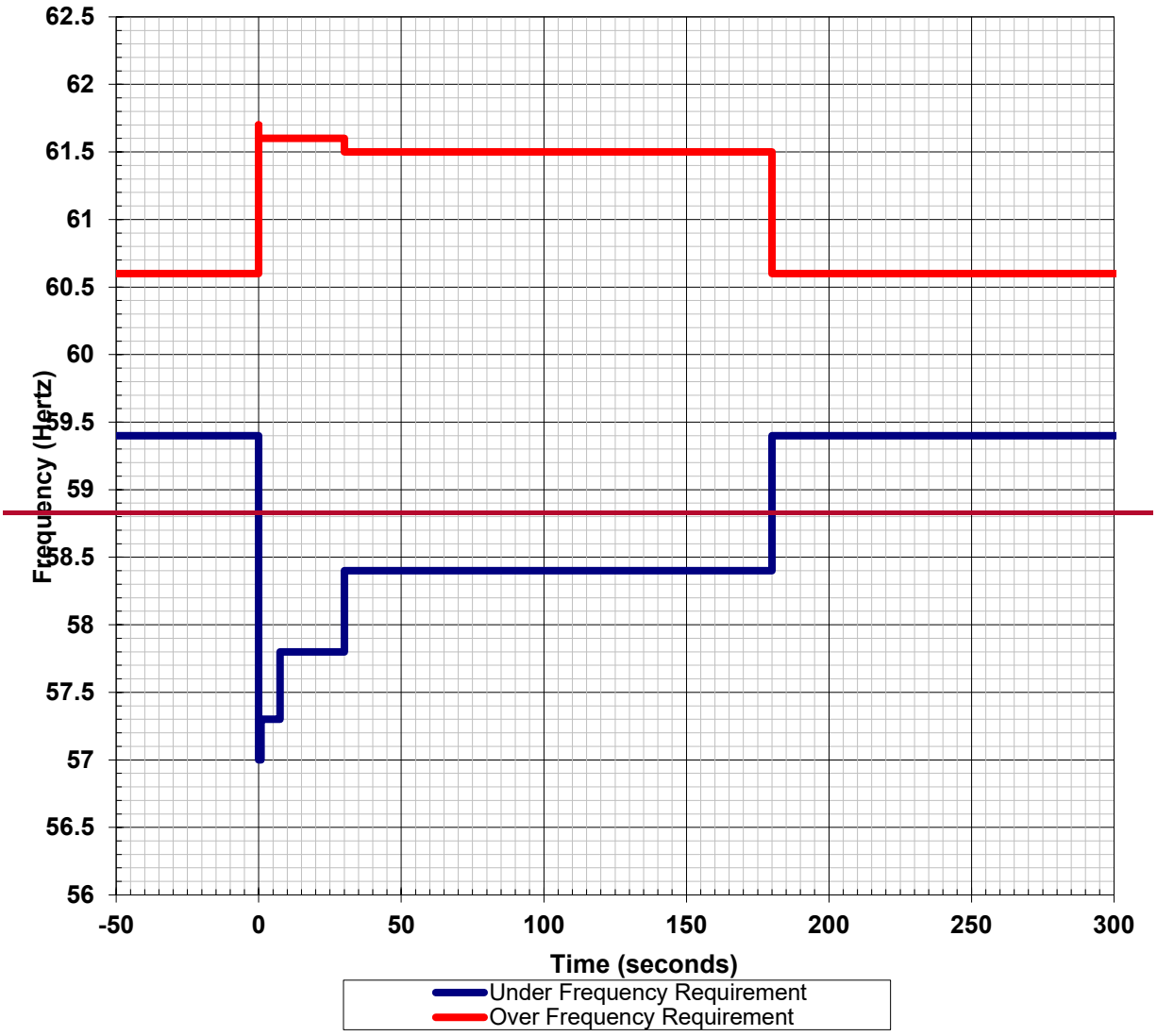
Appendix 1 – *Frequency Ranges*

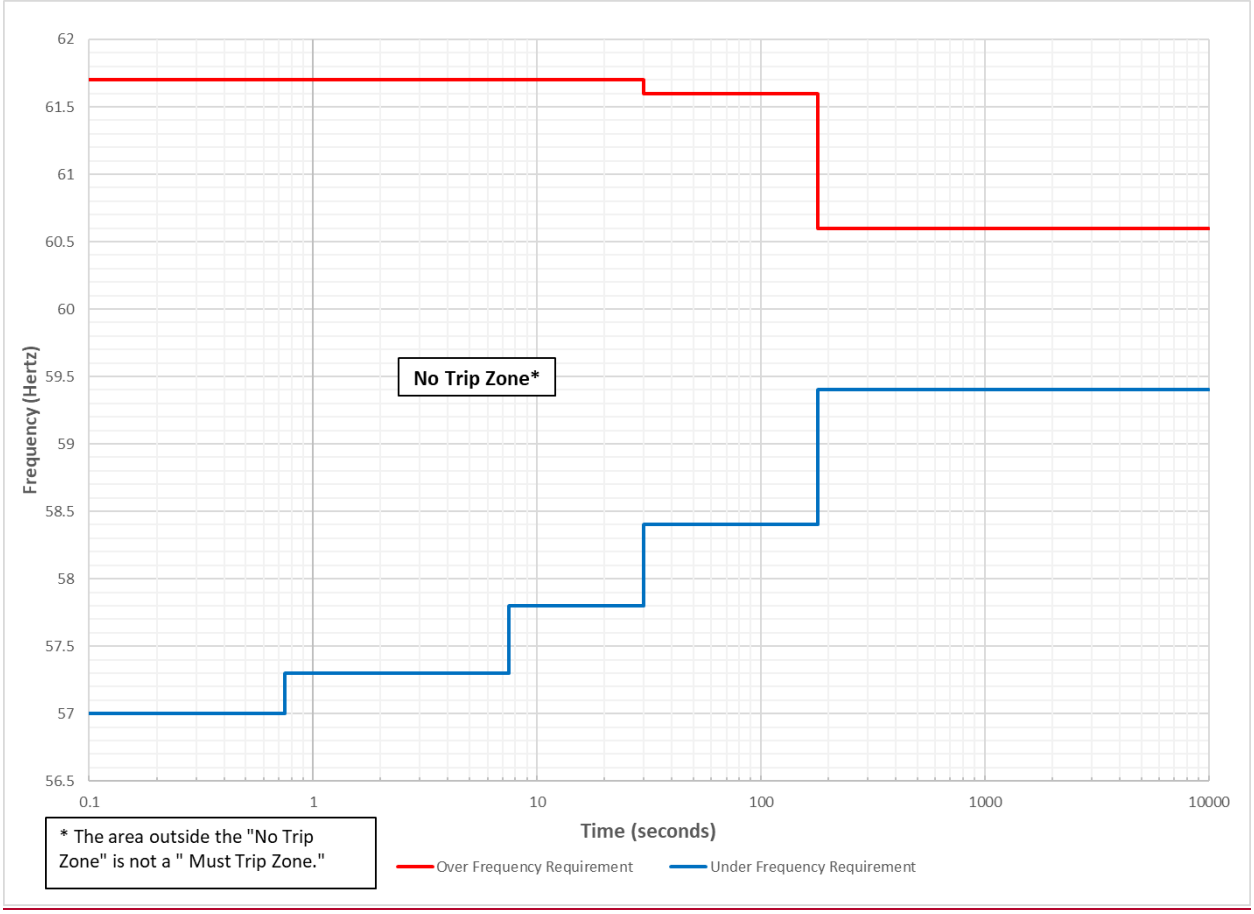
Revision History

Date	Description
20xx-xx-xx	
2018-02-01	Revised requirements to be technology agnostic, added new clarified requirements to define for proper frequency response.
2015-03-27	Replaced “effective date” within the initial release date in section 3(5); and replaced the word “Effective” in the Revision History to “Date”.
2014-12-23	Initial release

Appendix 1
Frequency Ranges

High Frequency Duration		Low Frequency Duration	
Frequency (Hz)	**Time (seconds)**	**Frequency (Hz)**	**Time (seconds)**
≥ 61.7	Instantaneous trip	≤57.0	Instantaneous trip
≥61.6	30	≤57.3	0.75
≥60.6	180	≤ 57.8	7.5
<60.6	Continuous operation	≤ 58.4	30
		≤ 59.4	180
		> 59.4	Continuous operation


62.5
62
61.5
61
60.5
60
59.5
59
58.5
58
57.5
57
56.5
56
Frequency (Hertz)
-50
0
50
100
150
200
250
300
Time (seconds)
Under Frequency Requirement
Over Frequency Requirement


62
61.5
61
60.5
60
59.5
59
58.5
58
57.5
57
56.5
Frequency (Hertz)
No Trip Zone*
0.1
1
10
100
1000
10000
Time (seconds)
* The area outside the "No Trip Zone" is not a " Must Trip Zone."
Over Frequency Requirement
Under Frequency Requirement

ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.6 Supplemental Reserve Technical Requirements and Performance Standards

Applicability

1 Section 205.6 applies to:

(a) a **pool participant**; and

(b) the **ISO**.

Requirements

Application for Qualification to Provide Supplemental Reserve

2(1) A **pool asset** must be qualified by the **ISO** in order to provide **supplemental reserve**.

(2) A **pool participant** seeking to have the **ISO** qualify a **pool asset** ~~qualified by the **ISO**~~ to provide **supplemental reserve** must provide the **ISO** with:

(a) a completed application form, available on the AESO website; and

(b) the data and records that the **ISO** specifies in the application form.

Eligibility to Provide Supplemental Reserve

3 A **pool participant** seeking to have the **ISO** qualify a **pool asset** ~~qualified by the **ISO**~~ to provide **supplemental reserve** must ensure that its **pool asset** has at least one ~~(1)~~ **supplemental reserve resource** that is at a minimum, capable of providing:

(a) 5 MW of **supplemental reserve**; and

(b) the amount of **real power** applied for under subsection 2(2) for a period of ~~sixty (60) minutes~~1 hour.

Qualification of a Pool Asset to Provide Supplemental Reserve

4(1) The **ISO** may qualify a **pool asset** to provide **supplemental reserve** if one ~~(1)~~ or more **supplemental reserve resources** of the **pool asset** meet the eligibility criteria set out in subsection 3.

(2) The **ISO** must, after qualifying a **pool asset** under subsection 4(1), determine the **real power** quantity in MW that each **supplemental reserve resource** of the **pool asset** is capable of providing, with consideration given to the following:

(a) whether the **supplemental reserve resource** participates in a **remedial action scheme**;

(b) the total **operating reserve** that could be lost during a single **contingency**;

(c) the maximum **real power** capability and minimum **real power** capability of each **supplemental reserve resource** of the **pool asset**; and

(d) any other factor that the **ISO** considers relevant.

(3) The **ISO** must advise a **pool participant** whether its **pool asset** is qualified to provide **supplemental reserve** within ~~sixty (~~60~~)~~ **days** of the **ISO** receiving a completed application under subsection 2(2).

Performance Requirements when under Dispatch to Provide Supplemental Reserve

5(1) A **pool participant** must ensure that, following the receipt of a **dispatch** to provide **supplemental reserve**, one ~~(1)~~ or more **supplemental reserve resources** of the **pool asset** are positioned to provide the **real power** set out in the **dispatch**~~,~~ within a total tolerance of minus:

(a) 1 MW for a **dispatch** of less than or equal to 20 MW; or

(b) 5% of the **dispatch** quantity for a **dispatch** greater than 20 MW.

(2) A **pool participant** must ensure that each **supplemental reserve resource** being used to provide **supplemental reserve** meets the requirements set out in subsection 5(1) beginning at:

(a) the time stated in the **dispatch**~~,~~ for a **dispatch** with a time more than ~~fifteen (~~15~~)~~ minutes from the time the **pool participant** receives the **dispatch**; or

(b) the time stated in the **dispatch**, or as soon as possible thereafter~~,~~ but ~~in any event,~~ not more than ~~fifteen (~~15~~)~~ minutes after receiving the **dispatch**, for a **dispatch** with a time ~~fifteen (~~15~~)~~ minutes or less from the time the **pool participant** receives the **dispatch**.

(3) A **pool participant** will not be paid for **supplemental reserve** unless the **pool participant** ensures that the **supplemental reserve resources** being used to provide **supplemental reserve** meet the requirements set out in subsections 5(1) and 5(2).

Performance Requirements when Responding to a Directive to Provide Supplemental Reserve

6(1) A **pool participant** must, within ~~ten (~~10~~)~~ minutes following receipt of a **directive** to provide **supplemental reserve**, ensure that its **pool asset** is providing a quantity of **real power** equal to the instantaneous amount of **real power** of the **pool asset** at the time of the **directive** and the amount of **real power** set out in the **directive**.

(2) A **pool participant** must ensure that, from the first time its **pool asset** achieves the response set out in subsection 6(1) to the time ~~fifteen (~~15~~)~~ minutes following receipt of the **directive**, the **pool asset** is providing an average response ~~equal to or~~ greater than or equal to the amount of **real power** set out in the **directive**.

(3) A **pool participant** must ensure that, for each consecutive ~~ten (~~10~~)~~ minute interval beginning ~~fifteen (~~15~~)~~ minutes following the receipt of a **directive**, the average response from the **pool asset** equals the amount of **real power** set out in the **directive**, within a tolerance of plus or minus:

(a) 5 MW for a **pool asset** with a **maximum capability** of 200 MW or less; or

(b) 10 MW for a **pool asset** with a **maximum capability** of greater than 200 MW.

(4) Where a **pool asset** does not have a **maximum capability**, the tolerances set out in subsection 6(3) will be measured against the maximum qualified facility capacity ~~of~~the **ISO** prescribes for the **pool asset** ~~prescribed by the **ISO**~~.

(5) A **pool participant** must ensure that its **pool asset** continues to meet the requirements set out in subsection 6(3) for as long as the **directive** to provide **supplemental reserve** is in effect.

(6) A **pool participant** must ensure that its **pool asset** is in the position set out in subsection 5(1) as soon as possible ~~or, in any event,~~but not more than ~~fifteen (~~15~~)~~ minutes after receiving a cancellation of the **directive** for **supplemental reserve**.

Measuring Response to a Directive

7 A **pool participant** must ensure that each **pool asset** complies with the requirements set out in subsection 6 as measured at:

(a) the stator winding terminals of the **generating unit**~~;~~ or synchronous **energy storage resource**;

(b) the circuit breaker or disconnection device that is electrically closest to each load;

(c) the alternating current terminal closest to each inverter based ~~technology~~resource;

(d) the **collector bus** for **aggregated** ~~**generating**~~ **facilities**; or

(e) a point ~~designated by~~ the **ISO** designates.

Test Requirements

8 The **ISO** may request a **pool participant** to test a **supplemental reserve resource**:

(a) prior to allowing the **supplemental reserve resource** to provide **supplemental reserve**;

(b) if the **ISO** provides evidence that the **supplemental reserve resource** exhibits behaviour that is inconsistent with the requirements of this Section 205.6; or

(c) if the **ISO** otherwise determines that such testing is necessary.

Maintaining Eligibility to Provide Supplemental Reserve

9(1) The **ISO** may issue a notice suspending the ability of a **pool participant** to provide **supplemental reserve** if the **pool participant** does not comply with:

(a) a testing request pursuant to subsection 8;

(b) any other provision of this Section 205.6; or

(c) other **ISO rules** that affect the provision of **supplemental reserve**.

(2) A **pool participant** that has received a suspension notice pursuant to subsection 9(1) ~~may~~must not submit an **offer** for **supplemental reserve** until the **ISO** confirms the **pool participant** is compliant with this Section 205.6 and all other **ISO rules** that affect the provision of **supplemental reserve**.

Revision History

Date	Description
2023-xx-xx	
2018-02-01	Revised requirements to be technology agnostic.
2014-12-23	Initial release

ISO Rules
Part 200 Markets
Division 205 Ancillary Services Market
Section 205.8 Transmission Must-Run

Applicability

1 Section 205.8 applies to:

(a) a **pool participant** with a contract with the **ISO** to provide **transmission must-run**; and

(b) the **ISO**,

when providing or procuring **transmission must-run** pursuant to a contract.

Requirements

Submission Method and Timing

2(1) A **pool participant** may only submit a declaration of **transmission must-run** capability to the **power pool** in respect to a **pool asset** listed opposite their name in the **ISO** list of **pool assets**.

(2) A **pool participant** submitting a declaration of **transmission must-run** capability must submit such declaration:

(a) subject to subsection 3(1), before 12:00 hours on the **day** before the **day** that the **offer** is effective; and

(b) no earlier than 00:00, ~~seven (~~7~~)~~ **days** prior to the **day** that the **offer** is effective.

Obligation to Submit a Declaration and Declaration Content

3(1) A **pool participant** must, for each **settlement interval**, submit a declaration of the availability of **transmission must-run** from each of its active ~~generating~~ **source assets** under a contract for **transmission must run**.

(2) A **pool participant** must include, in each declaration of the availability of **transmission must-run**, a quantity in MW.

(3) A **pool participant** submitting a declaration of **transmission must-run** capability must ensure that the declaration does not exceed the maximum approved capacity value for the ~~generating~~ **source asset** in the **transmission must-run** contract.

Issuing Dispatches

4(1) ~~If the~~The **ISO** must, if it determines that the delivery of **transmission must-run** is required to ensure the safe and reliable operation of the **interconnected electric system**, ~~the **ISO** must~~ issue a **dispatch** to a **pool participant** that can provide the required **transmission must-run**.

(2) The **ISO** must notify the **pool participant** when the **transmission must-run** is no longer required by either issuing a more recent **dispatch** or cancelling the **dispatch**.

Declining a Dispatch

5(1) ~~Notwithstanding section~~A **pool participant** may, notwithstanding Section 201.7 of the **ISO rules**, *Dispatches*, ~~a **pool participant** may~~ decline a **dispatch** for **transmission must-run** in accordance with their contract.

(2) ~~If a **pool participant** declines a **dispatch**, the~~A **pool participant** must, if it declines a **dispatch**:

(a) provide reasons; and

(b) restate in a timely manner, the new capability of the ~~generating~~ **source asset** to provide **transmission must-run**.

Restating Declarations of Capability

6(1) A **pool participant** may restate the declared availability of a ~~generating~~ **source asset** prior to receiving a **dispatch** for **transmission must-run**.

(2) A **pool participant** must restate the declared capability of a **source asset**, in a timely manner, if there is a change in capability to supply the **transmission must-run**.

Delivery Requirements

7 ~~If a~~A **pool participant** must, if it accepts a **dispatch** for **transmission must-run**, ~~the **pool participant** must~~ provide the **transmission must-run**.

Revision History

~~Effective~~Date	Description
20xx-xx-xx	
2013-01-08	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 301 General
Section 301.2 ISO Directives

Applicability

1 Section 301.2 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

Directives the ISO Issues

2(1) The **ISO** may issue a **directive** to a **market participant**, including a **directive** to:

(a) increase or decrease the **real power** or **reactive power** output, or both of them, from a facility;

(b) shut down or start up a facility; and

(c) switch **transmission system elements**, alter **planned outage** or maintenance schedules, or load shed.

(2) The **ISO** may issue a **directive** verbally, electronically, or in writing.

Requirement to Comply

3(1) A **market participant** must comply with a **directive** it receives subject to any other **ISO rule** or **reliability standard** and the exceptions in subsections 3(2) and 3(3).

(2) A **market participant** that is a **legal owner** of a **generating unit**, **energy storage resource**, or ~~an~~ **aggregated** ~~**generating** **facility**~~, or an **operator** of a **generating unit**, **energy storage resource**, or ~~an~~ **aggregated** ~~**generating** **facility**~~, must comply with a **directive** it receives subject to the following exceptions:

(a) it considers that a real and substantial risk of damage to its **generating unit**, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ could result if it complied with the **directive**;

(b) it considers that a real and substantial risk to the safety of its employees or the public could result if it complied with the **directive**; or

(c) it considers that a real and substantial risk of undue injury to the environment could result if it complied with the **directive**.

(3) A **market participant** that is a **legal owner** of a **transmission facility** or an **operator** of a **transmission facility** must ~~comply with a **directive** it receives~~, subject to subsection 39(4) of the **Act**~~.~~, comply with a **directive** it receives..

(4) A **market participant** that is a **pool participant** must, if the instructions contained in a **directive** it receives require an **operator** to take action, immediately communicate the **directive** to the **operator**.

Report Inability to Comply or Communicate

4(1) If a **market participant** is unable to comply with a **directive** or is unable to communicate it to the **operator**, as applicable, then it must, unless otherwise stipulated in the **directive**, verbally notify the **ISO** of the inability and provide reasons.

(2) The **market participant** must provide notice as soon as ~~practical but~~practicable, unless otherwise stipulated in the **directive**, not later then ~~five (~~5~~)~~ minutes after determining it is unable to comply with a **directive** or is unable to communicate a **directive** to the **operator**, as applicable.

Revision History

~~Effective~~Date	Description
~~2012-07-10~~20xx-xx-xx	~~Initial release~~
2014-07-02	Bolded the word “planned” in subsection 2(1)(c).
2012-07-10	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 302 Transmission Constraint Management
Section 302.1 Real Time Transmission Constraint Management

Applicability

1 Section 302.1 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

Real Time Transmission Constraint Mitigation

2(1) Subject to subsection 3, the **ISO** must comply with the following procedures in the following sequence to mitigate a **transmission constraint** in the present, real time:

(a) taking into account the **constraint effective factors**, determine the **pool assets** that would be effective in mitigating the **transmission constraint** and apply the appropriate procedure set out in this subsection 2(1) to those effective **pool assets**;

(b) ensure that any **pool assets** effective in mitigating the **transmission constraint** are not generating MW above their **maximum capability**, by cancelling any related **directives**;

(c) curtail by **directives**, any **downstream constraint side** service under **ISO tariff** rate schedules *Rate XOS 1 Hour* and *Rate XOS 1 Month* and any **upstream constraint side** service under **ISO tariff** rate schedule *Rate IOS*, that are effective in mitigating the **transmission constraint**;

(d) curtail by **directives**, any **loads** receiving service under **ISO tariff** rate schedules *Rate DOS 7 Minutes, Rate DOS 1 Hour* and *Rate DOS Term* at the **downstream constraint side** of the **transmission constraint**, that are effective in mitigating the **transmission constraint**;

(e) issue a **dispatch** to any **pool asset** that is under contract with the **ISO** to provide **transmission must-run** and that is effective in mitigating the **transmission constraint** at the **downstream constraint side**;

(f) issue a **directive** for **transmission-must run** to any **pool asset** that is not under contract with the **ISO** to provide **transmission must-run** and that is effective in mitigating the **transmission constraint** at the **downstream constraint side**;

(g) issue **directives** to curtail any **pool assets** that are effective in mitigating the **transmission constraint** at the **upstream constraint side** using the following additional procedures:

(i) the **ISO** must curtail using the energy market **merit order** with the highest priced in merit **offer** from the **pool asset** effective in mitigating the **transmission constraint** being curtailed first, followed by the **pool asset** with the next highest priced in merit **offer**, if necessary, during the remainder of the then current **settlement interval** and the next two (2) **settlement intervals**;

(ii) if there is a need to curtail two (2) or more such **pool assets** having equally priced **offers**, then the **ISO** must issue **directives** to the **pool assets** to curtail using a pro-rata methodology;

(iii) if the **transmission constraint** persists on a continuous basis for longer than the remainder of the then current **settlement interval** and the next two (2) **settlement intervals**, then the **ISO** must reallocate the required curtailment, using a pro-rata

methodology, to all **pool assets** having in merit **offers** that are effective in mitigating the **transmission constraint**; and

(h) curtail by **directives** any **loads** receiving service under **ISO tariff** rate schedule *Rate DTS* at the **downstream constraint side** of the **transmission constraint**, if so required by the **reliability** criteria, using the following procedures:

(i) the **ISO** must allocate the **load** curtailment using the energy market **merit order** with the lowest priced effective **bid** being curtailed first, followed by the next lowest priced effective **bid**, if necessary;

(ii) if there is a need to curtail **loads** with equal price **bids,** or there are no **bids** remaining, then the **ISO** must curtail using a pro-rata methodology.

(2) The **ISO** must comply with the following procedures in order to restore the energy balance to the **interconnected electric system**:

(a) where the procedures set out in subsection 2(1)(e) or (f) are used, issue **dispatches** for **dispatch down service** in accordance with section 204.2 of the **ISO rules**, *Issuing Dispatches for Dispatch Down Service*;

(b) except where the procedures set out in subsection 2(1)(e) and (f) are used:

(i) in circumstances where the **ISO** has notice of a **transmission constraint** that is anticipated to be of a significant duration and magnitude, as determined by the **ISO** acting reasonably, issue a **dispatch** to any **pool asset** that is effective in restoring the energy balance to the **interconnected electric system** and that is under contract with the **ISO** to provide **transmission must-run** in accordance with section 205.8 of the **ISO rules** – *Transmission Must-Run* and section 301.2 of the **ISO rules** – *ISO Directives,* and issue dispatches for **dispatch down service** in accordance with section 204.2 of the **ISO rules** – *Issuing Dispatches for Dispatch Down Service*;

(ii) in all other circumstances, or where necessary to supplement the volume **dispatched** for **transmission must-run** in subsection 2(2)(b)(i), issue **dispatches** for **transmission constraint rebalancing**, in accordance with the energy market **merit order**, and make payment to a **pool participant** with a **source asset** that has provided energy for **transmission constraint rebalancing** in accordance with subsection 7(1) of section 103.4 the **ISO rules**.

(3) With regard to any of the procedures set out in subsection 2(1) that involve **pool asset** or **load** curtailment, if the **pool asset** or **load** is supplying both **ancillary services** and energy production, then the **ISO** must first curtail **ancillary services** before energy production.

(4) When a **transmission constraint** has activated or is expected by the **ISO** to activate a **remedial action scheme,** then after the **ISO** has ensured that the **interconnected electric system** is operating in a safe and reliable mode, the **ISO** must recommence the procedural sequence set out in subsection 2(1) to manage the **transmission constraint**.

Additional Real Time Constraint Management Procedures

3 As the circumstances may warrant, the **ISO** may take into account the following alternative or complementary procedures to mitigate any present, real time **transmission constraint**:

(a) if the result of following the procedures set out in subsection 2(1)(g)(i) will be to curtail any **pool asset** below its **minimum stable generation** level but the **ISO** expects the **transmission constraint** to last only a short duration, then the **ISO** by **directive** may curtail

the **pool asset** to above or at the **minimum stable generation** level of that **pool asset**;

(b) in circumstances where abnormal operating or market conditions exist, the **ISO** acting reasonably may, in implementing mitigation measures to address a **transmission constraint**, take procedural steps not listed in subsection 2(1) if those steps are substantially consistent with **good electric industry operating practice** and the duties of the **ISO** under the **Act** to direct the safe, reliable and economic operation of the **interconnected electric system**;

(c) the abnormal conditions referred to in subsection 3(b) include circumstances of unusual natural risks to the **interconnected electric system**, and issues raised by a unique real time system configuration or **reliability** concerns stemming from voltage or **reactive power** effects;

(d) in mitigating a **transmission constraint**, the **ISO** must follow the procedural sequence set out in subsection 2(1) and any more specific and complementary **ISO rules** applicable for a given regional area of the **interconnected electric system**, unless real time operating conditions change such that following the specified sequence would put the **ISO** in contravention of any **reliability standard** requirement by failing to achieve compliance within the operating limits or required response time specified in that **reliability standard**;

(e) if the **ISO** alters the procedural sequence as set out in subsection 2(1), or takes alternate mitigating actions because of the circumstances referred to in subsection 3(b) or 3(d) above, then once the **ISO** is assured that the **interconnected electric system** is operating in a safe and reliable mode, the **ISO** must recommence the procedural sequence set out in subsection 2(1).

Reporting

4(1) The **ISO** must use reasonable efforts to publish, as near to real time as possible, information on the location of **transmission constraints** and costs of resolving these constraints.

(2) The **ISO** must monitor and publicly report on the costs incurred as a result of mitigating **transmission constraints** on an annual basis.

Revision History

Effective	Description
2012-03-26	Initial release
2013-01-08	Previously defined terms have been un-defined and the words have been un-bolded. Reference to section 6.3.6.3 *Determining Dispatch Down Service Dispatch Quantity* has been replaced with section 204.2 *Issuing Dispatches for Dispatch Down Service*.
2015-11-26	Revisions to subsections 2(1) and 2(2). Amendment to numbering references in subsection 3(a). Addition of subsection 4 “Reporting”.

ISO Rules
Part 300 System Reliability and Operations
Division 303 Interties
Section 303.1 Load Shed Service

Applicability

1 Section 303.1 applies to:

(a) a **market participant** that contracts with the **ISO** to provide **load shed service**; and

(b) the **ISO**.

Requirements

Providing Data

2 The **market participant** must provide the **ISO** with any information related to the provision of **load shed service** that the **ISO** requires in order to properly administer the service and must do so in real time via systems the **ISO** designates.

Determining Amount to Arm

3(1) The **ISO** must use current **Alberta internal load** levels and the net import schedule of the combined British Columbia and Montana transfer paths to determine the amount of **load shed service** that the **ISO** must arm.

(2) When arming the required amount of service, the **ISO** must prioritize the arming of available **load shed service** so as to minimize expected cost.

(3) The **ISO** must set the **load shed service** arming level at the beginning of the scheduling hour but may modify it if the requirement changes during the scheduling hour by more than fifteen (15) MW.

Restoring Service

4 After the operation of **load shed service**, while maintaining the **reliability** of the **interconnected electric system**, the **ISO** must restore the following in the following order:

(a) **contingency reserves**; then

(b) **load shed service**.

Arming and Disarming Service

5(1) The **ISO** will issue **dispatches** to arm and disarm **load shed service**.

(2) The **market participant** must arm and disarm services in accordance with any **dispatches** the **ISO** issues unless the **market participant** identifies a circumstance that, in the **ISO**'s opinion, amounts to an event of **force majeure** that would prevent the **market participant** from complying with a **dispatch**.

Determining the Alberta Internal Load Range

6 If the estimated **Alberta internal load** falls right on, or very close to, the boundary of one of the ranges the **ISO** identifies, the **ISO** will use the lower **Alberta internal load** range to determine the amount of **load shed service** to arm during the hour that the **Alberta internal load** is expected to be at, or near, the boundary.

Curtailing Import during the Scheduling Hour

7 If there is insufficient **load shed service** due to the unavailability of this service, the **ISO** must adjust the import transfer level to the level corresponding to the required amount.

Restoring Service

8 The **market participant** must not restore **load shed service** that has been tripped until the earlier of one (1) hour after tripping or the **ISO** authorizing such restoration.

No Double-Counting

9 The **market participant** must not use the MWs it uses to provide **load shed service** under this section of the **ISO rules** to also simultaneously provide **ancillary services** under any other section of the **ISO rules** or under any contract.

Revision History

Effective	Description
2011-04-01	Initial release
2013-07-01	Amendments made to accommodate the energization of MATL

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.2 Electric Motor Start Requirements

Applicability

1 Section 304.2 applies to:

(a) the **operator** of an industrial complex that is:

(i) the Shell Limestone industrial complex; or

(ii) the Edson Gas Storage industrial complex;

(b) the **operator** of the **transmission facility** that operates **bulk transmission line** 854L from the 39S Bickerdike substation to the 397S Benbow substation;

(c) the **operator** of the **transmission facility** that operates 348S Marlboro substation; and

(d) the **ISO**.

Requirements

ISO Approval Prior to Starting an Electric Motor

2(1) The **operator** of an industrial complex must have the prior verbal approval of the **ISO** by means of direct access telephone to start an electric motor at the industrial complex, in accordance with the specific requirements set out in subsections 3 and 4, as applicable.

(2) The **operator** of an industrial complex must report to the **ISO** by means of direct access telephone when an attempt to start the electric motor has been completed, whether successful or not.

(3) The **ISO** must notify the **operator** of the **transmission facility** in the regional area of the industrial complex that there has been a request to start up the electric motor, and confirm that the **operator** of the **transmission facility** is not aware of any **reliability** reason to not start the electric motor.

(4) The **ISO** must grant approval to start the electric motor unless the **ISO** has **reliability** concerns that would prevent the electric motor start.

Shell Limestone Electric Motor Start

3(1) If the **ISO** receives a request from the **operator** of an industrial complex that is the Shell Limestone industrial complex to start the 18,000 hp electric motor located at that industrial complex, then the **operator** must provide the anticipated date and time of the start of the electric motor and make the verbal request to the **ISO** at least 1 hour prior to that start.

(2) In addition, the **operator** must provide all affected direct connect **market participants**, served from the 581S Amoco Ricinus substation and which the **ISO** indicates, with at least 1 hour notice by telephone prior to the starting of the electric motor, indicating the expected time of start and that there may be a short dip in their utility voltage due to the electric motor start.

Edson Gas Storage Electric Motor Start

4(1) If the 348S Marlboro substation located in the Hinton/Edson Area experiences an outage or derate resulting in any of the 5,000 hp electric motor-driven compressors at the Edson Gas Storage industrial complex shutting down, then the **operator** of that industrial complex must request approval from the **ISO** before restarting any of the compressor electric motors.

(2) If an outage or derate is in the nature of a permanent fault, then depending on the location of the permanent fault, the **operator** of the **transmission facility** must sectionalize the appropriate section of **bulk transmission line** 854L to allow radial supply to the 348S Marlboro substation from either the 39S Bickerdike substation or the 397S Benbow substation.

Revision History

Date	Description
2020-09-16	Removed requirements for Empress Area. Moved content in Appendix 1 to subsections 3 and 4; removed conditions of approval examples; removed Appendix 1 and references to Appendix 1. Administrative amendments.
2014-07-02	Amended subsections 4(1), 4(2) and 5(1) of Appendix 1 by unbolding the references to “outages” and adding the words “or derate” after the word “outages”
2012-05-31	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.3 Wind and Solar Power Ramp Up Management

Applicability

1(1) Subject to subsections 1(2) and 1(3), Section 304.3 applies to:

(a) the **legal owner** of ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources that:

(i) is directly connected to the **interconnected electric system** or to an electric system within the **service area** of the City of Medicine Hat, including ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources situated within an industrial complex that is directly connected to the **interconnected electric system** or to an electric system within the **service area** of the City of Medicine Hat; and

(ii) has a **gross real power** capability greater than or equal to 5 MW;

(b) the **operator** of ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources that:

(i) is directly connected to the **interconnected electric system** or to an electric system within the **service area** of the City of Medicine Hat, including ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources situated within an industrial complex that is directly connected to the **interconnected electric system** or to an electric system within the **service area** of the City of Medicine Hat; and

(ii) has a **gross real power** capability greater than or equal to 5 MW; and

(c) the **ISO**.

(2) The provisions of this Section 304.3 do not apply to the **legal owner** of ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources that was energized and commissioned after April 7, 2017 and that is identified by its **pool asset** description in an exemption list the **ISO** publishes on the AESO website.

(3) The provisions of this Section 304.3 do not apply to the **legal owner** of ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources that was energized and commissioned:

(a) prior to April 7, 2017; or

(b) that is included in the exemption list referenced in subsection 1(2) in accordance with a previous technical requirement, technical standard, **ISO rule** or functional specification;

but the **legal owner** of such an existing ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or solar resources must remain compliant with the ramp up management requirements set out in that previous technical requirement, technical standard, **ISO rule** or functional specification

(4) Notwithstanding ~~subsections~~subsections 1(2) or 1(3), if any of the **aggregated ~~generating~~ facilities** containing wind or solar resources described in subsections 1(2) or 1(3~~),~~) undergoes one or more:

(a) facility additions after April 7, 2017 resulting in an increase in the cumulative **gross real power** capability of the ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or solar resources by an amount greater than or equal to 5 MW; or

(b) equipment replacements after April 7, 2017 where the equipment replaced has a **gross real power** capability greater than or equal to 5 MW irrespective of whether the cumulative **gross real power** capability of the ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or

solar resources is increased;

then the entire ~~wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources will be subject to, and the **legal owner** of the ~~wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must comply with the provisions of this Section 304.3.

(5) The **ISO** may, notwithstanding subsections 1(2), (3) and (4), require the **legal owner** of ~~a wind or solar~~ an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources to comply with any one or more specific provisions or all of the provisions of this Section 304.3~~,~~ if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.

Requirements

Functional Specification

2~~**(1)**~~ The **ISO** must, in accordance and generally consistent with this Section 304.3, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of ~~a wind or solar~~an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources and associated **transmission facility** connection facilities.

Real Power and Ramp Rate Limitations

3(1) The **legal owner** of ~~a wind or solar~~an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must ensure that the facility has the control capability to limit the **real power** output at the **point of connection**, or at the connection to the **electric distribution system**, in accordance with any limits or instructions contained in any **directive**.

(2) The **legal owner** of ~~a wind or solar~~an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must ensure that the **real power** control limit referred to in subsection 3(1) is adjustable from the minimum operating output to the **gross real power** capacity at an average resolution of 1 MW.

(3) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must, when a **real power** control limit is in effect, ensure that the 1-minute average **real power** output does not exceed the **real power** control limit specified in the **directive** referred to in subsection 5(1) by more than 2% of the **gross real power** capability.

(4) The **legal owner** of ~~a wind or solar~~an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must ensure that the facility is equipped with **ramp rate** limiting controls that are:

(a) capable of limiting the ramp up of the **real power** of the ~~wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources; and

(b) adjustable such that the **ramp rate** does not exceed, in MW per minute, a range from 5% to 20% of the **gross real power** capability.

(5) The **legal owner** of a ~~wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must ensure that the default setting for the ramp **rate** limiting controls referred to in subsection 3(4) is set at 10% of the **gross real power** capability.

(6) The **legal owner** of ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources must ensure that any difference between the **real power** at:

(a) the **point of connection** or the connection to the **electric distribution system** of the ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or solar resources~~,~~; and

(b) any **collector ~~busses~~buses** of the ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or solar resources,

is compensated for in the **real power** limiting and **ramp rate** limiting controls.

Calculation of the Alberta System Wind and Solar Power Limit

4~~(1)~~ The **ISO** must calculate, at a minimum monitoring interval of every 20 minutes, an Alberta system wind and solar power limit for ~~wind and solar~~ **aggregated ~~generating~~ facilities** containing wind or solar resources.

Calculation and implementation of the Wind and Solar Aggregated ~~Generating~~ Facilities Power Limit Pro Rata Share

5(1) The **ISO** must, by means of supervisory control and data acquisition signals, issue **directives** to the **operator** of each ~~wind or solar~~ **aggregated ~~generating~~ facility** containing wind or solar resources that includes their power limit pro rata share.

(2) The **ISO** must optimize the pro rata share **directive** described in subsection 5(1), including reallocating any amount that results in ~~a wind or solar~~an **aggregated ~~generating~~ facility** containing wind or solar resources exceeding its **maximum capability**.

Methodology Used to Calculate the Alberta System Wind and Solar Power Limit ~~and the Wind and Solar Aggregated Generating Facilities~~ Power Limit Pro Rata Share

6(1) The **ISO** must post to the AESO website the methodology used to calculate the Alberta system wind and solar power limit and the methodology used to calculate the Alberta system ~~wind and solar aggregated generating facilities~~ power limit pro-rata share ~~to the AESO website~~for **aggregated facilities** containing wind or solar resources.

(2) The **ISO** must notify **market participants** at least 30 **days** in advance of ~~amending~~amendments to the methodologies referenced in 6(1) coming into effect.

Revision History

Date	Description
20xx-xx-xx	
2021-03-19	Completed administrative amendments to align with red tape reduction goals and ISO drafting principles; corrected typographical errors; and simplified provisions. Consolidated sections 3(4), 3(5), 5(2), 6(1) and 6(3). Removed subsection 3(4), 3(5), 4 and 6(2). .
2019-12-11	Removed duplication with new Section 103.14, *Waivers and Variances*; standardized functional specifications language; capitalized references to “Section”
2018-09-01	Revised the applicability section to include solar aggregated generating

	facilities and to apply to an aggregated generating facility that has a gross real power capability equal to or greater than 5 MW; added real power and ramp rate limitations requirements; revised the requirement to issue a power limit pro rata share from when a predetermined criterion is met to at the start of each monitoring interval; removed the methodologies used to calculate the Alberta system wind power limit and pro rata share; added subsection 7; revised subsection 4 to allow the energy market merit order provisions of the ISO rules and pro rata share to occur concurrently; and administrative amendments.
2015-04-01	Rule references have been updated in subsection 5(1)(a)
2015-04-01	The words “or dispatch” were added in subsection 5(1)(b).
2013-01-08	Previously defined terms have been un-defined and the words have been un-bolded.
2011-12-01	Initial release.

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.4 Maintaining Network Voltage

Applicability

1 Section 304.4 applies to:

(a) ~~(a)~~ an **operator** of a **generating unit**;

(b) ~~(b)~~ an **operator** of an **aggregated ~~generating~~ facility**; ~~and~~

(c) ~~(c)~~ an **operator** of a **transmission facility** that is operating a controllable **reactive power** resource; and

~~(c)~~(d) an operator of an **energy storage resource**.

Requirements

No Adjustments without a Directive or Instruction

2 The **operator** of a **generating unit**, ~~**operator** of an~~ **aggregated ~~generating~~ facility** ~~and **operator** of a~~, **transmission facility**, or **energy storage resource** must not adjust:

(a) the set point of the **automatic voltage regulator** or **voltage regulating system**;

(b) the on-load tap changer that is manually operated; or

(c) the set point or status of the controllable **reactive power** resource,

unless in response to a **directive** or instruction to do so, or unless first advising the **ISO** of the reason for the adjustment and obtaining approval from the **ISO** to make the adjustment.

Other Exceptions

3(1) ~~Notwithstanding subsection 2, the~~The **operator** of a **generating unit**, ~~the **operator** of an~~ **aggregated ~~generating~~ facility** ~~and the **operator** of a~~, **transmission facility**, or **energy storage resource** may, notwithstanding subsection 2:

(a) while connecting to the **transmission system**, adjust either:

(i) the set point of the **automatic voltage regulator** or **voltage regulating system**; or

(ii) the on-load tap changer,

to match the **transmission system** level voltage; or

(b) make any of the adjustments set out in subsection 2(a), (b) or (c) if the adjustment is required to respond to a real and substantial risk:

(i) of damage to its **transmission facility**;

(ii) to the safety of its employees; or

(iii) of undue injury to the environment;

(2) Any **operator** of a **generating unit**, ~~**operator** of an~~ **aggregated ~~generating~~ facility** ~~or **operator** of a~~, **transmission facility**, or **energy storage resource** that makes an adjustment pursuant to subsection 3(1)(b) must notify the **ISO** of the adjustment as soon as reasonably practicable but not later than one ~~(1)~~ hour after determining the need for the adjustment.

Revision History

~~Effective~~**Date**	**Description**
20xx-xx-xx	
2013-10-01	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.5 Provision for Operation of a Transmission Facility within Ratings

Applicability

1 Section 304.5 applies to:

(a) the **legal owner** of a **transmission facility**; and

(b) the **operator** of a **transmission facility**.

Requirements

Provision for Operation of Transmission Facility within Ratings

2 The **legal owner** of a **transmission facility** must provide for the operation of its **transmission facility** within **normal ratings** under pre-**contingency** conditions.

3 The **legal owner** of a **transmission facility** must provide for the operation of its **transmission facility** within **emergency ratings** under post-**contingency** conditions.

4 The **operator** of a **transmission facility** must, during post-**contingency** conditions, coordinate with the **ISO** to return its **transmission facility** to within **normal ratings**.

Revision History

Date	Description
2016-08-15	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.6 Unplanned Transmission Facility Limit Changes

Applicability

1 Section 304.6 applies to:

(a) the **operator** of a **transmission facility**.

Requirements

Unplanned Transmission Facility Limit Changes

2(1) The **operator** of a **transmission facility** must verbally notify the **ISO** as soon as possible, but within twenty-four (24) hours, of unplanned limit changes to its **transmission facility**, indicating the new limit, the equipment affected by the limit change, the cause of the limit change and the estimated period of time the limit change will be in effect.

(2) The **operator** of a **transmission facility** must, within twenty-one (21) days of the verbal notification in subsection 2(1), or within a shorter or longer period of time if deemed necessary by the **ISO** in its sole discretion:

(a) provide the **ISO**, in writing, with its plan to restore the **transmission facility** to its previous limit; or

(b) notify the **ISO** that the **transmission facility** will not be restored to its previous limit.

Revision History

Date	Description
2016-07-26	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.7 Event Reporting

Applicability

1 Section 304.7 applies to:

(a) the **operator** of a **transmission facility**;

(b) the **operator** of a **generating unit** or **energy storage resource** that:

(i) is not part of an **aggregated ~~generating~~ facility**;

(ii) has a **maximum authorized real power** rating greater than 4.5 MW; and

(iii) is directly connected to the **transmission system**;

(c) the **operator** of an **aggregated ~~generating~~ facility** that:

(i) is directly connected to the **transmission system**; and

(ii) has a **maximum authorized real power** rating greater than 4.5 MW;

(collectively referred to as the "Responsible Entities")

and

(d) the **ISO**.

Requirements

Events Reportable by the Operator of a Transmission Facility

2 The **operator** of a **transmission facility** must submit a report to the **ISO** for each of the events identified in Appendix 1:

(a) in writing, in the form ~~specified by~~ the **ISO** specifies; and

(b) as soon as practicable and no later than ~~five (5)~~ **business days** ~~of~~after the **operator** of a **transmission facility** becoming aware of the event.

3 The **operator** of a **transmission facility** must notify ~~ASSIST~~PSIO, the RCMP and, where applicable, the local police, for each of the events identified in Appendix 1 as being reportable to these entities, as soon as practicable.

Events Reportable by the Operator of a Generating Unit ~~or,~~ Aggregated ~~Generating~~ Facility, or Energy Storage Resource

4 The **operator** of a **generating unit** ~~or the **operator** of an,~~ **aggregated ~~generating~~ facility**, or **energy storage resource** must ~~submit a report to the **ISO**,~~ for each of the events identified in Appendix 2, submit a report to the **ISO**:

(a) in writing, in the form ~~specified by~~ the **ISO** specifies; and

(b) as soon as practicable and no later than ~~five (5)~~ **business days** ~~of~~after the **operator** of a **generating unit** ~~or the **operator** of an,~~ **aggregated ~~generating~~ facility**, or **energy storage resource** becoming aware of the event.

