



20 October 2017

Neville Henderson
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submitted online: www.aemc.gov.au

REF: REL0065

Dear Mr Henderson

AEMC RELIABILITY PANEL – REVIEW OF THE FREQUENCY OPERATING STANDARD

Origin Energy Limited (Origin) welcomes the opportunity to comment on the review of the frequency operating standard (FOS) presented by the AEMC Reliability Panel.

Stage 1 – Draft Determination

The Reliability Panel's findings for Stage 1 are generally supported by Origin. The introduction of the protected events category should identify a number of non-credible contingencies that AEMO can plan for, and the settings for frequency excursion tolerance limits appear sound.

The existing FOS requires AEMO to maintain the power system frequency within extreme frequency excursion limits following *any* multiple contingency event. The draft determination allows AEMO to 'use reasonable endeavours' to maintain frequency within the FOS. This allows a slight relaxation of AEMO's obligation and Origin supports this change on the basis that the costs involved in managing, a potentially unlimited number of non-credible or multiple contingency events would be high when weighed against the probability of occurrence.

There was additional commentary from stakeholders that AEMO should not be required to manage frequency for non-credible or multiple contingency events and that this obligation should be removed. Origin does not support this viewpoint, and as above, supports maintaining a clear obligation on AEMO to manage frequency within the FOS for these types of events.

Origin supports relaxing the accumulated time error from 5 seconds to 15 seconds to determine if there are any unintended consequences that may affect NEM participants. Removal of the limit entirely during Stage 2 of the FOS review is premature. A longer evaluation period, (e.g. until the next FOS review) would allow for the effects of the time error change to be evaluated, thus giving a clearer view of potential removal and overall ensuring minimal impact on participants.

The addition of a generation event to include a sudden increase or decrease in generation of 50MW or more is welcome. Allowing AEMO to utilise both Regulation and Contingency FCAS should enable lowest priced outcomes to be achieved. While large scale solar farms are the target of this FOS inclusion, the Panel should also consider the rapid and co-ordinated movement of solar/battery systems from a DER standpoint and the impact they will have on maintaining stable frequency. There is also potential for increasing frequency oscillations as batteries switch between load and generation and vice versa. Co-ordination of these services will exacerbate this issue which must be considered in Stage 2 when setting the frequency operating bands.

Finally, Origin is comfortable with the definition of an electrical island aligning with the inertia sub-networks. This will allow consistency in the definition of an electrical island across SRAS and that found in the AEMC's review in managing rate of change of frequency.

Stage 2 – Setting the Frequency Operating Bands

There are a few high-level considerations that the Panel should consider when setting the boundaries across the three different frequency bands including:

- The availability of Regulation and Contingency FCAS across the NEM currently and into the future.
- The interaction between the Frequency Control Frameworks Review and the impact that generator governor settings (including mandatory droop control) would have on availability of services and setting the frequency boundaries.
- Increasing levels of frequency fluctuations and the ability to contain those, both within the frequency bands and with existing/future services.
- General discussion on defining credible contingencies.

The Panel discusses the trade-off between Regulation and Contingency services when setting the normal operating frequency bands. Widening or tightening the frequency band will cause changes in the required levels of Regulation and Contingency FCAS and the Panel is right to examine the appropriate trade off in these services. Origin would note that the FCAS market is currently valuing Raise FCAS, both Regulation and Contingency, as similarly priced. This is because higher wholesale energy prices are dictating that any reduction in generator output to supply Raise services must account for the loss of income from reduced output. Thus, any consideration by the Panel on the widening or tightening of frequency bands must consider current and future availability levels, as well as historical pricing of these services.

Origin believes that the outcomes of the Frequency Control Frameworks Review will have the largest impact on setting the frequency bands which will likely affect the level and availability of frequency control services offered to the market. It is imperative that the Panel take into account the effect of these changes before setting the frequency operating bands as any changes by this review will affect how generators operate within the NEM. Mandating governor settings, droop control and the interaction between good frequency control, causer pays factors and meeting 5 minute AGC targets should all be considered by the Panel's when determining the optimum settings for the frequency bands.

The NEM has recently experienced increased levels of frequency fluctuations as the number of non-synchronous generators increase as a proportion of total NEM generation. As frequency moves away from 50Hz, the greater the deviation, the greater the level of response required to return the frequency back within acceptable limits. From a generators perspective, greater wear and tear costs are incurred when the rate of change of frequency is high and the number of frequency excursions increases. For this reason Origin does not support increasing the level of frequency excursions from 1% and believe this level should be maintained to prevent greater wear and tear costs eventuating. It is also likely to reduce the quantum of contingency services required to return frequency back to 50Hz. The Panel should also take this point into account when determining if a wider frequency band is optimal.

The ability to contain frequency fluctuations quickly could be influenced by the introduction of a Fast Frequency Response (FFR) market. Pending the findings of the AEMC Frequency Frameworks Review, this market may provide an effective Contingency service that can return frequency back within acceptable operating limits quicker than current services. Again, the potential introduction of this service should be taken into account when determining the appropriate frequency operating bands.

Should you have any questions or wish to discuss this information further, please contact James Googan on james.googan@originenergy.com.au or (02) 9503 5061.

Yours sincerely,



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