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Chairman
Australian Energy Market Commission Reliability Panel
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Review of the Frequency Operating Standard Issues Paper – REL0065

Energy Networks Australia welcomes the opportunity to make a submission to the Australian Energy Market Commission (AEMC) Reliability Panel's Frequency Operating Standards (FOS) Issues Paper released on 11 July 2017.

Energy Networks Australia is the national industry body representing businesses operating Australia's electricity transmission and distribution and gas distribution networks. Member businesses provide energy to virtually every household and business in Australia.

Energy Networks Australia is supportive of the staged approach to the review to ensure assessment of the FOS takes account of the various on-going reviews of market and regulatory arrangements.

Given the compressed timeframe for consultation on Stage 1, Energy Networks Australia will engage further with the Reliability Panel (the Panel) following the release of the Stage 1 Draft Determination and Standard and into Stage 2, should matters raised in this earlier stage not be adequately addressed.

Energy Networks Australia member business, TasNetworks will be providing its own submission to address particular issues in the Tasmanian jurisdiction.

Energy Networks Australia notes that Stage 1 of the review focusses on the following key issues:

- » Implementation of the emergency frequency control schemes (EFCS) 2017 rule, including the inclusion of a frequency standard for 'protected events' in the FOS and the treatment of multiple contingencies in the FOS;
- » Guidance in relation to the definition of an electrical island;
- » Other issues for consideration including the requirement for a maximum accumulated time error in the FOS and definitions of terms in the FOS; and
- » A potential approach for Stage 2 of the review.

Issues arising from the EFCS rule

Energy Networks Australia notes that Stage 1 of the review primarily seeks to address technical issues and market framework changes arising from the EFCS rule and the new 'protected event' category in the FOS. Under the new framework, transmission network service providers (TNSPs) will play a key role in the planning and operation of EFCS, including the design, implementation and monitoring of EFCS in accordance with 'protected event' standards established by the Panel. Consequently, Energy Networks Australia's submission primarily focuses on issues related to that rule change.

It is important that the range within the FOS provides a clear design envelope for the power system, while also still recognising the need for pragmatic responses in the case of 'non-credible' contingencies and multiple contingency events. The Panel's Interim FOS is useful as it aligns with existing requirements and values for 'non-credible' contingencies, and helps to formalise actions TNSPs and the Australian Energy Market Operator (AEMO) would undertake on a 'reasonable endeavours' basis in such a situation. The introduction of the 'protected event' term as a sub-set of 'non-credible events' defined by AEMO and declared by the Panel, is supported.

In the case of Tasmania, this may apply to a partial or complete failure of the special (frequency control) protection scheme for Basslink and result in the invocation of the related Under Frequency Load Shedding Scheme. For South Australia, specific electrical islanding events could potentially be categorised as a 'protected event'.

Multiple contingency events in the FOS

Energy Networks Australia notes the Panel's concerns in relation to AEMO's obligations after a multiple contingency event. In the discussion on page 40 of the Issues Paper, the Panel suggests:

"...it may also be argued that removal of part B(f) [of the FOS] means that AEMO would face no obligation to manage the system for any event that falls outside the definition of a protected event".

Energy Networks Australia proposes that this matter could be potentially addressed through, introducing a requirement in the FOS that AEMO act on a "reasonable endeavours" basis. This could be similar to the requirement that:

"A Registered Participant must co-operate with a Network Service Provider to achieve stable operation of the national grid and must use all reasonable endeavours to negotiate with the Network Service Provider regarding the installation of emergency controls ..." for System Stability obligations and purposes under S.5.1.8 of the National Electricity Rules (NER).

Guidance in relation to the definition of an electrical island

Energy Networks Australia notes the Panel is aware of the need to holistically address linked issues including: the definition of 'protected events', prospective needs for minimum levels of inertia, and the definition of an electrical sub-network for the purposes of the Panel's System Restart Standard¹. Some of these matters remain unresolved as part of on-going consultation processes. Therefore, Energy Networks Australia considers the definition of 'electrical island', should not be finalised before these outstanding issues can be adequately resolved.

Energy Networks Australia considers there are strong similarities in what constitutes an electrical island in the various regulatory frameworks that relate to the management of power system frequency and power system security. Accordingly, Energy Networks Australia considers there is a need for alignment in the criteria and definitions for electrical islands relating to the FOS, 'protected events' and minimum inertia requirements.

Importantly however, there should be provision for FOS thresholds to take account of specific needs for different islands and requirements between jurisdictions. Various regions have quite distinct and idiosyncratic characteristics, for e.g. Tasmania and South Australia. It appears a particularly important consideration for NEM regions encountering a high proportion and growing numbers of semi-scheduled generation.