Events Reportable by a Responsible Entity

5 A Responsible Entity must submit a report to the **ISO** for each of the events identified in Appendix 3:

(a) in writing, in the form ~~specified by~~ the **ISO** specifies; and

(b) as soon as practicable and no later than ~~five (~~5~~)~~ **business days** ~~of~~after the Responsible Entity becoming aware of the event.

6 A Responsible Entity must notify ~~ASSIST~~PSIO, the RCMP and, where applicable, the local police, for each of the events identified in Appendix 3~~,~~ as soon as practicable.

7 ~~Notwithstanding~~A Responsible Entity is not, notwithstanding any other provision of this ~~section of the **ISO rules**, a Responsible Entity is not~~Section 304.7, required to report a theft to the **ISO**, ~~ASSIST~~PSIO, the RCMP ~~and~~or, where applicable, the local police in accordance with the provisions of this ~~section~~Section 304.7, unless the Responsible Entity reasonably determines that the theft degrades normal operation of ~~a **transmission facility**, **generating unit**, or **aggregated generating facility** that is part of or directly connected to the **bulk electric system**.~~:

(a) a **transmission facility** operated at a nominal voltage of 100 kV or higher, excluding a **radial circuit** only connected to load; or

(b) a **generating unit**, **aggregated facility**, or **energy storage resource** that is directly connected to the **transmission system** energized at 100 kV or higher.

Events Reportable to NERC

8 The **ISO** must forward a report received from a Responsible Entity in accordance with ~~subsection~~subsections 2 or 5 to the **NERC** within ~~five (~~5~~)~~ **business days** of receiving such a report, but only for those events identified in Appendix 4.

Revision History

Date	Description
20xx-xx-xx	
2016-08-30	Initial release

Appendix 1: Events Reportable by the Operator of a Transmission Facility

Event	Entity to Submit Report to
1. Damage to or destruction of a **transmission facility** that results in an unexpected sustained outage of any combination of ~~three (~~3~~)~~ or more of the following: (a) ~~(i)~~ transmission lines energized at greater than 25 kV; or (b) ~~(ii)~~ transformers with at least ~~two (~~2~~)~~ terminals energized at greater than 25 kV.	**ISO**
2. Unexpected loss, contrary to design, of any combination of ~~three (~~3~~)~~ or more of the following: (a) ~~(i)~~ transmission lines energized at greater than 25 kV; or (b) ~~(ii)~~ transformers with at least ~~two (~~2~~)~~ terminals energized at greater than 25 kV caused by a common **disturbance** (excluding successful automatic reclosing).	**ISO**
3. A physical threat to a **control centre** for the **bulk electric system**, excluding a weather or natural disaster related threat, which has the potential to degrade the normal operation of the **control centre**.	**ISO**, ~~ASSIST~~PSIO, RCMP and, where applicable, local police
4. A suspicious device or activity at a **control centre** for the **bulk electric system**.	**ISO**, ~~ASSIST~~PSIO, RCMP and, where applicable, local police
5. Automatic **firm load** shedding (via an automatic undervoltage or underfrequency load shedding scheme, or a **remedial action scheme**) that occurs as part of the **ISO**'s **under voltage load shed** program or **underfrequency load shedding** program.	**ISO**
6. The failure or **misoperation** of a **remedial action scheme** or **protection system** on the **transmission system** that impacts the **transmission system**, except where a **misoperation** incident report is provided in accordance with PRC-004-WECC-AB, *Protection System and Remedial Action Scheme Misoperation*.	**ISO**
7. A loss of monitoring or control that significantly affects the ability of the **operator** of a **transmission facility** to make operating decisions for ~~thirty (~~30~~)~~ continuous minutes or more, including:	**ISO**

Event	Entity to Submit Report to
(a) ~~(i)~~ loss of the ability to remotely monitor or control **system elements** of the **bulk electric system**; (b) ~~(ii)~~ loss of communications from supervisory control and data acquisition remote terminal units; (c) ~~(iii)~~ unavailability of "inter control centre protocol" links reducing **bulk electric system** visibility; or (d) ~~(iv)~~ loss of the ability to remotely monitor or control **generating units** providing **regulating reserves**.	
8. A complete loss, for ~~thirty (~~30~~)~~ continuous minutes or more, of voice communication systems for a **control centre** of a **transmission facility** that are required for the purpose of communicating with the **ISO** and the **operators** of adjacent **transmission facilities**.	**ISO**
9. An unplanned evacuation of a **control centre** of a **transmission facility** for ~~thirty (~~30~~)~~ continuous minutes or more.	**ISO**

Appendix 2: Events Reportable by the Operator of a Generating Unit, Energy Storage Resource or ~~an~~ Aggregated ~~Generating~~ Facility

Event	Entity to Submit Report to
1. An unexpected outage impacting ~~two (~~2~~)~~ or more **generating units** ~~or,~~ **aggregated** ~~**generating**~~ **facilities**, or **energy storage resources**, with an aggregate gross generation exceeding 500 MW at the time of the outage, which is caused by a common **disturbance** and contrary to the design of ~~the~~ **generating** ~~unit(s).~~**units**, **aggregated facilities**, or **energy storage resources**.	**ISO**
2. A loss of monitoring or control that significantly affects the ability of the **operator** of a **generating unit** ~~or an~~, **aggregated** ~~**generating**~~ **facility**, or **energy storage resource** to make operating decisions for ~~thirty (~~30~~)~~ continuous minutes or more, including: (a) loss of the ability to remotely monitor or control a generating ~~units~~unit or **energy storage resource** that is directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher; (b) loss of communications from supervisory control and data acquisition remote terminal units; (c) unavailability of "inter control centre protocol" links reducing visibility of a **generating** ~~**units**~~**unit** or **energy storage resource** that is directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher ; or (d) loss of the ability to remotely monitor or control **generating units** providing **regulating reserves**.	**ISO**
3. A complete loss, for ~~thirty (~~30~~)~~ continuous minutes or more, of voice communication systems for a **control centre** of a **generating unit** ~~or an~~, **aggregated** ~~**generating**~~ **facility**, or **energy storage resource** that are required for the purpose of communicating with the **ISO** and the **operators** of adjacent **transmission facilities**.	**ISO**
4. An unplanned evacuation of a **control centre** of a **generating unit** ~~or an~~, **aggregated** ~~**generating**~~ **facility**, or **energy storage resource**, for ~~thirty (~~30~~)~~ continuous minutes or more.	**ISO**

Appendix 3: Events Reportable by a Responsible Entity

Event	Entity to Submit Report to
1. Damage to or destruction of a **transmission facility**, **generating unit**, ~~or~~ **aggregated** ~~**generating**~~ **facility**, or **energy storage resource** that is ~~part of or is~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher that results from human action, which is known or suspected to be intentional.	**ISO**, ~~ASSIST~~PSIO, RCMP and, where applicable, local police
2. A physical threat to a **transmission facility**, **generating unit**, ~~or~~ **aggregated** ~~**generating**~~ **facility**, or **energy storage resource** that is ~~part of or~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher, excluding weather or natural disaster related threats, which has the potential to degrade the normal operation of the **transmission facility**, **generating unit**, ~~or~~ **aggregated** ~~**generating**~~ **facility**, or **energy storage resource**.	**ISO**, ~~ASSIST~~PSIO, RCMP and, where applicable, local police
3. A suspicious device or activity at a **transmission facility**, **generating unit**, ~~or~~ **aggregated** ~~**generating**~~ **facility**, or **energy storage resource** that is ~~part of or~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher.	**ISO**, ~~ASSIST~~PSIO, RCMP and, where applicable, local police

Appendix 4: Events Reportable by the ISO

Event	Entity to Forward Report to
1. Damage to or destruction of a **transmission facility** that results in an unexpected sustained outage of any combination of ~~three (~~3~~)~~ or more of the following: (i) transmission lines energized at greater than 25 kV; or (ii) transformers with at least ~~two (~~2~~)~~ terminals energized at greater than 25 kV.	**NERC**
2. Unexpected loss, contrary to design, of any combination of ~~three (~~3~~)~~ or more of the following: (a) ~~(i)~~ transmission lines energized at greater than 25 kV; or (b) ~~(ii)~~ transformers with at least ~~two (~~2~~)~~ terminals energized at greater than 25 kV caused by a common **disturbance** (excluding successful automatic reclosing).	**NERC**
3. Damage to or destruction of a **transmission facility**, **generating unit**, ~~or~~ **aggregated ~~generating~~ facility**, or **energy storage resource** that is ~~part of or is~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher that results from actual or suspected intentional human action.	**NERC**
4. A physical threat to a **control centre** for the **bulk electric system**, excluding a weather or natural disaster related threat, which has the potential to degrade the normal operation of the **control centre**.	**NERC**
5. A physical threat to a **transmission facility**, **generating unit**, ~~or~~ **aggregated ~~generating~~ facility**, or **energy storage resource** that is ~~part of or~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher, excluding weather or natural disaster related threats, which has the potential to degrade the normal operation of the **transmission facility**, **generating unit**, ~~or~~ **aggregated ~~generating~~ facility**, or **energy storage resource**.	**NERC**
6. A suspicious device or activity at a **control centre** for the **bulk electric system**.	**NERC**
7. A suspicious device or activity at a **transmission facility**, **generating unit**, ~~or~~ **aggregated ~~generating~~ facility**, or **energy storage resource** that is ~~part of or~~ directly connected to the ~~**bulk electric**~~**transmission system** energized at 100 kV or higher.	**NERC**

Event	Entity to Forward Report to
8. Automatic **firm load** shedding of greater than or equal to 100 MW (via an automatic undervoltage or underfrequency load shedding scheme, or a **remedial action scheme**) that occurs as part of the **ISO**'s **under voltage load shed** program or **underfrequency load shedding** program.	**NERC**
9. A loss of monitoring or control that significantly affects the ability of the **operator** of a **transmission facility** to make operating decisions for ~~thirty (~~30~~)~~ continuous minutes or more, including: (i) loss of the ability to remotely monitor or control **system elements** of the **bulk electric system**; (ii) loss of communications from supervisory control and data acquisition remote terminal units; (iii) unavailability of "inter control centre protocol" links reducing **bulk electric system** visibility; or (iv) loss of the ability to remotely monitor and control **generating units** providing **regulating reserves**.	**NERC**
10. A complete loss, for ~~thirty (~~30~~)~~ continuous minutes or more, of voice communication systems for a **control centre** of a **transmission facility** that are required for the purpose of communicating with the **ISO** and the **operators** of adjacent **transmission facilities**.	**NERC**
11. An unplanned evacuation of a **control centre** of a **transmission facility** for ~~thirty (~~30~~)~~ continuous minutes or more.	**NERC**

ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.8 Event Analysis

Applicability

1 Section 304.8 applies to:

(a) the **legal owner** and **operator** of a **transmission facility**;

(b) the **legal owner** and **operator** of an **electric distribution system**;

(c) the **legal owner** and **operator** of a facility that provides **ancillary services**;

(d) the **legal owner** and **operator** of a **generating unit** or **energy storage resource** that:

(i) is not part of an **aggregated ~~generating~~ facility**;

(ii) has a **maximum authorized real power** rating greater than 4.5 MW; and

(iii) is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat, including a **generating unit** or **energy storage resource** situated within an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(e) the **legal owner** or **operator** of an **aggregated ~~generating~~ facility** that:

(i) has a **maximum authorized real power** rating greater than 4.5 MW; and

(ii) is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat, including an **aggregated ~~generating~~ facility** situated within an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

~~(f) the **legal owner** of a **transmission facility**;~~

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

~~(h) the **legal owner** of a facility that provides **ancillary services**;~~

~~(i) the **legal owner** of a **generating unit** that:~~

~~(i) is not part of an **aggregated generating facility**;~~

~~(ii) has a **maximum authorized real power** rating greater than 4.5 MW; and~~

~~(iii) is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat, including a **generating unit** situated within an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;~~

~~(j) the **legal owner** of an **aggregated generating facility** that:~~

~~(i) has a **maximum authorized real power** rating greater than 4.5 MW~~

~~(ii) is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat, including an **aggregated generating facility** situated within an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;~~

(collectively referred to as the "Responsible Entities")

and

(~~k~~f) the **ISO**.

Requirements

Requirements to Perform Event Analysis

2(1) The **ISO** may conduct an event analysis of an event listed in Appendix 1.

(2) The **ISO** may conduct an event analysis for an event that is not listed in Appendix 1 where:

(a) the **ISO** determines that an analysis is necessary to evaluate the impact of an event on the reliable operation of the **interconnected electric system**; or

(b) the **NERC** or the **WECC** request an event analysis report ~~is requested by the **NERC** or the **WECC**~~.

(3) The **ISO** may categorize the event using the highest applicable category in Appendix 1 where Category 1 is the lowest and Category 5 is the highest.

Event Analysis Requests

3 The **ISO** may request a brief report ~~or~~, an event analysis report, or both from a Responsible Entity while conducting an event analysis.

Responsible Entity Reporting

4(1) A Responsible Entity must provide the **ISO** with a report requested in accordance with subsection 3:

(a) in a manner ~~specified by~~ the **ISO**~~,~~ specifies; and

(b) within 10 **business days** if the **ISO** requests a brief report; and

(c) within 30 **business days** if the **ISO** requests an event analysis report~~.~~ or within the time the **ISO** specifies if the **ISO** provides an extension pursuant to subsection 4(2).

(2) ~~Notwithstanding subsection 4(1), a~~A Responsible Entity may make written request, ~~in writing,~~ including all relevant supporting documentation, that the **ISO** provide an extension to the time frames indicated in ~~subsections~~subsection 4(1~~)(b) and 4(1)(c):~~)

(a) to allow for system restoration; or

(b) to allow the Responsible Entity to obtain accurate and complete information regarding the event.

(3) The **ISO** must respond, in writing, to an extension request made in accordance with subsection 4(2) within 3 **business days** of receiving the request.

Review

5(1) ~~Upon~~The **ISO** may, upon reviewing a brief report or event analysis report provided in accordance with subsection 4, ~~the **ISO** may~~ request that the Responsible Entity provide additional information as required to complete the event analysis within a specified time frame.

(2) A Responsible Entity must, upon receiving a request from the **ISO** under subsection 5(1) and within the time frame specified in the request:

(a) provide the **ISO** with the requested information; or

(b) notify the **ISO**, in writing, of the reasons for which the requested information is not available or the specified time frame cannot be met.

ISO Reporting

6~~(1)~~ The **ISO** may, after reviewing the reports provided in accordance with subsection 4 and subsection 5, decide to author additional reports.

Event Analysis Recommendations

7(1) The **ISO** may, after completing a report under subsection 6, identify:

(a) the Responsible Entity required to implement each recommendation in the report; and

(b) an implementation date for each recommendation in the report.

(2) The **ISO** may:

(a) provide a copy of a report issued under subsection 6 to each Responsible Entity identified under subsection 7(1); and

(b) ~~advise~~notify each Responsible Entity identified under subsection 7(1), in writing, of the implementation date for each recommendation applicable to that Responsible Entity.

(3) ~~Subject to subsection 7(2), the~~The **ISO** and each Responsible Entity identified under subsection 7(1) must, subject to subsection 7(2), treat a report provided under subsection 7(2)(a) as confidential.

(4) Each Responsible Entity identified under subsection 7(1) must implement each applicable recommendation by resolving the outstanding issues associated with each recommendation on or before the implementation date.

(5) Each Responsible Entity identified in subsection 7(1) must provide the **ISO** with:

(a) notification that the recommendation has been implemented in accordance with subsection 7(4) within 5 **business days** following such implementation, or

(b) a revised implementation date at least 5 **business days** before the implementation date ~~identified by~~ the **ISO** identifies in subsection 7(2)(b), if the recommendation cannot be implemented in accordance with subsection 7(4).

Lessons Learned

8(1) The **ISO** may complete a "Lessons Learned" document which includes the following information:

(a) high level details of the event;

(b) corrective actions for possible future events; and

(c) a list of lessons learned from the event.

(2) A "Lessons Learned" document must not contain any of the following information:

(a) names of **market participants**;

(b) names of facilities;

(c) the date on which the event occurred; and

(d) to the extent practicable, any other information that would otherwise permit the identification of a **market participant** or facilities.

(3) The **ISO** may publish the "Lessons Learned" document on the AESO website.

Requirement to Report to the NERC and the WECC

9 The **ISO** may forward the reports and documents described in this ~~section~~Section 304.8 to the **NERC** and the **WECC**.

Appendices

Appendix 1 – Event Categories

Revision History

Date	Description
20xx-xx-xx	
2020-09-16	Revised to add subsections 1(i)(ii) and 1(j)(i). Administrative amendments.
2018-04-30	Initial release

Appendix 1

Event Categories

Category 1: An event that results in one or more of the following:

(a) An unexpected sustained outage caused by a common **disturbance** and contrary to design of any combination of ~~three~~3 or more **transmission facilities**, **aggregated** ~~**generating** **facilities** ~~or~~,~~ **generating units**, or **energy storage resources** with an aggregate ~~generation~~supply of 500 MW to 1,999 MW at the time of the outage.

(b) Failure or **misoperation** of a **remedial action scheme**.

(c) A system wide voltage reduction of 3% or more that lasts more than 15 continuous minutes due to an emergency on the **interconnected electric system**.

(d) Unintended separation within the **interconnected electric system** that results in an island of 100 MW to 999 MW. Excludes **transmission system** radial connections, and **electric distribution system** level islanding.

(e) The loss of monitoring or control that significantly affects a Responsible Entity's ability to make operating decisions for 30 continuous minutes or more, including:

(i) loss of **operator** ability to remotely monitor or control ~~elements of the **bulk electric system, aggregated generating facilities** or **generating units** connected to the **bulk electric system**~~;

(A) elements of the **bulk electric system**;

(B) an **aggregated facility**, **generating unit**, or **energy storage resource** that is directly connected to the **transmission system** energized at 100 kV or higher;

(ii) loss of communications from supervisory and data acquisition remote terminal units for a substation rated 69 kV and above;

(iii) unavailability of inter-**control centre** protocol links reducing **bulk electric system** visibility

(iv) loss of the ability to remotely monitor and control an **aggregated facility**, **generating** ~~**units**~~**unit**, or **energy storage resource** providing **regulating reserves**; or

(v) state estimator or **contingency** analysis failing to solve at a **control centre** for:

(A) the **ISO**; or

(B) the **operator** of a **transmission facility**.

Category 2: An event that results in one or more of the following:

(a) Complete loss, for 30 minutes or more, of all voice communication systems for a **control centre** including a **control centre** for:

(i) the **ISO**;

(ii) the **operator** of a **transmission facility** (that controls **transmission facilities** at ~~2or~~2 or more locations); or

(iii) the **operator** of either one or both of a **generating unit** and **energy storage resource** (that controls either one or both of **generating units** and **energy storage resources** at 2 or more locations).

(b) Operating voltage excursions at the **point of connection** equal to or greater than 10% lasting more than 15 continuous minutes.

(c) Unintended separation within the **interconnected electric system** that results in an island of 1,000 MW to 4,999 MW.

(d) Unintended loss of 300 MW or more of **firm load** for more than 15 minutes.

(e) Interconnection reliability operating limit Tv violation.

Category 3: An event that results in one or more of the following:

(a) Unintended loss of ~~load~~supply or ~~generation~~demand of **real power** within the **interconnected electric system** of 2,000 MW to 5,000 MW.

(b) Unintended separation within the **interconnected electric system** that results in an island of 5,000 to 10,000 MW. Excludes the loss of **interconnections**.

Category 4: An event that results in one or more of the following:

(a) Unintended loss of ~~load~~supply or ~~generation~~demand of **real power** within the **interconnected electric system** of 5,001 MW to 9,999 MW.

(b) Unintended separation within the **interconnected electric system** that results in an island of more than 10,000 MW. Excludes the loss of **interconnections**.

Category 5: An event that results in one or more of the following:

(a) Unintended loss of ~~load~~demand within the **interconnected electric system** of 10,000 MW or more.

(b) Unintended loss of ~~generation~~supply within the **interconnected electric system** of 10,000 MW or more.

ISO ~~Rules~~Rule
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.9 Wind and Solar Aggregated ~~Generating~~ Facility Forecasting

Applicability

1 Section 304.9 applies to:

(a) the **legal owner** of ~~a wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources that is connected to:

(i) the **interconnected electric system** ~~or~~;

~~(i)~~(ii) an electric system within the service area of the City of Medicine Hat, including ~~a wind or solar~~ **aggregated** ~~**generating**~~ **facility** situated within an industrial complex that is directly connected to the **interconnected electric system**; or

~~(ii)~~(iii) to an electric system within the service area of the City of Medicine Hat and that has a **gross real power** capability ~~equal to or~~ greater than or equal to 5 MW; and

(b) the **ISO**.

Requirements

Functional Specification

2 The **ISO** must, in accordance and generally consistent with this Section 304.9, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of an **aggregated** ~~**generating**~~ **facility** containing wind or solar resources and any associated **transmission facility** connection facilities.

Successor to Prior Requirements and Compliance Timeframe

3~~**(1)**~~ The provisions of this Section 304.9 succeed all previous forecasting requirements for **aggregated** ~~**generating**~~ **facilities**, whether in an **ISO rule** or other document, and those requirements will no longer be in force and effect as of September 1, 2018.

Meteorological Data Collection Equipment and Availability Requirements

4(1) The **legal owner** of ~~a wind or solar~~ **aggregated** ~~**generating**~~ **facility** containing wind or solar resources must ensure that the facility is equipped with meteorological data collection equipment and related devices that are installed and maintained in accordance with the provisions of subsections 4 and 5.

(2) The **legal owner** of ~~a wind~~ **aggregated** ~~**generating**~~ **facility** containing wind resources must ensure that it is equipped with one set of instruments for each meteorological parameter in accordance with the requirements in Table 1.

(3) The **legal owner** of ~~a solar **aggregated generating**~~an**aggregated facility** containing solar resources must ensure that the facility is equipped with meteorological data collection equipment and related devices in accordance with the following:

(a) one ~~(1)~~ set of instruments for each meteorological parameter in accordance with the requirements in Table 1 per 49 square kilometers of surface area within the facility;

(b) each set of instruments, if required by subsection 4(3)(a), must be less than 8 kilometers apart; and

(c) measurements must be taken at not less than 2 meters and not greater than 10 meters above ground, except where otherwise noted in Table 1.

(4) The **legal owner** of ~~a~~an**aggregated facility** containing wind or solar ~~**aggregated generating**~~

~~facility~~resources must ensure that the meteorological data collection equipment and related devices described in subsections 4(2) and 4(3) take measurements of instantaneous values at ~~interval~~intervals of 15 **seconds** or less.

(5) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ **facility** containing wind or solar resources must measure, collect and submit to the **ISO** the meteorological data in Table 1.

(6) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ **facility** containing wind or solar resources must determine, at 30 minute intervals, and submit to the **ISO**, the **gross real power capability** with a precision to the nearest 2.0 MW.

(7) The **legal owner** of ~~a wind or solar~~an **aggregated** ~~generating~~ **facility** containing wind or solar must determine and submit to the **ISO**, the following data:

(a) any real power limits in ~~megawatts (~~MW~~),~~ with a precision for instantaneous measurements to the nearest 0.1 MW; and

(b) actual net to grid real power production in ~~megawatts (~~MW~~),~~ with a precision for instantaneous measurements to the nearest 0.1 MW.

Data Transfer Technical Specification

5(1) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ **facility** containing wind or solar resources must submit to the **ISO** the data specified in subsection 4(5) using one **minute** average data.

(2) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ **facility** containing wind or solar resources must submit to the **ISO** the data specified in subsection 4 in the method and format the **ISO** specifies.

(3) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ facility containing wind or solar resources must ensure that its meteorological data collection equipment and related devices including its data transfer equipment is designed and maintained with an availability of 98.0% in accordance with Table 1 and a mean time to repair of ~~forty-eight (~~48~~)~~ hours or less.

(4) The **legal owner** of ~~a~~an **aggregated facility** containing wind or solar ~~**aggregated generating facilities**~~resources must keep ~~seven (~~7~~)~~ **days** of back up data for any data that has been submitted in accordance with this subsection 5 and must provide it to the **ISO** upon request within ~~thirty (~~30~~)~~ **days**.

Notification of Unavailability, Suspected Failure or Data Error

6(1) The **legal owner** of ~~a wind or solar~~an **aggregated** ~~generating~~ **facility** must, if any component in the meteorological data collection equipment and related devices including data transfer equipment becomes unavailable due to an unplanned event, is suspected to have failed, or is suspected to be providing erroneous data, notify the **ISO** as soon as practicable, in writing, after identifying the unavailability, suspected failure or data error.

(2) The **legal owner** of ~~a wind or solar~~ an **aggregated** ~~generating~~ **facility** containing wind or solar resources must provide the **ISO** as soon as practicable, in writing:

(a) a description of the cause of any unavailability, suspected failure or data error reported pursuant to subsection 6(1); and

(b) in the event of an equipment failure~~,~~:

(i) a plan acceptable to the **ISO** to repair the failed equipment, including testing; and

(ii) ~~in the event of an equipment failure,~~ the expected date when the equipment will be repaired and the required measurements will be restored.

(3) The **legal owner** of ~~a wind or solar~~ an **aggregated ~~generating~~ facility** containing wind or solar resources must, if an equipment failure described in subsection 6(2) is not repaired and required measurements are not restored by the expected date, notify the **ISO** as soon as practicable, in writing, of the revised date and the reason the component in the equipment was not repaired by the expected date.

(4) The **legal owner** of ~~a wind or solar~~ an **aggregated ~~generating~~ facility** containing wind or solar resources must notify the **ISO** as soon as practicable in writing after an equipment failure described in subsection 6(2) is repaired and the required measurements are restored.

Exceptions

7 ~~Notwithstanding subsections 4 and 5, the~~The **legal owner** of ~~a wind or solar~~ an **aggregated ~~generating~~ facility** containing wind or solar resources is, notwithstanding subsections 4 and 5, not required to comply with the requirements of this Section 304.9 relating to meteorological data collection equipment and related devices including data transfer equipment when:

(a) such equipment is being repaired or replaced in accordance with a plan acceptable to the **ISO** under subsection 6; and

(b) the **legal owner** is using reasonable efforts to complete such repair or replacement in accordance with that plan.

Pre-Commissioning Facility Data and Records Requirements

8(1) The **legal owner** of ~~a wind~~an **aggregated ~~generating~~ facility** containing wind resources must provide to the **ISO** the pre-**commissioning** data and records referred to in this subsection 8 in a method and format the **ISO** specifies.

(2) The **legal owner** of ~~a solar~~an **aggregated ~~generating~~ facility** containing solar resources must provide to the **ISO,** in a method and format the **ISO** specifies, either:

(a) the pre-**commissioning** data and records referred to in this subsection 8; or

(b) an industry standard model that is approved by the **ISO**.

(3) ~~Subject to the provisions of this subsection 8, the~~ The **legal owner** of ~~a wind or solar~~ an **aggregated ~~generating~~ facility** containing wind or solar resources must, subjectto the provisions of this subsection 8, retain and provide within ~~sixty (~~60~~)~~ **days** of the **ISO**'s written request the following averaged meteorological data and records at ~~ten (~~10~~)~~ minute intervals or less, covering the ~~two (~~2~~)~~ calendar years prior to the **commissioning** of the ~~wind or solar~~ **aggregated ~~generating~~ facility**:

(a) details on the height of the measurements;

(b) wind speed;

(c) wind direction;

(d) temperature;

(e) barometric pressure; and

(f) for ~~solar~~ **aggregated ~~generating~~ facilities** containing solar resources only, global horizontal irradiance.

(4) The **legal owner** of ~~a wind~~an **aggregated** ~~**generating**~~ **facility** containing wind resources must, in response to a request by the **ISO** under subsection 8(3), provide the following facility data:

(a) meteorological tower data collection height in ~~meters (~~m~~),~~ with a precision for instantaneous measurements to the nearest 1 m;

(b) turbine model name;

(c) turbine model capacity in ~~megawatts (~~MW~~),~~ with a precision to the nearest 0.1 MW;

(d) turbine wind speed cut-in in ~~meters per second (~~m/s~~),~~ with a precision to the nearest 0.1 m/s;

(e) turbine wind speed cut-out in ~~meters per second (~~m/s~~),~~ with a precision to the nearest 0.1 m/s;

(f) turbine temperature cut-out lower in degrees Celsius (°C), with a precision for instantaneous measurements to the nearest 1 °C ~~and~~with an indicator ~~is required~~ to confirm that the numbers are ambient temperature within the rotor or air temperature;

(g) turbine temperature cut-out upper in degrees Celsius (°C), with a precision for instantaneous measurements to the nearest 1 °C ~~and~~with an indicator ~~is required~~ to confirm that the numbers are ambient temperature within the rotor or air temperature;

(h) site latitude and longitude in degrees; and

(i) turbine power curves.

(5) The **legal owner** of ~~a solar~~an **aggregated** ~~**generating**~~ **facility** containing solar resources must in response to a request by the **ISO** under subsection 8(3), provide the following solar array data and records, including:

(a) site latitude and longitude in degrees;

(b) direct ~~current (DC) **real**~~current**real** **power** rating;

(c) alternating current ~~(AC) **real power**~~ rating;

(d) inverter manufacturer and model;

(e) mounting height from ground in ~~meters (~~m~~);~~;

(f) tilt angle or range of tilt angles to horizontal plane in degrees;

(g) azimuth angle in degrees;

(h) alternating current ~~(AC)~~ **real power** capacity per **solar array** in ~~megawatts (~~MW~~);~~;

(i) mounting type, tracking (fixed, single or dual axis); and

(j) module type (crystalline, thin-film etc.).

Revision History

Date	Description
20xx-xx-xx	
2023-03-31	Updated to align with current AESO drafting principles.
2019-12-11	“Removed duplication with new Section 103.14, Waivers and Variances; standardized functional specifications language; capitalized references to “Section”.”

2018-09-01	Initial release.

Table 1
Wind and Solar Aggregated Generating Facility Meteorological Data Requirements

Wind Aggregated Generating Facility Meteorological Data Requirements						
Measurement Type	**Units**	**Precision**	**Range**	**Accuracy**	**Height of Instrument**	
					Set-1	
Wind Speed	Meters/Second (m/s)	0.1 m/s	0 to 50	±1m/s	At Hub Height	
Wind Direction	Degrees from True North	1 degree	0 to 360	±5°	At Hub Height	
Barometric Pressure	HectoPascals (HPa)	1 hPa	800 to 1000	±1.0 hPa at -20 to 50°C; and ±1.5 hPa at below -20°C	At Convenient location	
Ambient Temperature	Degree Celsius (°C)	0.1° C	-50 to +50	±0.2°C	At Hub Height	
Dewpoint	Degrees Celsius (°C)	0.1° C	-50 to +50	±0.2°C	At Convenient location	
Relative Humidity	Percentage (%)	1.00%	0 to 100 %	±2%	At Convenient location	
Ice-up Parameter Measured with an Icing Sensor	Scale 0.0 to1.0	0.1	0 to 1	n/a	At Convenient location	
Precipitation	Millimeters/minute (mm/min)	0.1	0 to11	2% up to 0.417 mm/mon 3% over 0.417 mm/min	At Convenient location	
Solar Aggregated Generating Facility Meteorological Data Requirements						
Measurement Type	**Units**	**Precision**	**Range**	**Accuracy**	**Height of Instrument**	
					Set-1 per 49 km^2	**Set-2 for each subsequent 49 km^2**
Wind Speed	Meters/Second (m/s)	0.1 m/s	0 to 50	±1m/s	Between 2-10 meters	Between 2-10 meters
Wind Direction	Degrees from True North	1 degree	0 to 360	±5°	Between 2-10 meters	Between 2-10 meters
Barometric Pressure	HectoPascals (HPa)	1 hPa	800 to 1000	±1.0 hPa at -20 to 50°C; and ±1.5 hPa at below -20°C	Between 2-10 meters	Between 2-10 meters

Ambient Temperature	Degree Celsius (°C)	0.1° C	-50 to +50	±0.2°C	Between 2-10 meters	Between 2-10 meters
Dewpoint	Degrees Celsius (°C)	0.1° C	-50 to +50	±0.2°C	Between 2-10 meters	Between 2-10 meters
Relative Humidity	Percentage (%)	1.00%	0 to 100 %	±2%	Between 2-10 meters	Between 2-10 meters
Precipitation	Millimeters/minute (mm/min)	0.1	0 to11	2% up to 0.417 mm/mon 3% over 0.417 mm/min	Between 2-10 meters	Between 2-10 meters
Back panel Temperature	Degree Celsius (°C)	0.1° C	-50 to +50	±0.15°C at -27 to +50°C; and ±0.2°C at below -27°C	Between 2-10 meters	Between 2-10 meters
Global Horizontal Irradiance	Watts/Square Meter (W/m^2)	0.1	0 to 4000	±3%	Between 2-10 meters	Between 2-10 meters
Diffused Horizontal Irradiance	Watts/Square Meter (W/m^2)	0.1	0 to 4000	±3%	Between 2-10 meters	Between 2-10 meters
Direct Normal Irradiance[1]	Watts/Square Meter (W/m^2)	0.1	0 to 2000	±3%	Between 2-10 meters	Between 2-10 meters

[1] The requirement to provide this parameter will be determined by the AESO based on solar technology used in the project.

ISO Rules
Part 300 System Reliability and Operations
Division 305 Contingency and Emergency
Section 305.1 Energy Emergency Alerts

Applicability

1 Section 305.1 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

Communications

2(1) The **ISO** must communicate to **market participants** the declaration, modification or termination of an Energy Emergency Alert.

(2) A **market participant** must communicate an Energy Emergency Alert within their organizations as appropriate.

(3) A **market participant** must verbally notify the **ISO** of any work that increases the risk of tripping a **generating unit**, an **aggregated generating facility** or an **intertie**, or of constraining generation.

Revision History

Effective	Description
2022-01-01	Amended to remove requirements related to the description of Energy Emergency Alerts as those descriptions were moved to reliability standard EOP-011-AB-1, *Emergency Operations*.
2014-01-01	Amended to remove reference to the WECC Reliability Coordinator, clarify Energy Emergency Alert 0 declarations and incidental amendments.
2012-10-31	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 305 Contingency and Emergency
Section 305.4 System Security

Applicability

1 Section 305.4 applies to:

(a) a **market participant**; and

(b) the **ISO**.

Requirements

ISO Responsibilities

2(1) The **ISO** must schedule to prevent a threat to **system security**.

(2) The **ISO** may schedule out of the **merit order** to prevent a threat to **system security**.

(3) The **ISO** must issue **dispatches** in a manner to prevent a threat to **system security**.

(4) The **ISO** may issue **dispatches** out of the **merit order** to prevent a threat to **system security** or to return the **interconnected electric system** to a safe and reliable state.

(5) The **ISO** must issue **directives** to prevent a threat to **system security** or to return the **interconnected electric system** to a safe and reliable state.

(6) The **ISO** must, when there is a system emergency, use reasonable efforts to promptly advise:

(a) affected **legal owners** of a **transmission facility**; and

(b) all **pool participants**.

Market Participant Responsibilities

3 A **market participant** must use reasonable efforts to promptly advise the **ISO** upon becoming aware of any circumstance with respect to its facilities that could be expected to adversely affect **system security** or the **interconnected electric system**'s ability to deliver energy.

Revision History

Date	Description
2020-09-16	Un-bold "system emergency".
2012-10-31	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 306 Outages and Disturbances
Section 306.3 Load Planned Outage Reporting

Applicability

1 Section 306.3 applies to:

(a) a **market participant** with load; and

(b) the **ISO**.

Requirements

Load Planned Outage Reporting

2(1) Subject to subsection 2(2), a **market participant** who has a planned decrease in its capability to consume load at a facility of 40 MW or greater, must comply with the **planned outage** reporting requirements of this Section 306.3.

(2) Subsection 2(1) does not apply if the **market participant** has documented the decrease in a restated **available capability** for the facility, in accordance with Section 203.3 of the **ISO rules**, *Energy Restatements*.

(3) The **market participant** referred to in subsection 2(1) must submit to the **ISO** the following **planned outage** information, in a form the **ISO** approves and publishes on the AESO website:

(a) the commencement date and time of the **planned outage**, but not where such date and time is historical;

(b) the end date a*n*d time of the **planned outage**; and

(c) the actual decrease, in MW, in the load capability.

(4) The **market participant** must submit the information to the **ISO** as soon as reasonably practicable after the **market participant** is aware of the **planned outage** information.

(5) Subsequent to the **ISO** receiving from **market participants** the submissions referred to in subsection 2(3), on each **business day** the **ISO** must aggregate all **planned outage** records for loads as submitted, and determine the aggregate daily **planned outages** in MW which the **ISO** will calculate as:

the sum of MWh of all submitted **planned outages** by time period;

divided by

the number of hours in the time period.

(6) Once the **ISO** has determined the aggregate daily **planned outages** under subsection 2(5), the **ISO** also must prepare a daily **planned outage** report and publish it each **business day** on the AESO website, which report must include:

(a) the time and date the report was prepared; and

(b) the daily average **planned outage** amount in MW, rounded to the nearest MW, for each **business day** of the then current **month** and the next 3 successive **months**.

(7) Subject to subsection 2(8), the **ISO** must keep confidential all **planned outage** information for loads submitted to it under this Section 306.3, except as otherwise required to be made public under the provisions of Section 103.1 of the **ISO rules**, *Confidentiality.*

(8) The **ISO** must publish on the AESO website the aggregate daily **planned outage** report in a manner that, in accordance with Section 103.1 of the **ISO rules**, *Confidentiality*, seeks to preserve the confidential nature of any **planned outage** information as submitted by any one **market participant**, and precludes the identification of any one **market participant**, or other directly affected **pool participant**.

Revision History

Date	Description
2020-09-16	Administrative amendments.
2014-07-02	Renumbered from section 208.1 of the ISO rules to section 306.3 of the ISO rules; unbolded all references to “load” and “loads”; and replaced references to “outage” with “planned outage”.
2013-01-08	Removed reference to section 3.5 *Offers and Bids*, and replaced with section 203.3 *Restatements for Energy*.
2011-09-30	Initial Release

ISO Rules
Part 300 System Reliability and Operations
Division 306 Outages and Disturbances
Section 306.4 Transmission Planned Outage Reporting and Coordination

Applicability

1 Section 306.4 applies to:

(a) the **legal owner** of a **transmission facility**;

(b) the **legal owner** of **generating unit** connected to a **transmission facility**;

(c) the **legal owner** of an **aggregated** ~~**generating**~~**facility** connected to a **transmission** **facility**;

(d) the **legal owner** of an **electric distribution facility**;

(e) the **legal owner** of an **intertie**;

(f) the **legal owner** of an **energy storage resource** connected to a **transmission facility**;

(g) the **legal owner** of load facility directly connected to the **transmission system**; and

(~~g~~h) the **ISO**;

when managing the reporting and coordination of **planned outages**, including live line work and recloser block situations, for **transmission facilities**.

Requirements

General

2 The **legal owner** of a **transmission facility** must, prior to the occurrence of a **planned outage**, submit to the **ISO** a **planned outage** request for approval by submitting the information specified in this Section 306.4 and according to the timelines set out below.

Planned Outage Schedule and Requests

3(1) The **legal owner** of a **transmission facility** must submit to the **ISO**, by the first **day** of every **month**, a schedule of significant **planned outages** that are planned to occur within the next 24 **months**.

(2) The **legal owner** of a **transmission facility** must submit to the **ISO** a significant **planned outage** request as soon as possible, and not less than 30 **days** before the start of the **operating week** in which the significant **planned outage** is intended to occur.

(3) The **legal owner** of a **transmission facility** must, in its schedule of significant **planned outages** and in its significant **planned outage** requests, include a **planned outage** that meets any one or more of the following criteria:

(a) it affects a **transmission facility** operating at 240 kV or greater;

(b) it affects an **intertie**;

(c) it affects a **system element** connecting facilities owned by 2 or more different **legal owners** of **transmission facilities**;

(d) it affects a **system element** that connects a **generating unit**, **energy storage resource**, or ~~an~~ **aggregated** ~~**generating**~~ **facility** to the **interconnected electric system**;

(e) it requires the **ISO** to issue a **dispatch** or **directive** for ~~generation~~**a generating unit**, **energy storage resource**, or **aggregated facility**, in order to facilitate the **planned outage**;

(f) it affects a cutplane limit;

(g) it limits or reduces the operability of a synchronous condenser, static VAr compensator, static compensator or other similar dynamic device; or

(h) it affects high voltage direct current facilities.

(4) The **legal owner** of a **transmission facility** must submit to the **ISO** a non-significant **planned outage** request no later than 12:00 noon on Tuesday in the week before the **operating week** in which the non-significant **planned outage** is intended to occur.

(5) The **legal owner** of a **transmission facility** must, on the Tuesday before each **operating week** and prior to 12:00 noon, resubmit to the **ISO** all **planned outage** requests that the **legal owner** intends to conduct in the following **operating week**.

Changes to Requests and Cancellations

4(1) The **legal owner** of a **transmission facility** must submit to the **ISO** any changes to a previously submitted **planned outage** request, including cancellations, as soon as possible, and no later than 10:00 am on the **business day** before the first **day** impacted by the intended change to the previously submitted **planned outage** request.

(2) The **legal owner** of a **transmission facility** must, if it is unable to comply with subsection 4(1), submit to the **ISO** a cancellation of a **planned outage** request as soon as possible after the deadline set out in subsection 4(1), and provide a reason as to why it was unable to submit the cancellation by that deadline.

Outage Pre-Work and Information

5(1) The **legal owner** of a **transmission facility** must, prior to submitting to the **ISO** any **planned outage** request or a change to a previously submitted **planned outage** request:

(a) coordinate the **planned outage** with other affected **legal owners**;

(b) perform a **contingency** assessment of the **planned outage**, considering conditions throughout the duration of the **planned outage,** and develop plans to mitigate any concerns identified; and

(c) determine the **planned outage** does not conflict with any other **planned outage**.

(2) The **legal owner** of a **transmission facility** must, as part of any **planned outage** request, provide **planned outage** information to the **ISO** in the form the **ISO** specifies, including the following:

(a) the **transmission facility** being taken out of service;

(b) dates and times, indicating the start of switching to isolate a facility and the end of switching to return the facility to service;

(c) nature of work and any related **system elements** that will be affected;

(d) details of the **contingency** assessment and any mitigation plans;

(e) confirmation of coordination with all affected **legal owners**;

(f) isolation points energized at greater than 25 kV; and

(g) time to restore the **transmission facility** in an emergency.

ISO Assessments

6(1) The **ISO** must, no later than the start of the **operating week** in which the **planned outage** is to occur, assess:

(a) in the case of a significant **planned outage**:

(i) a **planned outage** request submitted prior to 90 **days** before the start of the **operating week** in which the **planned outage** is to occur; and

(ii) a change to a **planned outage** request, previously submitted pursuant to subsection 6(1)(a)(i), that is submitted prior to 30 **days** before the start of the **operating week** in which the change is to occur; and

(b) in the case of a non-significant **planned outage**, a **planned outage** request, and any change to such request, that is submitted prior to 12:00 noon on Tuesday in the week before the **operating week** in which the **planned outage** or the change, as applicable, is to occur.

(2) The **ISO** may assess a change to a **planned outage** request that is submitted in accordance with subsection 4, but that is submitted later than the timelines specified in subsection 6(1).

(3) The **ISO** must, if it assesses a **planned outage** request or any change to such request, do so by taking into account:

(a) the **reliability** of the **interconnected electric system**;

(b) potential impacts to **market participants**;

(c) coordination of the **planned outage** with other affected **legal owners**; and

(d) coordination of the **planned outage** with other anticipated conditions on the **interconnected electric system**.

ISO Approvals

7(1) The **ISO** must approve a **planned outage** request or any changes to such request, excluding cancellations, if the **ISO**:

(a) assesses the **planned outage** request, or any change to such request, as set out in subsection 6; and

(b) determines that the **planned outage** can be conducted without adversely affecting the **reliability** of the system or the fair, efficient and openly competitive operation of the market.

(2) The **ISO** must, if it approves a **planned outage** request or any change to such request, communicate such approval via an approved outage report posted on the AESO website.

(3) The **ISO** must approve a **planned outage** request and any change to such request in order for the **planned outage** to proceed.

(4) The **ISO** may, based on real time **reliability** requirements of the **interconnected electric system** and necessary **ISO** operational flexibility, cancel any **planned outage** it has already approved under subsection 7(1) by providing written or verbal notice to the **legal owner** of the **transmission facility**.

Real-Time ISO Approval

8(1) The **legal owner** of a **transmission facility** must, in relation to any **planned outage**, obtain real-time approval from the **ISO** prior to switching transmission equipment out of service.

(2) The **legal owner** of a **transmission facility** must, in relation to any **planned outage**, obtain real-time approval from the **ISO** prior to energization of equipment after completion of an outage.

Coordination

9 The **legal owner** of a **generating unit**, ~~the **legal owner** of an~~**energy storage resource**, **aggregated** ~~**generating** **facility**, ~~the **legal owner** of an~~ **electric distribution system** ~~and the **legal owner** of~~, or load facility must, on a reasonable efforts basis, coordinate with the affected **legal owners** regarding any **planned outages**.

Provision of Outage Information by the ISO

10(1) The **ISO** must publish on the AESO website a list of significant **planned outages** that are to occur in the period beginning in the **operating week** after the upcoming **operating week** and ending 24 **months** later.

(2) The **ISO** must publish on the AESO website a list of all **planned outages** it has approved to occur during the remaining **days** of the current **operating week** and all **days** of the following **operating week**, and must use reasonable efforts to do so by 18:00 (6:00 pm) each Wednesday.

(3) The **ISO** must document details of its assessments of the approved **planned outages** noted on the list referred to in subsection 10(2) in a report commonly known as the coordination plan.

(4) The **ISO** must not include details of generation **dispatches**, generation **directives** or generation outage schedules in the coordination plan.

