Technical Rules interpretation notification: Clause 3.3.4.4 Frequency control

In response to questions regarding frequency control requirements, we can advise that the Technical Rules clause 3.3.4.4 Frequency control applies as follows:

1. Clause 3.3.4.4(d) Dead band

"The dead band of a generating unit (the sum of increase and decrease in power system frequency before a measurable change in the generating unit's active power output occurs) must be less than 0.05 Hz."

This clause defines the maximum dead band value, that is, the total governor non-response zone. This is the increase and the decrease in power system frequency which must be added together to determine the dead band. In practice, a dead band setting such as plus and minus 0.025 Hz is acceptable, as is illustrated in Figure 1.

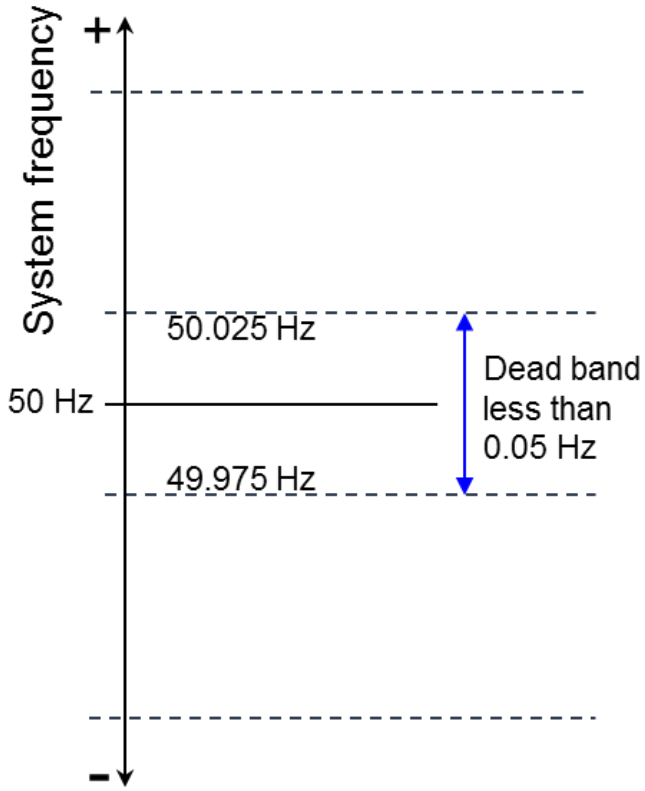

Figure 1 – The frequency control 'dead band' of a generating unit

2. **Clause 3.3.4.4(e)(1)(A) Control range, for dispatchable generating units**

   "The overall response of a dispatchable generating unit for power system frequency excursions must be settable and be capable of achieving an increase in the generating unit's active power output of not less than 5% for a 0.1 Hz reduction in power system frequency (4% droop) for any initial output up to 85% of rated output."

This clause quantifies the required response in under frequency situations. For any initial output up to 85% of rated output a generating unit must increase active power with 4% droop during under frequency excursions. A generating unit must be capable of operation in a manner to sustain high initial response of clause 3.3.4.4 (b).

3. **Clause 3.3.4.4 (e) (1) (B) Control range, for dispatchable generating units**

   "A dispatchable generating unit must also be capable of achieving a reduction in the generating unit's active power output of not less than 5% for a 0.1 Hz increase in system frequency provided this does not require operation below the technical minimum."

This clause quantifies the required response in over frequency situations. A generating unit must reduce active power with 4% droop during over frequency excursions (this operation is not required below the technical minimum of output). A generating unit must be capable of operation in a manner to sustain the high initial response of clause 3.3.4.4 (b).

4. **Clause 3.3.4.4 (e) (1) (C) Control range, for dispatchable generating units**

   "For initial outputs above 85% of rated active power output, a generating unit's response capability must be included in the relevant connection agreement, and the Generator must ensure that the generating unit responds in accordance with that connection agreement."

This clause requires documentation of the frequency control capability in the access contract for initial outputs above 85% of the rated active power output.

This clause does not remove the need to provide frequency control for initial outputs above 85% of the rated active power output. Western Power would normally expect the frequency control capability to be the same as that for initial outputs below 85% of the rated active power output.

5. **Other requirements of the Technical Rules apply, in addition to those explained here.**