Energy Networks Australia welcomes any further AEMO guiding principles for the purposes of its frequency related responsibilities on the characteristics of what may be considered a viable electrical island. Energy Networks Australia does not see that there is any need for any specific alignment between the electrical sub-networks for SRAS and the electrical islands under the FOS. As the Panel is aware, System Restart Ancillary Services (SRAS) is quite different in that it deals with the consequences of failing to form a viable electrical island.

Definitions of terms in the FOS

Energy Networks Australia is supportive of an examination of potential amendments to the current definition of a 'generation event' so it is more operationally realistic. Currently the term is defined as follows:

"a synchronisation of a generating unit of more than 50 MW or a credible contingency, not arising from a network event, a separation event or a part of a multiple contingency event."

The Issues Paper at footnote 17, p.13 explains:

"This is commonly interpreted to mean: a credible contingency event relating to the failure or disconnection, of a generating unit of more than 50MW. Note that the definition

¹ Refer to page 41 of the Issues Paper.

of a generation event in the FOS for Tasmania is worded slightly differently as: “a synchronisation of a generating unit of more than 50 MW or a credible contingency event in respect of either a single generating unit or a transmission element solely providing connection to a single generating unit, not arising from a network event, a separation event or a part of a multiple contingency event”.

This tends to focus on the sudden or unexpected tripping of a generator, and does not overtly account for the sudden and unexpected increase or decrease of generation output. Energy Networks Australia agrees with the Panel’s assessment that this should not be discounted as a likely future scenario.

The requirement for a maximum accumulated time error in the FOS

Energy Networks Australia considers that the accumulated time error for synchronous clocks is a lower-order priority for various parties. However, one potential approach for the Panel’s consideration is to initially replace the error standard with a guideline, as a means to an eventual removal. Energy Networks Australia acknowledges that the accumulated time error standard is one measure of overall system performance (monitored and reported on by AEMO), but is not an issue that markedly influences power system security and/or reliability². Energy Networks Australia and its members would be willing to participate in any Panel convened forum to discuss whether maintaining the accumulated time error issue is warranted ahead of its Stage 1 Draft Determination. Ideally, this could take place in mid to late August 2017.

Energy Networks Australia also recommends that the Panel review the application of the Restoration Range in Table B.4 NEM Mainland Frequency Operating Standards – Rule terms, at page 58 of the Issues Paper for applicability.

² As discussed on page 15 of the Issues Paper.

Potential approach for Stage 2

In addition to the matters noted in the Issues Paper for consideration in Stage 2 of the review, Energy Networks Australia suggests the following additional issues for further consideration by the Panel.

Issues for further Reliability Panel consideration

Energy Networks Australia suggests that the Panel consider the inclusion of a rate of change of frequency (ROCOF) limit to be potentially moved to the FOS, outside the existing NER. The most appropriate time to deliberate such an issue is as part of Stage 2 of the Panel's review process. Currently, the ROCOF withstand capability is defined in Schedule 5.2.5.3 of the NER, but the actual visibility of ROCOF limitations is becoming operationally challenging.

These have been expressed in terms of the minimum and automatic access standards, with the (i) Minimum set at 1 Hz/s, and (ii) Automatic set at 4 Hz/s.

- » TNSPs are concerned that when new generators connect at the *minimum access standard* level, that this could lead to problematic future outcomes for the overall power system. There may be scope for the Panel to examine a benchmark ROCOF above the existing *minimum access standard*. This could help to minimise the prospect of the concurrent loss of multiple generators and/or insufficient Frequency Control Ancillary Services capacity during frequency contingencies.
- » As part of any such changes, AEMO may need to enforce a mandatory minimum capability in the FOS, and is one of the many elements likely to be considered as part of AEMO's impending rule change proposal on Technical and Generator Performance Standards involving possible amendments to Schedule 5.2 of the Rules.
- » Finally, the Panel may consider what role the FOS can play in supporting the implementation of switching controllers in an attempt to reduce the probability of frequency 'overshoot' outcomes.

Energy Networks Australia looks forward to on-going engagement with the Panel and the wider industry as part of the FOS consultation process, as well as playing an integral part of the AEMC's impending [Frequency control frameworks review](#).

Should you have any additional queries, please feel free to contact Norman Jip, Energy Network Australia's Senior Program Manager - Transmission on (02) 6272 1521 or njip@energynetworks.com.au.

Yours sincerely



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