(5) The **ISO** must email the coordination plan to each **legal owner** of a **transmission facility** and must use reasonable efforts to do so by 18:00 (6:00 pm) each Thursday.

Revision History

Date	Description
20xx-xx-xx	
2020-09-16	Administrative amendments
2016-08-30	Inclusion of the defined term **system element**.
2014-07-02	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 306 Outages and Disturbances
Section 306.5 ~~Generation~~Source Asset Outage Reporting and Coordination

Applicability

1 Section 306.5 applies to:

(a) a **pool participant** with a ~~generating~~ **source asset**, excluding an import asset, with a **maximum capability** of greater than or equal to 5 MW ~~or higher~~;

(b) a **legal owner** of a **source asset** described in subsection 1(a); and

(c) the **ISO**.

Requirements

General

2(1) A **pool participant** must, for any outage that results or will result in a change in **available capability** of ~~5 MW or~~ greater than or equal to 5 MW, comply with the notification requirements set forth in subsections 3, 4 or 5, as applicable.

(2) A **pool participant** must provide to the **ISO**, in writing and in conjunction with its first **planned outage** notification, a list of contact **persons** who must be involved in the planning of outages and be in a position of authority to resolve with the **ISO** any issues or concerns regarding outages.

(3) A **pool participant** must submit information required to be provided to the **ISO** pursuant to this Section 306.5 via the Energy Trading System.

Planned Outage Notification Requirements

3(1) A **pool participant** must, in respect of any **planned outage**, submit to the **ISO**:

(a) the dates, times, durations and impact to MW capability for the **planned outage**;

(b) the specific nature of the **planned outage** work to be done; and

(c) a designation of the **planned outage** as “Derate-Planned” or **“**Outage-Planned”.

(2) A **pool participant** must, by the first ~~(1st)~~ **day** of every **month** after the date of energization, submit the information set out in subsection 3(1) to the **ISO** related to **planned outages** that, as of the time of the submission, are planned to occur at any time within the next 24 **months**.

(3) A **pool participant** must, with respect to:

(a) any revisions to the information submitted to the **ISO** under subsection 3(1); or

(b) a **planned outage** that is not included in the submission set out in subsection 3(2);

submit such information or **planned outage** as soon as reasonably practicable.

(4) A **pool participant** must, if information submitted under subsection 3(3) is submitted later than 3 **months** prior to the **day** the **planned outage** is to start, include a statement in its submission setting out the reasons that the information varies from the original subsection 3(1) submission or was not included in the submission set out in subsection 3(2).

Delayed Forced Outage Notification Requirements

4(1) A **pool participant** must, as soon as reasonably practicable, in respect of a **delayed forced outage**, submit to the **ISO**:

(a) the dates, times, durations and impact to MW capability for the **delayed forced outage**;

(b) the specific nature of the **delayed forced outage** work to be done; and

(c) a designation of the **delayed forced outage** as “Derate-Forced” or “Outage-Forced”.

(2) A **pool participant** must also, as soon as reasonably practicable, in respect of a **delayed forced outage** for which the **pool participant** has less than 24 hours between the time of discovering the circumstances requiring the **delayed forced outage** and the time of commencing the **delayed forced outage**, contact the **ISO** by telephone, on a telephone number that the **ISO** designates, which must contain a voice recording system.

Automatic Forced Outage Notification Requirements

5 A **pool participant** must, as soon as reasonably practicable, submit **automatic forced outage** information as follows:

(a) through contacting the **ISO** by telephone, on a telephone number that the **ISO** designates, which must contain a voice recording system; and

(b) submit a designation of the **automatic forced outage** as “Derate-Forced” or “Outage-Forced”.

Authority to Issue an Outage Cancellation Directive

6(1) The **ISO** may, if after:

(a) completing the assessments and procedures set out in subsections 7(2) through 7(6) the **ISO** determines that there remains:

(i) an immediate need on a short term basis for services provided by certain **source assets** to maintain the necessary level of **reliability** or **adequacy**, as the case may be; and

(ii) a high probability that the situation will not be alleviated in a voluntary manner:

(A) by any **pool participants** amending or revising outage plans; or

(B) through the ordinary course operation of the market; and

(b) taking into account the factors set out in subsection 7(7) below,

issue a **directive** to cancel any ~~1~~one or more of a **planned outage** or a **delayed forced outage**.

(2) The **ISO** must not issue a **directive** canceling an outage without the authorization of the Chief Executive Officer of the **ISO** or ~~his~~their designee.

Outage Cancellation Procedure

7(1) The **ISO** must, prior to issuing a **directive** canceling an outage, comply with the procedures set out in subsection 7(2) through 7(8) in sequence.

(2) The **ISO** must consider and analyze the results of the **adequacy** forecast undertaken in accordance with subsection 2 of Section 202.6 of the **ISO rules**, *Adequacy of Supply*, and perform a further assessment of the status of all **source assets** based on all **planned outage** plans **pool participants** submit under subsection 3.

(3) The **ISO** must:

(a) after completing the assessments and taking into account the total amount of all ~~generating~~ **source assets**, which are planned for outages; and

(b) if the **ISO** anticipates a high probability of a supply **adequacy** shortfall or **reliability** concern

notify **market participants** on the AESO website of its determination.

(4) The **ISO** must continue to conduct further situational analysis to seek to alleviate the potential supply **adequacy** shortfall or **reliability** concern and avoid the cancellation of any outages.

(5) The **ISO** must post the determination referred to in subsection 7(3) above for a minimum period of 1 calendar week, and in anticipation that certain **pool participants** may have flexibility to voluntarily amend plans for outages to assist in the alleviation of the supply **adequacy** shortfall or **reliability** situation.

(6) The **ISO** must, if the **ISO** posting referred to in subsection 7(5) and any resulting voluntary actions do not result in a reduction in the total amount of ~~generating~~ **source asset** capacity planned for outages such that the forecast supply **adequacy** shortfall or **reliability** remains unresolved, contact the individual **pool participants** to request that they further review outage plans.

(7) The **ISO** must consider all of the following factors in its determination as to whether or not to issue a **directive** canceling an outage as contemplated in this subsection 7:

(a) the economic and operational consequences for the **legal owner** of the **source asset** and for any designated **pool participant** of the **source asset**, if a different **person**;

(b) the operational and functional impact on the **source asset** if the outage is cancelled;

(c) the effectiveness of canceling the outage in alleviating the supply **adequacy** shortfall or **reliability** concern;

(d) the historical frequency that a given **source asset** has been the subject of outage cancellations relative to other **source assets**;

(e) the length of time of, and reasons for, any outage the **pool participant** has previously submitted to the **ISO** under the reporting requirements set out in subsections 3(1) and 4(1) of this Section ~~505.6~~306.5;

(f) the extent to which the outage will begin or end during the period of the forecast supply **adequacy** shortfall or **reliability** concern;

(g) any requirements or material implications under or related to any applicable municipal, provincial or federal legislation or regulations if the **ISO** proceeds to issue a **directive** to cancel an outage; and

(h) the practicality and effectiveness of market-based solutions to alleviate the supply **adequacy** shortfall or **reliability** concern, including a consideration of load curtailment options.

(8) The **ISO** must not issue a **directive** canceling an outage more than 90 **days** in advance of the first **day** of the period which the **ISO** has ~~been~~ determined to be the commencement of the **reliability** or **adequacy** shortfall.

Outage Planned Costs and Work Submission

8(1) A **pool participant** who has received a **directive** for the cancellation of an outage must use all reasonable efforts to submit to the **ISO** in advance of the period when the outage would have occurred:

(a) a detailed description and estimation of the work, which was to have been carried out during the outage, including an itemization of the specific plant, machinery and equipment which are the subject of the work during the that period; and

(b) an estimate of any known or anticipated **incremental generation costs** that may be the basis for a claim for compensation under these **ISO rules**.

(2) The submissions set out in subsection 8(1) do not limit compensation claims for other reasonable demonstrable costs.

Time Constrained Outage Cancellation

9 The **ISO** may, notwithstanding subsection 7, dispense with any or all of the procedures set out in that subsection 7 and proceed to issue a **directive** to cancel an outage~~,~~ if, in the **ISO**'s opinion, it is evident that immediate **reliability** or **adequacy** circumstances do not allow sufficient time to permit the **ISO** to comply with such procedures.

Outage Cancellation Report

10 The **ISO** must, if it issues a **directive** under subsection 6 to cancel an outage, prepare a report and post it on the AESO website, which report must contain:

(a) an explanation of the circumstances, background and chronological events that caused and are related to the issuance of the **directive** cancelling the outage;

(b) the particulars of the outage that was cancelled, including date of cancellation, duration and MW affected;

(c) any material market impacts known to the **ISO**;

(d) whether the cancellation was a time and procedurally constrained one under subsection 9, and if so, the reasons for a decision to depart from any prescribed procedures set out in subsection 7; and

(e) any other matters that, in the **ISO**'s opinion, are necessary in order to provide a full and complete explanation to **market participants** of the decision.

Payment Eligibility for Incremental Generation Costs and Claim Limitations

11(1) ~~Subject to this subsection 11, subsection 5.1 of Section 103.4 of the **ISO rules**, *Power Pool Financial Settlement* and the definition of **incremental generation costs**, a~~A **pool participant** or **legal owner** of a ~~generating~~ **source asset**, or both of them if different **persons**, that has complied with a **directive** to cancel an outage issued pursuant to subsection 6, is eligible to receive payment for **incremental generation costs** from the **ISO**, subject to this subsection 11, subsection 5(1) of Section 103.4 of the **ISO rules**, *Power Pool Financial Settlement* and the definition of **incremental generation costs**.

(2) A **pool participant** or a **legal owner** ~~who~~that is a claimant under this subsection 11 must, within ~~forty (~~40~~)~~ **days** after the end of the **settlement period** related to the period during which the **directive** was effective, provide the **ISO** with a written statement which contains:

(a) the detailed information of the claim and calculation of **incremental generation costs** as incurred and caused by the cancellation, to the extent those details and calculations are known or estimable as of the date of delivery of the statement to the **ISO**; or

(b) if any detailed information or calculations are not known or estimable as of the date of delivery of the statement, an estimate of the date by which any of the outstanding information or calculations required under subsection 11(2)(a) will be finally determined and delivered to the **ISO**.

(3) A **pool participant** or a **legal owner** ~~whe~~that is a claimant under this subsection 11 must provide the **ISO** with a supplementary written statement setting out all outstanding information or calculations as soon as reasonably practicable after the delivery of the original statement~~,~~ but ~~in any event no~~not later than ~~1~~one year after the end of the **settlement period** related to the period during which the cancellation **directive** was effective.

(4) A **pool participant** or a **legal owner** ~~whe~~that is a claimant under this subsection 11 must provide to the **ISO**:

(a) any and all of its own and third party supporting data, records, invoices, formulas, calculations, third party contract claims and related terms and conditions;

(b) any other information or materials used to calculate or determine the amounts claimed in the statement or any supplementary statement; and

(c) any other detail and information the **ISO** may reasonably request

in order to verify the **incremental generation costs**, claims, calculations, and particulars.

(5) The **ISO** must approve the compensation and settlement in respect of any **incremental generation costs** on or before the 40th **day** following the **day** ~~of the receipt by~~ the **ISO** ~~of~~receives the last of the initial statement, supplementary statement, or deficiency materials.

(6) The **ISO** must reject the portion of a claim for **incremental generation costs** related to any of the following:

(a) costs or claims related to a cancellation for which the claimant is eligible for compensation pursuant to the provisions of a **transmission must-run** contract with the **ISO**;

(b) costs or claims associated with or related to the claimant's market or hedging portfolio, other than those allowed under subsection (iv)(d)(B) of the definition of **incremental generation costs** which limits such costs and claims to the **source asset** which is the subject of the **directive**;

(c) lost opportunity costs, or other form of loss of profits, revenue, earnings, or revenue not specifically provided for in the definition of **incremental generation costs**;

(d) raw material, fuel, processing, production, manufacturing, or industrial costs of any nature which are not directly related to the **source asset**'s participation in the energy market;

(e) fixed costs; or

(f) costs or claims that the claimant could otherwise have mitigated through all reasonable efforts.

Cost Recovery

12 The **ISO** must treat the **incremental generation costs** paid to a claimant for an approved claim under subsection 11(6) as an **ancillary services** cost.

Timely Information from Legal Owner

13 A **legal owner** of a **source asset** must, if it is not the **pool participant** for that **source asset**, provide such timely and complete information to the **pool participant** for such **source asset** to enable the **pool participant** to comply with its obligations under subsections 3, 4, and 5.

Revision History

Date	Description
20xx-xx-xx	
2020-09-16	Addition of timing requirement for submission of delay forced outages in subsection 4. Revised subsection 4 title to Delayed Forced Outage Notification Requirements. Revised subsection 5 title to Automatic Forced Outage Notification Requirements. Administrative changes.
2015-04-01	The words “excluding a wind facility” were deleted from subsection 1(a).
2014-07-02	Initial release

ISO Rules
Part 300 System Reliability and Operations
Division 306 Outages and Disturbances
Section 306.7 Mothball Outage Reporting

The amendments in this draft reflect changes to incorporate storage into the existing version of Section 306.7. A proposed new version of Section 306.7 was filed with the Commission on March 7, 2023. The AESO will reconcile proposed amendments across the two versions based on the outcome of the Commission's process.

Applicability

1 Section 306.7 applies to:

(a) a **pool participant** with a ~~generating~~ **source asset**, excluding an import asset, with a **maximum capability** of ~~five (~~greater than or equal to 5~~)~~ MW or ~~higher~~;

(b) the **legal owner** of a **source asset** described in subsection 1(a); and

(c) the **ISO.**

Requirements

General

2 A **pool participant** must, for any **mothball outage** that results or will result in a change in **available capability** of ~~five (5) MW or~~ greater than or equal to 5 MW:

(a) comply with the notification requirements in subsection 3; and

(b) comply with the attestation requirements in subsection 4.

Mothball Outage Notification Requirements

3(1) A **pool participant** must, in respect of any **mothball outage**, submit to the **ISO**:

(a) the dates, times, durations and impact to MW capability for the **mothball outage**;

(b) a designation of the **mothball outage** as "Derate-Planned" or "Outage-Planned";

(c) the minimum time, which must be no more than ~~six (~~6~~)~~ **months**, that is required for the ~~generating~~ **source asset** to return to full capability if ~~issued~~the **ISO** issues a **directive** ~~by the **ISO**~~ in accordance with subsection ~~3;~~6(1); and

(d) a list of contact **persons** who are in a position of authority to resolve with the **ISO** any issues or concerns regarding the **mothball outage**.

(2) A **pool participant** must, by the first **day** of every **month** after the date of **energization**, submit the information set out in subsection 3(1) to the **ISO** related to **mothball outages** that, as of the time of the submission, are planned to occur at any time within the next ~~twenty-four (~~24~~)~~ **months**.

(3) A **pool participant** must, with respect to:

(a) any revisions to the information submitted to the **ISO** under subsection 3(1); or

(b) a **mothball outage** that is not included in the submission set out in subsection 3(2);

submit such information or **mothball outage** as soon as practicable but no later than ~~three (~~3~~)~~ **months** prior to the **day** the revision takes effect or the **mothball outage** is to start, unless the **ISO** otherwise ~~agreed to by the **ISO**~~agrees in writing.

(4) A **pool participant** must submit information required to be provided to the **ISO** pursuant to this

subsection 3 through the Energy Trading System, except that the information required to be provided in accordance with subsection 3(1)(c) and (d) is to be provided directly to the **ISO**, in writing.

Attestation

4(1) A **pool participant** must, if it provides a notification ~~is provided~~ to the **ISO** pursuant to subsections 3(1~~),~~) or 3(3)(a) where such notification results in an extension to the duration or increase in MW of the **mothball outage** originally submitted pursuant to subsection 3(1), provide an attestation to the **ISO** from a corporate officer of the **pool participant** of the **source asset** that:

(a) based on its reasonable assessment of forecast market prices and market conditions at the time the attestation is provided, such forecast market prices and market conditions are insufficient to recover avoidable costs for the **source asset** for the duration of the **mothball outage**; and

(b) the **mothball outage** will be cancelled if, based on its reasonable assessment of forecast market prices and market conditions, such forecast market prices and market conditions become sufficient to recover avoidable costs for the **source asset** for the remaining duration of the **mothball outage**.

4(2) A **pool participant** must provide an attestation in accordance with subsection 4(1):

(a) on the **day** that it provides a notification ~~is provided~~ to the **ISO** pursuant to subsections 3(1) or 3(3)(a), if such notification is received after May 28, 2018; and

(b) on the last **business day** that is 3 **months** prior to the **day** the **mothball outage** is planned to start when ~~the~~it provides a notification to the **ISO** pursuant to subsections 3(1) or 3(3)(a~~)~~), if notification is provided ~~to the **ISO** more than three (3) **months** prior to the **day** the **mothball outage** is planned to start, on the last **business day** that is three (~~3~~) **months** prior to the **day** the **mothball outage** is planned to start.

4(3) A **pool participant** must, if it is not the **legal owner** of the **source asset**, provide to the **ISO** on the **day** that the **pool participant** submits an attestation in accordance with subsection 4(2), an attestation from the **legal owner** of a **source asset** that the avoidable costs provided to the **pool participant** in accordance with subsection 8(a) are accurate.

Cancellation of Mothball Outage

5(1) A **pool participant** must provide the **ISO** with a minimum of ~~three (~~3~~)~~ **months**' written notice prior to cancelling a **mothball outage**.

(2) A **pool participant** must cancel a **mothball outage** no later than ~~twenty-four (~~24~~)~~ months after the date of commencement of the **mothball outage**, unless the **ISO** otherwise ~~agreed to by the **ISO**~~agrees, in writing.

(3) A **pool participant** must take one of the following actions upon cancelling a **mothball outage**:

(a) return the ~~generating~~ **source asset** to service; or

(b) terminate the **supply transmission service** contract for the ~~generating~~ **source asset**.

(4) A **pool participant** must not:

(a) schedule a **planned outage** immediately after a **mothball outage**; or

(b) schedule a **mothball outage** less than ~~three (~~3~~)~~ **months** after a previous **mothball outage**.

Authority to Issue an Outage Cancellation Directive

6(1) The **ISO** may, if after:

(a) completing the procedures set out in subsections 7(2) through 7(5) the **ISO** determines that there remains:

(i) an immediate need on a short-term basis for services provided by certain **source assets** to maintain the necessary level of **reliability** or **adequacy**, as the case may be; and

(ii) a high probability that the situation will not be alleviated in a voluntary manner:

(A) by any **pool participants** amending or revising outage plans; or

(B) through the ordinary course operation of the market; and

(b) taking into account the factors described in subsection 7(4) below,

issue a **directive** to cancel a **mothball outage**.

(2) The **ISO** must not issue a **directive** canceling a **mothball outage** without the authorization of the Chief Executive Officer of the **ISO** or ~~his~~their designee.

Mothball Outage Cancellation Procedure

7(1) The **ISO** must, in order to assist in determining whether to issue a **directive** canceling a **mothball outage**, forecast the **adequacy** of supply as described in subsection 2 of ~~section~~Section 202.6 of the **ISO Rules**, *Adequacy of Supply*.

(2) The **ISO** must, prior to issuing a **directive** canceling a **mothball outage**, comply with the outage cancellation procedures described in subsection 7 of ~~section~~Section 306.5 of the **ISO rules**, ~~*Generation*~~*Source Asset Outage Reporting and Coordination*.

(3) ~~In~~The **ISO** must, in performing the assessments described in ~~section~~Section 306.5, ~~the **ISO** must~~ take into account all **mothball outage** plans submitted to the **ISO** under subsection 3 of this ~~section~~Section 306.7.

(4) ~~In~~The **ISO** must, in addition to the factors set out in subsection 7(7) of ~~subsection~~Section 306.5, ~~the **ISO** must~~ consider the length of time of any outage the **pool participant** has previously submitted to the **ISO** under the reporting requirements set out in this ~~subsection~~Section 306.7 in its determination as to whether or not to issue a **directive** cancelling a **mothball outage**.

(5) ~~Notwithstanding~~The **ISO** may, notwithstanding subsection 7(8) of ~~section~~Section 306.5, ~~the **ISO** may~~ issue a **directive** cancelling a **mothball outage** at any time by providing notice equivalent to or greater than the minimum time that is required for the ~~generating~~ **source asset** to return to service provided under subsection 3(1)(c).

Timely Information from Legal Owner

8 A **legal owner** of a **source asset** must, if it is not the **pool participant** for that **source asset**:

(a) provide such timely and complete information to the **pool participant** for such **source asset** to enable the **pool participant** to comply with its obligations under subsection 3, 4, and 5; and

(b) provide an attestation to the **pool participant** from a corporate officer of the **legal owner** of such **source asset** to enable the **pool participant** to comply with its obligations under subsection 4(3).

Revision History

Date	Description
~~2023-01-01~~20xx-xx-xx	~~Revised subsection 7(1) by changing "assess the adequacy of supply" to "forecast the adequacy of supply"~~
2018-05-28	Addition of subsection 4 Amendment to subsection 8 Administrative amendments
2016-06-07	Initial release.

ISO Rules
Part 500 Facilities
Division 501 General
Section 501.3 Abbreviated Needs Approval Process

Applicability

1 Section 501.3 applies to:

(a) the **ISO**.

Requirements

Legislative Authority

2 Pursuant to subsection 11.2 of the *Transmission Regulation*, this Section 501.3 and any associated business practices the **ISO** establishes related to a **transmission facility** project outlined in subsection 3 are the sole requirements in respect of an abbreviated needs approval process.

Eligibility Assessment

3 The **ISO** may approve a **transmission facility** project under the abbreviated needs approval process set out in subsection 4 if:

(a) the **ISO** has identified a need consistent with the criteria set out in subsection 34(1) of the *Electric Utilities Act*;

(b) the **ISO** has determined that the **transmission facility** project is an appropriate option to meet the need; and

(c) the **ISO** reasonably expects the costs of the **transmission facility** project to be less than $25,000,000, of which system costs are not expected to exceed $15,000,000.

Conditions for Approval

4 The **ISO** must, prior to approving the need for a **transmission facility** project under the abbreviated needs approval process set out in subsection 4:

(a) comply with the **ISO** participant involvement program guidelines in **Commission** Rule 007, *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines*;

(b) confirm that the **transmission facility** project is not anticipated to result in significant environmental effects;

(c) provide at least 14 **days** notice, by way of a posting to the AESO website, of the **ISO**'s intention to consider a **transmission facility** project for approval under the abbreviated needs approval process, including supporting documentation; and

(d) confirm that any stakeholder concerns or objections with the need for a **transmission facility** have been addressed

Abbreviated Needs Approval Process

5 The **ISO** must, where it approves the need for a **transmission facility** project under this abbreviated needs approval process:

(a) provide an approval letter certifying that the **ISO** has approved the need for the **transmission facility** project to the **Commission** and to the applicable **legal owner** of a **transmission facility***;* and

(b) post a notice of the approval on the AESO website.

ISO Rules
Part 500 Facilities
Division 501 General
Section 501.3 Abbreviated Needs Approval Process

Revision History

Date	Description
2022-02-09	Simplified eligibility criteria under Section 3. Removed criteria related to facility size, configurations, etc. Updated conditions for approval under Section 4. Removed requirements related to how the ISO conducts its assessment of the need and options. Simplified and updated the approval process set out under Section 5. Removed the requirement to provide an approval letter to the market participant
2018-08-31	Amendments to subsection 2 Addition of subsection 3 Administrative amendments
2015-07-31	Initial release.

Applicability

1 Section 501.10 applies to:

(a) the **ISO**; and

(b) a **market participant** who has requested or is receiving **system access service** under:

(i) Rate STS of the **ISO tariff**, *Supply Transmission Service*;

(ii) Rate XOS of the **ISO tariff**, *Export Opportunity Service*;

(iii) Rate IOS of the **ISO tariff**, *Import Opportunity Service*; or

(iv) Rate DOS of the **ISO tariff**, *Demand Opportunity Service*.

Requirements

Establish and Maintain Loss Factors

2(1) The **ISO** must, subject to subsection 2(4), establish and maintain a final **loss factor** for each calendar year~~, subject to subsection 2(4) below,~~ for each **system access service** that a **market participant** is receiving under a rate of the **ISO tariff** included in subsection 1(b) above.

(2) The **ISO** must, subject to subsection 2(4), determine the anticipated losses on the **transmission system** and the average **loss factor** for the **transmission system** for each calendar year~~, subject to subsection 2(4) below~~.

(3) The **ISO** must establish a final **loss factor** for a new **system access service** that a **market participant** has requested under a rate of the **ISO tariff** included in subsection 1(b) above~~, as part of a loss factor study completed in accordance with the ISO tariff~~.

(4) The **ISO** may adjust one or more final **loss factors** during a calendar year when a change has occurred to a **generating unit**, **energy storage resource**, load facility, **transmission facility**, or other facility that is part of or is connected to the **interconnected electric system** and if as a result:

(a) the final **loss factor** for a **system access service** increases or decreases by 0.25 or more percentage points, then the **ISO** may adjust the final **loss factor** for that **system access service**; or

(b) the average **loss factor** for the **transmission system** increases or decreases by 0.25 or more percentage points, then the **ISO** may adjust the final **loss factors** for all **system access services** that **market participants** are receiving under rates of the **ISO tariff** included in subsection 1(b) above.

Make Loss Factors Publicly Available

3(1) The **ISO** must make final **loss factors,** including the dates when each **loss factor** becomes effective and ceases to be effective, publicly available on the AESO website:

(a) using reasonable best efforts, no later than the first **business day** of October prior to the calendar year in which the **loss factors** will apply; or

(b) if the **ISO** is unable to make final **loss factors** available by the first **business day** of October, no later than the first **business day** of December prior to the calendar year in which the **loss factors** will apply.

(2) The **ISO** must, when publishing final **loss factors** in accordance with subsection 3(1) above, also make publicly available on the AESO website the following information used to establish the **loss factors**:

(a) the hourly **merit order** data described in subsection 6(1) below, being the hourly **metered energy** and **operating blocks** for **source assets** and the **available transfer capability** that is not scheduled for imports over **interties**;

(b) a sample of the hourly load data described in subsection 6(2) below, being a sample of the hourly **metered energy** for **sink assets** that includes 4 hours randomly selected from each of the following:

(i) hours in which **system load** is in its highest quartile in each **month**;

(ii) hours in which **system load** is in its lowest quartile in each **month**; and

(iii) all other hours in each **month**;

and

(c) the process for requesting access to the 12 system topologies described in subsection 7 below;

(d) the *Procedure to Determine Transmission System Losses for Loss Factor Calculations* referred to in subsection 8(1) below;

(e) the software and scripts used to calculate hourly raw **loss factors** in accordance with subsection 8 below;

(f) a workbook showing the calculations from hourly raw **loss factors** to final **loss factors** in accordance with subsections 8(8), 9, 10, 11 and 12 below; and

(g) the anticipated losses on the **transmission system** and the average **loss factor** for the **transmission system** determined in subsection 2(2) above.

(3) The **ISO** must, when the final **loss factors** or other information changes in conjunction with an adjustment to a final **loss factor** in accordance with subsection 2(4) above, publish updated versions of the final **loss factors** made available in accordance with subsection 3(1) above and make publicly available updated versions of the other information described in subsection 3(2) above.

Recovery of Cost of Transmission System Losses

4(1) The **ISO** must reasonably recover the cost of losses on the **transmission system** by using the final **loss factor** for each **system access service** that a **market participant** receives under a rate of the **ISO tariff** included in subsection 1(b) above, as specified in the applicable rate of the **ISO tariff**.

(2) The **ISO** must reasonably recover the cost of losses on the **transmission system**, excluding **interties**, by using the final **loss factors** applied under Rate STS, Rate IOS and Rate DOS of the **ISO tariff**.

(3) The **ISO** must reasonably recover the cost of losses on an **intertie** that is not a merchant **intertie** by using the final **loss factors** applied under Rate XOS and Rate IOS of the **ISO tariff** over that **intertie**.

(4) The **ISO** must adjust final **loss factors** to ensure that the actual cost of losses is reasonably recovered on an annual basis through the use of Rider E of the **ISO tariff**, *Losses Calibration Factor Rider*.

Location at Which Loss Factors Are Determined

5(1) The **ISO** must establish a final **loss factor** for each location that is:

(a) a **point of supply** for **system access service** provided under Rate STS;

(b) a point where an **intertie** connects to the remainder of the **interconnected electric system** for **system access service** provided under Rate XOS or Rate IOS over that **intertie**; or

(c) a **point of delivery** for **system access service** provided under Rate DOS.

(2) A **market participant** must, subject to subsection 5(4) below, ensure that all **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** connected to the **transmission system** through a single location under subsection 5(1)(a) above:

(a) are owned or controlled, managed, and operated by the same entity;

(b) are part of a single economic enterprise or undertaking and not independent, standalone businesses; and

(c) have energy submitted in the energy market as part of the price-quantity **offers** for a single **source asset**, where that **source asset** does not include any other **generating unit** ~~or~~, **aggregated** ~~generating~~ **facility**, or **energy storage resource**.

(3) A **market participant** must, when ensuring it meets the requirements of subsection 5(2) above, consider that:

(a) all **generating units** and **energy storage resources** that are part of a single industrial system that has been designated as such by the **Commission** satisfy the single owner and single enterprise requirements of subsections 5(2)(a) and 5(2)(b) above;

(b) all **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** that are connected to part of an **electric distribution system** that receives **system access service** under subsection 5(1)(a) above satisfy the single owner, single enterprise, and single **source asset** requirements of subsection 5(2) above, including any of those **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** that have energy submitted in the energy market as a separate **source asset**; and

(c) all **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** that are connected to the **electric distribution system** or **transmission facilities** owned by the City of Medicine Hat satisfy the single owner, single enterprise, and single **source asset** requirements of subsection 5(2) above, including any of those **generating units** ~~and~~, **aggregated** ~~generating~~ **facilities**, and **energy storage resources** that have energy submitted in the energy market as a separate **source asset**~~;~~.

(d) all **generating units** that are subject to **power purchase arrangements** and are held by a single **power purchase arrangement** buyer satisfy the single owner and single enterprise requirements of subsection 5(2)(a) and 5(2)(b) above;

(e) a single **generating unit** that is subject to a **power purchase arrangement** and is held by more than one **power purchase arrangement** buyer satisfies the single owner and single enterprise requirements of subsection 5(2)(a) and 5(2)(b) above; and

(f) **generating units** that are subject to **power purchase arrangements** and are held by different **power purchase arrangement** buyers do not satisfy the single owner or single enterprise requirements of subsection 5(2)(a) and 5(2)(b) above, including any of those **generating units** that are subject to common **offer** control.

(4) A **market participant** may, notwithstanding subsection 5(2) above, continue the connection of **generating units**, **aggregated facilities**, and **energy storage resources** to the **transmission system** in the following configurations that existed on December 31, 2016:

(a) for the connection of multiple hydro **generating units** owned by TransAlta Corporation on the Bow River system upstream of Calgary, Alberta, at 11 locations that are **points of supply** for **system access service** provided under Rate STS and have energy submitted in the energy market in aggregate as a single **source asset**;

(b) for the connection of multiple **generating units**, **aggregated facilities**, and **energy storage resources** that are part of the Suncor Energy Inc. industrial system in the area of Fort McMurray, Alberta, at a single location that is a **point of supply** for **system access service**

provided under Rate STS and have energy submitted in the energy market as 3 **source assets**;

(c) for the connection of multiple **generating units**, **aggregated facilities**, and **energy storage resources** that are part of the Imperial Oil Resources Limited industrial system in the area of Cold Lake, Alberta, at a single location that is a **point of supply** for **system access service** provided under Rate STS and have energy submitted in the energy market as 2 **source assets**; and

(d) for the connection of multiple **generating units**, **aggregated facilities**, and **energy storage resources** that are part of the Shell Canada Limited Scotford industrial system in the area of Fort Saskatchewan, Alberta, at a single location that is a **point of supply** for **system access service** provided under Rate STS and have energy submitted in the energy market as 2 **source assets**.

(5) A **market participant** may request, no more than once each calendar year, a change to the configuration of **generating units** ~~or,~~ **aggregated** ~~**generating**~~ **facilities**, or **energy storage resources**:

(a) for:

(i) the aggregation of **generating units** ~~and,~~ **aggregated** ~~**generating**~~ **facilities**, and **energy storage resources** that are currently connected to the **transmission system** through multiple locations; or

(ii) the disaggregation of **generating units** ~~and,~~ **aggregated** ~~**generating**~~ **facilities**, and **energy storage resources** that are currently connected to the **transmission system** through a single location;

(b) while ensuring that the single owner, single enterprise, and single **source asset** requirements of subsections 5(2)(a), 5(2)(b), and 5(2)(c) above will continue to be satisfied; and

(c) by contacting the **ISO** no later than March 31 prior to the calendar year in which the **loss factors** will apply.

(6) The **ISO** must respond to a request under subsection 5(5) within 60 calendar **days** by:

(a) approving the request in writing and proceeding to work with the **market participant** to implement, on a best efforts basis, prior to the calendar year in which the **loss factors** will apply, any changes to **metering equipment**, **transmission facilities**, **system access service** agreements, or **source assets** required for the aggregation or disaggregation; or

(b) denying the request in writing, with reasons, which may include constraints on resources of the **ISO** or the **legal owner** of a **transmission facility** to implement changes to **metering equipment** or **transmission facilities** required for the aggregation or disaggregation.

(7) The **market participant** must pay the following costs if incurred to implement an aggregation or disaggregation:

(a) any costs incurred by a **legal owner** of a **transmission facility** related to changes to **metering equipment** or **transmission facilities**;

(b) any costs required to comply with applicable provisions of Section 502.10 of the ~~*AESO Measurement System Standard* or applicable~~ **ISO rules**, *Revenue Metering System Technical and Operating Requirements*, for any **measurement point** associated with the aggregation or disaggregation;

(c) any costs required by applicable provisions of the **ISO tariff**; and

(d) any costs required to maintain compliance with any other applicable provisions of the **ISO rules**, **reliability standards**, or **ISO tariff**.

Data Used to Calculate Loss Factors

6(1) The **ISO** must calculate **loss factors** using hourly historical metered volume and **merit order** data for all **source assets** connected to the **transmission system** that are included in the system topologies created in subsection 7 below, for the calendar year for which **loss factors** are being determined, by:

(a) using hourly historical data for the calendar year 2 years prior to the calendar year for which **loss factors** are being determined;

(b) including, in the following order, the following volumes for each **source asset**, including for the 11 locations at which hydro **generating units** on the Bow River system are connected to the **transmission system**:

(i) all **metered energy** for **source assets** that do not submit price-quantity **offers** in the energy market;

(ii) all dispatched **operating blocks** for **source assets** that submit price-quantity **offers** in the energy market, in **merit order** first by price and then by size;

(iii) all undispatched **operating blocks** offered in the energy market for **source assets** that submit price-quantity **offers** in the energy market, in **merit order** first by price and then by size;

(iv) all volumes for **source assets** that the **ISO** accepts for **dispatch** for **contingency reserve**, in **merit order** first by price and then by size; and

(v) all **available transfer capability** which is not scheduled for imports over **interties**;

(c) incorporating any change to **maximum capability** or **contract capacity** associated with a connection project, behind the fence project, or contract capacity change project for a **source asset** included in the historical data by increasing or decreasing the **source asset**'s historical volumes in subsection 6(b) above in proportion to the change in **maximum capability** or **contract capacity**, as appropriate;

(d) incorporating any return to service for a **source asset** that was subject to a **mothball outage**, a **planned outage**, or a similar extended outage for one entire **month** or longer during the historical year, by the **ISO** reasonably adjusting the historical volumes of the **source asset** for the **months** affected by the **mothball outage**, **planned outage**, or similar extended outage in the historical year, following an opportunity for the **legal owner** of the **source asset** to review and comment on the basis for the adjusted volumes;

(e) incorporating any new **source asset** not included in the historical data but which has an expected in-service date by the end of the calendar year for which the **ISO** is determining **loss factors** ~~are being determined~~, by assigning such new **source asset** an hourly data profile after its expected in-service date reflecting the hourly data profile that is, for the same period:

(i) the average of all **source assets** of the same technology owned by the same **market participant** in the historical data;

(ii) if no **source asset** of the same technology is owned by the same **market participant** in the historical data, the average of all **source assets** of the same technology owned by any **market participant** in the historical data; and

(iii) if no **source asset** of the same technology is owned by any **market participant** in the historical data, determined by the **ISO** after the **legal owner** of the new **source asset** has been provided an opportunity to review and comment on the basis for the hourly data profile.

and

(f) excluding any **source asset** during a **month** when, for the entirety of that **month** of the calendar year for which **loss factors** are being determined:

(i) the **market participant** has notified the **ISO** that the **source asset** is planned to be subject to a **mothball outage**, a **planned outage**, or a similar extended outage; or

(ii) the **system access service** for the **source asset** is planned to have been terminated.

(2) The **ISO** must calculate **loss factors** using hourly historical **metered energy** data for all **sink assets** connected to the **transmission system** that are included in the system topologies created in subsection 7 below, for the calendar year for which **loss factors** are being determined, by:

(a) using hourly historical data for the calendar year ~~2years~~2 years prior to the calendar year for which **loss factors** are being determined;

(b) including all **metered energy** for each **sink asset**;

(c) incorporating any change to **contract capacity** associated with a connection project, behind the fence project or a **contract capacity** change project for a **sink asset** included in the historical data by increasing or decreasing the **sink asset**'s **metered energy** in subsection 6(b) above in proportion to the change in **contract capacity**;

(d) incorporating any new **sink asset** not included in the historical data but which has an expected in-service date by the end of the calendar year for which **loss factors** are being determined, by assigning such new **sink asset** an hourly data profile reflecting the average hourly data profile of all **sink assets** included in the historical data after the expected in-service date of the new **sink asset**;

(e) excluding any **sink asset** during a **month** when, for the entirety of that **month** of the calendar year for which **loss factors** are being determined, the **system access service** for the **sink asset** is planned to have been terminated; and

(f) prorating all hourly **metered energy** for **sink assets** included in subsection 6(2)(b) above such that the total of the **metered energy** from the prorated **sink assets** plus the **metered energy** from the ~~unprorated~~un-prorated new **sink assets** included in subsection 6(2)(c) above is equal to the forecast **system load** annual volume for the calendar year for which **loss factors** are being determined.

System Topologies Used to Calculate Loss Factors

7(1) The **ISO** must create 12 system topologies that represent the **transmission system** in each of the12 **months** of the calendar year for which **loss factors** are being determined.

(2) The **ISO** must, subject to subsections 7(3) and 7(4) below, include in each system topology all **transmission facilities** that the **ISO** reasonably expects to be in service before or on the last **day** of the **month** for which the system topology is created, based on the project ~~queue~~list most recently published by the **ISO** when the 12 system topologies are created.

(3) The **ISO** must, subject to subsection 7(4) below, include in a system topology the **transmission facilities** that meet the in-service date criterion in subsection 7(2) above only when:

(a) for existing **transmission facilities**, the **transmission facilities**:

(i) are in service under normal operation when the system topologies are created; and

(ii) are not included in a plan ~~approved by~~ the **Commission** approves for decommissioning before the first **day** of the **month** for which the system topology is created;

(b) for proposed system **transmission facilities**, being **transmission facilities** that the **ISO** determines will benefit many **market participants**, the **Commission** has issued a permit and licence for the **transmission facilities** before the system topologies are created;

(c) for a proposed connection project or **market participant** choice project that requires construction of a new substation or transmission line:

(i) the **Commission** has issued a permit and licence for the **transmission facilities** before the system topologies are created; and

(ii) if required by the **ISO tariff**, the **market participant** has paid a **generating unit** owner's contribution before the system topologies are created;

(d) for a proposed connection project that only requires construction at an existing substation:

(i) the **legal owner** of the **transmission facilities** has filed a facility application with the **Commission** before the system topologies are created; and

(ii) if required by the **ISO tariff**, the **market participant** has paid a **generating unit** owner's contribution before the system topologies are created;

(e) for a proposed behind-the-fence project that does not require construction of **transmission facilities**:

(i) the **ISO** has, after completion of the functional specification stage of the connection process, issued an acknowledgement letter before the system topologies are created;

(ii) if required by the **ISO tariff**, the **market participant** has paid a **generating unit** owner's contribution before the system topologies are created; and

(iii) if required by the *Hydro and Electric Energy Act*, the **market participant** has filed a power plant or energy storage facility application with the **Commission** before the system topologies are created;

and

(f) for a proposed **contract capacity** change project that does not require construction of **transmission facilities**, the **market participant** has, after the **ISO** completes any required studies and calculations, acknowledged the **ISO**'s **construction contribution** decision before the system topologies are created.

(4) ~~Notwithstanding~~The **ISO** may, notwithstanding subsections 7(2) and 7(3) above, ~~the **ISO** may~~ exclude or include a **transmission facility**, **source asset**, or **sink asset** in a system topology if the **ISO** reasonably expects that the in-service date of the **transmission facility**, **source asset**, or **sink asset** will differ from that provided in the project ~~queue~~list on which the system topologies are based.

Calculation of Hourly Loss Factors

8(1) The **ISO** must calculate hourly raw **loss factors** for each location included in subsection 5(1) above for **system access service** provided under Rate STS, Rate IOS or Rate DOS for the calendar year for which **loss factors** are being determined, using:

(a) an incremental **loss factor** methodology with **merit order** redispatch as described in this subsection 8 and which calculates, for a **pool asset** in an hour:

(i) first, **transmission system losses** using the historical volume for that **pool asset**, in subsection 8(4) below;

(ii) second, **transmission system losses** after removing the **pool asset**'s volume and replacing it by redispatching other assets, using the historical **merit order** for the hour, in subsection 8(5) below; and

(iii) third, the hourly raw **loss factor** as the difference between **transmission system losses** calculated in subsections 8(1)(a)(i) and 8(1)(a)(ii) above, divided by the **pool asset**'s historical volume in the hour, in subsection 8(6) below;

and

(b) the *Procedure to Determine Transmission System Losses for Loss Factor Calculations*, as ~~published by~~ the **ISO** publishes on the AESO website and ~~as amended~~may amend from time to time ~~by the ISO~~ on notice to **market participants**.

(2) The **ISO** must, when calculating a raw **loss factor** for an hour under this subsection 8, use:

(a) the historical metered volume and **merit order** data for all **source assets** for that hour as described in subsection 6(1) above;

(b) the historical **metered energy** data for all **sink assets** for that hour as described in subsection 6(2) above; and

(c) the system topology for the **month** in which that hour occurs as described in subsection 7 above.

(3) The **ISO** must, when calculating **transmission system losses** under this subsection 8, exclude any losses that occur on:

(a) a **transmission facility** that is owned and operated by a **market participant** as part of its connection to the **transmission system** for **system access service**, including a **transmission facility** that is within an industrial system that has been designated as such by the **Commission**; or

(b) an **intertie**.

(4) The **ISO** must, unless it is not possible, calculate **transmission system losses** for an initial state for each hour of the calendar year for which **loss factors** are being determined, based on:

(a) the volumes for **metered energy** and dispatched **operating blocks** included in subsections 6(1)(b)(i), 6(1)(b)(ii), and 6(2)(b) above, as applicable, for that hour; and

(b) balancing total supply to total load plus **transmission system losses** in that hour by:

(i) increasing the volume for undispatched **operating blocks**, **contingency reserve** and **available transfer capability** which is not scheduled from one or more **source assets**, in the order described in subsection 6(1)(b) above;

(ii) where net demand from the **transmission system** exists at a location where volume from a **source asset** would be increased in subsection 8(4)(b)(i) above and that **source asset** submits offers in the energy market on a net supply basis:

(A) first decreasing the **metered energy** to load at that location as necessary to balance the system, but by no more than required to reduce net demand to 0 MW; and

(B) then increasing the volume from the **source asset** as necessary to balance the system;

or

(iii) decreasing the volume for **metered energy** and dispatched **operating blocks** in the order described in subsection 6(1)(b) above.

(5) The **ISO** must, unless it is not possible, calculate **transmission system** losses for a redispatched state for each hour of the calendar year for which **loss factors** are being determined:

(a) for each location for **system access service** provided under Rate STS or Rate IOS, based on:

(i) reducing the volume for **metered energy** or dispatched **operating blocks** for the location such that net supply to the **transmission system** is 0 MW while the facilities of the **market participant** remain connected for the applicable **system access service**;

(ii) increasing the volume for undispatched **operating blocks**, **contingency reserve** and **available transfer capability** which is not scheduled from one or more **source assets**, in the order described in subsection 6(1)(b) above, such that total supply balances the total load plus **transmission system losses** with the net supply to the **transmission system** set to 0 MW for the applicable **system access service**; and

(iii) where net demand from the **transmission system** exists at a location where volume from a **source asset** would be increased in subsection 8(5)(a)(ii) above and that **source asset** submits offers in the energy market on a net supply basis:

(A) first decreasing the **metered energy** to load at that location as necessary to balance the system, but by no more than required to reduce net demand to 0 MW; and

(B) then increasing the volume from the **source asset** as necessary to balance the system;

and

(b) for each location for **system access service** provided under Rate DOS, based on:

(i) reducing the volume for **metered energy** for the location such that net demand from the **transmission system** reflects the Rate DTS **contract capacity** for the applicable **system access service**;

(ii) decreasing the volume for **metered energy** and dispatched **operating blocks** from one or more **source assets**, in the order described in subsection 6(1)(b) above, such that total supply balances the total load plus **transmission system** losses with the net demand from the **transmission system** reflecting the Rate DTS **contract capacity** for the applicable **system access service**; and

(iii) where **metered energy** to load was decreased in subsection 8(4)(b)(ii) above at a location where volume from a **source asset** would be decreased in subsection 8(5)(b)(ii) above:

(A) first decreasing the volume from the **source asset** as necessary to balance the system, but by no more than required to reduce net supply to 0 MW; and

(B) then increasing the **metered energy** to load at that location as necessary to balance the system, but by no more than required to increase net demand to its original value.

