

Review of the Frequency Operating Standard

Final determination published for stage one of the review of the frequency operating standards

The Reliability Panel has determined a new frequency operating standard (the FOS) that relates to the operation of the National Electricity Market by the Australian Energy Market Operator (AEMO).

The review of the frequency operating standard

The Reliability Panel (Panel) is undertaking a review of the FOS that applies for Tasmania and for the mainland NEM. The FOS defines the acceptable frequency range for different operating states or following events that can occur within the power system, such as:

- Normal operating conditions, where generation and load are balanced.
- Credible contingency events, (including tripping of generation or load, or unplanned network outages).¹
- Emergency conditions related to non-credible contingency events (including loss of multiple generation or network elements, or the separation of a region or sub-network forming an electrical island)

Staged approach to the review

The Panel is undertaking this review in two stages. This staged approach reflects the various ongoing reviews of market and regulatory arrangements that are likely to have an impact on the Panel's assessment of the FOS.

Stage one is addressing primarily technical issues and market framework changes stemming from the new emergency frequency control scheme rule, including the new category of protected contingency event in the FOS.²

Stage two will consider the settings of the frequency bands and time requirements for maintenance and restoration of system frequency. The Panel recognises the dependencies for progressing stage two of the review with the potential of changes to the market and regulatory arrangements being considered by the AEMC through the *Frequency control frameworks review*. In particular the Panel recognises the relevance of any developments relating to primary frequency control and governor response during normal power system operation with the assessment of the normal operating frequency band. Therefore stage two will commence at a later date when the *Frequency control frameworks review* is further progressed.

The Panel has published a final determination which sets out the Panel's considerations in relation to the revised FOS for stage one of the review. This FOS is effective from 14 November 2017.

¹ The AEMC Fact sheet: *What is a protected event?*, provides a description of contingency events. The fact sheet is available at:

<http://www.aemc.gov.au/getattachment/e5a68389-611d-4e15-b89b-41ee5a74c3c5/Fact-sheet.aspx>

² AEMC, *Emergency Frequency Control Schemes*, final determination, March 2017.

See: <http://www.aemc.gov.au/Rule-Changes/Emergency-frequency-control-schemes-for-excess-gen>

The Panel has determined a revised FOS following completion of stage one of the review.

The new FOS is effective 14 November 2017.

Stage one final determination

The new FOS includes the following key changes:

- *The inclusion of a FOS for protected events* - The revised FOS states that following a protected event, the frequency should remain within the emergency frequency excursion tolerance limits.
- *A revised requirement relating to multiple contingency events* - The revised requirement requires AEMO use reasonable endeavours to stabilise and restore the power system following non-credible contingency event and multiple contingency events that are not protected events.
- *A revised definition of 'generation event'* – The revised definition includes the sudden, unexpected and significant change in output from one or more generating systems of 50MW or more within a 30 second period.
- *The revision of the definitions in the FOS relating to island operation* - The revised definition maintains the key elements of the existing definition of an island with the addition of a new requirement, that an island must be at least the equal to or greater than an inertia sub-network.
- *A revised limit for accumulated time error in the mainland* – The limit for accumulated time error that applies for the mainland is increased from 5 to 15 seconds. The limit of accumulated time error in the FOS for Tasmania remains at 15 seconds.

This new FOS is effective 14 November 2017.

Issues and timing for Stage two of the review

Issues for stage two

Stage two of the review will commence at a later date when the *Frequency control frameworks review* has been further progressed. Stage two will involve an assessment of each of the elements of the FOS, including the boundaries of the various frequency bands and the timeframes for restoration of power system frequency following a specific event.

During stage two the Panel will also consider whether it is appropriate to retain the current limit in the FOS on accumulated time error and whether the FOS should include a limit on the rate of change of frequency (ROCOF).

Timing for stage two

The terms of reference for the review of the FOS require that the review be finalised by the end of July 2018. This is in line with recommendation 2.3 from the Finkel Panel report, *Independent Review into the Future Security of the National Electricity Market – Blueprint for the Future*, which recommends that by mid-2018 AEMO and the AEMC consider the costs and benefits of tightening the frequency operating standard.³

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³ Finkel Panel, June 2017, *Independent Review into the Future Security of the National Electricity Market – Blueprint for the Future*, pp.21,61.