



EnergyAustralia

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Dear Commissioners

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Lodged electronically: www.aemc.gov.au (ERC0212, ERC0213)

AEMC 2016, Emergency under-frequency control schemes/Emergency over-frequency control schemes, Consultation Paper, 8 September 2016

EnergyAustralia is one of Australia's largest energy companies with over 2.5 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.

We welcome the opportunity to contribute to this important topic. Our customers expect a secure and reliable energy system and this should be a priority for the entire energy supply chain. The National Electricity Rules (the Rules), as they are currently drafted, already provide mechanisms to improve system security which should be progressed without delay. However improvements to the clarity of obligations with respect to system security are needed.

Establishing an Over-Frequency Generation Shedding (OFGS) scheme

AEMO has begun consultation on an OFGS scheme to be implemented in SA. The scheme is to be implemented under the Rules¹ which require Network Service Providers (NSPs) to plan and operate their network in a way to reduce the risk of cascading failures for any credible or non-credible event. We support this action and believe measures should be implemented as soon as possible to prevent further disruption to the electricity supply of South Australian customers.

Under-Frequency Load Shedding (UFLS) and OFGS schemes are low cost measures to ensure the system can be returned to a satisfactory operating state following an event with minimal disruption. For low-likelihood, non-credible events - such as the double line trip of the Heywood interconnector - customers will benefit from relying on load-shedding rather than additional transmission constraints or significant capital investment, which have the potential to materially increase the cost of electricity.

¹ S5.1.8 NER

The Rules do not currently include an explicit framework for OFGS as they do for UFLS. Harmonisation of these two corresponding schemes in the Rules is appropriate to provide clarity and consistency. The general principles for maintaining power system security² outline that adequate load shedding facilities be available to manage significant multiple contingency events. This should be expanded to generation shedding, and reworded as an obligation to meet the *system security standards*.

AEMO is currently progressing design of an OFGS scheme. Any changes to the Rules beyond those required for improvements, should ensure minimal disruption to any existing scheme.

Any amendments required to the Rules which would remove limits to the implementation of the most appropriate shedding schemes should be progressed immediately. For example, communication-enabled relays that respond to network events beyond frequency changes should not be excluded from consideration. However it does appear that under the Rules³ NSPs are required to install whatever emergency controls are required to manage cascading failures after either credible or non-credible events.

It is also appropriate for the South Australian jurisdictional system security coordinator to re-examine their approach to separation events.

Rate of Change of Frequency (RoCoF)

It may be determined that system security is compromised by excessive RoCoF following an event which cannot be managed by OFGS and UFLS. Modelling should be undertaken to ascertain the extent to which this applies. It is clear that AEMO understands the current schemes to be ineffective as a 3Hz/s RoCoF limit following the trip of the Heywood interconnector was implemented as a market constraint recently via Ministerial Order,⁴ and is now permanently in place. Improving the effectiveness of emergency control schemes to tolerate high RoCoF should be explored before this limit is considered a permanent fixture.

At a high level, RoCoF can be limited by either increasing inertia or decreasing the power imbalance following an event. Further limiting the flows on the Heywood interconnector to manage RoCoF would be a poor outcome for consumers given the recent investment to increase interconnection. Any RoCoF limits must be implemented alongside mechanisms to manage them efficiently.

Rule 3.11.6 allows dispatch of *network support and control ancillary services* (NSCAS) to increase power flow over a transmission network. If AEMO are able to contract for services to limit RoCoF under the Rules governing NSCAS, this provides a mechanism already in place to maintain a *secure operating state* while avoiding expensive constraints on interconnector flows.

The *power system security standards*⁵ developed by the reliability panel should explicitly contemplate RoCoF for clarity.

Protected Events

The consultation paper outlines the potential creation of a new contingency category of a 'protected event'. We have provided more detailed comments around the consideration of

² 4.2.6 NER

³ S5.1.8 NER

⁴ AEMO market notice no. 55222 04 October 2016 19:00

⁵ 8.8.3 NER

this proposal in our response to the AEMCs System Security Market Frameworks review. In that submission we discuss the existing powers for AEMO to re-classify contingencies in abnormal conditions and that the exercise of those powers may also need to be reviewed to ensure they are utilised effectively.

At present NSPs must consider non-credible contingency events in planning the power system.⁶ We expect that any 'protected event', which would include high impact or increased likelihood events, would currently be considered by the NSP under the existing framework. Therefore the creation of a protected event may not set a higher standard of system security.

However, we also agree that in reviewing the need for this protected event category consideration should be given to whether it provides a potentially lower cost way to mitigate risks due to abnormal system conditions that may not otherwise have resulted in re-classifying a non-credible contingency to credible. The cost vs benefit evaluation would need to be compelling to consider the introduction of a new event category, particularly in the context of the additional procedural complexity a new category would introduce.

Frequency Control

This paper focuses on schemes to re-establish a *satisfactory operating state* immediately following an event. A separate but related issue is the on-going management of the frequency within the *frequency operating standards* following separation. AEMO's current procedure is to procure FCAS in regions where a credible contingency would result in separation to ensure the services are available. This needs to be considered when designing the 'protected event' category contemplated in the Consultation Paper, as implementing local FCAS requirements pre-separation has been shown to be expensive.⁷

Regulation FCAS enables automatic load following and frequency control, optimising every five minutes over energy and FCAS markets. Consideration should be given to what mechanisms AEMO would rely on in the event of a non-credible event that caused limited regulation FCAS to be available and to what extent manual directions can substitute for non-AGC enabled plant or provide intra-dispatch interval targets. Given the rare and transitory nature of a separation event, greater manual control of generation to manage frequency following separation may be a more efficient solution.

Frequency excursions from non-scheduled generation and load reacting to volatile prices post separation may also exacerbate the issue and increase the amount of regulation FCAS that is required. A review of the cost recovery principles for regulation FCAS to ensure causers face a corresponding cost is warranted.

Conclusion

EnergyAustralia supports the establishment of an effective OFGS scheme. OFGS and UFLS are effective and low cost solutions to managing frequency under non-credible contingencies. In an environment where high RoCoF may impact on the utility of these schemes to operate as designed, we support the current work by both AEMO and AEMC to understand the potential problems and to identify suitable risk-based and cost effective solutions. We consider that setting RoCoF limits and establishing new categories for contingency events may assist in maintaining system security, but that more work needs to be done in assessing the various options identified as part of AEMO's Future Power System Security project.

⁶ S5.1.8 NER

⁷ AER Performance Report, FCAS prices above \$5000/MW - 11, 12 and 25 October 2015 (SA)

EnergyAustralia are keen to continue engaging with the Commission on issues relating to system security, to ensure the best outcome for customers. If you would like to discuss this submission please contact either Ben Hayward (03) 8628 4518 or Chris Streets (03 8628 1393).

Regards

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