(6) The **ISO** must, unless it is not possible, calculate the raw **loss factor**, in percent, for each location for **system access service** provided under Rate STS, Rate IOS or Rate DOS, for each hour of the calendar year for which **loss factors** are being determined, by dividing:

(a) the difference between:

(i) the **transmission system losses** for the initial state calculated in subsection 8(4) above; and

(ii) the **transmission system** losses for the redispatched state calculated in subsection 8(5) above;

by:

(b) the amount by which the volume for **metered energy** or dispatched **operating blocks** for the location was reduced or increased in the redispatched state in subsection 8(5) above.

(7) The **ISO** must exclude an hour from the calculations in subsections 8(8) through 11 below to determine final **loss factors** for all locations if, for any location in that hour, it is not possible to calculate **transmission system losses** for either the initial state in subsection 8(4) above or the redispatched state in subsection 8(5) above for any reason, including:

(a) missing or otherwise unavailable historical data for every **source asset** or every **sink asset** connected to the **transmission system** during that hour; or

(b) insufficient **source assets** to balance the **transmission system** in either the initial state in subsection 8(4) above or the redispatched state in subsection 8(5) above.

(8) The **ISO** must exclude an hour from the remaining calculations to determine a final **loss factor** for a single location if, for that location in that hour:

(a) for **system access service** provided under Rate STS or Rate IOS, the volume for **metered energy** or dispatched **operating blocks** for the location results in a net supply to the **transmission system** of less than 1.00 MW; or

(b) for **system access service** provided under Rate DOS, the volume for **metered energy** for the location results in a net demand to the **transmission system** of less than 1.00 MW.

(9) The **ISO** must, for each hour of the calendar year for which **loss factors** are being determined and which has not been excluded under subsection 8(7) above, add to or subtract from the hourly raw **loss factor** for each location a single hourly shift factor, in percent, such that the hourly shifted **loss factors** recover the **transmission system losses** calculated for the initial state in that hour in subsection 8(4) above, excluding any losses that occur on an **intertie**.

Calculation of Annual Loss Factors

9(1) The **ISO** must, subject to subsection 9(2) below, calculate an annual average **loss factor**, in percent, for each location included in subsection 5(1) above for **system access service** provided under Rate STS, Rate IOS or Rate DOS for the calendar year for which **loss factors** are being determined as the average of the shifted hourly **loss factors** calculated in subsection 8(9) above, weighted by the amount by which the volume for **metered energy** or dispatched **operating blocks** for the location was reduced or increased in each hour in the redispatched state in subsection 8(5) above.

(2) The **ISO** must, where all hours of the calendar year for which **loss factors** are being determined for a location have been excluded under subsections 8(7) and 8(8) above, use the following as the annual average **loss factor** for that location:

(a) the annual average **loss factor** calculated for the location for the year prior to the calendar year for which **loss factors** are being determined; or

(b) if no annual average **loss factor** was calculated for the location for the prior year, the average annual **loss factor** for the **transmission system** determined in subsection 2(2) above for the calendar year for which **loss factors** are being determined.

(3) The **ISO** must add to or subtract from the annual average **loss factor** for each location a single annual shift factor, in percent, such that the annual shifted **loss factors** recover the total **transmission system losses** forecast for the calendar year for which **loss factors** are being determined, excluding any losses that occur on an **intertie**.

(4) The **ISO** must use the annual shifted **loss factor** calculated in subsection 9(3) above as the uncompressed annual **loss factor**, in percent, for each location for **system access service** provided under Rate STS or Rate DOS for the calendar year for which **loss factors** are being determined.

Loss Factors for Interties

10(1) The **ISO** must calculate an uncompressed annual **loss factor**, in percent, for each location for **system access service** provided under Rate XOS over an **intertie** that is not a merchant **intertie**, that represents the average level of losses incurred in exporting electric energy over that **intertie**.

(2) The **ISO** must calculate an uncompressed annual **loss factor**, in percent, for each location for **system access service** provided under Rate IOS for an **intertie** that is not a merchant **intertie** for the calendar year for which **loss factors** are being determined, that is the sum of:

(a) the annual shifted **loss factor** calculated under subsection 9(3) above for **system access service** provided under Rate IOS over that **intertie**; and

(b) an additional **loss factor** that represents the average level of losses incurred in importing electric energy over that **intertie**.

(3) The **ISO** must use the annual shifted **loss factor** calculated in subsection 9(3) above as the uncompressed annual **loss factor**, in percent, for each location for **system access service** provided under Rate IOS over a merchant **intertie** for the calendar year for which **loss factors** are being determined.

(4) The **ISO** must calculate **loss factors** under subsections 10(1) and 10(2)(b) above based on historical data for the calendar year 2 years prior to the calendar year for which **loss factors** are being determined, for net flow over each **intertie** that is not a merchant **intertie**.

Compressed Loss Factors

11(1) The **ISO** must use the uncompressed annual **loss factors** calculated under subsections 9(4) and 10 above for all locations included in subsection 5(1) above, if no uncompressed annual **loss factor** is a charge that exceeds 12.00% or a credit that exceeds 12.00%.

(2) The **ISO** must, if any uncompressed annual **loss factor** calculated under subsections 9(3) or 10 above is a charge that exceeds 12.00% or a credit that exceeds 12.00%, compress the **loss factors** by:

(a) estimating the single compression shift factor, in percent, that would need to be added to or subtracted from each uncompressed annual **loss factor** to address any loss recovery imbalance that would result from clipping each uncompressed annual **loss factor** that is:

(i) a charge that exceeds 12.00% to a charge equal to 12.00%; and

(ii) a credit that exceeds 12.00% to a credit equal to 12.00%;

(b) adding to or subtracting from each uncompressed annual **loss factor** the single compression shift factor estimated in subsection 11(2)(a) above and clipping each resulting compressed annual **loss factor** that is:

(i) a charge that exceeds 12.00% to a charge equal to 12.00%; and

(ii) a credit that exceeds 12.00% to a credit equal to 12.00%;

and

(c) if the loss recovery imbalance in subsection 11(2)(a) is not fully addressed by the compressed and clipped **loss factors** resulting from subsection 11(2)(b) above, adjusting the single compression shift factor used in subsection 11(2)(b) above, through multiple iterations if necessary, until the compression shift factor addresses any remaining loss recovery imbalance.

Final Loss Factors

12 The **ISO** must establish the **loss factor** calculated under subsection 11(1) or 11(2) above as the final **loss factor**, in percent, for each location included in subsection 5(1) above for **system access service** provided under Rate STS, Rate XOS, Rate IOS or Rate DOS for the calendar year for which **loss factors** are being determined.

Revision History

Date	Description
20xx-xx-xx	
2020-09-16	Administrative amendments.
2019-09-17	Revised the requirement for the AESO to make loss factors publicly available in subsection 3(1). Revised subsection 6 to clarify that source assets and sink assets are included on the same basis as subsection 7. Revised subsection 6 to include increases or decreases to volumes for existing source assets and sink assets and the return to service of a source asset following a mothball outage, planned outage or similar extended outage. Removed subsections 7(5) and 8(8)(c). Revised subsections 8(4) and (5) to allow net demand at a self-supply site to be reduced before net supply is dispatched.
2017-12-07	Revised subsection 7.
2017-01-01	Revised to reflect directions, findings and guidance in Commission Decision 790-D03-2015.
2013-10-25	Updated to reflect new ISO tariff rate schedule Rate XOM which is related to the MATL energization and other incidental amendments.
2012-10-10	Initial release.

ISO Rules
Part 500 Facilities
Division 502 Technical & Operating Requirements
Section 502.4 Automated Dispatch and Messaging System and Voice Communication System

Section 502.4 the subject of a separate engagement. The AESO will propose to renumber this rule to a 200-series ISO rules as part of the changes proposed in conjunction with COM-001-AB-3 and COM-002-AB-4.

Applicability

1 Section 502.4 applies to:

(a) the **legal owner** of a **generating unit**;

(b) the **legal owner** of an **aggregated generating facility**;

(c) the **legal owner** of a **transmission facility**;

(d) the **legal owner** of an **electric distribution system**;

(e) a **pool participant**; and

(f) the **ISO**.

Requirements

New and Existing Systems

2(1) A **legal owner** in a subcategory identified in subsection 1 with a facility that has multiple control rooms must ensure that each control room is in compliance with the applicable Automated Dispatch and Messaging System and voice communication systems requirements of this Section 502.4.

(5) The **ISO** must have Automated Dispatch and Messaging System and voice communication systems in its coordination centre and other back up locations to exchange communications with the control room of any **market participant** that is required to comply with the provisions of this Section 502.4.

Systems Availability and Maintenance Requirements

4(1) All Automated Dispatch and Messaging system and voice communication systems under this Section 502.4 must be continuously operational twenty four (24) hours a **day**, seven (7) **days** a week.

(2) Those systems must be maintained and serviced generally in accordance with **good electric industry practice** to ensure they are continuously operational.

Dedicated Primary Direct Access Telephone and Cell Phone Connections

5(1) If there is a requirement under this Section 502.4 for one (1) or more primary direct access telephone connections to the **ISO** coordination centre from a **market participant** control room, then the connection must be dedicated for the exclusive use of the **ISO** and the **market participant**, and must not be degraded by any other communication or data transfer activities if there is any shared equipment or functionality associated with the connection.

(2) Each primary direct access telephone connection must be dedicated to the specific applicable operational function in the **ISO** coordination centre.

(3) Each primary direct access telephone number must be a primary number with automatic forwarding to another number if the primary number is busy or otherwise not available, and the use of voice mail is prohibited.

(4) Cell phone service may be used as a primary direct access telephone connection if it satisfies the requirements of subsections 4 and 5.

Mobile Satellite Telephone Service

6(1) If there is a requirement under this Section 502.4 for mobile satellite network telephone service to the **ISO** from a **market participant**, then the service must be commercially available for one-to-one communications with the **ISO**.

(2) If there is a requirement for such service to be available for **dispatch** purposes, then the service must allow for multiple party communications, including those between the **ISO** and the **market participant**.

Specific Requirements

7 The more specific systems requirements are as set out in the following Table 1:

Table 1

Automated Dispatch and Messaging System and Voice Communication Systems Requirements

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
1. A **pool participant** who may receive an energy market **dispatch** or a **directive**.	1. Automated Dispatch and Messaging System; plus 2. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
2. A **pool participant** who may receive an **ancillary service dispatch** or a **directive**.	1. Automated Dispatch and Messaging System; plus 2. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	One of the following additional services connecting from the control room to the **ISO** coordination centre: 1. A mobile satellite network telephone and **dispatch** service; 2. A back up direct access telephone connection; or 3. A utility orderwire service.
3. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of less than or equal to 25kV.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
4. A **legal owner** of a	1. A commercial service with	A back up direct access telephone

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
generating unit or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25kV where the aggregated electric energy output at the point of connection is less than 50 MW.	a primary direct access telephone connection from the control room to the **ISO** coordination centre.	connection from the control room to the **ISO** coordination centre.
5. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25 kV where the aggregated electric energy output at the point of connection is equal to or greater than 50 MW.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the telephone having mute and conference call capabilities.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the control room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A mobile satellite telephone service to the **ISO** coordination centre; 3. A back up direct access telephone connection to the **ISO** coordination centre; or 4. A utility orderwire service to the **ISO** coordination centre.
6. A **legal owner of** a **generating unit** providing a **black start capability** service.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	One of the following additional services connecting from the control room: 1. A direct access telephone connection from the control room to the operations room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A back up direct access dedicated commercial telephone connection from the control room to the **ISO** coordination centre; or 3. A utility orderwire service from the control room to the **ISO** coordination centre.
7. A **legal owner** of a	1. A commercial service with	One of the following additional services

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
transmission facility, except those who operate only radial **transmission system** equipment.	primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	connecting from the control room to the **ISO** coordination centre: 1. A mobile satellite network telephone service; 2. A back up direct access telephone connection; or 3. A utility orderwire service.
8. A **legal owner** of a **transmission facility** operating only radial **transmission system** equipment.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	1. A back up direct access telephone connection from the control room to the **ISO** coordination centre.
9. A **legal owner** of an **electric distribution system**.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
10. A **legal owner** of an **electric distribution system** who contributes **load** additions for **black start capability** process requirements.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the **legal owner** of the **transmission facility** providing the **transmission system** connection associated with the **black start capability** service. 2. A mobile satellite network telephone service to the **ISO** coordination centre; or. 3. A utility orderwire service to the **ISO** coordination centre.

Emergency and Back Up Communication Systems Requirements

8 Each applicable **market participant** and the **ISO** must use the specified emergency and back up communication systems when there is an event that causes a primary communication system to be materially disrupted or impaired, including an event such as:

(a) a real time **system emergency** condition, as may be referenced in any **reliability standard**; or

(b) a **disturbance** or interruption of service by any provider of a primary communications system service.

Testing of Emergency and Back Up Communication Systems

9(1) The **ISO** must conduct tests for all emergency and back up communication systems on a reasonable basis and the testing schedule time and date must be made known reasonably in advance to the **operator** of a **market participant** whose system will be tested.

(2) If the test is a success then the **ISO** will not notify the **operator**, but if the test is a failure then the **ISO** will verbally notify the **operator** of the failure no later than twenty four (24) hours after the test in completed.

(3) After the **ISO** notifies the **operator** of the testing schedule, the **operator** must ensure that there are trained personnel available to conduct and facilitate the test at the designated date and time.

(4) In accordance with the confidentiality provisions of subsection 2(1) of section 103.1 of the **ISO rules** *Confidentiality*, the **ISO** must keep confidential the name of any facility that is subject to testing, and the date and time of the tests.

(5) If there is a failure of a test, then the applicable **market participant** or the **ISO**, depending on whose emergency and back up communication system has failed, must ensure the cause is investigated and repaired as soon as reasonably possible, but in any event the system must be repaired no later than five (5) **business days** after:

(a) the date of the test failure, in the case of the **ISO**; or

(b) the date of delivery of notice of the test failure, in the case of the **market participant**.

(6) The **ISO** must keep a copy of any test results for no less than two (2) calendar years after the date of the test.

Loss of Emergency and Back Up Communication Systems

10(1) If either the **ISO** or a **market participant** experiences a material disruption or complete loss of any emergency and back up communication systems at a point in time other than during a test period, then verbal notice must be given by:

(a) the **ISO** to all affected **market participants**, if the **ISO** suffers the disruption of loss; or

(b) the applicable **market participant** to the **ISO**, if the **market participant** suffers the disruption or loss.

(2) The **market participant** that experiences the disruption or loss must investigate and repair it as soon as reasonably possible, but in any event no later than five (5) **business days** after the date of the discovery of the cause of the disruption or loss.

Appendices

Appendix 1 – *Technical Standards in Effect as of 2007*

Revision History

Date	Description
2011-06-01	Initial release
2013-01-08	Appendix added containing authoritative system availability requirements specified in Table 2 of ISO OPP 003.2. Previously defined terms have been un-defined and so the words have been un-

	bolded.
2014-07-02	Unbolded the reference to “outage” in Appendix 1.
2015-03-27	Replaced “effective date” with the initial release date in sections 2(1),(2) and 3; and replaced the word “Effective” in the Revision History to “Date”.

Appendix 1 – Technical Standards in Effect as of 2007

Standard Description	Applicable To	Standard Requirement	Reason for Standard
Maximum participant outage time	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Twenty-six point two five (26.25) hours per year. Ninety-nine point seven percent (99.7%) availability.	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	One hundred (100) hours per year. Ninety-nine point eight percent (98.8%) availability.	
Maximum outage time per incident	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Six (6) hours	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	Forty-eight (48) hours	
Call out response time	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Two (2) hours	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	Next working **day**	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.1 Functional Specification & Legacy Treatment

Applicability

1 Section 503.1 applies to:

(a) a **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** that is directly connected to the **transmission system**, or to **transmission facilities** within the City of Medicine Hat; and

(b) a **legal owner** of a **bulk transmission line**;

(c) the **ISO**.

Requirements

Functional Specification

2(1) The **ISO** must, approve a functional specification containing details, work requirements, and specifications for the design, construction, and operation of a project and any associated **transmission system** connection facilities.

(2) The functional specification referred to in subsection 2(1) must be generally consistent with the provisions of Division 503 of the **ISO rules**, as applicable, but may contain material variance the **ISO** approves based upon its analysis of any one or more of the technical, economic, safety, operational and reliability requirements of the interconnected electric system related to the specific facility.

Legacy Treatment

3 A **legal owner** must, unless otherwise specifically stated in an **ISO rule** within Division 503 of the **ISO rules**, remain compliant with the applicable predecessor document to an **ISO rule** within Division 503 if the **legal owner**'s facility received either of the following prior to the effective date of an **ISO rule** within Division 503:

(a) a first version of the final functional specification issued by the **ISO**; or

(b) approval for the construction and operation of the facility from the relevant regulatory authority with jurisdiction.

Modifications to Generating Units, Aggregated Facilities and Energy Storage Resources

4(1) A **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must, notwithstanding subsection 3, comply with the applicable requirements of Division 503 of the **ISO rules** if the **legal owner**'s facility or resource, or any supporting systems, undergoes an addition or upgrade.

(2) The **legal owner** of an **aggregated facility** that was energized and commissioned prior to April 7, 2017 must, notwithstanding subsection 4(1), comply with the applicable requirements of Division 503 of the **ISO rules** only if the **legal owner** replaces existing equipment where the equipment replaced has **a gross real power** capability equal to or greater than 5 MW, irrespective of whether the cumulative **gross real power** capability of the **aggregated facility** is increased.

(3) This subsection 4(1) does not apply to identical or similar replacements, or maintenance-related activities.

Modifications to Transmission Facilities

5 A **legal owner** of an existing **bulk transmission line** that is extending, tapping, or adding to the **bulk transmission line**:

(a) must, if the project circuit length will be greater than or equal to 1,500 meters, comply with the applicable requirements of Division 503 of the **ISO rules**; or

(b) must, if the project circuit length will be less than 1,500 meters, comply with the:

(i) applicable technical specification and design requirements for the **bulk transmission line** in effect as of the original date of the commencement of the design of the bulk transmission line; and

(ii) specifications set out in the most recently published edition of the *Alberta Electrical Utility Code.*

Authority to Require Compliance

6 The **ISO** may, notwithstanding subsection 3, require a **legal owner** to comply with any provision of Division 503 if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.2 Maximum Authorized Real Power and Maximum Authorized Charging Power

Applicability

1 Section 503.2 applies to:

(a) the **legal owner** and **operator** of a **generating unit, aggregated facility**, or **energy storage resource** 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

(b) the **ISO**.

Requirements

Maximum Authorized Real Power

2(1) The **legal owner** must, upon receiving a request from the **ISO**, determine the **maximum authorized real power** for the **generating unit**, **aggregated facility**, or **energy storage resource** and provide this value to the **ISO.**

(2) The **legal owner** of an **aggregated facility** must ignore any auxiliary power used in the operation of the facility in determining the **maximum authorized real power**.

(3) The **legal owner** must consider the capability and limitations of the **generating unit**, **aggregated facility**, or **energy storage resource** under optimal conditions when determining **maximum authorized real power**.

Maximum Authorized Charging Power

3(1) The **legal owner** of an **energy storage resource** or **aggregated facility** containing an **energy storage resource** must, upon receiving a request from the **ISO**, determine the **maximum authorized charging power** for the **energy storage resource** or **aggregated facility** and provide this value to the **ISO**.

(2) The **legal owner** of an **aggregated facility** containing an **energy storage resource** must ignore any auxiliary power used in the operation of the facility in determining the **maximum authorized charging power**.

(3) The **legal owner** of an **energy storage resource** or **aggregated facility** containing an **energy storage resource** must consider the capability and limitations of the **energy storage resource** or **aggregated facility** under optimal conditions when determining **maximum authorized charging power**.

Operation at Maximum Authorized Real Power

4(1) The **operator** must not operate the **generating unit**, **aggregated facility**, or **energy storage resource** above the **maximum authorized real power**.

(2) The **ISO** may, notwithstanding subsection 4(1), request that the **operator** operate above the **maximum authorized real power** of the **generating unit**, **aggregated facility**, or **energy storage resource** during supply shortfall events.

(3) The **ISO** must, when the additional **real power** referred to in subsection 4(2) is no longer required, notify the **operator** to return the **generating unit**, **aggregated facility**, or **energy storage resource** to a value at or below the **maximum authorized real power**.

Operation at Maximum Authorized Charging Power

5 The **operator** of an **energy storage resource** or **aggregated facility** containing an **energy storage resource** must not operate the **energy storage resource** or **aggregated facility** below the **maximum authorized charging power**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.3 Reactive Power

Applicability

1 Section 503.3 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**;

(b) the **legal owner** of a load facility, where for purposes of this Section 503.3:

(i) "legal owner" refers to:

(A) the **legal owner** of an **electric distribution system**;

(B) a **person** who has entered into an arrangement directly with the **ISO** for the provision of **system access service** under subsection 101(2) of the **Act**;

and

(ii) "load facility" refers to a facility connecting industrial load or distribution load to the **transmission system**;

(c) the **legal owner** of a **transmission facility** to which a load facility is connected;

and

(d) the **ISO**.

Requirements

Reactive Power

2(1) The **legal owner** must, for the purposes of determining the **reactive power** requirements of this Section 503.3, determine the root mean square phase-to-phase voltage at:

(a) the stator winding terminal, for a **generating unit** or synchronous **energy storage resource**; or

(b) the **collector bus**, for an **aggregated facility**;

to be used as the 1.00 per unit voltage value.

(2) The **legal owner** of **generating unit**, **aggregated facility**, or **energy storage resource** must ensure that the **generating unit**, **aggregated facility**, or **energy storage resource**, as well as any external **reactive power** resource approved under subsection 2(9), have the capability to operate in accordance with the requirements of this subsection 2 by both:

(a) manual control of the set point of the **automatic voltage regulator** or **voltage regulating system** of the **generating unit**, **aggregated facility**, or **energy storage resource**; and

(b) automated action of the **automatic voltage regulator** or **voltage regulating system** of the **generating unit**, **aggregated facility**, or **energy storage resource**.

(3) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must ensure that **reactive power** capability complies with the following minimum requirements:

(a) 0.9 **power factor**, supplying dynamic **reactive power**; and

(b) 0.95 **power factor**, absorbing dynamic **reactive power**.

(4) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must

ensure that the **reactive power** capability set out in subsection 2(3) is based on:

(a) for a **generating unit**, or **aggregated facility** not containing an **energy storage resource**, the **maximum authorized real power** of the **generating unit** or **aggregated facility** over the entire **real power** operating range, down to the applicable minimum **gross real power**; or

(b) for an **energy storage resource**, or **aggregated facility** containing an **energy storage resource**, the **maximum authorized real power** and **maximum authorized charging power** of the **energy storage resource** or **aggregated facility** over the entire **real power** operating range.

(5) Notwithstanding subsection 2(4), when a **generating unit, aggregated facility**, or **energy storage resource**, shares a common **point of connection**, the **reactive power** resources may be shared to meet the **reactive power** capability set out in subsection 2(3) if:

(a) the **reactive power** resources are designed to be in service at all times for any operating combination of the **generating unit**, **aggregated facility**, or **energy storage resource**; and

(b) the shared **reactive power** resources are sufficient to meet the total of the individual requirements of subsection 2(3) for each **generating unit**, **aggregated facility** or **energy storage resource** sharing the common **point of connection**.

(6) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must ensure that the limiters are not set to reduce the **reactive power** capability set out in subsection 2(3).

(7) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** that does not have the capability to meet the dynamic **reactive power** capability set out in subsection 2(3) must submit to the **ISO** a request in writing for approval of the use of an external dynamic **reactive power** resource to compensate for the lack of capability, such that the combined capability of the **generating unit**, **aggregated facility**, or **energy storage resource** and the external dynamic **reactive power** resource meets the requirements of subsection 2(3).

Load Facility Power Factor

3(1) The **legal owner** of a load facility and the **legal owner** of the **transmission facility** to which the load facility is connected must design the load facility with **reactive power** resources to result in a **power factor** of above 0.9 lagging.

(2) The **legal owner** of a load facility and the **legal owner** of the **transmission facility** to which the load facility is connected must ensure the **power factor** requirement in subsection 3(1) is based on expected normal operating conditions up to the **contract capacity**, and measured at the **point of common coupling**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.4 Voltage Regulation

Applicability

1 Section 503.4 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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

(b) the **ISO**.

Requirements

Voltage Regulation

2(1) The **legal owner** must ensure that the **generating unit**, **aggregated facility**, or **energy storage resource** has a continuously variable, continuously acting, closed loop, centralized **automatic voltage regulator** or **voltage regulating system** that:

(a) compares a measured voltage to a set point;

(b) controls any dynamic **reactive power** resources needed to meet the requirements of this Section 503.4;

(c) is designed to be continuously in service and controlling while the **generating unit**, **aggregated facility**, or **energy storage resource** is electrically connected to the **transmission system**;

(d) is capable of operating in a voltage set point control mode, to the exclusion of any other modes;

(e) is capable of manual set point adjustments to a value between 0.95 per unit and 1.05 per unit of the nominal voltage at the following point of control:

(i) the stator winding terminal, for a **generating unit** or synchronous **energy storage resource**; or

(ii) the **collector bus**, for an **aggregated facility**; or

(iii) at an alternative point of control for a facility that implements reactive current compensation in accordance with subsection 3(1);

and

(f) is able to achieve, under non-**disturbance** conditions, a steady state voltage regulation of plus or minus 0.5% of the voltage set point at the point of control.

(2) The **legal owner** must design a **generating unit**, **aggregated facility**, or **energy storage resource** such that the point of control for the **automatic voltage regulator** is not at the high voltage side of the **transmission system** step-up transformer.

(3) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must not use stator current limiters for the **generating unit** or **energy storage resource**.

(4) The **legal owner** of an **aggregated facility** or **energy storage resource** must ensure that the **aggregated facility** or **energy storage resource** is calibrated such that a change in **reactive power** will achieve 95% of its final value no sooner than 0.1 seconds and no later than one second following a step change in voltage.

(5) The **legal owner** of an **aggregated facility** must ensure the **aggregated facility** is able to regulate voltage at the **voltage regulation system** or **automatic voltage regulator** point of control under both

non-disturbance and disturbance conditions.

(6) The **legal owner** of an **aggregated facility** must ensure the **voltage regulating system** for the **aggregated facility** measures voltage that represents the overall voltage response of the **aggregated facility**.

(7) The **legal owner** of an **aggregated facility** must ensure that the **aggregated facility** is designed such that, when the **voltage regulation system** requires the switching of a shunt reactive device, the switching operation is delayed by 10 seconds.

Reactive Current Compensation Setting

3(1) The **legal owner** must, if 2 or more **automatic voltage regulators** or **voltage regulating systems** have:

(a) a common point of measurement; or

(b) separate points of measurement connected by a low impedance bus,

implement reactive current compensation in each **automatic voltage regulator** or **voltage regulating system**.

(2) The **legal owner** must ensure that the **voltage regulating system** of an **aggregated facility** is capable of:

(a) adjustable gain, or reactive droop compensation adjustable from 0% to 10%; and

(b) reactive current compensation.

(3) The **ISO** must specify in the functional specification for the **aggregated facility** whether the reactive current compensation in the **voltage regulating system** or **automatic voltage regulator** must be implemented.

Variance to Reactive Current Compensation

4(1) The **legal owner** must submit a request in writing to the **ISO** for approval to use a reactive current compensation feature in the **automatic voltage regulator** or **voltage regulating system** that has a point of control not listed in subsection 2(1)(e).

(2) The **ISO** must make a decision on its approval and notify the **legal owner** in writing of the decision no later than 90 **days** after the date of receiving the submission set out in subsection 4(1).

ISO Notice to Change Reactive Current Compensation Setting

5(1) The **ISO** must provide a **legal owner** with 180 **days**' written notice that a change to the reactive current compensation settings is required.

(2) The **legal owner** must, upon receiving the notice from the **ISO**:

(a) make a change to the reactive current compensation settings on or before the date specified in the notice; and

(b) provide written confirmation to the **ISO** that the change has been implemented.

(3) The **legal owner** of an **aggregated facility** that is not equipped with reactive current compensation must, notwithstanding subsection 5(2), advise the **ISO** in writing that it is not equipped with such settings on or before the date specified by the **ISO**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.5 Voltage Ride-Through

Applicability

1 Section 503.5 applies to:

(a) the **legal owner** of a **generating unit** that:

(i) has:

(A) a **maximum authorized real power** greater than 9.0 MW; or:

(B) is a part of a complex with another **generating unit**, **aggregated facility**, or **energy storage resource** with an aggregate **maximum authorized real power** amount greater than 9.0 MW;

and

(ii) is directly connected to the **transmission system**, or to a **transmission facility** within the service area of the City of Medicine Hat, including a **generating unit** situated within an industrial complex that is directly connected to the **transmission system**;

(b) the **legal owner** of an **aggregated facility** that:

(i) does not contain an **energy storage resource**; and

(ii) is directly connected to the **transmission system**, or to a **transmission facility** within the service area of the City of Medicine Hat, including an **aggregated facility** situated within an industrial complex that is directly connected to the **transmission system**;

and

(c) the **legal owner** of an **energy storage resource**, or **aggregated facility** containing an **energy storage resource**, that:

(i) has a range greater than 5 MW between its **maximum authorized charging power** and **maximum authorized real power**; and

(ii) is directly connected to the **transmission system** or **to transmission facilities** within the City of Medicine Hat, including an **energy storage resource** situated within an industrial complex that is directly connected to the **transmission system**.

Requirements

Voltage Ride-Through

2(1) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must, for purposes of determining the voltage ride-through requirements of this Section 503.5, determine the root mean square phase-to-phase voltage value at the high-voltage side of the **transmission system** step-up transformer, to be used as the 1.0 per unit voltage value.

(2) The **legal owner** must ensure that the **generating unit**, **aggregated facility**, or **energy storage resource** is designed to meet the following voltage ride-through requirements:

(a) continuous operation between greater than or equal to 0.90 and less than 1.10 per unit of the voltage value determined under subsection 2(1);

(b) not tripping or going off-line during, or as a result of, a voltage dip or post-transient voltage deviation resulting from a **disturbance** on the **transmission system**, on any phase or combination of phases at or beyond the **point of connection**, in accordance with the applicable timing requirements of Appendix 1; and

(c) the amount of time that the voltage of the **generating unit**, **aggregated facility**, or **energy**

storage resource remains at 0.0 per unit must be at least the **normal clearing** time for a 3-phase fault at the specific location where the **generating unit**, **aggregated facility**, or **energy storage resource** is electrically connected.

(3) A **generating unit**, **aggregated facility**, or **energy storage resource** is not required, notwithstanding any other provision of this Section 503.5, to ride-through a fault that:

(a) causes a forced outage of a radial transmission line connecting the **generating unit**, **aggregated facility**, or **energy storage resource** to the **transmission system**;

(b) occurs on the **generating unit**, **aggregated facility**, or **energy storage resource** side of the **point of connection**, including the low-voltage network and the substation; or

(c) results in the activation of a transfer trip or anti-islanding protection scheme at the **generating unit**, **aggregated facility**, or **energy storage resource** that causes the **generating unit**, **aggregated facility**, or **energy storage resource** to be disconnected from the **transmission system**.

Appendices

Appendix 1 – Voltage Ride-Through Requirements

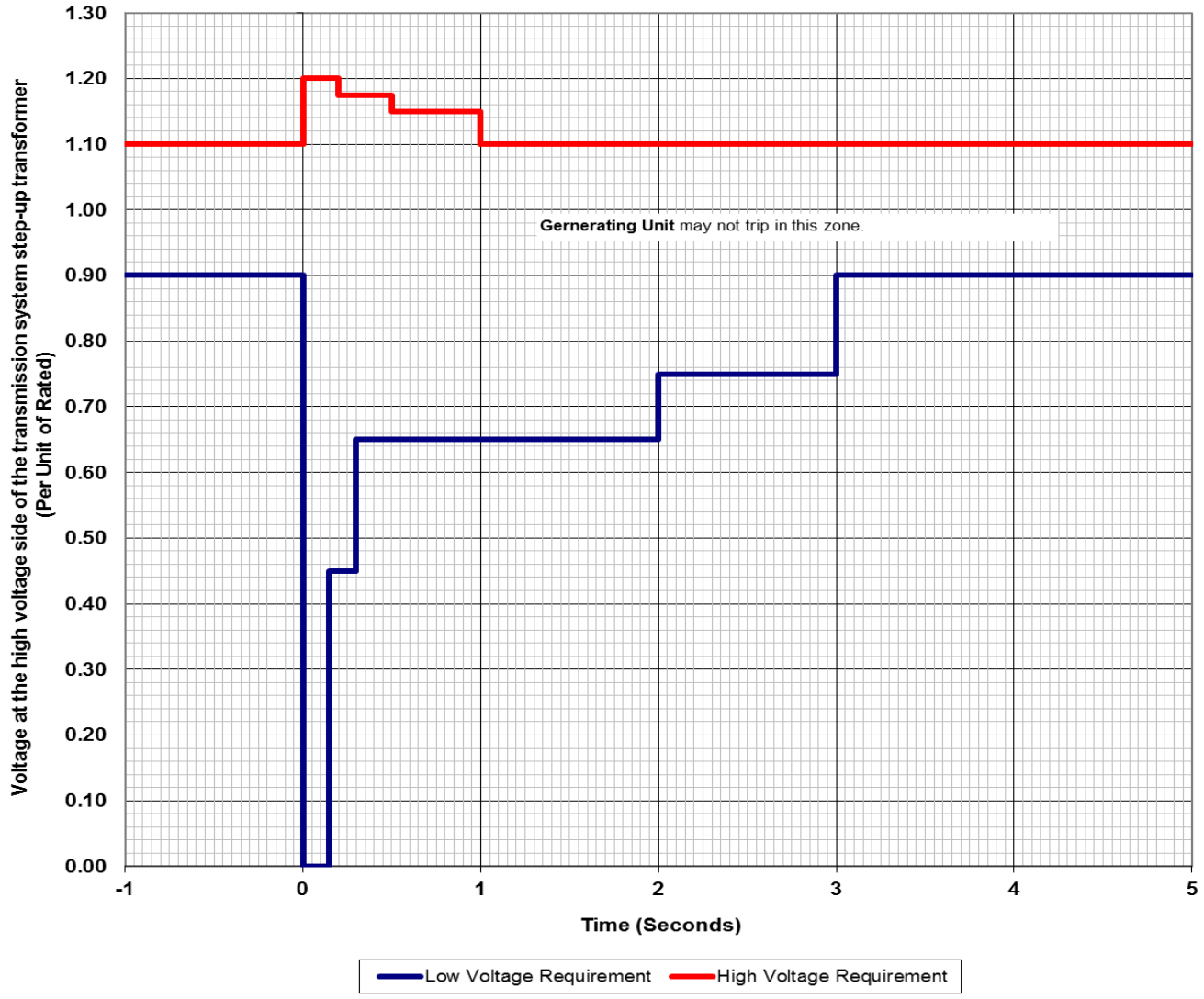
Revision History

Date	Description
20XX-XX-XX	

Appendices

Appendix 1 – Voltage Ride-Through Requirements

High Voltage Ride-Through Duration		Low Voltage Ride-Through Duration	
Voltage (per unit)	**Time**	**Voltage (per unit)**	**Time**
≥ 1.200	Instantaneous trip	< 0.45	4 to 9 cycles
≥ 1.175	0.20 seconds	< 0.65	0.30 seconds
≥ 1.15	0.50 seconds	< 0.75	2.00 seconds
≥ 1.10	1.00 seconds	< 0.90	3.00 seconds
< 1.10	Continuous operation	≥ 0.90	Continuous operation


Voltage at the high voltage side of the transmission system step-up transformer (Per Unit of Rated)
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-1
0
1
2
3
4
5
Time (Seconds)
Gernerating Unit may not trip in this zone.
Low Voltage Requirement
High Voltage Requirement

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.6 Frequency & Speed Governing

Applicability

1 Section 503.6 applies to:

(a) the **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**.

Requirements

Frequency and Speed Governing Requirements for Generating Units and Synchronous Energy Storage Resources

2(1) The **legal owner** of a **generating unit** or synchronous **energy storage resource** with **maximum authorized real power** equal to or greater than 10 MW must ensure that the **generating unit** or **energy storage resource** has a continuously acting **governor system** that is designed:

(a) to be continuously in service, free to respond to frequency changes and controlling the response to frequency changes while the **generating unit** or **energy storage resource** is:

(i) electrically connected to the **transmission system**; and

(ii) producing or consuming, as applicable, any **real power** as measured at the stator winding terminals;

(b) with a droop setting equal to or greater than 3% but less than or equal to 5% based on **maximum authorized real power**;

(c) with a deadband, intentional plus unintentional, not exceeding plus or minus 0.036 Hz; and

(d) with the capability of manual setpoint adjustments within a range of 59.4 Hz and 60.6 Hz.

Frequency and Speed Governing Requirements for Aggregated Facilities

3(1) The **legal owner** of an **aggregated facility** must ensure the **aggregated facility** has a continuously acting **governor system** that is designed:

(a) to be continuously in service, free to respond to frequency changes and controlling the response to frequency changes while the **aggregated facility** is:

(i) connected to the **transmission system** or a **transmission facility** within the service area of the City of Medicine Hat; and

(ii) producing or consuming any **real power** as measured at the **collector bus**;

(b) with a droop setting equal to or greater than 3% but less than or equal to 5%, where droop setting is based on:

(i) **maximum authorized real power**, for an **aggregated facility** that does not contain an **energy storage resource**; or

(ii) the greater of the **maximum authorized charging power** or **maximum authorized real power**, for an **aggregated facility** containing an **energy storage resource**.

(c) with a deadband, intentional plus unintentional, not exceeding plus or minus 0.036 Hz;

(d) not to have an intentional time delay added to the control system;

(e) with the capability of manual setpoint adjustments within a range of 59.4 Hz and 60.6 Hz;

(f) to continuously monitor frequency at a sample rate of at least 20 samples per second;

(g) with a resolution of at least 0.004 Hz; and

(h) to operate at a frequency response rate, measured in MW/s, that is less than or equal to 5% of the difference between the **maximum authorized real power** and the **maximum authorized charging power**, as applicable.

(2) The **legal owner** of an **aggregated facility** must ensure that the **governor system** overrides any **real power** limits in effect at the time of the frequency excursion, but only while the frequency remains outside of the deadband.

Ramp Rate Limitations

4 The **legal owner** must install controls that are capable of limiting the **ramp rate**.

Frequency Ride-Through

5(1) The **legal owner** must, subject to subsection 5(2), design a **generating unit**, **aggregated facility**, or **energy storage resource** to not trip for under-frequency and over-frequency deviations for the minimum time frames as set out in Appendix 1.

(2) The **legal owner** must, in the event that subsection 5(1) is not achievable, have binding and firm arrangements to automatically and simultaneously trip off an amount of load in MW on the **interconnected electric system** equal to the anticipated generation loss in MW at comparable frequency levels.

Operation of a Governor System

6 The **operator** must, subject to Section 503.19 of the **ISO rules**, *Operation and Maintenance of Facilities*, operate the **generating unit**, **aggregated facility**, or **energy storage resource** with the **governor system** in service, in droop mode, and free to respond to frequency changes while:

(a) supplying **active power** to the **interconnected electric system**; or

(b) providing an **ancillary service** that requires a response to frequency changes.

Appendices

Appendix 1 - Trip Settings for Off-Nominal Frequency Protective Relays

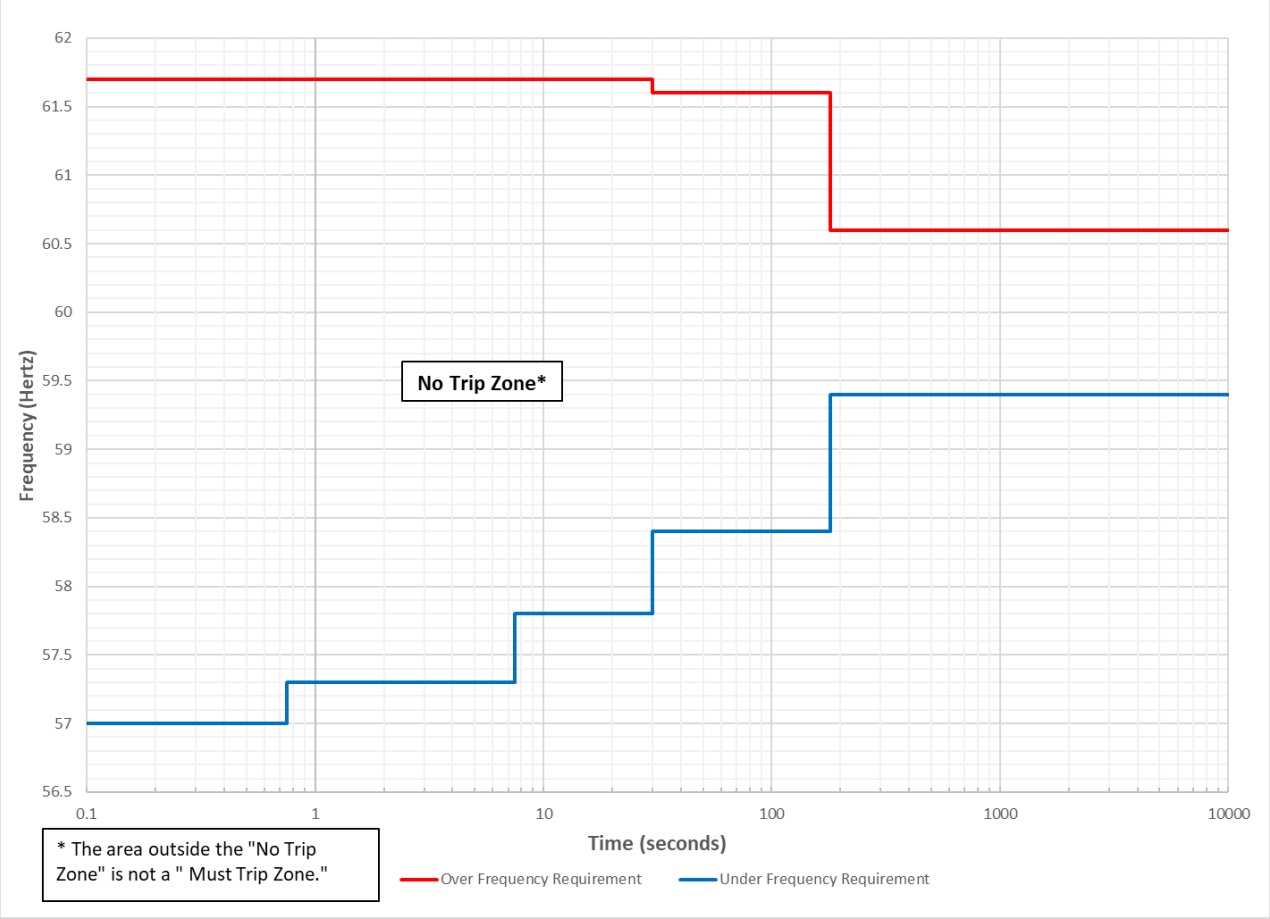
Revision History

Date	Description
20XX-XX-XX	

Appendices

Appendix 1 – Trip Settings for Off-Nominal Frequency Protective Relays

High Frequency Duration		Low Frequency Duration	
Frequency (Hz)	**Time (seconds)**	**Frequency (Hz)**	**Time (seconds)**
≥ 61.7	Instantaneous trip	≤57.0	Instantaneous trip
≥61.6	30	≤57.3	0.75
≥60.6	180	≤ 57.8	7.5
<60.6	Continuous operation	≤ 58.4	30
		≤ 59.4	180
		> 59.4	Continuous operation



ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.7 Power System Stabilizer

Applicability

1 Section 503.7 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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

(b) the **ISO**.

Requirements

Power System Stabilizer for Synchronous Resources and Facilities

2(1) The **legal owner** must, in accordance with this subsection 2, install a power system stabilizer on each synchronous:

(a) **generating unit** or **energy storage resource** that has a **maximum authorized real power** greater than 27 MW; or

(b) **generating unit** or **energy storage resource** that is a part of a facility with other **generating units** or **energy storage resources**, where the total **maximum authorized real power** of the facility is greater than 67.5 MW.

(2) The **legal owner** is, notwithstanding subsection 2(1), not required to install a power system stabilizer on a synchronous:

(a) **generating unit**;

(b) **aggregated facility**; or

(c) **energy storage resource**,

if the closed loop phase lag between the voltage at the stator winding terminals or **collector bus** of the **generating unit**, **aggregated facility**, or **energy storage resource** and the reference input for the **automatic voltage regulator** or **voltage regulating system** is greater than 135 degrees.

(3) The **legal owner** referred to in subsection 2(1) must ensure that the power system stabilizer:

(a) is designed to be in continuous operation while the **generating unit**, **aggregated facility**, or **energy storage resource** is on-line, except when the **generating unit**, **aggregated facility**, or **energy storage resource** is producing less **real power** than its design limit for effective power system stabilizer operation;

(b) is reviewed and retuned if any **automatic voltage regulator** or **voltage regulating system** response parameters are modified;

(c) is either:

(i) a dual-input integral of accelerating **real power** type; or

(ii) a single-input speed or frequency type;

(d) provides a compensated frequency response of the excitation system such that, through the frequency range from 0.1 Hz to 1.0 Hz, the phase shift will not exceed plus or minus 30 degrees;

(e) is capable of output limits between plus or minus 5% of the operating voltage value submitted under Section 503.3 of the **ISO rules**, *Reactive Power*, and is approved by the **ISO**;

(f) has the gain set to provide a gain margin of no less than 6 dB and no more than 10 dB; and

(g) has the washout time constant set as low as possible while maintaining the compensated phase criteria.

(4) The **legal owner** of a synchronous **energy storage resource** must, if the **energy storage resource** is equipped with a power system stabilizer and is capable of operating in a mode that consumes active power while electrically connected, such that the power system stabilizer does not produce negative damping, design the power system stabilizer to be in service while consuming active power.

(5) The **legal owner** referred to in subsection 2(1) is prohibited from using a power system stabilizer of the **real power** type.

