ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.5 Spinning Reserve Technical Requirements and Performance Standards

External Consultation Draft
September 28, 2017

Applicability

1 Section 205.5 applies to:

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

(b) the **ISO**~~,~~.

~~in relation to qualifying for, providing and utilizing **spinning reserve**.~~

Requirements

~~**General**~~**Application for Qualification to Provide Spinning Reserve**

2(1) A **pool participant** must be qualified by the **ISO** in order to provide ~~that provides or anticipates providing **spinning reserve** must satisfy the technical requirements set out in this section 205.5 and must continue to satisfy such technical requirements while providing~~ **spinning reserve**.

(2) A **pool participant** seeking to have a **pool asset** qualified by the **ISO** to provide **spinning reserve** 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.

~~**Minimum Requirements**~~**Eligibility to Provide Spinning Reserve**

3(1) A **pool participant** seeking to have its **pool asset** qualified by the **ISO** to provide **spinning reserve** must ensure that its **pool asset** has at least one (1) ~~each **generating unit** or load is capable of providing a minimum of ten (10) MW of~~ **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.

(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 0.036 Hz;

(iii) has a droop setting equal to or greater than 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 ~~A **pool participant** must ensure that each~~ **generating unit** that is equipped with an analog **governor**, as of December 23, 2014, until such time as the **governor** is replaced.~~or load is capable of providing the amount of **real power** the **ISO** qualifies the **generating unit** or load to provide under subsection 4(1) for the period from ten (10) minutes after receiving a **directive** to provide **spinning reserve** to sixty (60) minutes after receiving a **directive** to provide **spinning reserve**.~~

~~**(3)** A **pool participant** must ensure that each **generating unit** or load is equipped with a **governor system** that:~~

~~(a) is responsive to both over frequency and under frequency events;~~

~~(b) has a total deadband of equal to or less than zero point zero three six (0.036) Hertz;~~

~~(c) has a droop setting equal to or greater than three percent (3%) but less than or equal to five percent (5%) based on:~~
~~(i) the maximum operating range of each **generating unit** providing **spinning reserve**; or~~

~~(ii) the total **real power** capacity of each load providing **spinning reserve**;~~

~~(d) has no intentional time delays added to the control system;~~

~~(e) has a sample rate of at least thirty (30) samples per second;~~

~~(f) has a resolution of at least zero point zero zero four (0.004) Hertz; and~~

~~(g) while the **pool asset** is under a **dispatch** or **directive** to provide **spinning reserve** is:~~

~~(i) in service at all times; and~~

~~(ii) without load limiters or other control systems that override or interfere with the **governor system**; and~~

~~(iii) for **pool assets** providing both **spinning reserve** and **regulating reserve**, the **automatic generator control** signal must not override the frequency response of the **governor system**.~~

~~**(4)** A **pool participant** must ensure that any **pool asset** providing **spinning reserve** complies with subsections 3(1), (2) and (3) as measured at the:~~

~~(a) stator winding terminals of each qualified **generating unit**; or~~

~~(b) the circuit breaker or disconnection device that is electrically closest to each qualified load.~~

~~**(5)** The requirements set out in subsections 3(3)(e) and (f) do not apply to a **pool participant** that provides **spinning reserve** with a **generating unit** that is equipped with an analog **governor system**, as of December 23, 2014, , until such time as the **governor system** is replaced.~~

~~**(6)** A **pool participant** must ensure that, for the applicable minimum time period set out in Appendix 1, each **generating unit** or load providing **spinning reserve** will not trip as a result of under-frequency or over-frequency deviations when its **pool asset** is under a **dispatch** or a **directive** to provide **spinning reserve**.~~

Qualification of a ~~Generating Unit or a Load~~Pool Asset to Provide Spinning Reserve

4(1) The **ISO** may qualify a **pool asset** to provide ~~must, prior to any **generating unit** or load providing~~ **spinning reserve** if one (1) or more **spinning reserve resources** of the **pool asset** meet the eligibility criteria set out in subsection 3~~, assess the eligibility of each **generating unit** or load and determine the **real power** in MW it is qualified to provide~~.

(2) The **ISO** must, after qualifying a **pool asset** under subsection 4(1), determine ~~in determining~~ the **real power** quantity in MW that each **spinning reserve resource** of the **pool asset** is capable of providing, with consideration given to ~~**generating unit** or load is qualified to provide, consider~~ the following:

(a) whether the **spinning reserve resource** ~~**generating unit** or load~~ participates in a **remedial action scheme**;

(b) the total **operating reserve** that could be lost during a single **contingency**; ~~and~~

(c) the maximum **real power** capability and minimum **real power** capability of each **spinning reserve resource** of the **pool asset**; and~~**generating unit** or load.~~

(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** ~~of the eligibility of each **generating unit** or load~~ within sixty (60) **days** of the **ISO** receiving ~~an~~ a completed application under subsection 2(2)~~for **spinning reserve**~~.

