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;

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(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
2024-04-01	Initial release.

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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

* The area outside the "No Trip Zone" is not a " Must Trip Zone."