(6) The **ISO** must, notwithstanding subsection 2(1), approve the use of a single power system stabilizer for an **aggregated facility** containing directly-coupled synchronous **generating units** and document the approval within the functional specification.

Power System Stabilizer for Asynchronous Resources and Facilities

3(1) The **ISO** may, by written notice, require the **legal owner** of an asynchronous **energy storage resource** or **aggregated facility** containing an asynchronous **energy storage resource** to use a power system stabilizer that is specified by the **WECC**.

(2) The **legal owner** of an asynchronous **energy storage resource** or an **aggregated facility** containing an asynchronous **energy storage resource** must, upon receipt of the written notice described in subsection 3(1), install and enable a power system stabilizer, as specified by the **WECC**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.8 Transmission Step-Up Transformer

Applicability

1 Section 503.8 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**.

Requirements

Transmission System Step-Up Transformer

2(1) The **legal owner** must ensure that the capability of the **transmission system** step-up transformer for the **generating unit**, **aggregated facility**, or **energy storage resource** is such that the **real power** and **reactive power** requirements specified in Section 503.2 of the **ISO rules**, *Maximum Authorized Real Power and Maximum Authorized Charging Power* and Section 503.3 of the **ISO rules**, *Reactive Power*, are fully available throughout the continuous operating voltage range for the **generating unit**, **aggregated facility**, or **energy storage resource**.

(2) The **legal owner** must consider the following factors in determining the capability of the **transmission system** step-up transformer under subsection 2(1):

(a) the thermal capability of:

(i) bushings;

(ii) windings; and

(iii) the tap changer;

(b) the voltage ratio;

(c) the tap changer type;

(d) the tap changer range; and

(e) any other components that may limit the thermal capability of the **transmission system** step-up transformer.

(3) The **legal owner** may, to meet the requirements of subsection 2(1), subtract the amount of auxiliary load in **apparent power** from the **apparent power** capability of the **generating unit**, **aggregated facility**, or **energy storage resource** at the **maximum authorized real power**, but only if any of the auxiliary **system load** is connected between the **generating unit**, **aggregated facility**, or **energy storage resource** and the low side of the **transmission system** step-up transformer.

(4) The **legal owner** must ensure that the **transmission system** step-up transformer winding connections for the **generating unit**, **aggregated facility**, or **energy storage resource** provide for:

(a) a favourable circuit to block the transmission of harmonic currents;

(b) isolation of **transmission system** and low voltage side ground fault current contributions;

(c) an effectively grounded wye connection on the high voltage side of the transformer;

(d) on-load or off-load tap changers with a minimum capability of plus or minus 5% voltage range in 2.5% increments.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.9 Auxiliary Systems

Applicability

1 Section 503.9 applies to:

(a) the **legal owner** of a **generating unit** or **energy storage resource**, including a **generating unit** or **energy storage resource** situated within an industrial complex or **aggregated facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat.

Requirements

Auxiliary Systems

2(1) The **legal owner** must, when multiple **generating units** or **energy storage resources** are at a common location, design the auxiliary systems of each **generating unit** or **energy storage resource** such that:

(a) the failure of a single component will not result in the simultaneous tripping or shutdown of 2 or more **generating units** or **energy storage resources**;

(b) staggered shutdowns of each **generating unit** or **energy storage resource** must be separated in time by more than 10 minutes; and

(c) for combined cycle plants, the loss of the combustion turbine that results in the tripping of the steam turbine is acceptable.

(2) The **legal owner** must design the auxiliary systems of each **generating unit** or **energy storage resource** to take into account the voltage ride-through requirements as specified in Section 503.5 of the **ISO rules**, *Voltage Ride-Through*, as applicable.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.10 Isolating and Interrupting Devices

Applicability

1 Section 503.10 applies to:

(a) the **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**;

(b) the **legal owner** of a load facility, where for purposes of this Section 503.10:

(i) "**legal owner**" refers to

(A) the **legal owner** of an **electric distribution system**; or

(B) a **person** who has entered into an arrangement directly with the **ISO** for the provision of **system access service** under subsection 101(2) of the **Act**;

and

(ii) "load facility" refers to a facility connecting industrial load or distribution load to the transmission system;

(c) the **legal owner** of a **transmission facility** to which a **generating unit**, **aggregated facility**, **energy storage resource**, or load facility is connected;

and

(d) the **ISO**.

Fault Interrupting Devices

2(1) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must design the **generating unit**, **aggregated facility**, or **energy storage resource** fault interrupting devices to:

(a) account for the fault contributions from both the **transmission facilities** and **generating unit**, **aggregated facility**, or **energy storage resource**; and

(b) have fault interrupting and momentary withstand ratings that are adequate to meet the maximum expected fault levels, with a margin for future anticipated fault levels as the **ISO** approves in the functional specification for the **generating unit**, **aggregated facility**, or **energy storage resource**.

(2) The **legal owner** of a load facility and the **legal owner** of the **transmission facility** to which the load facility is connected to must ensure that there is at least one fault interrupting device that will electrically disconnect the load facility from the **transmission system** near the **point of connection**.

(3) The **legal owner** of a load facility and the **legal owner** of the **transmission facility** to which the load facility is connected to must ensure the fault interrupting device required by subsection 2(2) is designed and operated to account for the present and ultimate fault current contributions from both the load facility and the **transmission system**.

(4) The **legal owner** of:

(a) a **generating unit**, **aggregated facility**, **energy storage resource**, or load facility; and

(b) the **transmission facility** to which the **generating unit**, **aggregated facility**, **energy storage resource**, or load facility is connected to,

must not use high voltage fuses at 60 kV or higher.

Disconnection

3(1) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must have systems, controls, and related procedures to electrically disconnect the **generating unit**, **aggregated facility**, or **energy storage resource** at either one or both of:

(a) the **point of connection**; and

(b) the **collector bus** feeder breakers;

as documented in the functional specification, after consultation between the **legal owner** of the **generating unit**, **aggregated facility**, or **energy storage resource** and the **legal owner** of the applicable **transmission facility**.

(2) A **generating unit**, **aggregated facility**, or **energy storage resource** connecting to a **transmission facility** must provide the functionality and remote control capabilities to enable the **operator** of the **transmission facility** to open or trip any connecting circuit breaker either at the **point of connection** or any **collector bus** feeder breakers, as applicable.

Isolation Devices

4(1) The **legal owner** of:

(a) a **generating unit**, **aggregated facility**, **energy storage resource**, or load facility; and

(b) the **transmission facility** to which the **generating unit**, **aggregated facility**, **energy storage resource**, or load facility is connected,

must ensure that the **generating unit**, **aggregated facility**, **energy storage resource** or load facility has a minimum of one isolation device with manual operating capability at all points of isolation**.**

(2) The **legal owners** must, unless otherwise specified in the functional specification, ensure that the isolation devices referenced in subsection 4(1):

(a) permit visual verification of electrical isolation and must be capable of being locked open with 2 or more locks;

(b) are under the control of a single control authority as confirmed by a joint operating agreement between the **legal owner** of the **generating unit**, **aggregated facility**, **energy storage resource**, or load facility, and the **legal owner** of the **transmission facility**; and

(c) permit the installation of temporary safety grounding so that either side of the isolation device can be safely maintained when the other side is energized.

Notification to Reconnect

5 The **operator** of the **aggregated facility** must not, once a connecting breaker of the **aggregated facility** has been opened or tripped, electrically reconnect to the **transmission facility** unless it has received approval from the **ISO**.

Revision History

Date	Description
XXXX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.11 Power Quality

Applicability

1 Section 503.11 applies to:

(a) the **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**;

(b) the **legal owner** of a load facility, where for purposes of this Section 503.11:

(i) "**legal owner**" refers to:

a. the **legal owner** of an **electric distribution system**;

b. a **person** who has entered into an arrangement directly with the **ISO** for the provision of **system access service** under subsection 101(2) of the **Act**;

and

(ii) "load facility" refers to a facility connecting industrial load or distribution load to the **transmission system**;

(c) the **legal owner** of a **transmission facility** that a load facility is directly connect to;

and

(d) the **ISO**.

Requirements

Voltage Flicker, Harmonics and Resonance

2 The **legal owner** of a **generating unit**, **aggregated facility**, **energy storage resource**, or load facility must design and operate the **generating unit**, **aggregated facility**, **energy storage resource**, or load facility to meet the following power quality requirements at the **point of connection** or **point of common coupling**:

(a) the voltage flicker must:

(i) comply with the specifications set out in most recent version of the *International Electrotechnical Commission 61000-3-7, Electromagnetic compatibility (EMC) – Part 3-7: Limits - Assessment of emission limits for the connection of fluctuating installations to MV, HV and EHV power systems* in effect; and

(ii) without limiting the generality of subsection 2(a)(i), comply with the short and long term flicker limits as set out in the following Table 1:

Table 1
Short and Long Term Flicker Limits

Planning Levels		
	≤ 25 kV	>25 kV
P_{st}	0.9	0.8
P_{lt}	0.7	0.6

where:

P_{st} is an index representing the magnitude of the resulting short term flicker level for the considered aggregation of flicker sources (probabilistic value);

P_{lt} is an index representing the magnitude of the resulting long term flicker level for the considered aggregation of flicker sources (probabilistic value);

and

(iii) meet the:

(A) 99% probability weekly value for P_{st}; and

(B) 95% probability weekly value for P_{lt}

based on measurement period of one week of normal operation;

(b) the harmonics must comply with the specifications set out in the most recent version of *IEEE Standard 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems* in effect;

and

(c) undamped resonance must not be introduced into the **transmission system**, including self-excitation of induction machines, transformer ferroresonance, resonant effects of capacitor additions, and the capacitance of the lines and cables.

Voltage Unbalance

3(1) The **legal owner** of a load facility must design and operate the load facility to meet the following additional power quality requirements at the **point of common coupling**:

(a) the increase of the phase-to-phase voltage unbalance caused by the load facility project must not exceed 1%, where the phase-to-phase voltage unbalance is measured based on normal operating conditions for 95% of the time over any continuous 7 **day** measurement period, calculated in accordance with the following formula:

$$\text{Voltage unbalance} = \frac{\text{Negative sequence voltage component}}{\text{Positive sequence voltage component}} \times 100\%$$

and

(b) rapid voltage changes caused by any change of load, including the start of large motors, must be below the allowable limits set out in Table 2:

Table 2
Maximum Rapid Voltage Change Limits

Number of changes (n)	≤ 25 kV	> 25 kV
n ≤ 4 per **day**	5%	4%
n ≤ 2 per hour and > 4 per **day**	4%	3%
2 < n ≤ 10 per hour	3%	2.5%

(2) The **legal owner** of a **transmission facility** must design and operate the **transmission facility** at the **point of common coupling**:

(a) such that the phase-to-phase voltage unbalance is below the allowable limits set out in Table 3:

Table 3
Maximum Phase-to-Phase Voltage Unbalance Limits

$\leq$ 25 kV	1.8%
138/144 kV	1.4%
240/260 kV	1.4%
500 kV	0.8%

and

(b) the phase-to-phase voltage unbalance percentages must be based on normal operating conditions for 95% of the time over any continuous 7 **day** measurement period, calculated in accordance with the following formula:

$$\text{Voltage unbalance} = \frac{\text{Negative sequence voltage component}}{\text{Positive sequence voltage component}} \times 100\%$$

(3) The **legal owner** of the **transmission facility** must, if an existing **transmission facility** to which the load facility will be connected exceeds the maximum phase-to-phase voltage unbalance limits in this Table 3, submit to the **ISO** a proposal with an estimate to remedy such non-compliance.

Assessment of Voltage Unbalance

4 The **ISO** must, where voltage unbalance is identified on the **transmission system**, address the unbalance in accordance with the specifications set out in the version of the *International Electrotechnical Commission 61000-3-13, Electromagnetic compatibility (EMC) – Part 3-13: Limits - Assessment of emission limits for the connection of unbalanced installations to MV, HV and EHV power system* at all **points of connection** between the **generating unit**, **aggregated facility**, or **energy storage resource** and the **transmission system**.

Power Quality Investigations

5 The **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** must assist the **ISO** in a power quality investigation.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.12 Grounding and Surge Protection

Applicability

1 Section 503.12 applies to:

(a) the **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**;

(b) the **legal owner** of a load facility, where for purposes of this Section 503.12:

(i) "**legal owner**" refers to:

(A) the **legal owner** of an **electric distribution system**;

(B) a **person** who has entered into an arrangement directly with the **ISO** for the provision of **system access service** under subsection 101(2) of the **Act**;

and

(ii) "load facility" refers to a facility connecting industrial load or distribution load to the **transmission system**;

and

(c) the **legal owner** of a **transmission facility**.

Requirements

Grounding

2(1) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must design the **generating unit**, **aggregated facility**, or **energy storage resource** to operate within a **transmission system** that operates as an effectively grounded system.

(2) The **legal owner** of a load facility, or the **legal owner** of a **transmission facility** to which the load facility is connected to, must design the load facility and the **transmission facility** to operate within a **transmission system** that operates as an effectively grounded system.

Lightning and Other Surge Protection

3(1) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must equip any associated substation equipment with surge protection that operates under the following conditions:

(a) lightning, including the average ground flash density level, for the **generating unit**, **aggregated facility**, or **energy storage resource** location;

(b) switching surges;

(c) neutral shifts;

(d) **electrical islands**; and

(e) temporary over-voltages.

(2) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** must coordinate insulation levels with the **legal owner** of the **transmission facility** to which the **generating**

unit, **aggregated facility**, or **energy storage resource** is connected, taking into account the surge protection referred to in 3(1).

(3) The **legal owner** of a load facility must coordinate insulation levels with the **legal owner** of the **transmission facility** to which the load facility is connected to, taking into account the average lightning ground-flash density level for the site location of the load facility and compatibility with the connecting **transmission facility**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division ~~502~~503 Technical & Operating Requirements
Section ~~502.9~~503.13 Synchrophasor Measurement ~~Unit Technical Requirements~~ System

Applicability

1 Section ~~502.9~~503.13 applies to:

(a) ~~(a) 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

~~(i)~~(ii) implementing a synchrophasor measurement ~~unit~~;

~~(b) a **legal owner** of an **aggregated generating facility** implementing a synchrophasor measurement unit;~~

~~(a)~~(b) ~~(c) a~~the **legal owner** of a **transmission facility** implementing a synchrophasor measurement unit; ~~and~~

~~(d)~~ and

~~(b)~~(c) the **ISO**.

Requirements

~~**Facility with Functional Specifications Issued On or After March 1, 2022**~~

Verification

2 ~~A~~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**, ~~**legal owner** of an~~ **aggregated** ~~**generating facility** or **legal owner** of a **transmission facility** who is a~~**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**~~, an **aggregated generating facility** or **transmission facility** for which the **ISO** issues a functional specification on or after March 1, 2022,~~synchronous **energy storage resource** must design ~~and construct its facility~~ the synchrophasor measurement system referenced 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.~~ subsection 3(1) to record at the following locations:

~~**Facilities Built Prior to March 1, 2022**~~

~~**3(1)** Subject to subsection 3(3), the provisions of this Section 502.9 do not apply to a facility that was built in accordance with:~~

~~(a) a technical requirement, technical standard, or a functional specification the **ISO** issued prior to February 28, 2013; or~~

~~(b) the version of Section 502.9 in effect between February 28, 2013 and March 1, 2022 and for which the **ISO** issued a functional specification.~~

(a) ~~**(2)** A **legal owner** of a **generating unit**,~~ 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** ~~**generating** **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**~~, ~~or~~ 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 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** ~~of a **transmission facility** must, notwithstanding subsection 3(1), remain in compliance with the applicable technical requirement, technical standard, functional specification,~~may, if the **generating unit** or ~~version of Section 502.9, in effect at the time when:~~**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.

~~(a) the **ISO** issued the functional specification for the facility; or~~

~~(b) the facility was **commissioned** and energized, if the **ISO** did not issue a functional specification.~~

~~**(3)** The **ISO** may 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 provision 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.~~

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,~~**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~~StandardC37.118.2-2011 – IEEE Standard for Synchrophasors Data Transfer for Power Systems* specific to a synchrophasor measurement unit.

Synchrophasor Measurement Unit Signal Names

~~6~~**5** The **ISO** must provide ~~eacha~~ **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 *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

~~7~~**(1)** ~~Each of the **legal owner** of a **generating unit**, **legal owner** of an **aggregated generating facility** and **legal owner** of a **transmission facility**~~**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 ~~AESO~~**ISO** pursuant to subsection ~~7~~6(2).

(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~~The **legal owner** must, 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~~6(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~~6(2) for ~~1~~one 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**~~**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 ~~1~~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** ~~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~~one **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**~~**(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 ~~8~~7(2), must be within 2 **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~~7(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**~~**legal owner** 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~~7(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,~~**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
~~2022-03-01~~XXXX-XX-XX	~~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.~~

Date	Description
~~2020-09-16~~	~~Administrative revisions.~~
~~2019-12-11~~	~~Removed duplication with new Section 103.14, *Waivers and Variances*; 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".~~
~~2013-02-28~~	~~Initial release~~

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.14 Sequence of Events Monitoring

Applicability

1 Section 503.14 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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**.

Requirements

Internal Sequence of Event Monitoring

2(1) The **legal owner** must have an internal sequence of event monitoring system that initiates an event record for every event that results in a trip of the **generating unit**, **aggregated facility**, or **energy storage resource**.

(2) The **legal owner** must ensure that the event record referenced in subsection 2(1) includes the status or action of the following key components, if present:

(a) **governor system**;

(b) **automatic voltage regulator** or **voltage regulating system**, including:

(i) over-excitation limiter; and

(ii) under-excitation limiter;

(c) medium and low voltage switchgear and motor control centre protection;

(d) key auxiliary components, including:

(i) induced draft and forced draft fans;

(ii) boiler feed water pumps;

(iii) turbine inlet valves;

(iv) medium and low voltage switchgear and motor control centres;

and

(e) mechanical protection.

(3) The **legal owner** must design a sequence of event monitoring system that is capable of downloading and retaining the recordings set out in subsection 2(1) for a period of not less than one calendar year from the date of the initial recording.

(4) The **legal owner** must ensure that the sequence of event monitoring system is synchronized to within one millisecond of Coordinated Universal Time.

Data Retention for Sequence of Event Records

3 The **legal owner** must retain the sequence of event records for a minimum period of one calendar year.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division ~~502~~503 Technical & Operating Requirements
Section ~~502.3~~503.15 Interconnected Electric System Protection ~~Requirements~~

Applicability

1 Section ~~502.3~~503.15 applies to:

(a) the **legal owner** of a **generating unit** directly connected to the **transmission system**, with a **maximum authorized real power** rating greater than or equal to 18 MW;

(b) the **legal owner** of an **aggregated ~~generating unit~~ facility** directly connected to the **transmission system**, with a **maximum authorized real power** rating greater than or equal to 67.5 MW;

(c) the **legal owner** of an **energy storage resource** directly connected to the **transmission system**, with a **maximum authorized real power** rating greater than or equal to 18 MW;

(e) the **legal owner** of a **transmission facility** with a rated voltage ~~equal to or~~ greater than or equal to 100 kV; and

(~~d~~f) the **ISO**.

~~**2** The **legal owner** of a **generating unit**, **aggregated generating facility** or **transmission facility** that is energized and commissioned on or after April 7, 2017 must ensure the facility meets the minimum **protection system** requirements of this Section 502.3.~~

~~**3** The provisions of this Section 502.3 do not apply to the **legal owner** of a **generating unit**, **aggregated generating facility** or **transmission facility** that was energized and commissioned prior to April 7, 2017 in accordance with a previous technical requirement, technical standard, **ISO rule** or functional specification, but the legal owner of such an existing **generating unit**, **aggregated generating facility** or **transmission facility** must remain compliant with all the standards and requirements set out in that previous technical requirement, technical standard, **ISO rule** or functional specification.~~

~~Functional Specification~~

~~**4** The **ISO** must, in accordance and generally consistent with this Section 502.3 and any other applicable **ISO rules**, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of a **protection system** for the facility.~~

~~Successor to Prior Requirements~~

~~**5** Subject to subsection 3, this Section 502.3 succeeds the *Alberta Interconnected Electric System Protection Standard* which came into effect as of December 1, 2004, and that standard, together with any other prior standards or drafts of standards on the subject matter no longer will be in force and effect as of December 31, 2012.~~

Protection System General Requirements

Basic Requirements

~~**6** The **legal owner** of a **generating unit**, the **legal owner** of an **aggregated generating facility** and the **legal owner** of a **transmission facility**~~**2** The **legal owner** must design, engineer and construct all **protection systems** to:

(a) successfully detect all phase-to-ground with ground impedance less than 5 ohms, phase-to-phase-to-ground with ground impedance less than 5 ohms, phase-to-phase, and ~~three (~~3~~)~~

phase faults on the protected equipment within the zone of protection;

(b) initiate isolation of the faulted equipment from all sources;

(c) coordinate with any adjacent **protection systems** and remain stable for faults external to the zone of protection; and

(d) ensure cascade tripping does not occur.

Requirement for ~~Two (~~2~~)~~ Protection Systems

~~7~~3**(1)** Except as otherwise specified in this Section ~~502.3~~503.15, all facilities of the applicable entities listed in subsection 1 must be equipped with no less than ~~two (~~2~~)~~ independently operating **protection systems**.

(2) Each of the ~~two (~~2~~)~~ **protection systems** must:

(a) meet the operate time requirements set out in subsection ~~8~~4;

(b) include~~,~~ an independent secondary potential transformer winding, independent current transformer core, independent communication channel, independent interconnecting ~~cable(s),~~cables, independently protected direct current power supply and independent trip circuit, including breaker trip coil; and

(c) operate ~~independent~~independently of and without interference from the other **protection system**.

(3) The relay for one ~~(1)~~ of the **protection systems** must be from a different manufacturer than the relay for the other **protection system**, or must operate on a different protection principle from the other **protection system**.

Protection Relay Operate Times

~~8~~4**(1)** For bus protection relays, the primary protection relay operate times for phase-to-phase or ~~three (~~3~~)~~ phase bus faults must be:

(a) specified to not exceed; or

(b) tested to confirm they do not exceed,

the maximum operate times, expressed in cycles, in the following Table 1:

Table 1

Bus Protection Maximum Operate Times

Voltage	Operate Time
~~500kV~~500 kV	1.50 cycles
~~240kV~~240 kV	1.50 cycles
~~138kV~~138 kV	2.00 cycles

(2) For line distance relays, the primary protection relay operate times for phase-to-phase or ~~three (~~3~~)~~ phase faults for near end faults on **bulk transmission lines** with ~~two (~~2~~)~~ terminals and ~~two (~~2~~)~~ sources that are long enough to have an effective zone 1 distance protection must be:

(a) specified to not exceed; or

(b) tested to confirm they do not exceed,

the maximum operate times, expressed in cycles, in the following Table 2:

Table 2

Line Distance Protection

Voltage	Operate Time
~~500kV~~500 kV	1.00 cycles
~~240kV~~240 kV	1.00 cycles
~~138kV~~138 kV	2.00 cycles

(3) For line differential relays, the primary protection relay operate times for phase-to-phase or ~~three (~~3~~)~~ phase faults on **bulk transmission lines** with ~~two (~~2~~)~~ terminals and ~~two (~~2~~)~~ sources must be:

(a) specified to not exceed; or

(b) tested to confirm they do not exceed,

the maximum operate times, expressed in cycles, in the following Table 3:

Table 3

Line Differential Protection

Voltage	Operate Time
~~500kV~~500 kV	2.00 cycles
~~240kV~~240 kV	2.00 cycles
~~138kV~~138 kV	2.00 cycles

(4) The primary protection relay operate times for phase-to-phase or ~~three (~~3~~)~~ phase faults:

(a) within the zone of protection of equipment, including transformers, capacitor banks, reactors, and static VAR compensators; and

(b) close to the equipment's high voltage bushings that are connected to the **interconnected electric system**;

must be:

(c) specified to not exceed; or

(d) tested to confirm they do not exceed,

the maximum operate times, expressed in cycles, in the following Table 4:

Table 4

Equipment Protection

Voltage	Operate Time
~~500kV~~500 kV	1.50 cycles
~~240kV~~240 kV	1.50 cycles
~~138kV~~138 kV	2.00 cycles

Instrument Transformers

~~**9(1)** The **legal owner** of a **generating unit**, the **legal owner** of an **aggregated generating facility** and the **legal owner** of a **transmission facility**~~**5(1)** The **legal owner** must ensure the facility uses protection class voltage and current transformers.

(2) Each **protection system** must have separate current cores and utilize separate secondary voltage transformer windings.

Voltage Transformers

~~**10**~~**6(1)** Voltage transformers for a facility must be wire wound, capacitive or optical voltage transformers, and any other form of transformer is prohibited.

(2) For 240 kV or higher voltage facilities, **protection system** devices that require voltage transformer inputs to provide protection functions must be connected to voltage transformers that are directly connected to the protected **system element**.

(3) For 144 kV or lower voltage facilities that utilize simple bus design, the use of common bus voltage transformers is acceptable.

Fuse Failure Alarm for Voltage Transformers

~~**11**~~**7** A voltage transformer used for protective purposes, including synchronism checking, must have a loss of potential alarm.

Current Transformers

~~**12**~~**8(1)** A current transformer used in a **protection system** must be either magnetic or optical, and must not be the limiting element in the **transmission facility's** rating.

(2) The maximum available current transformer ratio must be sized for the ultimate fault level of the facility as set out in the functional specification.

(3) A current transformer used in a **protection system** must meet the 2.5 L low internal secondary impedance accuracy requirement as set out in *CAN/CSA-C60044-1:07, Instrument transformer – Part 1: Current transformers, Table 1B*, or an equivalent accuracy requirement at its maximum possible ratio, regardless of the ratio actually being utilized.

Protection System Power Supply

~~13~~9**(1)** The direct current supply for each of the ~~two (~~2~~)~~ **protection systems** for a facility must be protected such that a direct current fault within one ~~(1)~~ of the **protection systems** is isolated and will not affect the operation of the other **protection system**.

(2) A **protection system** must be such that it may be isolated from its direct current supply without affecting the operation of any other **protection system**.

Event Capture

~~14~~10**(1)** For each zone of protection, there must be a **protection system** with no less than one ~~(1)~~ relay or digital style fault event recorder to capture wave form event records.

(2) Faults within the zone of protection must trigger an event capture.

(3) The event recorder must be able to time stamp an event to an accuracy level within ~~one point zero (~~1.0~~)~~ milliseconds of Universal Time Constant.

(4) All event records must be retrievable within ~~twenty four (~~24~~)~~ hours of request.

Bulk Transmission Line

Ground Fault Resistance Coverage

~~15~~11 If a **bulk transmission line** experiences a fault of the following type, then each of the ~~two (~~2~~)~~ **protection systems** for the **bulk transmission line** must initiate isolation of the fault:

(a) single line-to-ground, with a minimum impedance of 5 ohms; or

(b) phase-to-phase-to-ground with a minimum impedance of 5 ohms.

Auto-Reclosing

~~16~~12**(1)** The **ISO** must, for 240 kV or higher voltage **bulk transmission lines**, specify the type of auto-reclosing in the functional specification.

(2) When single pole trip and reclose is specified in the functional specification for a 240 kV or higher voltage **bulk transmission line**, the following must be met:

(a) auto-reclose single pole upon a single phase fault and not reclose for any multiphase fault, unless ~~three (~~3~~)~~ pole auto-reclosing operation or no reclosing is specifically requested in the functional specification;

(b) not allow for more than one ~~(1)~~ attempt at each end of the **bulk transmission line** to auto-reclose the **bulk transmission line**; and

(c) have adequate dead time to ensure the secondary arc is extinguished.

(3) A 144 kV or lower voltage **bulk transmission line** must:

(a) trip and auto-reclose ~~three (~~3~~)~~ pole once for all fault types unless no reclosing is specified in the project functional specification and

(b) have adequate dead time to ensure any secondary arc is extinguished

Auto–Reclosing Prohibition

~~17~~13**(1)** If a **bulk transmission line** is a dedicated single line connecting from ~~a~~any **generating unit** ~~or any~~, **aggregated** ~~**generating** **facility**~~, or **energy storage resource** to the **interconnected electric system**, then the installation of auto-reclosing equipment is prohibited, unless specifically provided for in the functional specification.

(2) Auto-reclosing on cables is not permitted.

Switch onto Fault

~~18~~14 Instantaneous tripping must occur for the entire length of the **bulk transmission line** if upon an auto-reclose the fault re-establishes.

Synchronism Check Relaying

~~19~~15 For all 240 kV and higher voltage **bulk transmission line** breakers, a synchronism check relay must be used for all ~~three (~~3~~)~~ pole closing but those breakers that switch only a load transformer, a capacitor, or a reactor, and have no power source of their own, do not require a synchronism check relay.

Distance or Impedance Protection Systems

~~20~~16 A **protection system** for a **bulk transmission line** utilizing distance or impedance protection as a primary manner of protecting a ~~two (~~2~~)~~ terminal, ~~two (~~2~~)~~ source **bulk transmission line** must have:

(a) no instantaneous distance element, such as zone 1, reach past the remote bus; and

(b) at least ~~one (~~1~~)~~ distance element, such as zone 2, overreach the remote bus.

Differential Protection Systems

~~21~~17**(1)** On **bulk transmission lines**, the use of differential protection is acceptable.

(2) Upon communication failure:

(a) the **protection system** must still be capable of fault detection and tripping; and

(b) protection relay operate times slower than those specified in subsection ~~8~~4(3) are acceptable.

Stub Protection

~~22~~18 Any stubs created by opening line motorized disconnects must be protected by ~~two (~~2~~)~~ **protection systems**.

Protection System Communications

~~23~~19 Each communication system utilized in a **protection system** must be designed to have an overall availability of not less than 99.99% unless specified otherwise in the functional specification.

~~Three (3)~~ Terminal Lines

~~24~~20**(1)** For a new ~~three (~~3~~)~~ terminal **bulk transmission line**, regardless of source or load locations, communications between all ~~three (~~3~~)~~ terminals is required.

(2) Notwithstanding subsections ~~6~~2(c) and ~~24~~20(1), if a protection study is undertaken identifying the level of mis-coordination and associated risks, the **ISO** may choose to grant an exemption in the functional specification.

(3) Clearing times for faults on the ~~three (~~3~~)~~ terminal line must comply with the requirements the **ISO** specifies in the functional specification for the facility.

Bulk Transmission Line Connected Reactors

~~25~~21**(1)** The line reactor for a 240 kV or higher voltage **bulk transmission line** must be equipped with ~~two (~~2~~)~~ **protection systems**.

(2) The reactor **protection systems** must be in compliance with the following requirements:

(a) a phase reactor must be equipped with ~~two (~~2~~)~~ differential **protection systems**;

(b) a phase reactor must be equipped with a phase and residual over-current **protection system**, which may be included in ~~one (~~1~~)~~ of the differential **protection systems**;

(c) an oil-filled reactor must have non-electrical **protection systems** with the same requirement as an oil-filled transformer; and

(d) a neutral reactor must be either included in an overall zero sequence differential zone or equipped with a single phase differential **protection system** and must also be equipped with a second differential protection or over-current protection as backup.

Switch Onto Fault Protection – Manual Close

~~26~~22**(1)** A **bulk transmission line** terminal must be equipped with switch onto fault protection as identified in subsection ~~18~~14 for **operator**-initiated breaker close.

(2) For a manual switch onto fault event, auto-reclose must be blocked.

Positive, Negative, Zero ~~(0),~~ and Mutual Impedances

~~27~~23 For the protection of a **bulk transmission line**, the **protection system** equipment and settings must take into account the zero ~~(0)~~ sequence mutual coupling during fault conditions, and the under-reach or over-reach of the distance element must be either mitigated or the zone reaches adjusted accordingly.

~~Five Hundred (~~500~~)~~ kV Protection System Setting Verification

~~28~~24 A 500 kV line **protection system** utilizing distance or impedance protection as its primary protection must have settings verified utilizing real-time digital simulation.

Substations

Transformers

~~29~~25**(1)** All transformers with a base rating less than 25 MVA must have:

(a) one ~~(1)~~ independent overcurrent **protection system** installed on the high voltage side;

(b) one ~~(1)~~ independent differential **protection system**;

(c) an oil level alarm;

(d) a minimum of gas accumulation alarming and gas surge protection tripping; and

(e) ~~two (~~2~~)~~ levels for thermal alarm and the time between the first alarm and the second alarm must allow time to take action to unload the transformer.

(2) A transformer with a base rating of 25 MVA or larger must have:

(a) one ~~(1)~~ overcurrent **protection system** which may be combined with a differential protection **system**;

(b) ~~two (~~2~~)~~ independent differential **protection systems**;

(c) an oil level alarm;

(d) a minimum of gas accumulation alarming and gas surge protection tripping; and

(e) ~~two (~~2~~)~~ levels for thermal alarm and the time between the first alarm and the second alarm must allow time to take action to unload the transformer.

(3) All transformers with tertiary windings that are used for loads, such as station service, must have the tertiary windings included in the transformer differential protection zone.

240 kV and Higher Voltage Substation Bus Protection

~~30~~26**(1)** All 240 kV and higher voltage substation buses must have ~~two (~~2~~)~~ bus **protection systems**.

(2) All 240 kV and higher voltage substation bus **protection systems** must trip all associated breakers to isolate the fault.

144 kV and Lower Voltage Substation Bus Protection

~~31~~27**(1)** All 144 kV and lower voltage substation buses must have ~~two (~~2~~)~~ bus **protection systems.**

(2) If protection studies show that the remote line **protection systems** can clear a bus fault in ~~zero point six (~~0.6~~)~~ seconds, then the remote line **protection systems** can be considered to be one ~~(1)~~ of the ~~two (~~2~~)~~ **protection systems** required in subsection ~~31~~27(1).

(3) All 144 kV and lower voltage substation bus **protection systems** must trip all associated breakers to isolate the fault.

Ring Bus Protection

~~32~~28 Notwithstanding subsections ~~30~~26 and ~~31~~27, ring bus configured substations that have ~~two (~~2~~)~~ overlapping **protection systems** that are capable of stub protection as identified in subsection ~~22~~18 do not require additional bus protection.

Substation Shunt Capacitor Banks

~~33~~29**(1)** Auto-restoration of a faulted capacitor bank is prohibited.

(2) ~~Two (~~2~~)~~ over-current **protection systems** must be applied to shunt capacitor banks to detect major faults such as a phase-to-phase fault or phase-to-ground fault.

(3) For wye or wye-wye shunt capacitor banks, at least one ~~(1)~~ **protection system** must be applied which provides both an alarm and a trip level to detect capacitor bank unit or capacitor bank element failure.

Substation Shunt Reactor Banks

~~34~~30 The **protection systems** for shunt reactor banks must comply with the following:

(a) 144 kV and lower voltage reactors must be equipped with a minimum of ~~one (~~1~~)~~ independent phase differential and one ~~(1)~~ independent over-current **protection systems**;

(b) 240 kV and higher voltage reactors must be equipped with ~~two (~~2~~)~~ differential **protection systems** and overcurrent protection which may be included in one ~~(1)~~ of the differential **protection systems**; and

(c) an oil filled reactor, in addition, must have a minimum of gas accumulation alarming and gas surge protection tripping.

Breaker Failure Protection

~~35~~31**(1)** All breakers must have a minimum of one ~~(1)~~ breaker failure **protection system** and all protection trips excluding **remedial action scheme** trips must initiate a current or contact supervised breaker failure **protection system**.

(2) The **ISO** must identify the need for **remedial action schemes** to initiate breaker fail in the functional specifications on a project basis.

(3) For 240 kV and higher voltage breakers, the breaker failure **protection system** must utilize direct tripping of all remote breakers utilizing communications.

(4) For 144 kV and lower voltage breakers, a breaker failure **protection system** must be installed which trips all:

(a) local breakers; and

(b) remote breakers:

(i) by a communication system which, notwithstanding subsection ~~23~~19, must be designed to have an availability of at least 99.5%; or

(ii) within a definite time period the **legal owner** of a **generating unit**, ~~the legal owner of an~~ **aggregated** ~~generating~~ **facility**, energy storage resource, or ~~the legal owner of a~~ **transmission facility**, as applicable, defines, and without thermally damaging

additional facilities beyond the faulted facility.

(5) The maximum time delay for breaker fail operate time measured from the primary **protection system**'s trip output contact closing to the last local breaker receiving the open signal for solid single line-to-ground or ~~three (~~3~~)~~ phase faults that generate high fault currents must not be longer than:

(a) ~~six (~~6~~)~~ cycles, being ~~zero point one zero zero (~~0.100~~)~~ seconds, for 500 kV breakers;

(b) ~~seven (~~7~~)~~ cycles, being ~~zero point one one seven (~~0.117~~)~~ seconds, for 240 kV breakers; and

(c) ~~twelve (~~12~~)~~ cycles, being ~~zero point two zero zero (~~0.200~~)~~ seconds, for 138 kV and 144 kV breakers.

(6) For applications where free standing current transformers are used with live-tank breakers it is acceptable to have a breaker fail operation for faults located between the breaker and the current transformer.

Substation Transformer Ended Lines

~~36~~32 For 144 kV and lower voltage transformer ended **transmission lines** without a breaker, the substation must be equipped with ~~two (~~2~~)~~ independent direct transfer trip communication channels to trip any remote end breakers.

Generating Unit ~~and~~, Aggregated ~~Generating~~ Facility, and Energy Storage Resource Protection

Inadvertent Energization

~~37~~33 No facility may be designed, engineered or constructed such that there may be inadvertent energization of any **generating unit** ~~or~~, **aggregated** ~~generating~~ **facility**, or **energy storage resource**, including through the station service bus.

Protection from Interconnected Electric System Faults

~~38~~34 The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **aggregated** ~~generating~~ **facility**, or **energy storage resource** must each ensure that their facilities have appropriate **protection systems** to protect the facilities from the effects of faults on the **interconnected electric system**.

Tripping

~~39~~35**(1)** If a **generating unit** ~~or~~, **aggregated** ~~generating~~ **facility**, or **energy storage resource** fault occurs, the **protection system** at a minimum~~,~~ must isolate the fault from the **interconnected electric system** by opening the appropriate breakers and initiating breaker failure protection.

(2) If it is possible to energize or back-feed the **generating unit** ~~or~~, **aggregated** ~~generating~~ **facility**, or **energy storage resource** through the station service, then the **protection system** must also trip the low voltage station service breakers, including those with high-speed bus transfer schemes.

Auto-Reclosing

~~40~~36 Auto-reclosing of generator breakers after a **generating unit** ~~or~~, **aggregated** ~~generating facilities~~**facility**, or **energy storage resource** fault is prohibited.

Synchronizing

~~41~~37 A synchronous **generating unit** ~~or~~, **aggregated** ~~generating~~ **facility** or **energy storage resource** must be equipped with full synchronizing equipment, capable of assuming full control of the **governor system** and **automatic voltage regulator** during the synchronizing process.

60 Hz Synchronous Generating Units and Energy Storage Resources (other than ~~aggregated generating facilities~~Aggregated Facilities) Electrical Protection

~~42~~38 A 60 Hz synchronous **generating unit** or **energy storage resource**, excluding any **aggregated** ~~generating~~ **facility**, must meet the following protection requirements:

(a) ~~two (~~2~~)~~ **generating unit** differential **protection systems**;

(b) ~~two (~~2~~)~~ **generating unit** and facility step up transformers **protection systems**;

(c) ~~two (~~2~~)~~ high voltage bus **protection systems**; and

(d) **generating unit** excitation transformers must have ~~two (~~2~~)~~ **protection systems**.

Out of Step Condition

~~43~~39 For any 60 Hz synchronous **generating unit** or **energy storage resource**, excluding an **aggregated** ~~generating facilities~~**facility**, impedance protection at the **generating unit** or **energy storage resource** step-up transformer terminals must be applied to mitigate any out-of-step condition when an electric energy swing traverses ~~either~~ the **generating unit** ~~or~~, **energy storage resource**, **generating unit** step-up transformer~~.~~, or **energy storage resource** step-up transformer.

Aggregated ~~Generating~~ Facilities and Energy Storage Resources (Excluding 60 Hz Synchronous Energy Storage Resources)

~~44~~40 An **aggregated** ~~generating~~ **facility** or **energy storage resource**, excluding any 60 Hz synchronous **energy storage resources**, must meet the following protection requirements:

(a) ~~have two (~~2~~)~~ **aggregated** ~~generating~~ **facility** step-up transformer **protection systems**; and

(b) ~~have two (~~2~~)~~ high voltage bus **protection systems**.

Reverse Electric Energy Condition

~~45~~41 Two ~~(2)~~ **protection systems** must be capable of detecting reverse power flowing into the **generating unit** and the **generating unit** must be removed from service if either of the **protection systems** detects reverse power flow.

Revision History

Date	Description
20xx-xx-xx	
2019-12-11	Removed duplication with new Section 103.14, Waivers and Variances; standardized functional specifications language; capitalized references to “Section”.
2018-09-01	Revised references to “wind aggregated generating facilities” to “aggregated

	generating facilities"; revised applicability section; and administrative revisions.
2016-08-30	Inclusion of the defined term **system element**.
2015-03-27	Replaced "effective date" with the initial release date in sections 2, 3 and 5; and replaced the word "Effective" in the Revision History to "Date".
2012-12-31	Initial release

ISO Rules
Part 500 Facilities
Division ~~502~~503 Technical ~~Requirements~~
~~Section 502.8 SCADA Technical and~~& Operating Requirements
Section 503.16 SCADA

Applicability

1 ~~Subject to subsections 2 and 3 below,~~ Section ~~502.8~~503.16 applies to:

(a) the **legal owner** of a **generating unit** or ~~an **aggregated generating facility**~~**energy storage resource** that has a **gross real power** capability greater than or equal to 5 MW and is:

(i) connected to the **interconnected electric system** or an electric system in the **service area** of the City of Medicine Hat, including by way of connection to an **electric distribution system**;

(ii) part of an industrial complex connected to the **transmission system**; or

(iii) providing, or part of a facility providing, **ancillary services**;

(b) the **legal owner** of an **aggregated facility** that has a **gross real power** capability greater than or equal to 5 MW and is:

(i) connected to the **interconnected electric system** or an electric system in the **service area** of the City of Medicine Hat, including by way of connection to an **electric distribution system**;

(ii) part of an industrial complex connected to the **transmission system**; or

(iii) providing, or part of a facility providing, **ancillary services**;

(c) the **legal owner** of a **transmission facility** connected to the **transmission system** or **transmission facilities** in the service area of the City of Medicine Hat;

(~~c~~d) the **legal owner** of a load facility, where for the purposes of this Section 503.16, "load facility" means a facility that is:

(i) connected to the **transmission system**;

(ii) connected to **transmission facilities** in the service area of the City of Medicine Hat;

(iii) part of an industrial complex connected to the **transmission system**; or

(iv) providing **ancillary services**;

and

(~~d~~e) the **ISO**.

~~**2** The **legal owner** of a **generating unit**, **aggregated generating facility**, **transmission facility**, or a load facility that is energized and commissioned on or after April 7, 2017 must ensure the facility meets the minimum supervisory control and data acquisition requirements of this Section 502.8 and, where applicable, verify with the **ISO** that the facility meets the requirements during **commissioning** and before energization.~~

~~**3(1)** Subject to subsection 3(3), the provisions of this Section 502.8 do not apply to the **legal owner** of a **generating unit**, **aggregated generating facility**, **transmission facility**, or a load facility that was energized and commissioned prior to April 7, 2017 in accordance with a previous technical requirement, technical standard, **ISO rule** or functional specification, but the **legal owner** of such an existing **generating unit**, **aggregated generating facility**, **transmission facility**, or a load facility must remain compliant with all the standards and requirements set out in that previous technical requirement, technical~~

~~standard, **ISO rule**, or functional specification.~~

~~**(2)** The **ISO** may, notwithstanding subsection 3(1), require the **legal owner** of a **generating unit**, **aggregated generating facility**, **transmission facility**, or a load facility to comply with any specific provision or all of the provisions of this Section 502.8, if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.~~

~~**(3)** The **legal owner** of a **generating unit**, **transmission facility**, **aggregated generating facility**, or a load facility must, notwithstanding subsection 3(1), comply with the provisions of this Section 502.8 if:~~

~~(a) it modifies its facilities after April 7, 2017 to:~~

~~(i) increase its Rate DTS or Rate STS **contract capacity**; or~~

~~(ii) upgrade or alter the functionality of its supervisory control and data acquisition system; and~~

~~(b) the **ISO** determines that such compliance is necessary for safe and reliable operation of the **interconnected electric system**.~~

~~**Functional Specification**~~

~~**4** The **ISO** must, in accordance and generally consistent with this Section 502.8, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of a supervisory control and data acquisition system for the facility.~~

Requirements

Supervisory Control and Data Acquisition Data ~~Requirements~~

~~52~~**(1)** The **legal owner** of a synchronous **generating unit** must ~~provide~~meet the supervisory control and data acquisition data requirements set out in Appendix 1~~, *Supervisory Control and Data Acquisition Data Requirements for Synchronous Generating Units*~~.

(2) The **legal owner** of an **aggregated facility** containing a wind or solar ~~**aggregated generating facility**~~resource must meet the supervisory control and data acquisition data requirements set out in Appendix 2~~, *Supervisory Control and Data Acquisition Data Requirements for Wind or Solar Aggregated Generating Facilities*~~.

(3) The **legal owner** of a **generating unit** or **energy storage resource** that is part of an industrial complex and the **legal owner** of a load facility must meet the supervisory control and data acquisition data requirements set out in Appendix 3~~, *Supervisory Control and Data Acquisition Data Requirements for Industrial Complexes and Load Facilities*~~.

(4) The **legal owner** of a **transmission facility** must meet the supervisory control and data acquisition data requirements set out in Appendix 4, ~~*Supervisory Control and Data Acquisition Data Requirements for Transmission Facilities*,~~ if at least one of the following criteria is met:

(a) the substation contains 2 or more buses operated at nominal voltage greater than 60 kV;

(b) the substation contains one or more buses operated at a nominal voltage greater than 200 kV;

(c) the substation contains a capacitor bank, reactor, static VAr compensator or synchronous condenser rated greater than or equal to 5 MVAr;

(d) the substation connects 3 or more transmission lines operated at a nominal voltage greater than 60 kV;

(e) the substation supplies local site load, with having normally energized site load equipment rated greater than or equal toat 5 MVA or more that are offered for **ancillary services** or are included in **remedial action schemes**;

(f) the substation supplies local site load with normally energized site load equipment rated greater than or equal toat 10 MVA or more;

(g) the substation supplies **supplemental reserve** load greater than or equal to 5 MVA; or

(h) the substation supplies **system load** that is part of a **remedial action scheme**.