~~Application~~Performance Requirements when under Dispatch to Provide Spinning Reserve

5(1) A **pool participant** must ensure that, following the receipt of a **dispatch** ~~may apply~~ to provide **spinning reserve** ~~by completing and providing to the ISO the documents the ISO specifies and posts on the AESO website.~~, 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:

(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).

~~Performance Requirements to a Dispatch~~Frequency Response Requirements when under Dispatch to Provide Spinning Reserve

6(1) A **pool participant** ~~will not be paid for **spinning reserve** unless the **pool participant**~~must ensure~~s~~ that, while its **pool asset** is under **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~~upon receipt of a **dispatch** to provide **spinning reserve,** if the time stated in the **dispatch** for the **pool asset** to be in a position to provide the **real power** quantity indicated in the **dispatch** is:~~

(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.

~~the **pool asset** maintains the ability to provide the **real power** quantity corresponding to the **dispatch** quantity, as measured in accordance with subsection 3(4):~~

~~(i) by the times set out in subsections 6(1)(a)(i) and (ii); and~~

~~(ii) within a tolerance of minus:~~

~~(A) one (1) MW for a **dispatch** of less than or equal to twenty (20) MW; or~~
~~(B) five percent (5%) for a **dispatch** greater than twenty (20) MW;~~

~~for as long as the dispatch is in effect.~~

(2) A **pool participant** must ensure that, while its ~~the~~ **pool asset** ~~remains connected to the **interconnected electric system** and be frequency responsive, as described in subsection 3(3), while~~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 **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 **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 **dispatch** to provide **spinning reserve**.

~~Performance Requirements to a Directive~~ Maintaining Connection when under Dispatch to Provide Spinning Reserve

7~~(1)~~ A **pool participant** must~~, within ten (10) minutes after receiving a **directive** to provide **spinning reserve,**~~ ensure that, while its ~~the~~ **pool asset** is under **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.~~providing a quantity of **real power** equal to the instantaneous amount of **real power** of the **pool asset** at the time of the **directive** plus the amount of **real power** set out in the **directive,** as measured in accordance with subsection 3(4).~~

~~**(2)** A **pool participant** must ensure that, from the first time the **pool asset** achieves the quantity of **real power** set out in subsection 7(1) to fifteen (15) minutes after the time of the **directive**, the average quantity of **real power** provided by the **pool asset** is equal to or more than the quantity set out in subsection 7(1), as measured in accordance with subsection 3(4).~~

~~**(3)** A pool participant must ensure that, for each consecutive ten (10) minute interval starting fifteen (15) minutes following the receipt of a **directive**, the average **real power** from the **pool asset** equals the quantity set out in subsection 7(1), as measured in accordance with subsection 3(4), within a tolerance of:~~

- ~~(a) five (5) MW for a load **pool asset** or a generating **pool asset** with a **maximum capability** of two hundred (200) MW or less; or~~
- ~~(b) ten (10) MW for a load **pool asset** or a generating **pool asset** with a **maximum capability** of greater than two hundred (200) MW.~~

~~**(4)** Notwithstanding subsection 3(2), a **pool participant** must ensure the **pool asset** continues to provide the average **real power** set out in subsection 7(3) for as long as the **directive** is in effect.~~

~~**(5)** A **pool participant** must ensure that the **pool asset** remains connected to the **interconnected electric system** and remains frequency responsive, as described in subsection 3(3), while under a **directive** to provide **spinning reserve**.~~

~~**(6)** Notwithstanding subsections 7(1) through 7(4), a **pool participant** following the receipt of a **directive** for **spinning reserve** to zero (0) MW must as soon as possible, and, in any event, not more than fifteen (15) minutes after receiving the **directive** to zero (0) MW:~~

- ~~(a) ensure the generating **pool asset** is within the **allowable dispatch variance** of its current energy **dispatch**; or~~
- ~~(b) ensure the load poo**l asset** is in position to provide the **real power** quantity indicated in its current **dispatch** for **spinning reserve.**~~

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**;
- (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;
- (d) the **collector bus** for **aggregated generating facilities**; or
- (e) a point designated by the **ISO**.

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:

(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 **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, 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**;

(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;

(d) the **collector bus** for **aggregated generating facilities**; or

(e) a point designated by the **ISO**.

Test Requirements

~~8~~12 The **ISO** may request ~~that~~ a **pool participant** to test ~~its~~ a **spinning reserve resource**~~pool asset's responses to dispatches and directives~~:

(a) prior to allowing the **spinning reserve resource** ~~**pool asset**~~ to provide **spinning reserve**; ~~or~~

(b) if the **ISO** provides evidence that the **spinning reserve resource** ~~**spinning reserve**~~ exhibits behaviour that is inconsistent with the requirements of this ~~s~~Section 205.5; or

(c) if the **ISO** otherwise determines that such testing is necessary.

