INFORMATION

Review of the Frequency Operating Standard

Issues paper pubished for frequency operating standards review

The Reliability Panel has published an issues paper seeking stakeholder comment on issues relating to the frequency operating standard (the FOS) that applies to power system frequency in the National Electricity Market.

What is the frequency operating standard?

In the National Electricity Market (NEM), electricity is supplied through an alternating current power system that operates within a set frequency range around 50 Hertz (Hz).

The FOS defines maximum acceptable frequency deviations for different types of 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 an unplanned network outage).[1]
- 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)[1]

These requirements then inform how AEMO operates the power system, including:

- The application of technical standards that apply to generator and network equipment.
- How generators are dispatched, in order to manage the potential consequences of credible contingency events.
- The procurement of frequency control ancillary services (FCAS), that are capable of rebalancing generation and load to respond to frequency disturbances.
- The coordination of emergency frequency control schemes, such as automatic load or generation shedding schemes, which react to large frequency disturbances to rebalance the power system and maintain system security.

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 issues paper sets out the Panel's approach to the review and sets out a number of issues on which stakeholder comment is sought.

The Panel is proposing to complete 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 ability to effectively assess the FOS.

In particular, the Panel recognises the interactions between this review and the AEMC's *Frequency control frameworks* review. This review will consider the market frameworks necessary to support better frequency control and commenced on 7 July 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

The reliability panel is undertaking the review of the frequency operating standard in two stages.

Staged approach to the review

Stage one will commence immediately and address primarily technical issues and market framework changes stemming from the new emergency frequency control scheme rule, including the inclusion of the new protected event contingency category in the FOS.[2]

Stage two will consider the settings of the frequency bands and time requirements for maintenance and restoration of system frequency. Stage two will commence at a later date when the *Frequency control frameworks review* and other related work identified in the issues paper is further progressed.

Issues for consultation through stage one of the review

The Issues Paper for the review of the FOS standard seeks stakeholder comment on the following issues.

Issues arising from the emergency frequency control schemes rule

On 30 March 2017, the AEMC published the emergency frequency control schemes rule. This rule clarified the process for the planning and operation of emergency frequency control schemes which help restore the power system in the event of severe contingency events. A protected event must be managed to maintain the stable operation of the power system, while allowing for any necessary automatic generation and load shedding through the operation of emergency frequency control schemes.

In response to this rule the panel is reviewing the FOS to:

- include settings in the standard to apply in the event of a protected event
- consider whether any additional clarification should be provided in the standard as to the expected operational approach to multiple contingency events that are not protected events.

Guidance on the characteristics of a power island

The Tasmanian and mainland NEM FOS each include frequency standards that apply to a power island formed as the result of a separation event.

The Panel is considering whether or not the FOS should contain further guidance on the characteristics of a viable power island.

The requirement for a maximum accumulated time error

The Tasmanian and mainland NEM FOS currently include a maximum amount of accumulated time error that must be maintained by AEMO as they operate the power system. This requirement dates back to a time when clocks that were synchronised with the system frequency were more common and it was necessary to limit the accumulated time error to maintain accurate time keeping. While some consumer appliances still use the power system frequency to keep time, the cost and system security implications of maintaining this requirement may exceed the cost of removing or relaxing it.

Therefore, the Panel is considering whether there is a basis for relaxing or removing the maximum accumulated time error requirement from the FOS.

Approach and issues for stage two of the review

The review of the FOS is one part of an integrated approach to addressing current challenges relating to maintaining system security as the NEM undergoes technological transformation. The ongoing review processes particularly relevant to the Panel's review of the FOS include:

- The requirement for a minimum level of inertia to manage the rate of change of frequency in the power system. This is being considered by the AEMC through the *Managing the rate of change of power system frequency* rule change.
- Changes to the requirements for generator performance with respect to frequency, such as the potential introduction of a mandatory governor response capability. This is being considered through the AEMC's *Frequency control frameworks review*.

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[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

Stakeholders are invited to comment on the issues being considered in stage one and on the proposed approach to stage two of the review.

Submissions are due by 1 August 2017.

Stage two the review of the FOS will commence at a later date when these issues have been further progressed. At this stage the Panel anticipates that stage 2 of the review will be completed before mid-2018. The Panel invites stakeholder comment on this approach.

Background

On 30 March 2017, the AEMC provided Terms of Reference to the Panel to initiate a review of the FOS.

Among other things, the Terms of Reference require the Panel to give consideration to:

- Whether the terminology, standards and settings in the FOS remain appropriate.
- What amendments to the FOS may be necessary in light of the AEMC's final determination of the Emergency frequency control schemes rule change published on 30 March 2017.
- Whether further guidance can be provided regarding the definition of what part of the power system the FOS is to be applied following separation from the rest of the NEM. Specifically, whether the FOS should refer to a separated region, or some smaller subsection of a region, for maintenance of frequency following a separation event.

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