(5) The **legal owner** of a **generating unit**, an**energy storage resource**, **aggregated generating facility**, or a load facility must, if they providethe facility provides **ancillary services**, meet the supervisory control and data acquisition data requirements for **ancillary services** set out in Appendix 5, *Supervisory Control and Data Acquisition Data Requirements for Ancillary Services*.

(6) The **ISO** must meet the supervisory control and data acquisition data requirements set out in :

(i) Appendix 2, *Supervisory Control* and *Data Acquisition Data Requirements for Wind or Solar Aggregated Generating Facilities*; and

(ii) Appendix 5, *Supervisory Control and Data Acquisition Data Requirements for Ancillary Services*. .

(7) The **legal owner** of an **energy storage resource**, or an **aggregated facility** containing an **energy storage resource**, must meet the supervisory control and data acquisition data requirements set out in Appendix 6.

Separate Meters

6 A**3** The **legal owner** must gather supervisory control and data acquisition data using a device that is independent from a **revenue meter**.

Supervisory Control and Data Acquisition Data General Requirements

74(1) The **ISO** must initiate all supervisory control and data acquisition communications with a **legal owner**'s equipment directly connected to the **ISO**'s equipment to acquire supervisory control and data acquisition data from a **legal owner**.

(2) The **ISO** must configure the **ISO**'s communications device to be the "master" device.

(3) AThe **legal owner** must configure its communication device to be the "subordinate" device using the appropriate addressing the **ISO** assigns.

(4) The **legal owner** must configure the supervisory control and data acquisition data so that each datadatum falls within the allowable deadbands for the measurement types specified in Table 1 when using report-by-exception polls with the **ISO**.

Table 1
Allowable Deadband Requirement by Measurement Type

Measurement Type	Equipment Normal Rating Range	Allowable Deadband
Real power	0 to 200 MW	0.5 MW
	Greater than 200 MW	1.0 MW
Reactive power	0 to 200 MVAr	0.5 MVAr
	Greater than 200 MVAr	1.0 MVAr
Voltage	0 to 20 kV	0.1 kV
	Greater than 20 kV	0.5 kV

(5) A **legal owner** must, if it is providing analog values to the **ISO**, provide those values with the following minimum accuracy and resolution as specified in Table 2.

Table 2
Accuracy and Resolution Requirements by Measurement Type

Measurement Type	Units	Accuracy	Resolution
All facilities			
All analog measurements not otherwise specified below		~~+/-~~ ±2% of full scale	0.1
Frequency (between 55 Hz and 65 Hz only)	Hz	~~+/-~~ ± 0.012 Hz	0.001 Hz
Transformer tap position	Position	Integer Value	1
Renewable **aggregated ~~generating~~ facilities**			
Ambient temperature (for solar facilities)	°C	~~+/-~~ ±1 °C	1°C
Barometric pressure	hPa	6 hPa	1 hPa
Global horizontal irradiance (for solar facilities)	W/m^2	~~+/-~~ ±25 W/m^2	1 W/m^2
Potential **real power** capability	MW	~~+/-~~ ±10% of full scale	0.1
Wind direction from true north	Degrees	~~+/-~~ ±5°	1°
Regulating reserve			
Regulating reserve measurements	MW	0.25% of Full Scale	0.25% of measurement

(6) AThe **legal owner** must ensure that the transducer is scaled such that the maximum, full scale, Table 2 values returned are between 120% and 200% of the **normal rating** of the equipment.

(7) The **legal owner** of a **generating unit** that uses a mode of operation of either a synchronous condenser or motor, must ensure that the minimum, full scale, Table 2 values are between 120% and 200% of the lowest operating condition.

(8) AThe **legal owner** must report supervisory control and data acquisition data relating to power flows with the sign convention of positive power flow being out from a bus, except in situations where source measurements are positive polarity.

(9) AThe **legal owner** must, notwithstanding subsection 74(8), report:

(a) **real power** and **reactive power** measurements from a **collector bus** as positive polarity;

(b) **reactive power** measurements from a capacitor as positive polarity; and.

(c) **reactive power** measurements from a reactor as negative polarity.

(10) AThe **legal owner** must, if installing a global positioning system clock as required in a functional specification, use the coordinated universal time as the base time where the base time is the universal time code minus 7 hours.

(11) AThe **legal owner** must ensure that its global positioning system clock functionality provides for a time stamped event accuracy of 1 millisecond and can automatically adjustadjusts for seasonal changes to daylight savingssaving time.

Supervisory Control and Data Acquisition Communications

85(1) A **legal owner** must implement the communication methods for supervisory control and data acquisition data between its facility and the **ISO** in accordance with Table 3.

Table 3Communication3
Communication Requirements by Maximum Authorized Real Power for Generating Units, Aggregated Generating Facilities, Energy Storage Resources, and Load Facilities

Maximum Authorized Real Power	Communication Method Options	Data Latency	Data Availability	Mean Time to Repair
less than 50 MW	Internet or Dedicated	30 seconds	98.0%	48 hours
greater than or equal to 50 MW, and less than 300 MW	Dedicated	15 seconds	98.0%	48 hours
greater than or equal to 300 MW	Dedicated	4 seconds	99.8%	48 hours

(2) A The **legal owner** providing **ancillary services** must implement the communication methods for supervisory control and data acquisition data between its facility and the **ISO** in accordance with Table 4 or Table 3 as applicable.

Table 4
Communication Requirements by Ancillary Service Type Provided

Ancillary Service Type	Communication Method Options	Data Latency	Data Availability	Mean Time to Repair
Regulating Reserve	Dedicated	2 seconds	99.8%	4 hours
Regulating reserve for high/low limits	Dedicated	10 seconds	99.8%	4 hours
Spinning reserve	Dedicated	10 seconds	99.8%	4 hours

(3) ~~A~~ The **legal owner** of a **transmission facility** must implement the communication methods for supervisory control and data acquisition data between its facility and the **ISO** in accordance with Table 5.

Table 5
Communication Requirements for Transmission Facilities by Bus Operating Voltage

Bus Operating Voltage	Communication Method Options	Data Latency	Data Availability	Mean Time to Repair
Greater than or equal to 60 kV, and less than 200 kV	Dedicated	30 seconds	98.0%	48 hours
greater than or equal to 200 kV	Dedicated	15 seconds	98.0%	48 hours

(4) ~~A~~ The **legal owner** that has been directed by the **ISO** to participate in a **remedial action scheme** must implement the communication methods for supervisory control and data acquisition data between the **legal owner**'s facility that participates in the **remedial action scheme** and the **ISO** in accordance with Table 6 below.

Table 6
Communication Requirements for Remedial Action Scheme Facilities by Bus Operating Voltage

Bus Operating Voltage	Communication Method Options	Data Latency	Data Availability	Mean Time to Repair
greater than or equal to 60 kV, and less than 200 kV	Dedicated	30 seconds	99.8%	4 hours
greater than or equal to 200 kV	Dedicated	15 seconds	99.8%	4 hours

(5) ~~A~~ The **legal owner** with a **reactive power** resource must implement the communication methods for its **reactive power** resource between its facility and the **ISO** in accordance with Table 7.

Table 7
Communication Requirements for Reactive Power Resources by Type

Reactive Resource Type	Communication Method Options	Data Latency	Data Availability	Mean Time to Repair
Capacitor bank/reactor	Dedicated	30 seconds	98.0%	48 hours
Static VAr compensator, synchronous condenser, or other similar device	Dedicated	15 seconds	98.0%	48 hours

(6) AThe **legal owner** must provide and maintain a connectivity point and data communication to both the **ISO**'s primary system **control centre** and the **ISO**'s backup **control centre**.

(7) The **ISO** must provide and maintain a connectivity point to the **legal owner**'s facility at both the **ISO**'s primary **control centre** and the **ISO**'s backup **control centre**.

(8) The **legal owner** of a **generating unit**, anenergy storage resource, **aggregated generating facility**, or a load facility must, if it owns a facility with the capability of combined load and generation greater than 1000 MW, provide 2 communication circuits that must connect each of the **ISO**'s primary **control centre** and the **ISO**'s backup **control centre** to each of the **legal owner**'s primary and backup **control centrecentres**.

(9) A **legal owner** of a **generating unit**, anenergy storage resource, **aggregated generating facility**, or a load facility must, when providing **ancillary services**, send supervisory control and data acquisition data to each of the **ISO**'s primary **control centre** and the **ISO**'s backup **control centre**.

(10) A **legal owner** must, based on the **ISO**'s generic communication block diagrams and prior to connecting facilities to the **interconnected electric system** or an electric system in the **service area** of the City of Medicine Hat, indicate to the **ISO** the generic communication block diagram that depicts the communication protocols between the **legal owner**'s facility and the **ISO**'s system **control centre**, with any variations, as appropriate.

(11) A **legal owner** must, if it changes the communication protocols used between itself and the **ISO**, communicate these changes to the **ISO** in writing 90 **business days** prior to changing the protocols.

Notification of Actual or Suspected Data Unavailability or Data Error

96(1) A **legal owner** must, if supervisory control and data acquisition data becomes, or is suspected of being unavailable or erroneous, notify the **ISO** as soon as practicable after becoming aware of this data unavailability or data error.

(2) The **ISO** may, following receipt of the notification pursuant to subsection 96(1), require the **legal owner** to discontinue the provision of **ancillary services**.

(3) A **legal owner** must, provide the **ISO**, in writing and as soon as practicable following, or as part of the notification pursuant to subsection 96(1), provide the **ISO** with, as soon as practicable, in writing: the following::

(a) the cause of any supervisory control and data acquisition data unavailability or data error;

(b) if there is an equipment failure that relates to subsection ~~9~~6(3)(a), a plan that is acceptable to the **ISO** to repair the failed equipment;

(c) the expected date when the supervisory control and data acquisition data will be restored or repaired; and

(d) if~~, following the notification pursuant to subsection 9(1),~~ the **legal owner** determines that there was no ~~actual~~ supervisory control and data acquisition data unavailability or data error, ~~then the **legal owner** must notify the **ISO** of~~ a notification to this ~~determination.~~effect

(4) The **legal owner** must notify the **ISO**, as soon as practicable~~,~~ and in writing, of any revisions necessary to the plan and the rationale for the revisions to the plan.

(5) The **legal owner** must notify the **ISO** once the supervisory control and data acquisition data is restored or repaired.

Exceptions

~~10~~7 A **legal owner** is not required to comply with the specific supervisory control and data acquisition data submission requirements of this Section ~~502.8~~503.16 applicable to a particular device:

(a) that is being repaired or replaced in accordance with a plan accepted by the **ISO** pursuant to subsection ~~9~~6; and

(b) where the **legal owner** is using reasonable efforts to complete such repair or replacement in accordance with that plan.

Appendices

Appendix 1 – *Supervisory Control and Data Acquisition Data Requirements for Synchronous Generating Units*

Appendix 2 – *Supervisory Control and Data Acquisition Data Requirements for ~~Wind or Solar~~ Aggregated ~~Generating~~ Facilities Containing Wind or Solar Resources*

Appendix 3 – *Supervisory Control and Data Acquisition Data Requirements for Industrial Complexes and Load Facilities*

Appendix 4 – *Supervisory Control and Data Acquisition Data Requirements for Transmission Facilities*

Appendix 5 – *Supervisory Control and Data Acquisition Data Requirements for Ancillary Services*

Appendix 6 – *Supervisory Control and Data Acquisition Data Requirements for Energy Storage Resources and Aggregated Facilities Containing Energy Storage Resources*

Revision History

Date	Description
XXXX-XX-XX	
2021-02-18	Administrative amendments to align with ISO drafting principles, fix typographical errors, and remove and consolidate some provisions of Section 502.8 in order to improve clarity, reduce repetition, and reduce overall requirements.

2019-12-11	Removed duplication with new Section 103.14, *Waivers and Variances*; standardized functional specifications language; capitalized references to "Section".
2018-09-01	Revised applicability section; clarified which requirements are applicable to synchronous generating units; added requirements for a distribution connected aggregated generating facility; added additional SCADA requirements for wind aggregated generating facilities to Appendix 2; and added SCADA requirements for solar aggregated generating facilities to Appendix 2.
2015-03-27	Replaced "effective date" with the initial release date in sections 2 and 3; and replaced the word "Effective" in the Revision History to "Date".
2014-12-23	Appendix 1 amended by combining the two lines concerning generating unit automatic voltage regulation into one line. Appendix 5 amended reflect that the regulating reserve set point signal is sent by ISO every 4 seconds, not every 2 seconds. Appendix 5 amended to include the measurement point for load facility when providing spinning reserve.
2013-02-28	Initial release

Appendix 1 – Supervisory Control and Data Acquisition Data Requirements for Synchronous Generating Units

Facility/ Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each power plant	Status	Communications failure alarm from remote terminal unit acting as a data concentrator for one or more **generating unit** to a **transmission facility control centre**, if applicable	0 = Normal	1= Alarm
		Communications failure indication between an intelligent electronic device and any remote terminal unit acting as a data concentrator	0 = Normal	1= Alarm
For each synchronous **generating unit** directly connected to the **transmission system** or **transmission facilities** in the **service area** of Medicine Hat.	Analog	**Gross real power** as measured at the stator winding terminal	MW	
		Gross **reactive power** as measured at the stator winding terminal	MVAr	
		Generating unit voltage at the generator stator winding terminal or equivalent bus voltage	kV	
		Unit frequency as measured at the stator winding terminal or equivalent bus frequency	Hz	
		Net **real power** as measured on the high side terminal of the **transmission system** step up transformer	MW	
		Net **real power** of summated generation of a facility with multiple **generating units** offering as a single **market participant**	MW	
		Net **reactive power** as measured on the high side terminal of the **transmission system** step up transformer	MVAr	
		Net **reactive power** of summated generation of a facility with multiple **generating units** offering as a single **market participant**	MVAr	
		Unit service load measured on the high side of the unit service transformer if the capacity is greater than 0.5 MW	MW	
		Unit service load measured on the high side of the unit service transformer if the capacity is greater than 0.5 MW	MVAr	
		Station service load **real power** if the capacity is greater than 0.5 MW, or if the station service load is for multiple units then the combined load for those units, measured on the high side of the station service transformer	MW	
		Station service load **reactive power** if the capacity is greater than 0.5 MW, or if the station service load is for multiple units then the combined load for those units, measured on the high side of the station service transformer	MVAr	
		Excitation system **real power** if the capacity is greater than 0.5 MW, measured on the high side of the excitation system transformer	MW	
		Excitation system **reactive power** if the capacity is greater than 0.5 MW, measured on the high side of the excitation system transformer	MVAr	
		Voltage at the **point of connection** to the **transmission system**	kV	
		Automatic voltage regulation setpoint	kV	
		Transmission system step-up transformer tap position if the step up transformer has a load tap changer	Tap position	
		Ambient temperature if the **generating unit** is a gas turbine **generating unit** (range of -50^{0}C and +50^{0}C)	^{0}C	

	Status	Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1= Closed
		Transmission system step up transformer voltage regulator if the **transmission system** step up transformer has a load tap changer	0 = Manual	1= Auto
		Generating unit power system stabilizer status	0 = Off	1 = On
		Generating unit automatic voltage regulation in service and controlling voltage	0 = Off	1 = On
		Remedial action scheme armed status, if applicable	0 = Disarmed	1= Armed
		Remedial action scheme operated status on communications failure, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on runback, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on trip, if applicable	0 = Normal	1 = Alarm
For each distribution connected facility including distributed connected in the **service area** of the City of Medicine Hat. synchronous **generating unit**, or **aggregated ~~generating facilities~~facility** consisting of synchronous **generating units**, where the **gross real power** capability is greater than or equal to 5 MW	Analog	**Gross real power** as measured at the stator winding terminal	MW	
		Gross **reactive power** as measured at the stator winding terminal	MVAr	
		Generating unit voltage at the generator stator winding terminal or equivalent bus voltage	kV	
	Status	Breaker, circuit switchers, motor operated air brakes, or other devices that can remotely control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1= Closed

Appendix 2 – Supervisory Control and Data Acquisition Data Requirements for ~~Wind or Solar~~ Aggregated ~~Generating~~ Facilities Containing Wind or Solar Resources

Facility / Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each wind or solar **aggregated** ~~generating~~ **facility** directly connected to the **transmission system** or **transmission facilities** in the **service area** of the City of Medicine Hat, and where the **gross real power** capability is greater than or equal to 5 MW.	Analog	**Real power** of each collector system feeder	MW	
		Reactive power of each collector system feeder	MVAr	
		DC power for each collector system feeder (if the wind or solar resource shares an inverter with another technology)	MW	
		Voltage for each **collector bus**	kV	
		Real power of station service greater than 0.5 MW	MW	
		Reactive power of station service greater than 0.5 MW	MVAr	
		Reactive power of each **reactive power** resource (other than **generating units**)	MVAr	
		Real power at the low side of **transmission system** step up transformer	MW	
		Reactive power at the low side of **transmission system** step up transformer	MVAr	
		Transmission system step-up transformer tap position if the step up transformer has a load tap changer	Tap position	
		Net **real power** at the **point of connection**	MW	
		Net **reactive power** at the **point of connection**	MVAr	
		Frequency at the **point of connection**	Hz	
		Voltage at the **point of connection**	kV	
		Voltage regulation system setpoint	kV	
		Potential **real power** capability, where potential **real power** capability is the **real power** that would have been produced at the **point of connection** without **aggregated** ~~generating facilities~~**facility** curtailment and based on **real time** meteorological conditions	MW	
		Real power limit used in the power limiting control system at the **aggregated generating facilities**	MW	
		Wind speed at hub height as collected at the meteorological tower, (for wind facilities)	~~m/s~~km/h	
		Wind direction from the true north as collected at the meteorological tower, (for wind facilities)	Degrees	
		Barometric pressure (for wind facilities)	hPa	
		Ambient temperature (for wind facilities)	°C	
		Wind Speed at between 2 to 10 m above ground (for solar facilities)	~~m/s~~km/h	
		Wind direction from the true north at between 2 to 10 m above ground (for solar facilities)	Degrees	
		Ambient Temperature (for solar facilities)	°C	
		Global Horizontal Irradiance (for solar facilities)	W/m²	
	Status	Communications failure alarm from remote terminal unit acting as a data concentrator for one or more **generating units** to the **control centre** of a **transmission facility**, if applicable	0 = Normal	1= Alarm

Facility / Service Description	Signal Type	Description	Unit	
		Communications failure indication between an intelligent electronic device and any remote terminal unit acting as a data concentrator	0 = Normal	1= Alarm
		Each collector system feeder breaker	0 = Open	1 = Closed
		Each **reactive power** resource feeder breaker	0 = Open	1 = Closed
		Power limiting control system	0 = Off	1 = On
		Voltage regulation system status	0 = Manual	1 = Automatic
		Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1 = Closed
		Generating unit step up transformer voltage regulator if the **transmission system** step up transformer has a load tap changer	0 = Manual	1 = Automatic
		Remedial action scheme armed status, if applicable	0 = Disarmed	1= Armed
		Remedial action scheme operated status on communications failure, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on runback, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on trip, if applicable	0 = Normal	1 = Alarm
ISO supervisory control data requirements				
For each wind or solar **aggregated ~~generating~~ facility** directly connected to the **transmission system** or **transmission facilities** in the **service area** of the City of Medicine Hat, and where the **gross real power** capability is greater than or equal to 5 MW.	Analog	Facility limit	MW	
		Reason for facility limit	1 = Transmission, 2= Ramp, 3 = No limit	
Legal owner data acquisition data requirements				
For each wind or solar **aggregated ~~generating~~ facility**, where the **gross real power** capability is greater than or equal to 5 MW and is connected to an	Analog	**Gross real power** as measured at the **collector bus**	MW	
		Gross **reactive power** as measured at the **collector bus**	MVAr	
		DC power for each collector system feeder (if the wind or solar resource shares an inverter with another technology)	MW	
		Generating unit voltage at the **collector bus**	kV	
		Net **real power** at the **point of connection**	MW	
		Net **reactive power** at the **point of connection**	MVAr	
		Frequency at the **point of connection**	Hz	

Facility / Service Description	Signal Type	Description	Unit	
electric distribution system including distribution facilities in the **service area** of the City of Medicine Hat.		Potential **real power** capability, where potential **real power** capability is the **real power** that would have been produced at the **point of connection** without **aggregated generating facilities** curtailment and based on **real time** meteorological conditions.	MW	
		Real power limit used in the power limiting control system at the **aggregated** ~~generating facilities~~facility	MW	
		Wind speed at hub height as collected at the meteorological tower, (for wind facilities)	m/s	
		Wind direction from the true north as collected at the meteorological tower, (for wind facilities)	Degrees	
		Barometric pressure with precision for instantaneous measurements (for wind facilities)	HPa	
		Ambient temperature (for wind facilities)	°C	
		Wind Speed at between 2 and 10 m above ground (for solar facilities)	~~m/s~~km/h	
		Wind direction from the true north at between 2 and 10 m above ground (for solar facilities)	Degrees	
		Ambient Temperature (for solar facilities)	^{0}C	
		Global Horizontal Irradiance (for solar facilities)	W/m²	
	Status	Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1= Closed
ISO supervisory control data requirements				
For each wind or solar **aggregated** ~~generating~~ **facility**, where the **gross real power** capability is greater than or equal to 5 MW and is connected to an **electric distribution system** including distribution facilities in the **service area** of the City of Medicine Hat.	Analog	Facility limit	MW	
		Reason for facility limit	1 = Transmission, 2= Ramp, 3 = No limit	

Appendix 3 – Supervisory Control and Data Acquisition Data Requirements for Industrial Complexes and Load Facilities

Facility / Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each facility	Status	Communications failure alarm from remote terminal unit acting as a data concentrator for one or more **generating units** to a **transmission facility control centre** (if applicable)	0 = Normal	1= Alarm
		Communications failure indication between an intelligent electronic device and any remote terminal unit acting as a data concentrator	0 = Normal	1= Alarm
For each load facility or industrial complex	Analog	**Real power** at the **point of connection**	MW	
		Reactive power at the **point of connection**	MVAr	
		Voltage at the **point of connection**	kV	
	Status	Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1 = Closed
A **market participant** with a **remedial action scheme** on its load facility or industrial complex	Analog	Total **remedial action scheme** load available	MW	
		Amount of load armed	MW	
	Status	**Remedial action scheme** circuit breaker, circuit switcher, or other controllable isolating devices	0 = Open	1 = Closed
		Arming status of the **remedial action scheme**	0 = Disarmed	1 = Armed
		Remedial action scheme operated status on communications failure, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on runback, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on trip, if applicable	0 = Normal	1 = Alarm

Appendix 4 – Supervisory Control and Data Acquisition Data Requirements for Transmission Facilities

Facility / Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each substation	Status	Communications failure alarm from remote terminal unit acting as a data concentrator for one or more **generating units** to a **transmission facility control centre**, if applicable	0 = Normal	1= Alarm
		Communications failure indication between an intelligent electronic device and each remote terminal unit acting as a data concentrator	0 = Normal	1= Alarm
Bus	Analog	Bus voltage line-to-line. Ring or split buses require a minimum of two voltage sources	kV	
	Status	Breakers, circuit switchers, motor operated switches, or other remotely or automatically controllable isolating device status	0 = Open	1= Closed
Transformer winding greater than 60 kV	Analog	**Real power** as measured on the high side terminal of the transformer	MW	
		Reactive power as measured on the high side terminal of the transformer	MVAr	
		Transformer voltage regulation setpoint if the transformer has a load tap changer	kV	
		Transformer tap position if the step up transformer has a load tap changer	Tap position	
	Status	Load tap changer	0 = Manual	1 = Automatic
Reactive Power Resources	Analog	**Reactive power** of switchable **reactive power** resource - capacitor bank (positive polarity) or reactor (negative polarity)	MVAr	
		Reactive power of dynamic **reactive power** resource – static VAr compensator, synchronous condenser, or other similar device	MVAr	
		Voltage setpoint of dynamic **reactive power** resource – static VAr compensator, synchronous condenser, or other similar device	kV	
	Status	**Reactive power** resource control device - capacitor bank or reactor	0 = Off	1 = On
		Reactive power resource control device – static VAr compensator, synchronous condenser, or other similar device	0 = Off	1 = On
		Automatic voltage regulation status for dynamic **reactive power** resource – static VAr compensator, synchronous condenser, or other similar device	0 = Off	1 = On
Remedial Action Scheme	Status	**Remedial action scheme** circuit breaker, circuit switcher or other controllable isolating devices	0 = Open	1 = Closed
		Remedial action scheme armed status, if applicable	0 = Disarmed	1= Armed
		Remedial action scheme operated status on communications failure, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated on equipment overload, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on trip, if applicable	0 = Normal	1 = Alarm
Transmission line where the nominal voltage is greater than or equal to 60 kV and less than 200 kV	Analog	**Real power**	MW	
		Reactive power	MVAr	
	Status	Breakers, circuit switchers, motor operated switches, or other remotely or automatically controllable isolating device status	0 = Open	1= Closed
Transmission line where the nominal voltage is greater than or equal to 200 kV	Analog	**Real power**	MW	
		Reactive power	MVAr	
		Line side voltage	kV	
	Status	Breakers, circuit switchers, motor operated switches, or other remotely or automatically controllable isolating device status	0 = Open	1= Closed

Appendix 5 – Supervisory Control and Data Acquisition Data Requirements for Ancillary Services

Facility / Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each blackstart resource	Analog	Bus frequency	Hz	
Legal owner data acquisition data requirements				
For each **regulating reserve resource**	Analog	**Gross real power** ~~as measured at the stator winding terminal~~	MW	
		Net **real power** ~~as measured on~~at the ~~high side terminal~~point of ~~the step up transformer~~connection	MW	
		Gross real power setpoint from the **regulating reserve resource** control system	MW	
		High limit of the **regulating reserve** range	MW	
		Low limit of the **regulating reserve** range	MW	
	Status	**Regulating reserve resource** circuit breaker status (required for all circuit breakers composing the resource)	0 = Open	1= Closed
		Regulating reserve resource control status	0 = Disabled	1= Enabled
ISO supervisory control data requirements				
For each **regulating reserve resource**	Analog	Setpoint every 4 seconds. Note if multiple resources are used to provide the full resource commitment, the **ISO** will send a totalized expected MW output signal	MW	
	Status	**ISO** has control of the **regulating reserve resource**	0 = Disarmed	1= Armed
Legal owner data acquisition data requirements				
For each **spinning reserves resource**	Analog	**Gross real power** ~~as measured at:~~ ~~a) For **source assets**, the stator winding terminal or~~ ~~For **sink assets** the closest circuit breaker or disconnection device to each load facility.~~	MW	
	Status	**Spinning reserve resource** circuit breaker status (required for all circuit breakers composing the resource)	0 = Open	1= Closed
Legal owner data acquisition data requirements				
For each **supplemental reserve resource** ~~either load facility or generation~~	Analog	**Gross real power**	MW	
	Status	**Supplemental reserve resource** circuit breaker status (required for all circuit breakers composing the resource)	0 = Open	1= Closed
Legal owner data acquisition data requirements				
For each resource providing **load shed service**	Analog	Actual ~~Volume~~volume of **real power** ~~consumed at the **point of connection**~~	MW	
		Offered ~~Volume~~volume of **real power**	MW	
		Armed ~~Volume~~volume of **real power** commitment	MW	
	Status	~~**Load shed service**~~Service provider **dispatch** status indication	0 = Disarmed	1 = Armed
		Service provider trip status confirmation	0 = Normal	1 = Tripped
		~~**Real power** dispatched~~ **Forced outage** condition status	~~MW~~0 = Normal	1 = Outage

		~~**Dispatch**~~Trip status ~~for **load shed service**~~	0 = ~~Disarmed~~Normal	1 = ~~Armed~~Trip

Appendix 6 – Supervisory Control and Data Acquisition Data Requirements for Energy Storage Resources and Aggregated Facilities containing Energy Storage Resources

Facility / Service Description	Signal Type	Description	Unit	
Legal owner data acquisition data requirements				
For each **energy storage resource** directly connected to the **transmission system** or **transmission facilities** in the **service area** of the City of Medicine Hat, and where the **gross real power** capability is greater than or equal to 5 MW.	Analog	**Gross real power**	MW	
		Gross **reactive power**	MVAr	
		Gross DC power (if the energy storage resource shares an inverter with another technology)	MW	
		Energy storage resource voltage at the **collector bus**	kV	
		Real power of station service greater than 0.5 MW	MW	
		Reactive power of station service greater than 0.5 MW	MVAr	
		Reactive power of each **reactive power** resource (other than **energy storage resources**)	MVAr	
		Real power at the low side of **transmission system** step up transformer	MW	
		Reactive power at the low side of **transmission system** step up transformer	MVAr	
		Transmission system step-up transformer tap position if the step up transformer has a load tap changer	Tap position	
		Net **real power** at the **point of connection**	MW	
		Net **reactive power** at the **point of connection**	MVAr	
		Frequency at the **point of connection**	Hz	
		Voltage at the **point of connection**	kV	
		Voltage regulation system setpoint	kV	
		State of charge in percent	%	
		State of charge in MWh	MWh	
		Operational maximum state of charge	MWh	
		Operational minimum state of charge	MWh	
	Status	Communications failure alarm from remote terminal unit acting as a data concentrator for one or more **energy storage resources** to the **control centre** of a **transmission facility**, if applicable	0 = Normal	1= Alarm
		Communications failure indication between an intelligent electronic device and any remote terminal unit acting as a data concentrator	0 = Normal	1= Alarm
		Each **reactive power** resource feeder breaker	0 = Open	1 = Closed
		Energy storage resource power system stabilizer (PSS) status	0 = Off	1 = On
		Voltage regulation system status	0 = Manual	1 = Automatic
		Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1 = Closed
		Step up transformer voltage regulator if the **transmission system** step up transformer has a load tap changer	0 = Manual	1 = Automatic
		Remedial action scheme armed status, if applicable	0 = Disarmed	1= Armed
		Remedial action scheme communications failure status, if applicable	0 = Normal	1 = Alarm

Facility / Service Description	Signal Type	Description	Unit	
		Remedial action scheme operated status on runback, if applicable	0 = Normal	1 = Alarm
		Remedial action scheme operated status on trip, if applicable	0 = Normal	1 = Alarm
Legal owner data acquisition data requirements				
For each **energy storage resource**, where the **gross real power** capability is greater than or equal to 5 MW and is connected to an **electric distribution system** including distribution facilities in the **service area** of the City of Medicine Hat.	Analog	**Gross real power**	MW	
		Gross **reactive power**	MVAr	
		Gross DC power (if the energy storage resource shares an inverter with another technology)	MW	
		Energy storage resource voltage at the **collector bus**	kV	
		Net **real power** at the **point of connection**	MW	
		Net **reactive power** at the **point of connection**	MVAr	
		Frequency at the **point of connection**	Hz	
		State of charge in percent	%	
		State of charge in MWh	MWh	
		Operational maximum state of charge	MWh	
		Operational minimum state of charge	MWh	
	Status	Breaker, circuit switchers, motor operated switches, or other devices that can remotely or automatically control the connection to the **interconnected electric system**; and does not include manually operated air breaks.	0 = Open	1= Closed

ISO Rules
Part 500 Facilities
Division ~~502~~503 Technical & Operating Requirements
Section ~~502.10~~503.17 Revenue Metering System ~~Technical and Operating Requirements~~

Applicability

1 Section ~~502.10~~503.17 applies to:

(a) the **legal owner** of a **revenue meter**; and

(b) the **ISO**.

Requirements

~~**Successor to Prior Requirements**~~

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

~~**(2)** The *AESO 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 be in force and effect as of the effective date of this Section 502.10.~~

~~**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 meter** for a facility.~~

~~**(2)** The functional specification referred to in subsection 3(1) must be generally consistent with the provisions of this Section 502.10, but may contain material variances the **ISO** approves of based upon its discrete analysis of any 1 or more of the technical, economic, safety, operational and reliability requirements of the **interconnected electric system** related to the specific facility.~~

Measurement Point Definition Record

~~4~~2**(1)** The **legal owner** of a **revenue meter** must, where such **legal owner** requires a new **measurement point definition record** or an amendment to an existing **measurement point definition record**, submit a complete application form to the **ISO**~~,~~ prior to energizing the new or altered **revenue metering system**.

(2) The **ISO** must issue a **measurement point definition record** for a **measurement point** to the **legal owner** of the **revenue meter**, or to a **person** designated by the **legal owner** of the **revenue meter**, if the information in the application form submitted in accordance with subsection ~~4~~2(1):

(a) is complete;

(b) allows for the proper measurement of **metered energy**, measurement of **metered demand**, and calculation of **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**.

(3) The **legal owner** of a **revenue meter** must install and operate a **revenue meter** in accordance with the **measurement point definition record** the **ISO** issues in accordance with subsection ~~4~~2(2).

Revenue Meter

~~5~~3**(1)** 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.

(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 0.5% 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~~4**(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 measurement transformer 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

~~7~~5**(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, 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 record** issued in accordance with subsection ~~4~~2(2).

(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.

(4) The **legal owner** must maintain validation records until the date of the next in-situ test ~~performed~~.

Revenue Meter Testing and Reporting

~~8~~6**(1)** The **legal owner** of a **revenue meter** must perform in-situ testing:

(a) upon a change of any **metering equipment** associated with the **revenue meter**; and

(b) as per the testing intervals set out in Table 1:

Table 1 – In-situ Testing Frequency Based on Revenue Meter MW Class

MW Class	Testing Interval
(i) Greater than 20 MW	(A) Every 2 years from the date of commissioning; or (B) For existing revenue meters, every 2 years from the date of the previous in-situ test.
(ii) Greater than or equal to 5 MW and less than or equal to 20 MW	(A) Every 4 years from the date of commissioning; or (B) For existing revenue meters, every 4 years from the date of the previous in-situ test.

(2) The **legal owner** of a **revenue meter** must calculate the MW class in subsection ~~8~~6(1)(b) as follows:

(a) determine the total active energy in MWh at the **measurement point** for the calendar year; and

(b) divide the total active energy determined in subsection ~~8~~6(2)(a) by the number of settlement intervals in the same calendar year, including the intervals in which active energy is zero.

(3) The **legal owner** of a **revenue meter** must provide the results of the in-situ test performed in subsection ~~8~~6(1) to the **ISO** if the test resulted in an error measurement of +/- 3%.

(4) Notwithstanding subsections ~~8~~6(1), ~~8~~6(2) and ~~8~~6(3) above, the **legal owner** of a **revenue meter** must, at the request of the **ISO**, complete and report the results of an in-situ test for the **metering equipment** within 30 **days** of receiving the **ISO**'s request or within a mutually agreed time frame.

Measurement Data Corrections

~~9~~7 The **legal owner** of a **revenue meter** must, if the **legal owner** discovers an error in measurement data, where the net difference in consumption from the measurement data previously submitted to the **ISO** is:

(a) 100 MWh or greater, for sites other than large micro-generation; or

(b) 100 kWh or greater for large micro-generation sites,

notify the **ISO** in writing of the reason for the error.

Restoration

~~10~~8**(1)** The **legal owner** of a **revenue meter** must, upon becoming aware of a failure of the **revenue metering system**, restore the **revenue metering system** within 30 **days**.

(2) The **legal owner** of a **revenue meter** must notify the **ISO** in writing of the failure if the **legal owner** is unable to restore the **revenue metering system** within 30 **days** in accordance with subsection ~~10~~8(1).

(3) The **legal owner** of a **revenue meter** must include a plan to restore the **revenue metering system** when notifying the **ISO** in accordance with subsection ~~10~~8(2).

(4) The **legal owner** of a **revenue meter** must notify the **ISO** in writing after completing the restoration of the **revenue metering system** in accordance with the plan referred to in subsection ~~10~~8(3).

Revision History

Date	Description
20xx-xx-xx	
2021-03-18	Initial release

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.18 Operation and Maintenance of Facilities

Applicability

1 Section 503.18 applies to:

(a) the **legal owner** and **operator** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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

(b) the **ISO**.

Requirements

Operation and Maintenance

2(1) This subsection 2 does not apply to:

(a) excitation systems;

(b) **automatic voltage regulators**; or

(c) power system stabilizers.

(2) The **legal owner** must operate and maintain the **generating unit**, **aggregated facility**, or **energy storage resource** to comply with the applicable technical design requirements of Division 503 of the **ISO rules** for so long as the **generating unit**, **aggregated facility**, or **energy storage resource** remains electrically connected.

(3) The **operator** must, if it determines that any equipment required to meet the technical design requirements of an applicable **ISO rule** has become unavailable or is otherwise no longer meeting those requirements, notify the **ISO**, in writing, in accordance with subsection 2(4) no later than one **business day** after making such a determination.

(4) The **operator** must include the following information in the notification to the **ISO** under subsection 2(2):

(a) a description of the cause of the equipment unavailability or the reason that the equipment no longer meets the technical design requirements;

(b) a plan to address the issue identified under subsection 2(3), including testing; and

(c) the expected date and time at which the issue identified under subsection 2(3) will be resolved.

(5) The **operator** must, if the issue identified under subsection 2(3) is not resolved by the expected date and time provided in accordance with subsection 2(4), notify the **ISO** in writing, no later than one **business day** after the original expected date and time, of the reason why the issue was not resolved by the expected date and time, and provide the **ISO** with a revised date and time under subsection 2(4)(c).

(6) The **operator** must notify the **ISO** no later than one **business day** after the issue identified under subsection 2(3) has been resolved.

(7) The **operator** of:

(a) multiple **generating units** or synchronous **energy storage resources** within a single complex; or

(b) an **aggregated facility** containing an **energy storage resource**;

must, as soon as practicable, verbally notify the **ISO** when it determines that the auxiliary systems are configured such that multiple **generating units** or **energy storage resources** will trip or go off-line for a single **contingency** within the facility, such that it is being operated contrary to subsection 2 of Section 503.9 of the **ISO rules**, *Auxiliary Systems*.

(8) The **legal owner** must, if the **ISO** provides written notice detailing evidence that the observed performance of the **generating unit**, **aggregated facility**, or **energy storage resource** is not consistent with any of the applicable requirements set out in Division 503 of the **ISO rules**, submit to the **ISO** a written report demonstrating that the **generating unit**, **aggregated facility**, or **energy storage resource** is capable of meeting those requirements.

(9) The **legal owner** must submit a report no later than 60 **business days** after receipt of the written notice described in subsection 2(8).

(10) The **legal owner** is not required, notwithstanding subsections 2(8) and 2(9), to provide the report if, between the date the **ISO** delivers the written notice and the deadline date for the submission of the report:

(a) the **legal owner** demonstrates to the satisfaction of the **ISO** that the failure to perform in accordance with the requirements set out in Division 503 of the **ISO rules**, was caused by equipment issues with the **generating unit**, **aggregated facility**, or **energy storage resource** that the **legal owner** corrected no later than 60 **business days** after receipt of the written notice described in subsection 2(8); and

(b) the **ISO** provides written notice to the **legal owner** that the report is not required.

Operating Data Requests from the ISO

3(1) The **ISO** may request, by way of written notice, operating data from the **legal owner**, including the records described in Section 503.13 of the **ISO rules**, *Synchrophasor Measurement System* and Section 503.14 of the **ISO rules**, *Sequence of Events Monitoring*.

(2) The **legal owner** must:

(a) submit the operating data requested by the **ISO**, if available, no later than 5 **business days** after receipt of the notice under subsection 3(1); or

Operator Availability

4 The **legal owner** must have designated personnel available 24 hours a **day** every **day** of the calendar year for contact and communication with the **ISO**, in accordance with all applicable **ISO rules** and **reliability standards**.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.19 Reactive Power Verification Testing

Applicability

1 Section 503.19 applies to:

(a) the **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** 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

(b) the **ISO**.

Requirements

Reactive Power Verification Testing

2(1) The **legal owner** must, subject to subsection 2(3), verify the **reactive power** capability of the **generating unit**, **aggregated facility**, or **energy storage resource** at:

(a) the **maximum authorized real power**; and

(b) the **maximum authorized charging power** if applicable

at regular intervals no later than 5 years from the date the prior **reactive power** verification or re-verification testing was completed.

(2) The **legal owner** must ensure that the **reactive power** testing for the **generating unit**, **aggregated facility**, or **energy storage resource** for both the **maximum authorized real power** and the **maximum authorized charging power**, if applicable, achieves:

(a) the **gross reactive power** at 0.90 **power factor** supplying **reactive power**; and

(b) the **gross reactive power** at 0.95 **power factor** absorbing **reactive power**.

(3) The **legal owner** may test the **generating unit**, **aggregated facility**, or **energy storage resource** at values other than the **maximum authorized real power** and **maximum authorized charging power**, but only if ambient conditions or **transmission system** limits do not allow the **generating unit**, **aggregated facility**, or **energy storage resource** to achieve the **maximum authorized real power** and **maximum authorized charging power** or the **reactive power** requirements.

(4) The **legal owner** of a **generating unit**, **aggregated facility**, or **energy storage resource** that:

(a) has a common **point of connection** with another **generating unit**, **aggregated facility,** or **energy storage resource**; and

(b) share **reactive power** resources;

must verify that the **reactive power** capability is in accordance with the applicable requirements of Section 503.3 of the **ISO rules**, *Reactive Power.*

Inconsistent Test Results

3(1) The **legal owner** must, if the **ISO** provides written notice that the modeled response of the **generating unit**, **aggregated facility**, or **energy storage resource** is not consistent with the observed response:

(a) perform the applicable testing in accordance with this Section 503.19; and

(b) provide the written results of the test to the **ISO** no later than 60 **business days** after receipt of the **ISO**'s notice.

(2) The **legal owner** is, notwithstanding subsection 3(1), not required to perform testing if between the date the **ISO** delivers the written notice and the deadline date for the submission of model testing results:

(a) the **legal owner** demonstrates to the satisfaction of the **ISO** that the inconsistency described in subsection 3(1) was caused by equipment problems that the **legal owner** corrected prior to the testing date; and

(b) the **ISO** provides written notice to the **legal owner** that the testing results are not required.

Reporting

4(1) The **legal owner** must report to the **ISO** the results of reactive power verification testing performed pursuant to this Section 503.19 in the form specified by the **ISO**.

(2) The **legal owner** must, in the form specified by the **ISO**, submit an additional reactive power testing report to the **ISO** no later than 180 **days** after the date of completion of each of the following:

(a) the first connection of a **generating unit**, **aggregated facility**, or **energy storage resource** to the **transmission system** or a **transmission facility** within the **service area** of the City of Medicine Hat;

(b) a modification of a **generating unit**, **aggregated facility**, or **energy storage resource** to the **transmission system** or a **transmission facility** within the **service area** of the City of Medicine Hat;

(c) the in-service date of any increase to the **maximum authorized real power** or **maximum authorized charging power** of a **generating unit**, **aggregated facility**, or **energy storage resource** that the **ISO** approves;

(d) any model revalidation testing; and

(e) any **reactive power** verification or re-verification testing other than that required in subsection 3(1).

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division 503 Technical & Operating Requirements
Section 503.20 Baseline and Model Validation Testing

Applicability

1 Section 503.20 applies to:

(a) the **legal owner** of an **aggregated facility** that is directly connected to the **transmission system**, or to **transmission facilities** within the City of Medicine Hat, and has:

(i) **maximum authorized real power** greater than 9 MW; or

(ii) a range greater than 9 MW between the **maximum authorized charging power** and the **maximum authorized real power**;

including an **aggregated facility** situated within an industrial complex that is directly connected to the **transmission system**;

(b) the **legal owner** of a **generating unit** or **energy storage resource** that is directly connected to the **transmission system**, or to **transmission facilities** within the City of Medicine Hat, and has:

(i) **maximum authorized real power** equal to or greater than 9 MW; or

(ii) **maximum authorized real power** aggregate equal to or greater than 18 MW, where the **generating unit** or **energy storage resource** is part of a complex with other **generating units** or **energy storage resources**;

and

(c) the **ISO**.

2 Section 503.20 does not apply to a **legal owner** ifthe **generating unit**, **aggregated facility**, or **energy storage resource** is connected to the in-plant distribution system of an industrial complex with 2 or more voltage transformations between the **generating unit**, **aggregated facility**, or **energy storage resource** and the **transmission system**.

Requirements

Baseline Testing for Aggregated Facilities

3(1) The **legal owner** of an **aggregated facility** must perform baseline testing, including model validation, in accordance with subsection 3(2), to validate the following models as applicable to the technology used in the **aggregated facility**:

(a) generator or converter;

(b) excitation system including the:

(i) **voltage regulating system** or **automatic voltage regulator** in voltage control mode; and

(ii) **reactive power** resources;

(c) power system stabilizer, for an **aggregated facility** equipped with a power system stabilizer;

(d) turbine-**governor system** or **real power** controller; and

(e) other **aggregated facility** models as the **ISO** requests.

(2) The **legal owner** of an **aggregated facility** must perform baseline testing when:

(a) the **aggregated facility** is connected to the **transmission system** for the first time;

(b) changes are made to control settings, software, or hardware of:

(i) the **voltage regulating system** or **automatic voltage regulator**; or

(ii) the **governor system**;

or

(c) any modification is made that changes the modeled behaviour of the **aggregated facility** with respect to the **transmission facilities**.

(3) The **legal owner** of an **aggregated facility** is only required to perform testing on those portions of the models that are affected by the modifications described in subsection 3(2).

(4) The **legal owner** of an **aggregated facility** must perform **reactive power** verification, in accordance with Section 503.19 of the **ISO rules**, *Reactive Power Verification Testing* as part of the baseline testing.

(5) The **legal owner** of an **aggregated facility** must report the results of the baseline testing performed pursuant to subsection 3(2) to the **ISO** in accordance with subsection 8.