Maintaining Eligibility to Provide Spinning Reserve

~~9~~13(1) The **ISO** may issue a notice suspending the ability of ~~, if~~ a **pool participant** to provide **spinning reserve** if the **pool participant** does not~~refuses to~~ comply with:

(a) a testing request pursuant to subsection ~~8~~12;

(b) any other provision of this ~~s~~Section 205.5; or

(c) any other ~~section of the~~ **ISO rules** that affects the provision of **spinning reserve**.~~;~~

~~provide notice to the **pool participant** that it cannot participate in the **spinning reserve** market until the **pool participant** is compliant with this section 205.5 and all other **ISO rules** that affect the provision of **spinning reserve**.~~

(2) A **pool participant** that has received a suspension notice issued pursuant to subsection ~~9~~13(1) ~~must~~ may not submit an **offer** for **spinning reserve** until the **ISO** confirms that the **pool participant** is compliant with this ~~s~~Section 205.5 and all other **ISO rules** that affect the provision of **spinning reserve**.

Appendices

Appendix 1 – *Frequency Ranges*

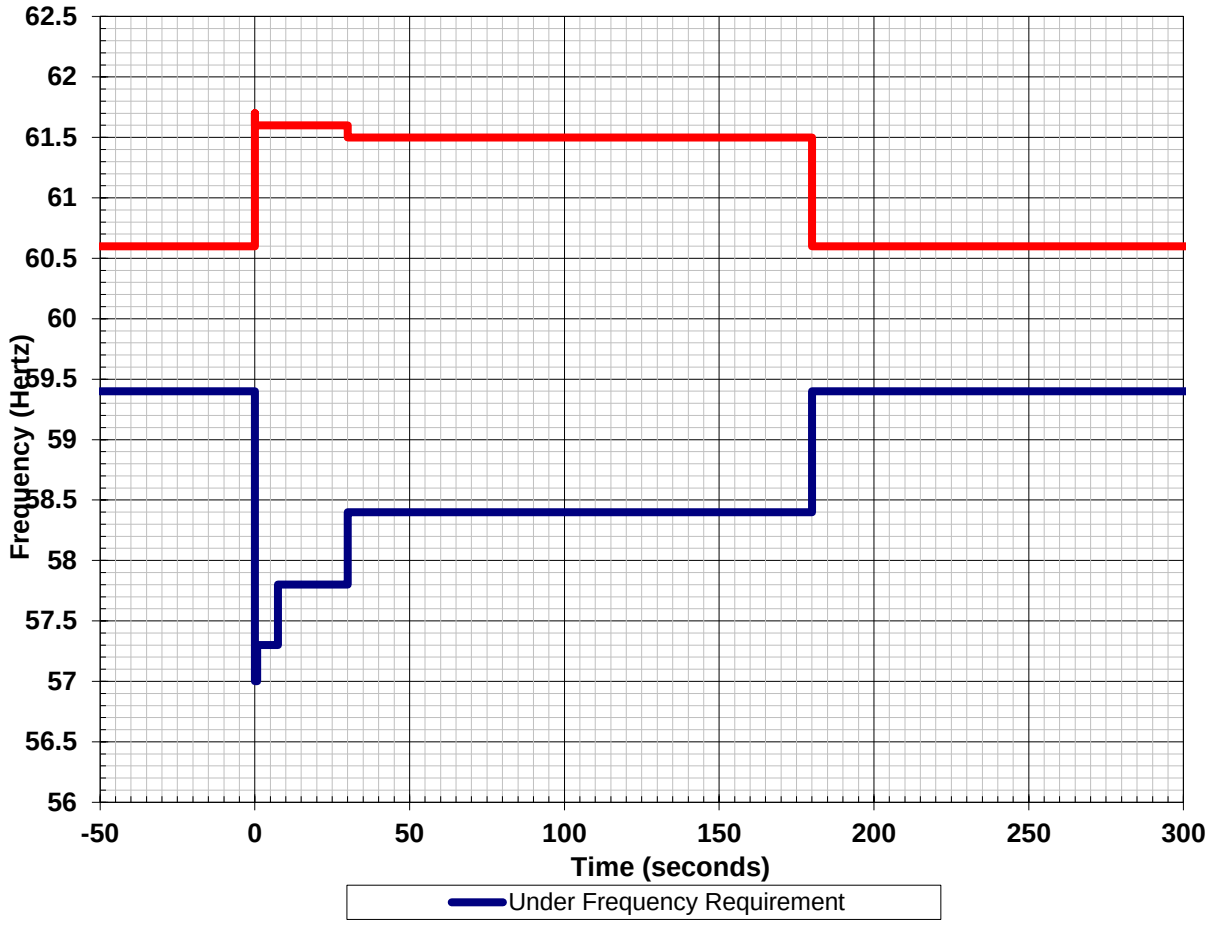
Revision History

Date	Description
yyyy-mm-dd	
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 (Sec)~~	~~Frequency (Hz)~~	~~Time (sec)~~
~~≥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~~

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
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58.5
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57.5
57
56.5
56
Frequency (Hertz)
-50
0
50
100
150
200
250
300
Time (seconds)
Under Frequency Requirement