ISO Rules
Part 200 Markets
Division 205 Ancillary Services
Section 205.4 Regulating Reserve Technical Requirements and Performance Standards

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** 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** to provide **regulating reserve** must ensure that its **pool asset** has at least one **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 1 hour;

(iii) without manual intervention, **real power** movement in the direction of the latest **automatic generation control** signal within no more than:

A. 28 seconds of receiving an **automatic generation control** signal; and

B. 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 less or equal to than 0.036 Hz;

(iii) has a droop setting 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 **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 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 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 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 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 15 minutes after receiving the **dispatch**, for a **dispatch** with a time (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 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:

(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 resource;

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

(e) a point 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) 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

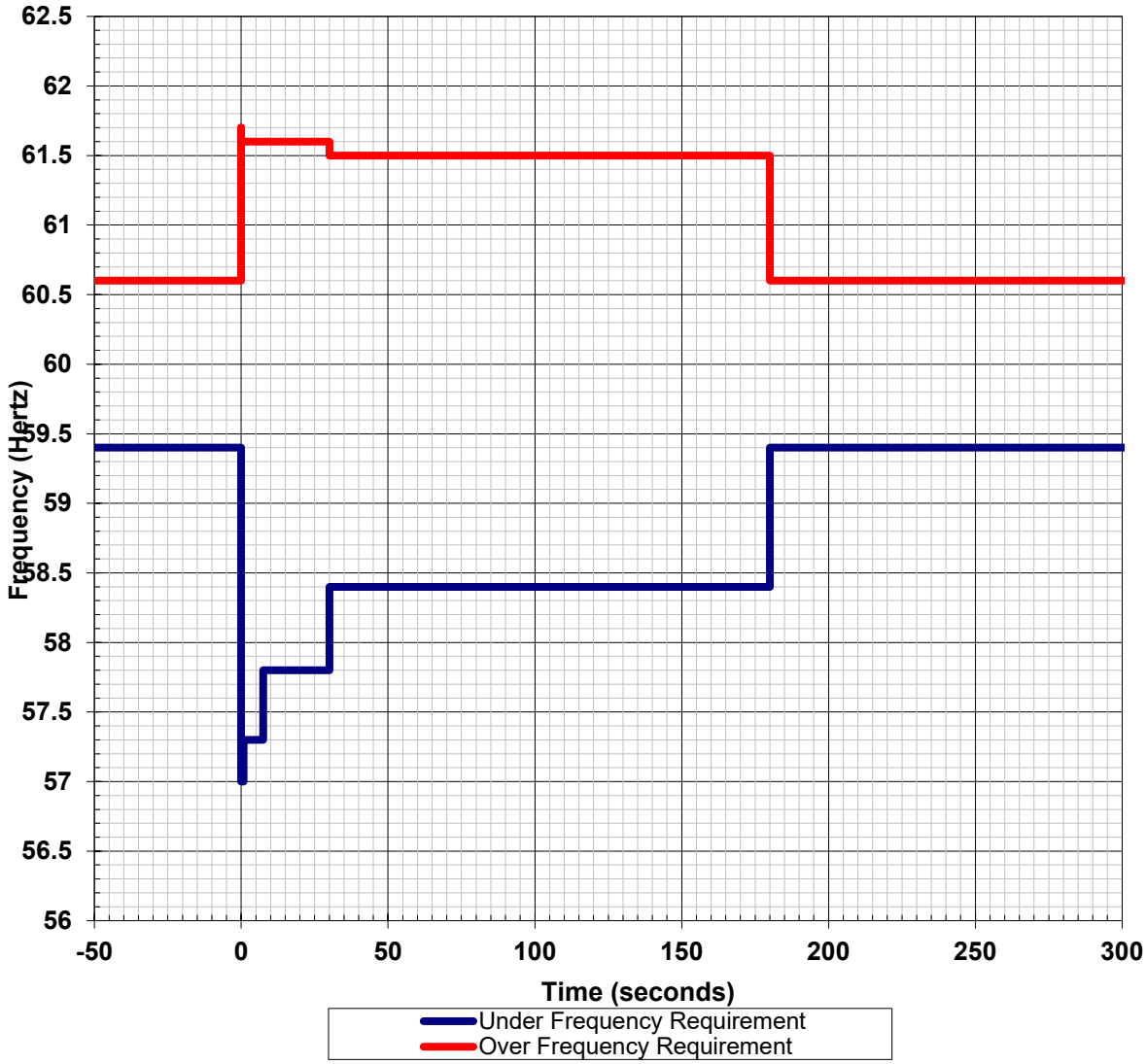
Appendix 1 – *Frequency Ranges*

Revision History

Date	Description
2024-04-01	Amended, as approved in **Commission** Decision 28176-D01-2023 issued on June 13, 2023.
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