Baseline Testing for Generating Units and Synchronous Energy Storage Resources

4(1) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must perform baseline testing, including model validation, in accordance with subsection 4(2), to validate the following **generating unit** or synchronous **energy storage resource** models:

(a) synchronous machine including:

(i) open circuit saturation;

(ii) inertia; and

(iii) synchronous machine impedances and time constants;

(b) excitation system including:

(i) the **automatic voltage regulator** in voltage control mode; and

(ii) the open circuit saturation of the exciter for a **generating unit** or synchronous **energy storage resource** equipped with a rotary exciter;

(c) power system stabilizer for a **generating unit** or synchronous **energy storage resource** equipped with a power system stabilizer;

(d) turbine-**governor system**; and

(e) other **generating unit** or synchronous **energy storage resource** models as the **ISO** requires.

(2) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must perform baseline testing when any of the following occurs:

(a) the **generating unit** or synchronous **energy storage resource** is synchronized to the **transmission system** for the first time;

(b) replacement or changes to control settings or software of:

(i) the **automatic voltage regulator**;

(ii) the power system stabilizer; or

(iii) the **governor system**;

(c) a **generating unit** or synchronous **energy storage resource** stator rewind;

(d) a **generating unit** or synchronous **energy storage resource** rotor rewind;

(e) a rotary exciter rewind;

(f) a turbine replacement; or

(g) any other modification that changes the modeled behaviour of the **generating unit** or synchronous **energy storage resource** with respect to the **transmission system**.

(3) The **legal owner** of a **generating unit** or synchronous **energy storage resource** is, notwithstanding subsection 4(2), not required to perform baseline testing if any of the work described in subsections 4(2)(b) through (f) does not result in changes to the modeled behaviour of the **generating unit** or synchronous **energy storage resource** with respect to the **transmission system**.

(4) The **legal owner** of a **generating unit** or synchronous **energy storage resource** referred to in subsections 4(2)(b) through (g) is only required to perform testing on those portions of the models that are affected by the modifications.

(5) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must perform **reactive power** verification, in accordance with Section 503.19 of the **ISO rules**, *Reactive Power Verification Testing*, as part of the baseline testing.

(6) The **legal owner** of a **generating unit** or synchronous **energy storage resource** must report the results of the baseline testing performed pursuant to subsection 4(2) to the **ISO** in accordance with subsection 8.

Model Revalidation Testing for Aggregated Facilities

5(1) The **legal owner** of an **aggregated facility** must, for each model referenced in subsection 5(2) and as applicable to the technology used in the **aggregated facility**, perform model revalidation testing no later than 5 calendar years from the date of the most recently completed baseline testing or model revalidation testing.

(2) Model revalidation testing must consist of the following **aggregated facility** models:

(a) **voltage regulating system** or **automatic voltage regulator** in voltage control mode;

(b) power system stabilizer for an **aggregated facility** equipped with a power system stabilizer; and

(c) **governor system** or **real power** controller.

(3) The **legal owner** of an **aggregated facility** must, when the **ISO** provides written notice to the **legal owner** that the modeled response of the **aggregated facility** is not consistent with the observed response, perform model revalidation testing of the **aggregated facility** in accordance with subsection 5(2).

(4) The **legal owner** of an **aggregated facility** must provide to the **ISO** the written results of any model revalidation testing no later than 60 **business days** after receipt of the notice described in subsection 5(3).

(5) The **legal owner** of an **aggregated facility** is not required, notwithstanding subsection 5(4), to perform the revalidation testing if, between the date the **ISO** delivers the written notice and the deadline date for the submission of model revalidation testing results:

(a) the **legal owner** demonstrates to the satisfaction of the **ISO** that the lack of consistency described in subsection 5(3) was caused by equipment problems for the **aggregated facility** that the **legal owner** corrected prior to the revalidation testing date; and

(b) the **ISO** provides written notice to the **legal owner** that the revalidation testing results are not required.

(6) Notwithstanding subsection 5(1):

(a) the **legal owner** may make a request in writing to the **ISO** for a deferral of model validation testing for no more than one year if there is a planned change to equipment within that year; and

(b) the **ISO** must reply in writing within 60 **business days** of receiving such a request.

(7) The results of any model revalidation testing performed pursuant to subsections 5(1) and 5(3) must be reported to the **ISO** in accordance with the requirements of subsection 8.

Model Revalidation Testing for Generating Units and Synchronous Energy Storage Resources

6(1) The **legal owner** of a **generating unit** or **energy storage resource** must, for each model referenced in subsection 6(2), perform model revalidation testing no later than 5 years from the date of the most recently completed baseline testing or model revalidation testing.

(2) Model revalidation testing must consist of the following **generating unit** or **energy storage resource** models:

(a) **excitation system**, including the **automatic voltage regulator** in voltage control mode;

(b) power system stabilizer for **generating units** or **energy storage resources** equipped with a power system stabilizer; and

(c) turbine-**governor system**.

(3) Where the **ISO** provides written notice to the **legal owner** of a **generating unit** or **energy storage resource** that the modeled response of the **generating unit** or **energy storage resource** is not consistent with the observed response, the **legal owner** must perform model revalidation testing of the **generating unit** or **energy storage resource** in accordance with subsection 6(2).

(4) The **legal owner** of a **generating unit** or **energy storage resource** must provide to the **ISO** the written results of any model revalidation testing no later than 60 **business days** after receipt of the notice described in subsection 6(3).

(5) The **legal owner** of a **generating unit** or **energy storage resource** is not required, notwithstanding subsection 6(4), to perform the revalidation testing if, between the date the **ISO** delivers the written notice and the deadline date for the submission of model revalidation testing results:

(a) the **legal owner** demonstrates to the satisfaction of the **ISO** that the lack of consistency described in subsection 6(3) was caused by equipment problems for the **generating unit** or **energy storage resource** that the **legal owner** corrected prior to the revalidation testing date; and

(b) the **ISO** provides written notice to the **legal owner** that the revalidation testing results are not required.

(6) Notwithstanding subsection 6(1):

(a) the **legal owner** may make a request to the **ISO**, in writing, for a deferral of model revalidation testing for no more than one year if there is a planned change to equipment within that year; and

(b) the **ISO** must reply to the **legal owner**, in writing, within 60 **business days** of receiving a

request under section 6(1)(a).

(7) The results of any model revalidation testing performed pursuant to subsections 6(1) and 6(3) must be reported to the **ISO** in accordance with the requirements of subsection 7.

Reporting

7(1) The **legal owner** must report all test results referred to in this Section 503.20 to the **ISO**.

(2) The **legal owner** must submit an additional testing report to the **ISO**, in the form specified by the **ISO**, no later than 180 **days** after the date of completion of each of:

(a) the first connection of a **generating unit**, **aggregated facility**, or **energy storage resource** to the **transmission system** or a **transmission facility** within the **service area** of the City of Medicine Hat;

(b) the first connection of a **generating unit**, **aggregated facility**, or **energy storage resource** to the **transmission system** or a **transmission facility** within the **service area** of the City of Medicine Hat upon completion of any modification described in subsection 3(2) or 4(2) as applicable;

(c) any increase or decrease to the **maximum authorized real power** or **maximum authorized charging power** of a **generating unit**, **aggregated facility**, or **energy storage resource** that the **ISO** approves; and

(d) any model revalidation testing other than that required in subsections 5 or 6.

Revision History

Date	Description
20XX-XX-XX	

ISO Rules
Part 500 Facilities
Division ~~502~~503 Technical & Operating Requirements
Section ~~502.15~~503.21 Reporting Facility Modelling Data

Applicability

1 Section ~~502.15~~503.21 applies to:

(a) the **legal owner** of a **transmission facility**;

(b) the **legal owner** of an **aggregated ~~generating~~ facility** directly connected to the **transmission system**;

(c) the **legal owner** of a **generating unit** directly connected to the **transmission system**;

(d) the **legal owner** of an industrial complex directly connected to the **transmission system**;

(e) the **legal owner** of an **electric distribution system**; ~~and~~

~~(f~~(f) the **legal owner** of an **energy storage resource** directly connected to the **transmission system**; and

(g) the **ISO**.

Requirements

Submission of Data Related to a New Facility, or a Planned Modification to, or Re-rating of, an Existing Facility

2(1) The **ISO** must post a list of electrical and physical parameters for the modelling data and records that are to be submitted to the **ISO** in accordance with this Section ~~502.15~~503.21 to the AESO website, which may be amended from time to time in accordance with subsection ~~8~~7.

(2) ~~Subject~~A **legal owner** must, subject to subsection 3, ~~a **legal owner** must~~ submit to the **ISO** the modelling data and records related to new equipment, machinery or other facility components or a planned modification to, or re-rating of, any existing equipment, machinery or other facility components set out in the list of electrical and physical parameters provided to the **legal owner** by the **ISO** in accordance with subsection 2(1).

(3) The modelling data and records described in subsection 2(2) must be submitted to the **ISO** in writing, in the forms provided by the **ISO**, no later than ~~thirty (~~30~~)~~ **days** prior to the proposed date of energization of new equipment, machinery or other facility components or the modification of existing equipment, machinery or other facility components, or ~~thirty (~~30~~)~~ **days** prior to the application of new ratings to existing equipment, machinery or other facility components, unless otherwise specified by the **ISO**.

(4) The **ISO** may notify the **legal owner**, in writing, of any deficiencies the **ISO** identifies regarding the modelling data and records submitted pursuant to subsection 2(3).

(5) A **legal owner** that receives a written notice under subsection 2(4) must respond to the **ISO**, in writing, and, where necessary, resubmit the modelling data and records provided under subsection 2(3) no later than ~~thirty (~~30~~)~~ **days** after receipt of the written notice.

Submission of Data Related to an Urgent and Unplanned Modification to, or Re-rating of, an

Existing Facility

3(1) Where a **legal owner** ~~specified in subsection 1~~ makes a modification to, or re-rating of, any existing equipment, machinery or other facility components set out in the list of electrical and physical parameters provided to the **legal owner** by the **ISO** in accordance with subsection 2(1) on an urgent and unplanned basis, including an unplanned **transmission facility** limit change described in Section 304.6 of the **ISO rules**, *Unplanned Transmission Facility Limit Changes*, and such modification or re-rating precludes the **legal owner** from complying with the submission timing requirements of subsection 2(3), then the **legal owner** must, within ~~three (~~3~~)~~ **business days** after making the modification or re-rating, or within a shorter period of time as deemed necessary by the **ISO** in its sole discretion, submit the following information to the **ISO** in writing:

(a) a description of the modification or re-rating made to each piece of equipment, machinery or other facility component;

(b) the reason for the modification or re-rating;

(c) the period of time the modification or re-rating will be in effect; and

(d) the modelling data and records related to the modification or re-rating.

(2) ~~The~~A **legal owner** must, if it does not have the specific modelling data and records available to meet the ~~three (~~3~~)~~ **business days** requirement in subsection 3(1)(d), notify the **ISO** in writing within ~~three (~~3~~)~~ **business days** after making the modification or re-rating, and submit these records to the **ISO**, in writing, as they become available.

(3) ~~Notwithstanding subsection 3(1), the~~A **legal owner** is not required, notwithstanding subsection 3(1), to submit modelling data and records for a mobile transformer if:

(a) the **legal owner** is setting up a mobile transformer to address an urgent or unplanned situation; and

(b) the mobile transformer is energized for less than ~~fifteen (~~15~~)~~ **days**.

Reporting of Errors by the Legal Owner

4(1) If a **legal owner** ~~identified in subsection 1~~ identifies an error in any modelling data and records maintained by the **ISO** of the type described in subsection 2(2), the **legal owner** must provide the **ISO** with written notice of the error and corrections to the modelling data and records no later than ~~thirty (~~30~~)~~ **days** after the date the **legal owner** identifies the error.

(2) The **ISO** must review a written notice submitted pursuant to subsection 4(1) and may notify the **legal owner** in writing of any additional information the **ISO** requires to correct the error.

(3) A **legal owner** must respond to a written notice received from the **ISO** under subsection 4(2) and submit to the **ISO**:

(a) any additional requested information, or

(b) a description of the reasons for which the **legal owner** cannot provide the additional requested information,

no later than ~~thirty (~~30~~)~~ **days** after receipt of the written notice.

Reporting of Suspected Errors by the ISO

5(1) If the **ISO** identifies a suspected error within any modelling data and records maintained by the **ISO** of the type described in subsection 2(2), the **ISO** may provide the applicable **legal owner** with written notice of the suspected error, which notice must include a description of the reasons for which the **ISO** suspects an error.

(2) The **legal owner** must review the written notice received pursuant to subsection 5(1) and provide a written response to the **ISO** no later than ~~thirty (~~30~~)~~ **days** after the receipt of the written ~~noticewhich~~notice which either:

(a) confirms the error and provides the necessary corrections to the modelling data and records; or

(b) provides a sufficient explanation of the reasons for which the **ISO**'s determination of the suspected error was inaccurate or incorrect.

(3) If the **ISO** is not satisfied with a response provided by a **legal owner** pursuant to subsection 5(2) or 5(4), it may notify the **legal owner** in writing, which notice must specify the reasons for which the **ISO** is not satisfied with the response.

(4) A **legal owner** must, if it receives a notice from the **ISO** under subsection 5(3), submit an updated response no later than ~~thirty (~~30~~)~~ **days** after receipt of the notice.

Provision of Modelling Data and Records by a Legal Owner

6(1) The **ISO** may make a written request of a **legal owner** identified in subsection 1 for modelling data and records.

(2) ~~Notwithstanding~~The **ISO** may, notwithstanding subsections 2(1) and (2), ~~the **ISO** may~~ make a request under subsection 6(1) for modelling data and records that are not included on the **ISO**'s list of electrical and physical parameters.

(3) A **legal owner** must respond to a request received from the **ISO** under subsection 6(1) and submit to the **ISO** in writing:

(a) the requested modelling data and records, or

(b) a description of the reasons for which the **legal owner** cannot provide the requested modelling data and records,

no later than ~~thirty (~~30~~)~~ **days** after receipt of the request.

Revision to the List of Electrical and Physical Parameters

7 The **ISO** must, to amend the list of electrical and physical parameters posted to the AESO website in accordance with subsection 2(1):

(a) notify and seek comments from the Transmission Data Committee, or its successor, regarding the amendments to the list of electrical and physical parameters;

(b) notify **market participants** no less than ~~thirty (~~30~~)~~ **days** in advance of the amended list of electrical and physical parameters coming into effect; and

(c) post the amended list of electrical and physical parameters to the AESO website on the effective date.

Revision History

Date	Description
20XX-XX-XX	
2019-~~xx-xx~~12-11	Removed duplication with new Section 103.14, Waivers and Variances; standardized functional specifications language; capitalized references to "Section".
2016-07-26	Initial release

ISO Rules
Part 500 Facilities
Division ~~502,~~503 Technical & Operating Requirements
Section ~~502.2~~503.22 Bulk Transmission Line Technical Requirements

Applicability

1 This Section ~~502.2~~503.22 applies to:

(a) the **legal owner** of any **bulk transmission line** with a voltage equal to or greater than one hundred (100) kV; and

(b) the **ISO**.

Requirements

~~**New and Existing Bulk Transmission Lines**~~

~~**2(1)** On and after January 1, 2012, the **legal owner** of any new **bulk transmission line** which is to be directly connected to the **interconnected electric system** must comply with the provisions of this Section 502.2, prior to the new **bulk transmission line** being energized.~~

~~**(2)** Subject to subsection 2(3), the provisions of this Section 502.2 do not apply to any new **bulk transmission line** with a functional specification the **ISO** approves of prior to January 1, 2012, but that **bulk transmission line** must remain in compliance with that functional specification including all of the standards and requirements referenced in that functional specification.~~

~~**(3)** If there is a project to design, construct and operate any extension, tap or addition to any **bulk transmission line** existing and commissioned as of January 1, 2012 and where the project circuit length will be equal to or greater than fifteen hundred (1,500) meters, then the project must be in compliance with this Section 502.2.~~

~~**(4)** If there is a project to design, construct and operate any extension, tap or addition for an existing and commissioned **bulk transmission line** where the circuit length is less than fifteen hundred (1,500) meters, then the project must be in compliance with the technical specification and design requirements for that **bulk transmission line** which were in effect as of the original date of the commencement of the design of that **bulk transmission line,** and in addition must be in compliance with the specifications set out in the most recently published edition of the *Alberta Electrical Utility Code*.~~

~~**(5)** Notwithstanding any other provision of this subsection 2, the **ISO**, through an amendment to the original functional specification, the issuance of a new functional specification or a letter, may require the **legal owner** of an existing and commissioned **bulk transmission line** to comply with any specific one or all of the provisions of this Section 502.2, if the **ISO** determines that such compliance is critical for the safe and reliable operation of the **interconnected electric system**.~~

~~**Functional Specification**~~

~~**3** The **ISO** must, in accordance and generally consistent with this Section 502.2 and any other applicable **ISO rules**, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of any **bulk transmission line** connection project and any associated **transmission system** connection facilities.~~

~~**Successor to Prior Requirements**~~

~~**4** Subject to subsection 2, this Section 502.2 succeeds and replaces the *Technical Requirements for Connecting to the Alberta Interconnected Electric System (IES) Transmission System Part 3 Technical Requirements for Connecting Transmission Facilities* which came in effect as of December 29, 1999, and that standard together with any other prior standards or drafts of standards on the subject matter no longer will be in force and effect as of January 1, 2012.~~

Other Code Requirements

~~5~~2**(1)** The design, construction and operational specifications for any new **bulk transmission line** must meet or exceed the most recently published edition and applicable provisions and requirements as set out in all federal and Alberta provincial enactments, standards, guidelines, codes, mandatory requirements and regulations governing such a **bulk transmission line**, including:

(a) the *Alberta Electrical Utility Code*;

(b) the *Alberta Health and Safety Code*;

(c) the version of Canadian Standards Association (CSA) *Overhead Systems Standard (C22.3 No. 1*) referenced in the *Alberta Electrical Utility Code*;

(d) the International Electrotechnical Commission (IEC) *Standard 61472 Live working – Minimum approach distances for a.c. systems in the voltage range 72.5 kV to 800 kV – A method of calculation*; and

(e) all federal government requirements for obstruction marking, including those applicable to a **bulk transmission line** crossing large bodies of water and structures in the vicinity of airports, as set out in the document *Standard 621.19 – Standards Obstruction Markings.*

(2) The **legal owner** in addition must ensure that the **bulk transmission line** is designed, constructed and operated in a manner that is compliant with all provisions of any order, ruling, permit or license that the **Commission** issues, or that any other body having jurisdiction issues under any enactment.

Weather Loading Return Periods

~~6~~3**(1)** Subject to subsection ~~6~~3(4), the minimum return period values for weather loadings used for any **bulk transmission line** must be as follows:

(a) for a ~~138kV~~138 kV or a 144 kV **bulk transmission line**, a fifty (50) year return period;

(b) for a single circuit 240 kV **bulk transmission line**, a seventy five (75) year return period;

(c) for a double circuit 240 kV **bulk transmission line**, a one hundred (100) year return period; and

(d) for a 500 kV alternating current or a +/- 500 kV high voltage direct current **bulk transmission line**, a one hundred (100) year return period.

(2) For wind loading, the return periods as set out in subsection ~~6~~3(1) must be based on wind gust data from the *Gust Wind Loading* map made available on the AESO website.

(3) For wet snow and wind loadings, the return periods set out in subsection ~~6~~3(1) must be based on combined wet snow and wind gust data from the *Wet Snow and Wind Loading* map made available on the AESO website.

(4) The **ISO** must approve of, in a project functional specification for a connection project under this Section ~~502.2~~503.22, any return period which is less than the specified minimum return period set out in subsection ~~6~~3(1).

Weather Loading for Wind

~~7~~4**(1)** A **bulk transmission line** must withstand wind loadings, based on extreme value analysis of historical wind velocity or wind gust data.

(2) Wind velocity data from the *Gust Wind Loading* map made available on the AESO website must be used as the basis for the design of any **bulk transmission line,** and the minimum return period values must be as set out in subsection ~~6~~3(1) above.

(3) Subject to subsection ~~7~~4(4), wind velocity data related to a **bulk transmission line** design must be converted to pressure and adjusted for the height of wires and structures in accordance with the manual titled, *American Society of Civil Engineering Manual 74 –Guidelines for Electrical Transmission Line Structural Loading Third Edition.*

(4) The applicable minimum wind gust response factor values, in substitution for the values calculated by the method set out in the manual referred to in subsection ~~7~~4(3), must be as set out in the following Table 1:

Table 1

Wind Gust Response Factor Values

Span Range (meters)	Gust Response Factor G_w
Less than 200	1.0
200 to 300	0.9
Greater than 300	0.85

Weather Loading for Wet Snow and Wind

~~8~~5**(1)** A **bulk transmission line** must withstand combined wet snow and wind loadings, based on extreme value analysis of historical weather data.

(2) The loading design requirements as set out in subsection ~~8~~5(1) must be probability based and the minimum return period values must be as set out in subsection ~~6~~3(1), except that there is no requirement to design a 138 kV or a 144 kV **bulk transmission line** for the probability based wet snow and wind loading.

(3) Combined loading data from the *Wet Snow and Wind Loading Map* made available on the AESO website must be used as the basis for the loading design.

Weather Loading for Vertical Loading Alone

~~96~~**(1)** Subject to subsection ~~96~~(2), a **bulk transmission line** must withstand vertical loading that represents in-cloud or rime ice, and the minimum return period values for such vertical loading must be as set out in subsection ~~63~~(1).

(2) For a 138 kV or a 144 kV **bulk transmission line**, a fifty (50) year return vertical loading must be used in the design, except that this loading will only be applied to the design of structure arms and not the overall structure, and must not be used to determine conductor tension for design of any type of structures.

(3) The radial accretion values from the combined wet snow and wind loading, with a density of 350 kg/m^3 and a temperature of minus twenty (-20) degrees Celsius assuming no wind, must be used to represent the rime ice vertical loading condition.

Failure Containment Loading

~~107~~**(1)** Subject to subsection ~~107~~(8), a **bulk transmission line** must withstand failure containment loading so as to limit the extent of a **bulk transmission line** failure, minimize greater or additional structural damages or losses beyond the location of the initial failure, and avoid longitudinal cascades.

(2) The failure containment loading design must satisfy the requirements of either one of the following subsections (a) or (b):

(a) subject to subsection ~~107~~(3), all suspension type structures must have longitudinal strength;

(b) anti-cascade structures must be constructed at the intervals as set out in subsection ~~107~~(5).

(3) The suspension type structures design requirement of subsection ~~107~~(2) (a) in addition must provide for both of the two (2) loading conditions as set out in the following subsections (a) and (b):

(a) broken wire loading, with loading values calculated assuming bare wires, no wind, final tension and zero (0) degrees Celsius:

(i) for a single circuit **bulk transmission line**, the loading from a complete broken phase or broken overhead shield wire must be applied to any single conductor phase support or at any one (1) ground wire support;

(ii) for a double circuit **bulk transmission line**, the loading from a complete broken phase or broken overhead shield wire must be applied to any two (2) conductor phase supports, two (2) ground wire supports, or one (1) conductor phase and one (1) ground wire support; and

(iii) allowance must be made for insulator swing and structure deflection; and

(b) unbalanced wet snow on one (1) or more phases, or overhead shield wires in the span on one side of the structure and no wet snow on the wires in the span on the other side of the structure where:

(i) the wet snow loading must be equal to the return period values as set out in subsection ~~63~~(1);

(ii) loading values calculated assuming wet snow density of 350 kg/m, no wind, final tensions and zero (0) degrees Celsius; and

(ii) allowance must be made for insulator swing and structure deflection.

(4) If longitudinal strength is not provided for each suspension type structure of a **bulk transmission line**, then anti-cascade structures must be used to limit the extent of longitudinal cascade failures.

(5) The interval between anti-cascade structures must not exceed:

(a) ten (10) km for a 138 kV or a 144 kV **bulk transmission line**; or

(b) five (5) km for a 240 kV, a 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line**.

(6) Anti-cascade structures for a **bulk transmission line** must be designed to be capable of withstanding all loading due to all wires on one side of the structure being broken, with final unloaded tensions at zero (0) degrees Celsius.

(7) Heavy angle and deadend structures may be utilized as anti-cascade structures, but only if they are of the requisite strength as set out in subsection ~~107~~(6).

(8) For a wood pole **bulk transmission line** including one constructed with wood laminate poles, if a longitudinal loading analysis for that **bulk transmission line** is carried out using a computer program that accurately models the characteristics of the structures on that **bulk transmission line**, using the broken wire and unbalanced ice loadings as set out in subsection ~~107~~(3), and the results indicate that either:

(a) no structure failures will occur, or

(b) the number of structure failures does not exceed ten (10);

then the anti-cascade structure requirements of subsections ~~107~~(4) through ~~107~~(7) are not required for that **bulk transmission line**.

Overload and Strength Factors for Reliability Based Loadings

~~118~~**(1)** The overload factor for **reliability** based loading for a **bulk transmission line** must be one point zero (1.0) for all structural materials, including steel, wood and any composite material.

(2) Subject to subsection ~~118~~(3), the **reliability** based strength factors for **bulk transmission line** components must be as set out in the following Table 2:

Table 2

Reliability Based Strength Factors

Component	Strength Factor
Metal structures	1.0

Wood structures	0.75
Support hardware	1.0
Guy wire	0.9

(3) In addition to being in compliance with the requirements of Table 2, a **bulk transmission line** must meet the following minimum strength factors for metal structures and hardware for the purpose of establishing a desired sequence of failure:

(a) the strength factor for angle and deadend metal structures must be zero point nine (0.9); and

(b) the strength factor for deadend hardware must be zero point nine (0.9).

Conductor Selection

~~12~~9**(1)** The selection of conductor size and type for a **bulk transmission line** must be in accordance with the following requirements:

(a) the conductor must be standard aluminum conductor steel reinforced (ACSR) or aluminum conductor steel reinforced / trapezoidal wire (ACSR/TW);

(b) for any extension of an existing radial **bulk transmission line**, the conductor used for the new line segments must have no less than the same thermal capacity as the conductors of that existing **bulk transmission line**;

(c) for a new **bulk transmission** l**ine** having a total length equal to or greater than ten (10) km, the conductor selection must include consideration of both capital costs and net present value of electricity losses, and be based on the results of either:

(i) a **bulk transmission line** optimization study provided to the **ISO** which includes the cost of structures; or

(ii) a conductor optimization study which includes only the cost of the conductor and assumes that the cost of structures does not change significantly with changes in conductor size; and

(d) for a new **bulk transmission line** of 240 kV or above and a total length equal to or greater than fifty (50) km, a **bulk transmission line** optimization study must be conducted and provided to the **ISO**, and be used as the basis for conductor selection.

(2) The **ISO** must approve of, in the project functional specification for a connection project under this Section ~~502.2~~503.22, any conductor type other than the standard conductor types as set out in subsection ~~12~~9(1)(a).

(3) Conductor mechanical strength must be such that the tension as set out in the *Alberta Electrical Utility Code* loading requirements does not exceed sixty percent (60%) of the rated tensile strength of the conductor.

(4) Tension under the maximum loading conditions, including those involving high wind, combined wet snow and wind, or in-cloud icing, must not exceed ninety percent (90%) of the rated tensile strength of the conductor.

Sequence of Failure

~~13~~10**(1)** A 240 kV, a 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line** which is to be constructed of steel structures, excluding direct embedded tubular structures, must have a target sequence of failure in order to minimize or contain the damage due to failure of a single component or structure.

(2) All **bulk transmission line** components must be designed to fail in the following sequential order:

(a) tangent towers, followed by their foundations and hardware; then

(b) angle towers, followed by their foundations and hardware; then

(c) dead-end towers, followed by their foundations and hardware; and finally

(d) conductors, followed by insulators and conductor attachment hardware.

(3) The design of the **bulk transmission line** components must ensure that the strength of all components are coordinated, or adjusted by means of strength factors, so as to achieve the design failure sequence as set out in subsection ~~13~~10(2).

(4) For greater certainty, a sequence of failure analysis is not required for a **bulk transmission line** with wood structures, given the relatively high strength variation of wood structures.

(5) The **ISO** must approve of, in the functional specification for a connection project under this Section ~~502.2~~503.22, any sequence of failure other than the standard one as set out in subsection ~~13~~10(2).

Overhead Shieldwires

~~14~~11**(1)** For the purposes of this Section ~~502.2~~503.22, a reference to shieldwires includes galvanized steel strand, aluminum clad steel strand and optical ground wires.

(2) Shieldwires must be installed on a 138 kV, a 144 kV, a 240 kV, a 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line**.

(3) The number and positioning of the shieldwires must be so as to produce lightning flashover rates that are consistent with all **reliability** requirements of the **bulk transmission line**.

(4) The size of any shieldwire must be adequate to withstand the fault current expected at any given location on the **bulk transmission line**, taking into account the applicable magnitude and duration parameters of the fault.

(5) Shieldwires must be sized appropriately to satisfy ground fault currents the **ISO** specifies in the functional specification for the **bulk transmission line**, and without loss of strength or degradation of the protective coating that may reduce life expectancy.

(6) The size of any shieldwire must be adequate to withstand the weather loading expected at any given location on the **bulk transmission line**.

(7) For a **bulk transmission line** having average span lengths in excess of one hundred and fifty (150) meters, the minimum size of the shieldwire must be 3/8” Gr. 220 galvanized steel strand.

Aeolian Vibration Control

~~15~~12**(1)** Vibration dampers must be installed on all conductors and overhead shieldwires for a **bulk transmission line** where the average span exceeds one hundred (100) meters, with the exception of slack spans.

(2) The design and location of the dampers must take into account the characteristics of the **bulk transmission line** wire, including spans, tension values and terrain.

(3) The application of conductor dampers that reduce the thermal capacity of the wire is prohibited.

(4) Spacer dampers must be installed on a **bulk transmission line** with bundled conductors and a rated design voltage equal to or greater than 500 kV.

(5) The application of spacer dampers having two (2) part metal clamps that result in metal to metal contact between the conductor and the clamp is prohibited.

(6) For standard ACSR conductor and steel strand overhead shieldwires:

(a) the initial tension must not exceed twenty five percent (25%) rated tensile strength under a winter design temperature of minus thirty (-30) degrees Celsius; and

(b) final tension must not exceed twenty percent (20%) rated tensile strength under an average annual temperature of four (4) degrees Celsius.

Voltage Values for Electrical Clearances

~~16~~13 The values of voltage used to determine electrical clearances for a **bulk transmission line** must be based on nominal voltage, taking into account the operating practices for that portion of the **interconnected electric system** where that **bulk transmission line** is to be constructed.

Basic Design Clearances

~~17~~14**(1)** A **bulk transmission line** must satisfy basic electrical clearances, including ground clearances for various locations, as specified in the *Alberta Electrical Utility Code* and its referenced version of *CSA C22.3 No. 1.*

(2) Ground clearance requirements for a **bulk transmission line** must be maintained under conditions of maximum sag in accordance with the following:

(a) for a 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line**, the maximum sag conditions must be the most stringent of either of:

(i) sag under *Alberta Electrical Utility Code* loading conditions of combined ice and wind; or

(ii) the conductor temperature corresponding to the maximum load transfer specified in the functional specification for the connection project under this Section ~~502.2~~503.22;

(b) for a **bulk transmission line** less than 500 kV, the maximum sag conditions must be the most stringent of either of:

(i) the conductor at one hundred (100) degrees Celsius; or

(ii) sag under *Alberta Electrical Utility Code* loading conditions of combined ice and wind.

(3) A 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line** must have a minimum of twelve point two (12.2) meters of ground clearance above any agricultural land.

(4) Suspension type structures must be designed to provide clearances from the conductors, in a swung position, to the nearest point of the structure, in accordance with the following requirements:

(a) with conductors subjected to a wind pressure of 230 Pa, at four (4) degrees Celsius and final tension, clearances from the energized conductors to the structure as per the flashover-to-ground distance requirements of CSA *C22.3 No. 1-10 Table A.1*;

(b) with a five (5) year return wind gust, with conductors at four (4) degrees Celsius and final tension, with no ice and minimum clearance equal to the sixty (60) Hz flashover distances; and

(c) with moderate wind gust, with conductors at minus thirty degrees (-30) degrees Celsius, final tension and no ice, with wind pressure values as set out in the following Table 3 and corresponding electrical clearances as set out in subsection ~~17~~14(5);

Table 3

Wind Pressure Values

Loading Area (As Defined on **ISO's** *Snow and Ice Loading Zones* Map)	**Wood Pole Lines Wind Pressure (Pa)**	**1-Cct Lattice & Monopole Structure Lines Wind Pressure (Pa)**	**2-Cct Lattice & Monopole Structure Lines Wind Pressure (Pa)**
A	450	550	600
B	350	400	500
C	300	350	400
D	250	300	350

(5) Electrical clearances for use with the wind pressure values of Table 3 must be determined from the application of the methodology outlined in *IEEE Standard 1313.2 The Application of Insulation Coordination*, for transmission line phase to ground switching over voltages.

(6) The clearance values as set out in subsection ~~17~~14(5) must be determined assuming wet conditions, and switching surge values must be determined in accordance with *CSA C22.3 No. 1-10 Table A.1.*

(7) For angle structures where the insulators are free to swing, the clearance requirements set out in subsection ~~17~~14(4) must be maintained with both forward and reverse wind and for both initial and final tensions.

(8) The clearance requirements as set out in subsection ~~17~~14(4) may be reduced if line surge arrestors are installed and the following conditions are satisfied:

(a) a qualified professional engineer must complete an insulation study which must include a **bulk transmission line** design with the clearances specified in subsection ~~17~~14(4) and with the proposed surge arrestors and reduced clearances; and

(b) the insulation study must demonstrate that the **bulk transmission line** with the surge arrestors is as reliable as if the clearances as set out in subsection ~~17~~14(4) were not reduced.

(9) The electrical clearance values as set out in subsection ~~17~~14(4~~) ()~~(c) may be replaced by values from an insulation design study, if the study:

(a) is completed by a qualified professional engineer; and

(b) demonstrates that the **bulk transmission line** is as reliable as it would be if the clearances as set out in subsection ~~17~~14(4~~) ()~~(c) were not replaced.

(10) Suspension type structures of a 500 kV alternating current, or a +/- 500 kV high voltage direct current **bulk transmission line** must provide clearances from the conductors, in a swung position, to the nearest point of the structure, in accordance with the results of a comprehensive insulation design study conducted by a qualified professional engineer.

Clearances Under Differential Loading

~~18~~15 For the design of a **bulk transmission line**, clearances in any direction for the switching surge air gap values specified in subsection ~~17~~14(5) must be maintained under the following loading conditions:

(a) overhead shield wire or upper phase loaded with twelve point five (12.5) mm radial glaze ice at a density of 900 kg/m^3 and no wind at minus twenty (-20) degrees Celsius, and the phase below unloaded at minus twenty (-20) degrees Celsius, with all wires under final sag conditions; and

(b) for a **bulk transmission line** of 240 kV and above, overhead shield wire or upper phase loaded with forty (40) mm radial rime ice at a density of 350 kg/m^3 and no wind at zero (0) degrees Celsius, and the phase below unloaded at zero (0) degrees Celsius, with all wires under final sag conditions.

Clearances to Edge of Right of Way

~~19~~16**(1)** With respect to the requirement for conductor swing clearance at or near the edge of a right of way for any **bulk transmission line**, the horizontal clearance requirements of *CSA C22.3 No. 1* are deemed to be satisfied if the actual swing clearance is equal to the clearance requirements for the location of a building as set forth in CSA *C22.3 No. 1*.

(2) A 138 kV or a 144 kV **bulk transmission line** located on a road allowance is exempt from the requirements of subsection ~~19~~16(1).

Fall Free Spacing

~~20~~17**(1)** Subject to subsection ~~20~~17(2), if one (1) or more 500 kV **bulk transmission lines** are located in a corridor, then those **bulk transmission lines** must meet the following minimum requirements for fall free spacing:

(a) if there are two (2) or more 500 kV **bulk transmission lines** in the corridor and the structures of any one of those 500 kV **bulk transmission lines** fail and fall toward an adjacent 500 kV **bulk transmission line**, then neither the structures nor the wires of the failed **bulk transmission line** must come into contact with the structures or wires of that adjacent 500 kV **bulk transmission line**;

(b) if there is one (1) or more lower voltage **bulk transmission line** in a corridor with one (1) or more 500 kV **bulk transmission line** and the structures of a lower voltage **bulk transmission line** fail and fall toward an adjacent 500 kV **bulk transmission line**, then neither the structures nor the wires of the failed lower voltage **bulk transmission line** must come into contact with the structures or the wires of that adjacent 500 kV **bulk transmission line**.

(2) For a **bulk transmission line**, all structures must be assumed to fail at the groundline, unless either one of the following assumption requirements are complied with:

(a) a detailed analysis of the structure, conducted by a qualified professional engineer or resulting from a full scale structure test at a qualified testing site, must confirm that there is a different failure location under loading for both high wind and combined wet snow and wind; or

(b) if there are results from both a full scale structure test and a detailed analysis of the structure, then the failure location results of the test will govern and take precedence over results of the analysis.

(3) If a **bulk transmission line** enters and exits a substation or converter station, then the free fall spacing requirements set out in subsection ~~20~~17(1) do not apply to the first five (5) spans of the **bulk transmission line**.

Insulators

~~21~~18**(1)** For a **bulk transmission line**, insulator shed material for ceramic insulators must be made of porcelain or glass.

(2) Shed material for synthetic insulators used in contaminated areas must be made of silicone rubber.

(3) Porcelain or glass insulators must satisfy all requirements of *CSA-C411.1*, except that dovetail head designs are prohibited.

(4) Synthetic insulators must satisfy all requirements of *CSA-C411.4 Composite Suspension Insulators for Transmission Applications*.

(5) The length of insulator strings must be adequate to allow live **bulk transmission line** maintenance activities.

(6) The following specified insulator types must meet the following specified mechanical strength requirements:

(a) tension in a glass and porcelain insulator must not exceed fifty percent (50%) of the combined mechanical and electrical rating, and the "*Specified Mechanical Load*" for synthetic insulators, under *Alberta Electrical Utility Code* loading conditions;

(b) tension in a glass or porcelain insulator must not exceed eighty percent (80%) of the mechanical and electrical rating under maximum loading conditions;

(c) tension in a synthetic insulator must not exceed fifty percent (50%) of the "*Specified Mechanical Load*" rating under maximum loading conditions; and

(d) insulators used for deadend applications must have a strength rating at least equal to the rated tensile strength of the conductor attached to the insulators.

(7) The minimum insulation levels for a **bulk transmission line** and any 25 kV distribution line located on **bulk transmission line** structures must be as set out in the following Table 4:

Table 4

Required Insulation Levels

Nominal Voltage (kV)	Critical Impulse Flashover (CIFO) (kV)
25	165
138/144	715
240	1155

Conductor Thermal Ratings Methodology

~~22~~19**(1)** The calculation of thermal ratings of conductors for a **bulk transmission line** must be determined in accordance with the provisions of *IEEE Standard 738 – IEEE Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors.*

(2) The following requirements must be used in the calculation of conductor ampacity:

(a) a wind speed of 0.6 m/s at right angles to the conductor is assumed;

(b) the time of day is assumed to be 1200 hours;

(c) the elevation above sea level, latitude and **bulk transmission line** direction must be based on the **bulk transmission line** location and orientation;

(d) the atmosphere is assumed to be clear;

(e) the solar absorption coefficient is assumed to be zero point eight (0.8); and

(f) the emissivity is assumed to be zero point six (0.6).

(3) The maximum temperature for a standard ACSR conductor must not exceed one hundred (100) degrees Celsius.

(4) A new **bulk transmission line**, other than a 500 kV alternating current **bulk transmission line** or a +/-500 KV high voltage direct current **bulk transmission line**, must be designed to operate up to a steady state ampacity level that corresponds to a conductor temperature of one hundred (100) degrees Celsius.

(5) For a 500 kV alternating current **bulk transmission line** or a +/-500 kV high voltage direct current **bulk transmission line**, the steady state ampacity level must be approved by the **ISO**.

Conductor Emergency Thermal Ratings Methodology

~~23~~20**(1)** A **bulk transmission line** conductor emergency thermal rating must be based on a thirty (30) minute time period.

(2) Conductor emergency thermal ratings are deemed to be equal to the static ratings as set out in subsection ~~22~~19.

Galloping

~~24~~21**(1)** A **bulk transmission line** which is required to be designed to withstand one hundred year (100) year return loadings must also be designed for conductor galloping.

(2) For design purposes, the galloping envelope condition must be assumed to be twelve point five (12.5) mm of radial glaze ice and 96 Pa wind at zero (0) degrees Celsius and with final condition wire sags.

(3) The electrical clearance between galloping envelopes must be the sixty (60) Hz flashover value, either phase to phase or phase to ground, depending upon which two (2) galloping envelopes are being compared.

(4) The galloping envelopes requirements, for determination of acceptable galloping performance, must be designed and constructed in accordance with the requirements and illustrations of Appendix 1.

(5) If the functional specification for a connection project under this Section ~~502.2~~503.22 specifies a compact line design or the use of any existing towers and the galloping envelope design and clearances as set out in subsections ~~24~~21(2), (3) and (4) cannot be met, then the project functional specification must contain a further provision that the compact line design or existing towers must include interphase spacers.

Hardware Requirements

~~25~~22**(1)** Ferrous components of hardware installed on a **bulk transmission line** must have low temperature impact properties, in accordance with *CSA C83 Communication and Power Line Hardware*.

(2) Without limiting subsection ~~25~~22(1), the minimum requirement for energy absorption must be Level 1 as referenced in *CSA C83 Communication and Power Line Hardware*, which is twenty (20) joules at minus twenty (–20) degrees Celsius.

Provisions for Maintenance

~~26~~23 A **bulk transmission line** must accommodate all reasonably anticipated maintenance methods and requirements for the **bulk transmission line**, including:

(a) live line maintenance access from and to all structures, with minimum approach distances as calculated using the methodology in *IEC 61472 Live working – Minimum approach distances for a.c. systems in the voltage range 72.5 kV to 800 kV – A method of calculation*;

(b) access to all structure locations, whether along the right of way or otherwise;

(c) access to conductors and insulators by ensuring of the ability to attach to rated fall protection anchor points, having strength as specified in section 152 of *the Alberta Occupational Health and Safety Code*; and

(d) any other requirements necessary to allow routine and emergency maintenance to be conducted in a timely manner at all structural, tower and any other **bulk transmission line** locations.

Appendices

Appendix 1 – Galloping Envelope Requirements

Revision History

~~Effective~~Date	Description
20XX-XX-XX	
2019-12-11	Removed duplication with new Section 103.14, *Waivers and Variances;* standardized functional specifications language; capitalized references to "Section"; inserted effective date of January 1, 2012, where applicable.
2012-01-01	Initial Release

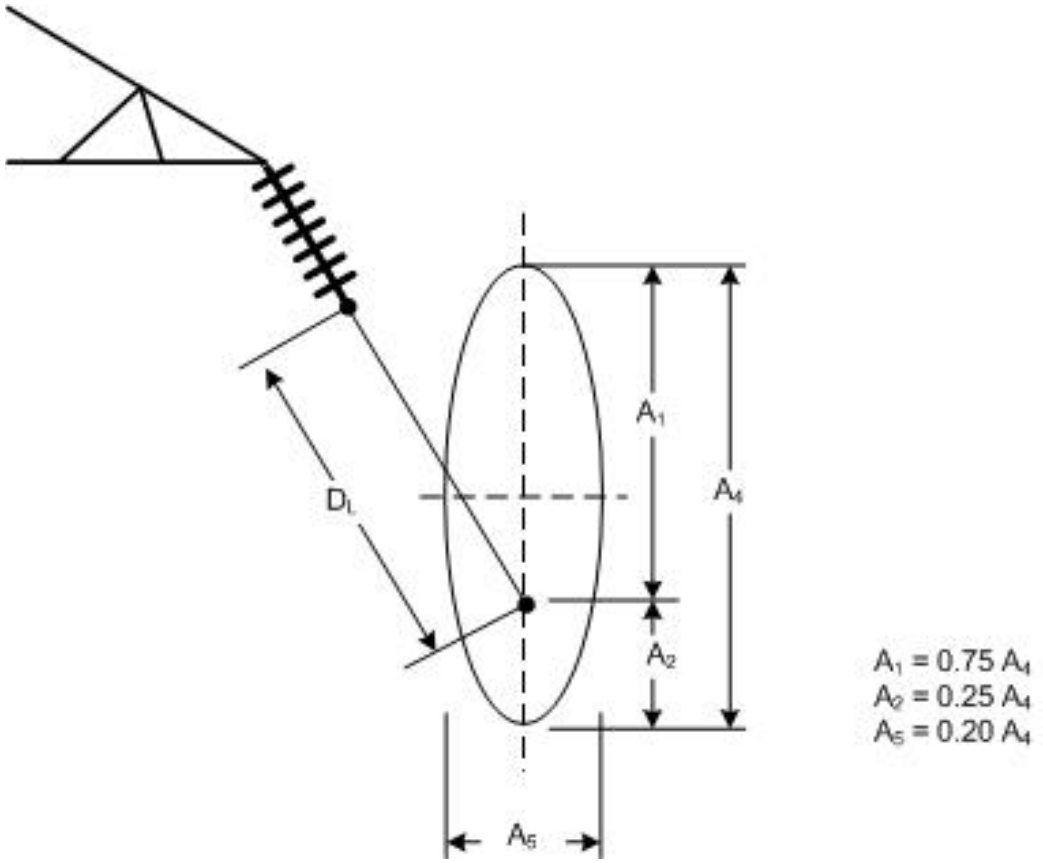
Appendix 1

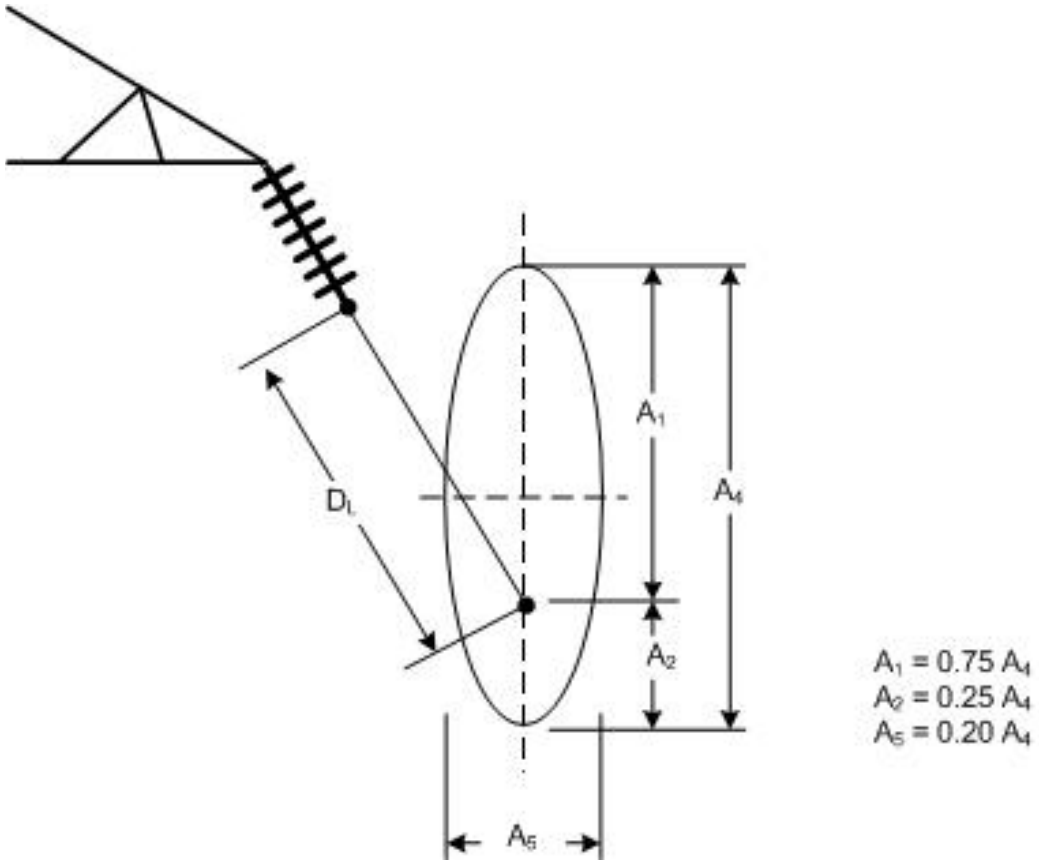
Galloping Envelope Requirements

1 The **bulk transmission line** galloping envelope requirements for the determination of acceptable galloping performance must be in accordance with the following provisions and illustrations of this Appendix 1.

