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Reliability Panel
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Dear Panel Members

Lodged electronically: www.aemc.gov.au (REL0065)

AEMC Reliability Panel, Review of the Frequency Operating Standard, Issues Paper, 14 July 2017

EnergyAustralia is one of Australia's largest energy companies with over 2.6 million electricity and gas accounts in NSW, Victoria, Queensland, South Australia, and the Australian Capital Territory. We also own and operate a multi-billion dollar energy generation portfolio across Australia, including coal, gas, and wind assets with control of over 4,500MW of generation in the National Electricity Market.

EnergyAustralia appreciates the opportunity to comment on the Review of the Frequency Operating Standard (FOS) Issues Paper. We note the two-stage process, and support the Reliability Panel in delaying review of the specific settings of the FOS to ensure this can take into account the outcomes of the Australian Energy Market Commission's (AEMC) other review processes relating to frequency control within the National Electricity Market (NEM).

Approach to assessment

The Issues Paper asks what settings in the FOS are best defined through a cost-benefit trade-off. We consider that the parameters defining normal operating bands and single contingencies are the most appropriate to be assessed by means of a cost-benefit analysis. This is due to these parameters being related to system normal for the operation of the NEM. The assessment of the costs imposed by these settings is therefore clearly weighed against the benefits provided.

While we consider that assessing protected events and multiple contingencies in terms of cost-benefit is also appropriate we also note that the cost benefits analyses of such events are not as straightforward to assess as those within normal operating bands. The consequences of such events may be significant (if unlikely) and there may be a judgement about whether the cost of a mitigation in appropriate given the risk involved. Such judgements are not typical of cost benefit analysis; however, there is a case to be considered where relatively small investments may mitigate the potential for very high consequence (albeit unlikely) events. The need for such judgements to be made appears to arise from

consumer desires for more reliable supply than is embedded within the reliability standard. Anecdotal evidence suggests that the current environment of rising prices, coupled with observed load shedding, is lessening the public tolerance for supply disruptions.

Despite the rarity of multiple contingencies (and it is assumed protected events), system security based market interventions are occurring within the existing market, particularly where any form of load-shedding or supply interruption occurs. They have tended to be imposed on a reactive, unpredictable, non-transparent basis, which can then pose costs to consumers and market participants. The sorts of interventions observed to date include discretionary limits on the Heywood interconnector, wind generation being constrained off, directions on synchronous generation and new requirements on generation units. In this regard, where mechanisms for frequency control are being implemented, transparency is essential to allow the market to identify and reliably predict where these interventions are happening and when they are likely to occur.

In looking at what criteria should be considered in reviewing and determining the settings in the FOS, we would note it needs to be determined whether the present settings are the key driver of what appears to be increasingly poor frequency control within the NEM. Information provided to the AEMC's system security market frameworks review[1] and then expanded upon in the Issues Paper has shown a looser distribution of frequency within the NEM. That is, the distribution of frequency is increasingly flattening out across the normal operating band, as defined in the FOS. It has been noted that this behaviour is consistent with the settings in the FOS. However, we are concerned that this indicates a far less secure power system that is less likely to have less ability to resist frequency collapse post-contingency.

In broad terms, we consider that some key aspects of reviewing the FOS include:

- Examining what good frequency control within the NEM is. This includes assessing the benefits of the tighter distribution of frequency seen in previous years, particularly prior to 2016. The review should look at why the current broader distribution is occurring, what potential impacts it is likely to have on the market and what role the FOS has in driving any required change to this distribution.

- Identifying the key drivers for changes to the requirements regarding frequency control into the future. This should include a framework for ongoing monitoring of frequency control against specific indicators to ensure that the FOS is appropriate in a transitioning market.