Illustration 1

Galloping Ellipse Parameters





2 The galloping envelope ellipse parameters for tower head design must be calculated in accordance with the following requirements, with reference to Illustration 1:

(a) the major axis or amplitude, A_4, must be computed as follows:

(i) for a single conductor: **A_4/Dia** equals 80 LN (8xSi/ (50xDia)); and

(ii) for a bundled conductor: **A_4/Dia** equals 170 LN (8xSi/ (500xDia))

where:

A_4 equals the major axis of galloping ellipse (m), as set out in Illustration 1;

Dia equals the diameter of conductor (m); and

Si equals the conductor final sag with 12.5mm radial glaze ice and 96 Pa wind, at 0° Celsius (m), with glaze ice assumed to have a density of 900 kg/m3.

(b) The major axis must not exceed twelve (12) meters, regardless of the results of the above calculation,

(c) The minor axis must be computed as follows:

$\mathbf{A_5}$ equals 0.2 x A_4

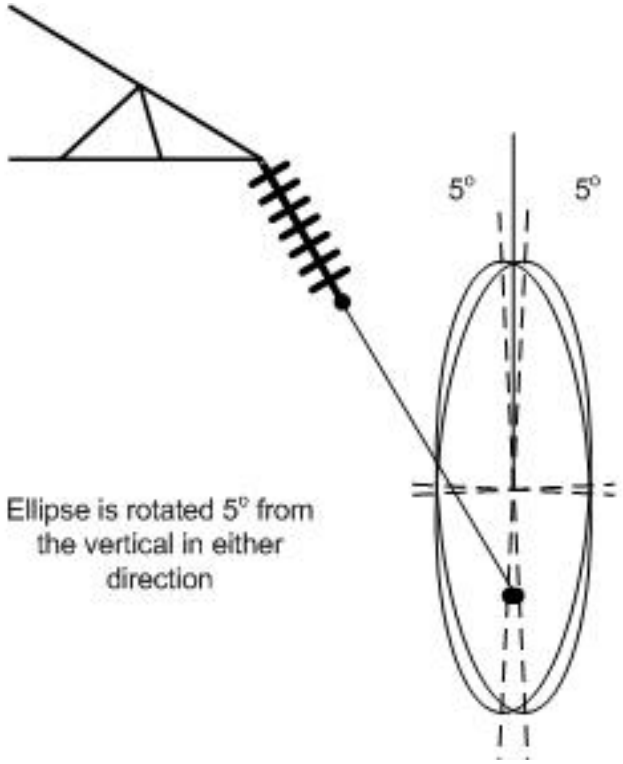
where:

A5 and A4 are as set out in *Illustration 1*; and

(d) The final conductor galloping envelope must be determined by rotating the galloping ellipse by five (5) degrees either side of the vertical axis in accordance with Illustration 2

Illustration 2

Galloping Envelope



Applicability

1 Section 504.3 applies to:

(a) the **legal owner** of a **transmission facility** that requires:

(i) a new connection to other **transmission facilities** in the **balancing authority area** of the **ISO**;

(ii) a **transmission facility** modification to facilities with equipment listed in subsections 5 or 6; or

(iii) testing in accordance with any **ancillary services** technical requirements;

(b) the **legal owner** of a transmission-connected load facility, which the **ISO** determines may impact the reliable operation of the **interconnected electric system** and notifies the **legal owner** of such determination, and that requires:

(i) a new connection to other **transmission facilities** in the **balancing authority area** of the **ISO**;

(ii) a **transmission facility** modification to facilities with equipment listed in subsection 5 or 6; or

(iii) testing in accordance with any **ancillary services** technical requirements; ~~and~~

and

(c) the **ISO**.

Requirements

Connecting New Facilities

2(1) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must not energize its facility until obtaining written confirmation from the **ISO** that:

(a) the **legal owner** has met the energization requirements; and

(b) the **legal owner**'s final **commissioning** plan, required under subsection 4, is approved.

(2) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must, ~~on the **day** of and~~ not less than one ~~(1)~~ hour prior to energizing any facility, phone the **ISO** and obtain verbal authorization from the **ISO** to energize the facility.

(3) ~~After receiving authorization to energize its facilities, the~~ The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may, after receiving the authorization in subsection 2(2), energize the facility and commence the **commissioning** activities.

Conducting Ancillary Services Testing

3(1) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must not begin testing its facility in accordance with **ancillary services** technical requirements until obtaining written confirmation from the **ISO** that the **legal owner**'s final testing plan, required under subsection 4, is approved.

~~required under subsection 4, is approved.~~

(2) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must, ~~on the **day** of and~~ not less than one ~~(1)~~ hour prior to testing any facility in accordance with **ancillary services** technical requirements, phone the **ISO** and obtain verbal authorization from the **ISO** to energize the facility.

(3) ~~After receiving authorization to test its facility, the~~ The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may, after receiving the authorization in subsection 3(2), commence testing activities in accordance with **ancillary services** technical requirements.

Plans for Commissioning New Facilities or Conducting Ancillary Services Testing

4 ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must provide final, written **commissioning** or testing plans to the **ISO**:

(a) which the **ISO** approves as ~~being able to be implemented~~implementable without impacting the reliable operation of the **interconnected electric system**;

(b) detailing the types of tests the **legal owner** proposes to conduct;

(c) in sufficient time to allow the **ISO** to approve the plans a minimum of ~~thirty (~~30~~)~~ **days** prior to **commissioning**; and

(d) containing the minimum detail as noted in subsection 5 and 6, as appropriate.

Plan Details for Commissioning and Ancillary Services Testing of Major Facilities

5 ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility that owns any of the following **transmission facilities**:

(a) motors of a rating sufficient to cause operational concerns, as the **ISO** identifies during the connection project process;

(b) static VAr compensators;

(c) high voltage direct current facilities;

(d) flexible alternating current transmission system devices;

(e) phase shifting transformers;

(f) alternating current transmission line series compensation;

(g) synchronous condensers; or

(h) energy storage ~~facilities~~included in an **needs identification document** that has been approved by the **Commission** ,

intending to conduct **commissioning** or **ancillary services** testing activities on such facilities, must include in its **commissioning** or testing plan the details of the proposed testing activities, including the expected output, consumption or transfer of **real power** and **reactive power** from the facility to the **interconnected electric system** and over what periods of time.

Commissioning Minor Facilities Plan Details

6 The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility intending to conduct **commissioning** and testing activities on any of the following:

(a) circuit breakers;

(b) transformers and voltage regulators;

(c) capacitor banks;

(d) reactors; and

(e) alternating current transmission lines,

must include in its **commissioning** plan the proposed date and time of energization.

Changes to Approved Commissioning or Testing Activities

7(1) The **ISO** may amend or suspend any **commissioning** or testing activities it has already approved under subsection 4, based on real time **reliability** requirements of the **interconnected electric system** and necessary **ISO** operational flexibility, and it may do so by providing written or verbal notice to the **legal owner** of the facility.

(2) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may suspend its **commissioning** or testing activities by giving verbal notice to the **ISO**.

(3) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may amend its **commissioning** or testing activities by making a verbal request to the **ISO** and obtaining verbal approval.

(4) A **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility that has amended or suspended any previously approved **commissioning** or testing activities must, if the **ISO** requests, submit a revised, written **commissioning** or testing plan and must do so within the timeframe the **ISO** specifies in order to proceed with **commissioning** or testing activities.

Revision History

Effective	Description
xxxx-xx-xx	
2012-12-31	Initial release

ISO Rules
Part 500 Facilities
Division 504 Legal Owners of Transmission Facilities and Load Facilities
Section 504.4 Coordinating Operational Testing

Applicability

1 Section 504.4 applies to:

(a) the **legal owner** of a **transmission facility**:

(i) that is already in normal operation; and

(ii) for which the **legal owner** intends to conduct operational testing activities;

(b) the **legal owner** of a transmission-connected load facility, which the **ISO** determines may impact the reliable operation of the **interconnected electric system** and notifies the **legal owner** of such determination; and~~:~~

(i) that is already in normal operation; and

(ii) for which the **legal owner** intends to conduct operational testing activities; and

(c) the **ISO**.

Requirements

Conducting Operational Testing Activities

2(1) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must not conduct operational testing activities on the facility until obtaining written confirmation from the **ISO** that the **legal owner**'s final operational testing plan, required under subsection 3(2), is approved.

(2) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility must, ~~on the **day** of but~~ no less than one ~~(1)~~ hour prior to conducting operational testing activities on any facilities, phone the **ISO** and obtain verbal authorization from the **ISO** to conduct the activities.

(3) ~~After receiving authorization to conduct operational testing activities on a facility, the~~ The **legal owner** of a **transmission facility** ~~and the **legal owner** of~~or a transmission-connected load facility may, after receiving the authorization in subsection 2(2), conduct the testing activities.

Major Operational Testing Plan Details

3(1) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility that owns any of the following **transmission facilities**:

(a) motors of a rating sufficient to cause operational concerns, as the **ISO** ~~identified~~identifies during the connection process;

(b) static VAr compensators;

(c) high voltage direct current facilities;

(d) flexible alternating current transmission system devices;

(e) phase shifting transformers;

(f) alternating current transmission line series compensation;

(g) synchronous condensers; or

(h) energy storage ~~facilities,~~included in an **needs identification document** that has been approved by the **Commission**.

must provide its final, written operational testing plans to the **ISO** detailing the proposed date and time of testing, the proposed testing activities, including the expected output, consumption or transfer of **real power** and **reactive power** from the facility to the **interconnected electric system** and over what periods of time.

(2) The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility that provides final, operational testing plans to the **ISO** under subsection 3(1) must ensure that:

(a) the **ISO** approves such plans as being able to be implemented without impacting the reliable operation of the **interconnected electric system**; and

(a) the **legal owner** provides such plans in sufficient time to allow the **ISO** to approve the plans a minimum of ~~fifteen (~~15~~)~~ **days** prior to the desired testing date.

Unexpected Operational Testing Plan Details

4 ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility who desires to perform operational testing in order to recover from an unexpected operational problem must:

(a) contact the **ISO** by phone to request approval for the testing;

(b) provide a description of the testing, including the expected output, consumption or transfer of **real power** and **reactive power** from the facility to the **interconnected electric system** and over what periods of time;

(c) not initiate the testing until obtaining verbal approval from the **ISO**; and

(d) phone the **ISO** to advise when the testing is complete.

Changes to Approved Testing Activities

5(1) The **ISO** may amend or suspend any testing activities it has already approved, based on real time **reliability** requirements of the **interconnected electric system** and necessary **ISO** operational flexibility, and it may do so by providing written or verbal notice to the **legal owner** of the facility.

(2) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may suspend its testing activities by giving verbal notice to the **ISO**.

(3) ~~Each of the~~The **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility may amend its testing activities by making a verbal request to the **ISO** and obtaining verbal approval from the **ISO**.

(4) A **legal owner** of a **transmission facility** ~~and the **legal owner** of a~~or transmission-connected load facility that has amended or suspended any previously approved testing activities must, if the **ISO** requests, submit a revised written ~~operatonal~~operational testing plan and must do so within the timeframe the **ISO** specifies in order to proceed with the testing activities.

Revision History

Effective	Description
xxxx-xx-xx	
2012-12-31	Initial release

Applicability

1 Section 504.5 applies to:

(a) the **legal owner** of a **transmission facility**, except where the person who is eligible to apply for the construction and operation of the **transmission facility** is determined by a competitive process developed by the **ISO** in accordance with the **Act**; and

(b) the **ISO**.

Requirements

Service Proposal

2 The **legal owner** of a **transmission facility** must, when it receives a written request from the **ISO** to provide a **service proposal**, provide the **service proposal** within the time specified in the request, or within an alternative timeframe agreed to by the **ISO**.

Cost Estimate

3 The **ISO** may provide a written request for information to the **legal owner** of a **transmission facility** regarding the preparation of a **cost estimate** or revised **cost estimate** in a specified accuracy range for a **transmission facility** project as follows:

(a) a **needs identification document estimate**; or

(b) a **service proposal estimate**.

4 The **legal owner** of a **transmission facility** must, when it receives a written request for information from the **ISO** under subsection 3, provide a written response to the **ISO** within fifteen (15) **business days** or within an alternative time frame agreed to by the **ISO**, including:

(a) an estimate of the time required to prepare the **cost estimate** or revised **cost estimate**;

(b) an estimate of the expense required to prepare the **cost estimate** or revised **cost estimate**;

(c) where the **legal owner** of a **transmission facility** cannot provide the **ISO** with a **cost estimate** or a revised **cost estimate** within the **accuracy range** specified in the **ISO**'s request:

(i) an indication of the **accuracy range** in which the **cost estimate** can be provided; and

(ii) a description of the reason why the **cost estimate** can be provided within this alternate **accuracy range** but not within the **accuracy range** specified in the **ISO**'s request.

5(1) Upon receiving the information described in subsection 4, the **ISO** may make a written request that the **legal owner** of a **transmission facility** provide a **cost estimate** or revised **cost estimate** within a specified time period.

(2) The **legal owner** of a **transmission facility** must provide the **ISO** with a **cost estimate** or revised **cost estimate** requested in accordance with subsection 5(1) within the time period specified by the **ISO**, including:

(a) the assumptions used in preparing the **cost estimate**;

(b) the period of time for which the **cost estimate** is valid; and

(c) any proposed capital maintenance costs included within any **Commission** approval.

(3) The **ISO** must, when making a written request under subsection 5(1), provide the **legal owner** of a **transmission facility** with the information that the **legal owner** reasonably requires in order to prepare the **cost estimate**.

6 The most recent **service proposal estimate** provided in accordance with subsection 5 will be considered the **original budget** for the **transmission facility** project.

Post Permit and License Estimate

7(1) The **legal owner** of a **transmission facility** that provides a **cost estimate** to the **ISO** in accordance with subsection 5 must provide a **post permit and license estimate** for a **transmission facility** project to the **ISO** within one hundred and eighty (180) **days** from the date that the **Commission** has issued all permits and granted all licences for the facilities associated with the **transmission facility** project in accordance with the *Hydro and Electric Energy Regulation*, unless the **ISO** otherwise authorizes in writing.

(2) The **ISO** may make a written request that a **post permit and license estimate** referenced in subsection 7(1) be provided in a specific **accuracy range**.

(3) The **legal owner** of a **transmission facility** must, when it receives a request from the **ISO** in accordance with subsection 7(2), provide the **post permit and licence estimate** in the accuracy range specified in the request.

(4) Notwithstanding subsection 7(1), where the **final energization** date of all facilities included in a service proposal for a single **transmission facility** project is less than one hundred and eighty (180) **days** after permit and license are granted, the **legal owner** of a **transmission facility** is not required to provide a **post permit and license estimate** to the **ISO**.

Final Cost Estimate

8(1) The **legal owner** of a **transmission facility** that provides a **cost estimate** to the **ISO** in accordance with subsection 5 must provide the **ISO** with a **final cost estimate** no later than ninety (90) **days** after **final energization** of all facilities included in a **service proposal** for a **transmission facility** project, unless the **ISO** agrees otherwise in writing.

(2) The **ISO** may make a written request that a **final cost estimate** referenced in subsection 8(1) be provided in a specific **accuracy range**.

(3) The **legal owner** of a **transmission facility** must, when it receives a request from the **ISO** in accordance with subsection 8(2), provide the **final cost estimate** in the accuracy range specified in the request.

Preparation of Cost Estimates and Provision of Further Information

9(1) The **legal owner** of a **transmission facility** must ensure that any **cost estimate** provided in accordance with this section 504.5 of the **ISO rules** is accurate, complete and in an appropriate level of detail.

(2) The **ISO** may make a written request that the **legal owner** of a **transmission facility** provide additional information relating to a **cost estimate** provided in accordance with this section of the **ISO rules** within a specified time period.

(3) The **legal owner** of a **transmission facility** must provide the **ISO** with the additional information requested under subsection 9(2) within the time period specified by the **ISO**, unless the **ISO** agrees otherwise in writing.

Final Cost Report

10 The **legal owner** of a **transmission facility** that provides a **final cost estimate** to the **ISO** in accordance with subsection 8 must, as soon as practicable and no later than one hundred and eighty (180) **days** after the **final energization** of all facilities included a the **service proposal** for a **transmission facility** project, provide an accurate and complete **final cost report** for the **transmission facility** project in the same level of detail as the **final cost estimate**, unless the **ISO** agrees otherwise in writing.

Revision History

Date	Description
2016-04-29	Initial release.

ISO Rules
Part 500 Transmission
Division 505 Legal Owners of Generating Facilities
Section 505.2 Performance Assessment for Refund of Generating Unit Owner's Contribution

Applicability

1 Section 505.2 applies to:

(a) the **ISO**.

Requirements

Performance Assessment

2 The **ISO** must, subject to the **ISO tariff**, assess the performance of a **generating unit**, energy storage resource, or **aggregated** ~~generating~~ **facility** as follows:

(a) subject to subsection 2(b), if the **revenue meter** of the **generating unit**, energy storage resource, or **aggregated** ~~generating~~ **facility** recorded zero metered energy in all **settlement intervals** during the previous calendar year, the performance factor is 0%;

(b) for a site with 1 or more onsite **generating units**, energy storage resources, or **aggregated** ~~generating~~ **facilities** that supply electric energy for 1 or more onsite load assets and provides excess generation to the energy market, if the **revenue meter** recorded zero metered energy in all **settlement intervals** because load growth at the site resulted in no export to the **interconnected electric system**, the performance factor is 100%; and

(c) in all other cases, the performance factor is 100%.

Refund of Generating Unit Owner's Contribution

3 The **ISO** must calculate a refund for each calendar year during the refund period as follows:

$$\text{refund} = (\text{annual amount x performance factor})$$

where:

(a) annual amount is as specified in the **ISO tariff**; and

(b) performance factor is the performance factor assessed in accordance with subsection 2 for the calendar year.

Preliminary Refund Assessment

4 The **ISO** must provide a preliminary refund assessment, along with relevant input data, to the **legal owner** of a **generating unit**, **energy storage resource**, or ~~an~~ **aggregated** ~~**generating**~~ **facility** by January 31 of the year following the calendar year to which the refund relates.

Revision History

Date	Description
20xx-xx-xx	
2021-03-25	Revisions to introduce new performance assessment methodology in response to changes to ISO tariff.
2020-01-01	Revisions to clarify "generating facility" as "generating unit or aggregated generating facility"; and applicability to a solar aggregated generating facility.
2016-01-29	Initial release.

ISO Rules
Part 500 Facilities
Division 505 Legal Owners of Generating Facilities
Section 505.3 Coordinating Synchronization, Commissioning, ~~WECC~~ Model and Reactive Power Validation Testing and Ancillary Services Testing

Applicability

1 Section 505.3 applies to:

(a) the **legal owner** of a **generating unit** or **energy storage resource** with a rating ~~of five (5) MW or~~ greater ~~that~~than or equal to 5 MWthat is connected or to be connected to **transmission facilities** or an **electric distribution system** in the **balancing authority area** of the **ISO** and ~~which such~~where the **generating unit** or **energy storage resource**:

(i) is a new **generating unit** or new **energy storage resource**;

(ii) has been the subject of a modification affecting its net-to-grid operating capabilities;

(iii) requires baseline ~~and~~ model validation ~~testing, being **WECC**~~and reactive power testing; or

(iv) requires testing in accordance with any **ancillary services** technical requirements;

(b) the **legal owner** of an **aggregated ~~generating~~ facility** with a rating ~~of five (5) MW or~~ greater ~~that~~than or equal to 5 MWthat is connected or to be connected to **transmission facilities** or to an **electric distribution system** in the **balancing authority area** of the **ISO** and ~~which such~~where the **aggregated ~~generating~~ facility**:

(i) is a new **aggregated ~~generating~~ facility**;

(ii) has been the subject of a modification affecting its net-to-grid operating capabilities;

(iii) requires baseline ~~and~~ model validation and reactive power testing, ~~being **WECC** testing~~; or

(iv) requires testing in accordance with any **ancillary services** technical requirements;~~ and~~

(c) the **ISO**.

Requirements

Connecting New Facilities

2(1) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated ~~generating~~ facility** must not synchronize its ~~generating~~ facility until obtaining written confirmation from the **ISO** that:

(a) the **legal owner** has met the energization requirements; and

(b) the **legal owner**'s final **commissioning** plan, required under subsection 3, is approved.

(2) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~ , **energy storage resource**, or **aggregated ~~generating~~ facility** must, ~~on the **day** of and~~ not less than one ~~(1)~~ hour prior to synchronizing ~~any generating facilities~~its facility, phone the **ISO** and obtain verbal authorization from the

ISO to synchronize the ~~generating~~ facility.

(3) ~~After receiving authorization to synchronize its generating facilities, the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ may, after receiving authorization to synchronize its facility, synchronize ~~them~~it to the **transmission system**.

Plans for Commissioning, ~~WECC~~Model and Reactive Power Validation Testing, or Ancillary Services Testing Activities

~~Each of the~~**3** The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ must provide a final, written **commissioning** or testing plan to the **ISO**:

(a) which the **ISO** approves as ~~being able to be implemented~~implementable without impacting the reliable operation of the **interconnected electric system**;

(b) detailing the types of tests the **legal owner** proposes to conduct, including ~~**WECC**~~model and reactive power validation tests; and

(c) a minimum of ~~thirty (~~30~~)~~ **days** prior to **commissioning** or testing.

Commissioning or Testing Major Facilities Plan Details

~~**4** Any of the following:~~

~~(a) the~~The **legal owner** of a **generating unit** ~~equal to~~, **energy storage resource**, or ~~greater than five (5) MW;~~

~~(b) the **legal owner** of an **aggregated** **generating** **facility** equal to or greater than five (5) MW; or~~

~~(c) the **legal owner** of a **generating unit** or the **legal owner** of an **aggregated generating facility** which owns any of the following major transmission or load facilities:~~

~~(i) motors of a rating sufficient to cause operational concerns, as identified during the connection project process;~~

~~(ii) static VAr compensators;~~

~~(iii) high voltage direct current facilities;~~

~~(iv) flexible alternating current transmission system devices;~~

~~(v) phase shifting transformers;~~

~~(vi) alternating current transmission line series compensation; and~~

~~(vii) synchronous condensers~~

~~**5**~~**4** intending to perform **commissioning**, ~~**WECC**~~model and reactive power validation testing, or

ancillary services testing activities ~~on such facilities~~, must include in its **commissioning** or testing plan the details of the proposed testing activities, including the expected output, consumption, or transfer of **real power** and **reactive power** from the facility to the **interconnected electric system** and over what periods of time.

Commissioning Minor Facilities Plan Details

~~6~~**5** ~~Each of the~~A **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or~~n~~ **aggregated** ~~**generating** **facility** that owns any of the following:

(a) circuit breakers;

(b) transformers and voltage regulators;

(c) capacitor banks;

(d) reactors; and

(e) alternating current transmission lines,

intending to conduct **commissioning** on such facilities must include in its **commissioning** plan the proposed date and time of energization.

Conducting Commissioning, ~~WECC~~Model and Reactive Power Validation Testing, or Ancillary Services Testing Activities

6(1) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility** must not begin its **commissioning** or testing activities until obtaining written confirmation from the **ISO** that the **legal owner**'s final **commissioning** or testing plan, required under subsection 3, is approved.

(2) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility** must, ~~on the **day** of and~~ not less than one ~~(1)~~ hour prior to the scheduled time of **commissioning** or testing, phone the **ISO** and obtain verbal authorization from the **ISO** to proceed.

(3) ~~After~~The **legal owner** of a **generating unit**, **energy storage resource**, or **aggregated facility** may, after receiving authorization to proceed with its **commissioning** or testing activities, ~~the **legal owner** of a **generating unit** and the **legal owner** of an **aggregated generating facility** may~~ commence the **commissioning** or testing activities.

Changes to Approved Commissioning or Testing Activities

7(1) The **ISO** may amend or suspend any **commissioning**, ~~**WECC**~~model and reactive power validation testing, or **ancillary services** testing activities it has already approved under subsection 3, based on real time **reliability** requirements of the **interconnected electric system** and necessary **ISO** operational flexibility, and it may do so by providing written or verbal notice to the **legal owner** of the facility.

(2) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility** may suspend its **commissioning**, ~~**WECC**~~model and reactive power validation testing, or **ancillary services** testing activities by giving verbal notice to the **ISO**.

(3) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility** may amend its **commissioning**, ~~**WECC**~~model and reactive

power validation testing, or **ancillary services** testing activities by making a verbal request to the **ISO** and obtaining verbal approval.

(4) A **legal owner** of a **generating unit** ~~and the **legal owner** of an~~ , **energy storage resource**, or **aggregated** ~~**generating**~~ **facility** that has amended or suspended any previously approved **commissioning**, ~~**WECC**~~model and reactive power validation testing, or **ancillary services** testing activities must, if the **ISO** requests, submit a revised written **commissioning** or testing plan and must do so within the timeframe the **ISO** specifies in order to proceed with **commissioning**, ~~**WECC**~~model and reactive power validation testing, or **ancillary services** testing activities.

Revision History

Effective	Description
XXXX-XX-XX	
2012-12-31	Initial release

ISO Rules
Part 500 Facilities
Division 505 Legal Owners of Generating Facilities
Section 505.4 Coordinating Operational Testing

Applicability

1 Section 505.4 applies to:

(a) the **legal owner** of a **generating unit** or **energy storage resource**:

(i) with a rating of 5 MW or greater ~~than five (5) MW~~;

(ii) connected to **transmission facilities** or to an **electric distribution system**, in the **balancing authority area** of the **ISO**;

(iii) that is already in **commercial operation**; and

(iv) for which the **legal owner** intends to conduct operational testing activities;

(b) the **legal owner** of an **aggregated** ~~**generating unit**~~**facility**:

(i) with a rating of 5 MW or greater ~~than five (5) MW~~;

(ii) connected to **transmission facilities** or to an **electric distribution system**, in the **balancing authority area** of the **ISO**~~:~~;

(~~i~~iii) that is already in **commercial operation**; and

(~~i~~iv) for which the **legal owner** intends to conduct operational testing activities; ~~and~~

(c) the **ISO**.

Requirements

Plans for Operational Testing

2 ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating**~~ **facility** must provide final, written operational testing plans to the **ISO**:

(a) which the **ISO** approves as being able to be implemented without impacting the ~~reliable operation~~**reliability** of the **interconnected electric system**;

(b) detailing the proposed date and time of operational testing and expected duration;

(c) specifying the types of operational testing activities;

(d) detailing the expected output of **real power** and **reactive power** from the **generating** ~~facility~~**unit** or **energy storage resource** to the **interconnected electric system** and over what periods of time; and

(e) in sufficient time to allow the **ISO** to approve the operational testing plans a minimum of ~~fifteen (~~15~~)~~ **days** prior to the desired testing date.

Conducting Operational Testing Activities

3(1) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating**~~ **facility** must not conduct operational testing activities on the **generating unit**, **energy storage resource** or **aggregated facility** until obtaining written confirmation from the **ISO** that the **legal owner**'s final operational testing plan, required under subsection 2, is approved.

(2) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating**~~ **facility** must, ~~on the **day** of and~~ no less than one ~~(1)~~ hour prior to conducting operational testing activities

~~on any generating facilities~~, phone the **ISO** and obtain verbal authorization from the **ISO** to conduct the activities.

(3) ~~After~~The **legal owner** of a **generating unit**, **energy storage resource**, or **aggregated facility** may, after receiving authorization to conduct operational testing activities on a facility, ~~the **legal owner** of a **generating unit** and the **legal owner** of an **aggregated generating facility** may~~ conduct the activities.

(4) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility** who~~that desires to perform operational testing that is required in order to recover from an unexpected operational problem must:

(a) contact the **ISO** by phone to request approval for the operational testing;

(b) provide a description of the operational testing, including the expected output, consumption or transfer of **real power** and **reactive power** from the ~~generating~~ facility to the **interconnected electric system** and over what periods of time;

(c) not initiate the operational testing until obtaining verbal approval from the **ISO**; and

(d) phone the **ISO** to advise when the operational testing is complete.

Changes to Approved Testing Activities

4(1) The **ISO** may amend or suspend any operational testing activities it has already approved, based on real time **reliability** requirements of the **interconnected electric system** and necessary **ISO** operational flexibility, and it may do so by providing written or verbal notice to the **legal owner** of the ~~generating~~ facility.

(2) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ may suspend its operational testing activities by giving verbal notice to the **ISO**.

(3) ~~Each of the~~The **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ may amend its operational testing activities by making a verbal request to the **ISO** and obtaining verbal approval from the **ISO**.

(4) A **legal owner** of a **generating unit** ~~and the **legal owner** of an~~, **energy storage resource**, or **aggregated** ~~**generating** **facility**~~ that has amended or suspended any previously approved operational testing activities must, if the **ISO** requests, submit a revised written operational testing plan and must do so within the timeframe the **ISO** specifies in order to proceed with the operational testing activities.

Revision History

Effective	Description
xxxx-xx-xx	
2012-12-31	Initial release

ISO Rules
Part 500 Facilities
Division 507 Industrial System Designations
Section 507.1 Open Access Requirements for Proposed Interties

Applicability

1 Section 507.1 applies to:

(a) a **person** proposing an **intertie** be:

(i) constructed; or

(ii) upgraded or enhanced in a manner that would result in an increase to the path rating of the **intertie**.

Requirements

Open and Non-Discriminatory Manner

2(1) A **person** proposing an **intertie** must provide open access to **market participants** and provide that the **intertie** be available in an open and non-discriminatory manner, similar to the access available to other **transmission facilities**.

(2) A **person** proposing an **intertie** must, as part of the open and non-discriminatory manner required in subsection 2(1):

(a) provide public notice which must, at a minimum:

(i) indicate the **person**'s intention to provide access to the **intertie** by way of an open and non-discriminatory process; and

(ii) be inserted in major newspapers in Alberta and in jurisdictions outside Alberta in which the **intertie** is planned to be located, in the section of each such newspaper where such a notice would reasonably be expected to appear;

(b) include conducting public information sessions in Alberta and in jurisdictions outside Alberta in which the **intertie** is planned to be located; and

(c) make its terms and conditions of access publicly available.

Sale of Intertie Capacity

3(1) A **person** proposing an **intertie** may only sell, or otherwise make available, **intertie** capacity in accordance with an open and non-discriminatory process, including **intertie** capacity that was not sold in the initial process.

(2) The **person** proposing an **intertie** must make publicly available:

(a) the names of **persons** who have acquired **intertie** capacity; and

(b) the amount of **intertie** capacity each has acquired; and

must do so within 1 month of such acquisition.

Affiliates

4 If an **affiliate** of a **person** proposing an **intertie** participates in the open and non-discriminatory process identified in subsection 3, the **person** proposing an **intertie** must:

(a) make public that participation;

(b) confirm that the **affiliate** was not provided any advantage in such process over other

interested parties; and

must do so within 1 month of such participation.

Terms and Conditions

5 A **person** proposing an **intertie** must include in the terms and conditions it files pursuant to subsection 27(5)(a) of the *Transmission Regulation*, provisions to prevent capacity withholding and other anti-competitive behavior.

Records

6 A **person** proposing an **intertie** must maintain its books and records at least to the extent reasonably necessary to verify compliance with this Section 507.1 and must make those records available to the **ISO** upon reasonable prior notice.

Revision History

Date	Description
2020-09-16	Administrative amendments.
2012-11-16	Initial Release

9. TRANSMISSION

9.1 Transmission Facility Projects

9.1.1 Eligible TFO

9.1.1.1 Eligibility by Service Area

Subject to **rule** 9.1.1.2 b), c), d), e), and f) each **service area** shall have one **TFO** eligible to apply for the construction or operation, or both, of **transmission facilities** in such area. For purposes of this **rule** 9.1.1.1, the following **TFO**s are eligible for the referenced **service area**:

TFO	**Service area**
AltaLink L.P.	FortisAlberta Inc.
ATCO Electric Ltd.	ATCO Electric
ENMAX Power Corporation	ENMAX Corp.
EPCOR Distribution & Transmission Inc.	EPCOR Distribution & Transmission Inc.
City of Red Deer	City of Red Deer
City of Lethbridge	City of Lethbridge

9.1.1.2 Directions

a) Subject to **rule**s 9.1.1.2 b), c), d), e) and f),

i) the **ISO** will issue a **Direction** to the **TFO** eligible in the **service area** where the **Project** is located;

ii) with respect to a **Project** located in more than one **service area**, the **ISO** will issue a **Direction** to each **TFO** for that part of the **Project** located in its service area;

b) With respect to transmission facilities that exist as of August 12, 2004, the owner of such facilities, or its successors and assigns, shall be the **TFO** eligible to receive a **Direction** with respect to any enhancements or upgrades to such facilities, subject to the **ISO** being satisfied that the operation of such facilities will result in the safe, reliable and efficient operation of the facilities. For purposes of this rule 9.1.1.2 b), owners include the following:

Owners
AltaLink L.P.
TransAlta Utilities Corp
ATCO Electric Ltd.
ENMAX Power Corporation
EPCOR Distribution & Transmission Inc.
City of Red Deer
City of Lethbridge

c) The **ISO** may issue a **Direction** to a **TFO** other than the **TFO** that is eligible pursuant to **rule** 9.1.1.1. if such **TFO** and the **TFO** in whose **service area** the **Project** is located, have entered into an arrangement or agreement which would result in the safe, reliable and efficient operation of the **transmission system** and such arrangement or agreement has been filed with the **Commission**;

d) Where the person who is eligible to apply for the construction and operation of a **transmission facility** was determined by a competitive process developed by the **ISO** in accordance with the **Act**, **rule** 9.1 does not apply;

e) With respect to a **Project** that is located in more than one **service area**, where the **TFO**s in those service areas have entered into an arrangement or agreements, with respect to the **Project**,

i) whereby the Project is to be constructed or operated or both by one or more of the TFOs or by a separate entity created for the purpose of the Project and wholly owned, directly or indirectly, by one or more of: (A) the TFOs; (B) the direct or indirect owners of the TFOs; and (C) entities that are directly or indirectly wholly owned by the owners of the TFOs; and

ii) which would result in the safe, reliable and efficient operation of the transmission system and such arrangement or agreement has been filed with the **Commission**.

the **ISO** may issue a **Direction** in respect of the **Project** to one or more of the **TFO**s in accordance with such arrangement or agreement, and one or more of the **TFO**s, or the entity created for the purpose of the **Project**, is eligible to apply for the construction or operation, or both, of the transmission facilities.

f) with respect to a **Project** all but a small portion of which is located in one **service area** with the small portion located in an adjacent **service area**, the **ISO** may issue a **Direction** to the **TFO** in whose **service area** the largest portion of the **Project** is located, if, in the **ISO**'s opinion, acting reasonably, such **Direction** will result in the safe, reliable, efficient and economic operation of the **interconnected electric system.**

9.1.1.3 Directions - Interconnections to Jurisdictions outside Alberta

a) If the **ISO** has obtained approval of a **NID** for a **Project** contemplated by the **T-Reg:**

i) the **ISO** may issue a **Direction** to the **TFO** eligible in the **service area** where the connection of the **Project** to the **interconnected electric system** will be located if the proponent of the **Project** has submitted an application under the **HEEA** for a permit and license for the remainder of the **Project**; or

ii) the **ISO** may issue a **Direction** to the **TFO** eligible in accordance with **rule** 9.1.1.1 if the **Project** is proposed by the **ISO**.

9.1.2 TFO Obligation to Provide Estimates and Proposals

Removed – Effective April 29, 2016

9.1.3 Project Reporting by Designated TFOs

9.1.3.1 Monthly Reporting

Unless agreed otherwise, each **Designated TFO** with respect to a **Project**, the cost of which is estimated to be more than one million dollars, shall provide to the **ISO** on or before the 15th **Business Day** of each month commencing the month after the **ISO** has issued a **Direction** to such **Designated TFO(s)**, a **Project Progress Report**.

9.1.3.2 Project Variance Reporting

In addition to any other obligations it has with respect to a **Project**, the **Designated TFO** shall notify the **ISO** as soon as reasonably practical in the event of any of the following:

a) if the in service date of the **Project** is forecast by it to be delayed from the in service date specified in the **Direction**; or

b) if the forecast costs of the **Project** are expected to vary by more than 10% from the amount specified in the **Direction** or if applicable, the amount agreed to by the **ISO** in an amendment to the **Direction**; or

c) if the **TFO** has determined that a material amendment to the scope of the **Project** is required to meet the need identified with respect to the **Project**.

9.1.3.3 Project Variance Explanation

The **Designated TFO** shall include with the notice given in **rule** 9.1.3.2, the reason or reasons for any or all of the variances, including schedule delays, cost trends and scope change.

9.1.3.4 Project Change Proposal

The **Designated TFO** shall prepare and submit to the **ISO** a **Project Change Proposal** to address the delay, cost trends, or scope change, as the case may be, identified in a notice pursuant to **rule** 9.1.3.2**.** The **Designated TFO** shall prepare and submit such proposal to the **ISO** as soon as reasonably practical and in any event no later than 15 **days** from the date of the notice pursuant to **rule** 9.1.3.2.

9.1.3.5 Project Change Proposal Review

The **ISO** shall review the **Project Change Proposal** submitted by the **Designated TFO** pursuant to **rule** 9.1.3.4. As soon as reasonably practical, and no later than **15 days** following receipt of the **Project Change Proposal**, the **ISO** must do one or more of the following:

a) approve such proposal, with or without amendments, in which event the **Project** shall be deemed amended;

b) reject such proposal with or without requesting a revised **Project Change Proposal**;

c) cancel the **Project**; and/or

d) recommend that the **TFO** apply to the **Commission** for an amendment to any approval it may have obtained pursuant to the **HEEA**.

9.1.3.6 Final Cost Report

Removed – Effective April 29, 2016

9.1.3.7 Notification – Transmission Customer Projects

Notwithstanding any other provision within this **rule** 9.1.3, if a **Transmission Customer** has made an application for **system access service** for a specific **Project**, or portion of a **Project**, the ISO shall notify the **Designated TFO** in that regard. Subject to such notification;

a) the **Designated TFO** shall provide to the **Customer** at the same time it is required to provide or submit to the **ISO,** any and all notifications and documents it is required to provide or to submit pursuant to this **rule** 9.1.3; and

b) the **ISO** and the TFO shall review any **Project Change Proposal** with the **Customer**, and thereafter the **ISO** acting reasonably, must do one of the things identified in rule 9.1.3.5.

9.1.4 ISO Projects Reporting

No later than the last day of the month following each **Quarter**, the **ISO** shall make available on its website the **Quarterly Projects Report**.

9.1.5 Project Procurement

9.1.5.1 Project Material Procurement by Designated TFO

A **Designated TFO**, shall, in carrying out the construction of the **transmission facilities**, comply with the procurement requirements contained in this **rule**.

9.1.5.2 Major acquisitions

Where the cost of a specific item or type of any **Project Material** required for a **Project** is forecast by the **Designated TFO**, acting reasonably, to exceed $50,000, the **Designated TFO** shall solicit written bids to provide such material from not less than 3 arm's length suppliers.

9.1.5.3 Minor acquisitions

Where the cost of all of any specific item or type of any **Project Material** required for a **Project** is forecast by the **Designated TFO**, acting reasonably, to exceed $10,000 but be less than $50,000, the **Designated TFO** shall solicit written bids, including short form written bids, to provide such material from not less than 3 arm's length suppliers.

9.1.5.4 Standing Bids

The **Designated TFO** may obtain from a supplier a written bid, including a short form written bid, that is in effect for a specified period of time and utilize such bid for purpose of making a determination in accordance with the following **rule** 9.1.5.5.

9.1.5.5 Lowest Priced Compliant Bid

Subject to rule 9.1.5.6 a), in the event the **Designated TFO** receives one or more compliant bid pursuant to **rule** 9.1.5.2 or 9.1.5.3, it shall award the contract to the party that has submitted the lowest priced, fully compliant bid.

9.1.5.6 Exceptions

a) In the event the **Designated TFO** has awarded a contract to a party from whom it has received a bid pursuant to **rules** 9.1.5.2 or 9.1.5.3, and such party did not submit the lowest priced, fully compliant bid such **TFO** shall;

i) demonstrate to the **ISO**, if requested, that it was commercially reasonable to do so;

ii) with respect to a contract awarded where bids were received pursuant to **rule** 9.1.5.2 include in the next **Project Progress Report** for the **Project**, its reasons for not awarding such contract in compliance with **rule** 9.1.5.5; and

iii) with respect to all such contracts, include in its books and records its reasons for not awarding such contracts in compliance with **rule** 9.1.5.5.

b) A **Designated TFO** may award a contract to a party without obtaining a bid pursuant to **rule** 9.1.5.2 or 9.1.5.3 if the **Designated TFO** can demonstrate to the ISO that it was reasonable not to obtain competitive bids, based on any of the following:

i) that the party awarded the contract was the only entity capable to provide the **Project Material**;

ii) that given reasonable **Project** schedule requirements, there was insufficient time to solicit bids; or

iii) that there was insufficient information on which to base a bid.

9.1.5.7 Maintenance of Procurement Books and Records

Subject to any other obligation or duty a **Designated TFO** has, including without limitation any obligations it has pursuant to the **ISO Tariff** or the terms and conditions contained in the current version of the **Commission** approved tariff of such **TFO**, the **Designated TFO** shall maintain all written bids relating to the procurement of **Project Material** for each **Project** regarding which it has been issued a **Direction** for not less than one year from the date that the **ISO** has received the completed **Final Cost Report** for the **Project**.

9.1.5.8 Compliance Review Right of ISO

The **ISO** shall have the right exercisable upon reasonable prior notice to the **Designated TFO** to examine the books and records of the **Designated TFO**, including all written bids relating to the procurement of **Project Material**, to the extent reasonably necessary to verify, with respect to any **Project** compliance by the **TFO** with this **rule** 9.1.5; provided, that such right shall only continue for a period of one year from the date it has delivered the **Final Cost Report** of such **Project** to the **ISO.**

9.1.5.9 Reasons for non-compliance

In addition to any other provisions in these rules, in the event the **ISO**, acting reasonably, determines that a **Designated TFO** has not complied with this **rule** 9.1.5 regarding procurement, it shall advise the **Designated TFO** and give it the reasons for such non-compliance.

9.1.5.10 Project Procurement Report

The **Designated TFO** shall include in the **Final Cost Report** details regarding the level of competitive procurement with respect to the acquisitions for a **Project** made pursuant to **rule** 9.1.5.2.

9.1.6 Confidentiality

9.1.6.1 Data and Information Included

Subject to **rule** 9.1.6.2, all data and information either the **ISO** or **Designated TFO** provides to the other with respect to **rule** 9.1 shall be treated by the party receiving such data and information in accordance with the confidentiality provisions in the **ISO rules** or the terms and conditions contained in the current version of the **Commission** approved tariff of the **TFO**.

9.1.6.2 Data and Information Excluded

All **NID Estimates** and all **Quarterly Projects Reports** shall not be confidential.

9.1.7 Interpretation

In the event of any conflict or inconsistency between this **rule** 9.1 and any tariff approved by the **Commission,** or **Commission** order or directive, the latter shall prevail.

9.2 Transmission Loss Factors

Removed; Effective October 10, 2012. Section has been redrafted and relocated to New ISO Rules Section 501.10.

9.3 Abbreviated Needs Identification Approval

Removed – Effective July 31, 2015

9.4 Real Time Transmission Constraint Management

Removed – Effective March 26, 2012

9.5 Annual Performance Criteria for Refund of System Contribution

Removed – Effective January 29, 2016

9.6 Merchant Transmission Facility Open Access

Removed – Effective November 16, 2012