- Where possible the FOS should ensure the grid can provide good frequency control through expected technology changes, including but not limited to:

    - Increasing asynchronous generation with limited frequency control contribution

    - New generation technologies that have a potential to cause frequency deviations – such as fast ramping energy sources

    - Increased behind-the-meter response

- Integrating the outcomes of reviews into the overarching frequency control frameworks. This includes the FOS, Frequency Control Ancillary Service Markets and relevant technical obligations on market participants. This requires taking into account

[1] Pacific Hydro, 6 February 2017, Submission to the AEMC's Interim report – System Security Market Frameworks Review, p.4.

the work of the Ancillary Services Technical Working Group and AEMC's Frequency Control Frameworks Review.

Protected Events

A key component of this first stage of the review is related to the integration of the protected event category into the National Electricity Rules. This new category seeks to ensure that for specific contingencies there is a level of additional protection due to the potential consequences of the event. Our view is that at the present time this new category is likely to be primarily utilised for the management of such events on the Heywood double circuit interconnector. The incident of 28 September 2016, where a non-credible contingency occurred and was unable to be arrested through existing frequency control and load shedding schemes demonstrated the potential consequences of such events. Contingencies on other interconnectors may also be subject of reclassification to this new category.

The use of the protected event category seeks to allow for a more bespoke level of management of system security in order to prevent similar outcomes to the 28 September events. In our view, this will require a trade-off between the additional costs required to manage more proactively, what was previously defined as a non-credible contingency, against the potential costs of the existing emergency frequency control schemes failing to manage a contingency.

As part of the AEMC's final determination on the Emergency Frequency Control Scheme Rule change, an interim standard was imposed in respect of any protected events. This was defined as[2]:

> "*For a protected event, system frequency should not exceed the applicable extreme frequency excursion tolerance limits and should not exceed the applicable load change band for more than two minutes while there is no contingency event or the applicable normal operating frequency band for more than 10 minutes while there is no contingency event.*"

This standard sets the frequency limits to those currently defined for non-credible multiple contingency events at the extreme frequency excursion tolerance limits. However, unlike the almost unlimited variations of multiple contingencies (discussed below), protected events are likely to be discrete scenarios. There is likely to be a greater understanding of the consequence of the event occurring, in addition to what other interactions the event will have within the power system.

The review will need to consider if the identified consequences of the protected event occurring justify tighter frequency limits, which would come at an increased cost of managing them. Tighter frequency limits may provide greater insurance that the system could be brought back to a secure operating state following a protected event, or prevent system collapse were another contingency to occur soon after the protected event.

Such a consideration must take into account the added cost to the market in proactively managing the system in order to meet this standard, versus the potential consequences of a protected event occurring. We consider that the ultimate goal of the Reliability Panel should be to keep the parameters as close to the appropriate non-credible contingency definition as possible.

[2] Reliability Panel. Issues Paper. Review of the Frequency Operating Standards. 14 July 2017. p.39.

It may be that the setting of a blanket standard for all protected events could lead to the conclusion that management of such events not being fit for purpose in all circumstances. Depending on the specification of protected events, there may be some that have more severe consequences and require the imposition of a more stringent standard. However, this could create issues of complexity, if there were to be a large number of contingencies classified as protected events. The review should consider whether having a more targeted standard for each protected event may more adequately allow for the appropriate level of management at the lowest cost to consumers, or alternatively, that consistency of approach may in fact allow for more cost-effective management of these events.

Multiple-contingency events

Our main concern with the FOS requirement for multiple contingencies to be managed in a way that contains them within the extreme frequency excursion tolerance limits, is that there is no way to define a likely impact on the power system for a multiple contingency event. As discussed in the Issues Paper, the potential combination of multiple contingencies is unlimited. If this current FOS requirement is simply to provide a general obligation on the market operator, as set out in the Issues Paper, then we consider it should be reviewed to see if it is drafted in an appropriate fashion. Alternatively, it should be replaced with a more targeted obligation for the market operator to meet in preventing system collapse following multiple contingencies.

We look forward to engaging with the Reliability Panel on this issue as the review progresses.

If you would like to discuss this submission, please contact Chris Streets on (03) 8628 1393 or at chris.streets@energyaustralia.com.au.

Regards

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