9 February 2017

Mr John Pierce
Mr Neville Henderson
Dr Brian Spalding
Australian Energy Market Commission

EnergyAustralia Pty Ltd
ABN 99 086 014 968

Level 33
385 Bourke Street
Melbourne Victoria 3000

Phone +61 3 8628 1000
Facsimile +61 3 8628 1050

enq@energyaustralia.com.au
energyaustralia.com.au

Dear Commissioners

Lodged electronically: www.aemc.gov.au
(EPR0053)

AEMC, System Security Market Frameworks Review, Interim Report, 15 December 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.

System Security Market Frameworks Review

EnergyAustralia welcomes the opportunity to provide further input to the Review. We reiterate our support for this ongoing assessment of the current state of system security, as well as the identification of issues that may arise in the future and potential solutions to the these issues. However, as previously stated, we continue to have concerns about the coordination of a wide range of similar reviews and work programs. We note that some solutions are already being implemented by AEMO, while others are proposed through various Rule change proposals, and concurrent reviews of related issues are being conducted by a range of market and government bodies.

Notably, some actions have already been implemented, and various other projects are already underway, including:

- Adoption of a 3Hz/sec rate of change of frequency (RoCoF) transfer constraint limit on flows into and out of SA via the Heywood interconnector
- New requirements to ensure at least two synchronous generators are in service at all times in SA to provide appropriate system strength
- Redesign of the under frequency load shedding scheme (UFLS) in South Australia to allow for implementation of a hybrid involving relays that measure and act on RoCoF, as well as traditional relays that trip based on an absolute pre-set frequency value.

- Design and implementation of an over frequency generation shedding (OFGS) scheme in South Australia[1],
- A Regulatory Investment Test – Transmission to assess network and non-network options aimed at improving energy security, reliability and affordability in South Australia.

In the Review's Interim Report we note two of the key findings are that power system security would be enhanced by the inclusion of mechanisms to procure both Fast Frequency Response (FFR) and inertia. These findings could appear premature given the wide range of changes under consideration and in progress. We reiterate that the roles for inertia and FFR, as well as costs for implementing these schemes, should be assessed in light of any of the above potential solutions resulting from other current system reviews. The roles for FFR and inertia may be much reduced, or they may be critical, depending on other mechanisms used to manage RoCoF and system security more broadly. Our submission concentrates on providing comments relating to the preliminary conclusions relating to the need for FFR and inertia services.

The need FFR or inertia

EnergyAustralia supports the findings of the review, in so far as both FFR and inertia are identified as primarily assisting power system security by allowing other system security measures such as emergency frequency control schemes to operate. Schemes such as under frequency load shedding and over frequency generation shedding offer a technical safety net and low cost solution to ensuring that the power system remains in a secure state in the event of foreseeable but non-credible contingencies. However, we also note that the technical parameters for these schemes are not fully understood yet.

The concurrent reviews into system security by both AEMO and the Commission have identified RoCoF as being a fundamental risk to the operation of emergency frequency control schemes and therefore the continued satisfactory operation of the integrated power system. The reviews do not express a definitive view on the RoCoF limits that the power system is capable of withstanding and thus the specific requirements in terms of inertia under given circumstances. EnergyAustralia considers it essential that the work into better understanding generation performance and impacts of RoCoF on system security is prioritised as a means to determining the requirements for FFR and inertia services.

Against this lack of explicit understanding of the effects of RoCoF and the requirements for inertia, two market interventions have occurred subsequent to the SA black system event on 28 September 2016. Both of these have had significant impact on consumers and participants. The 3Hz/s RoCoF limit on the Heywood interconnector and the requirement for a minimum amount of synchronous generation (i.e. inertia) to be online have been imposed on the market without adequate understanding of whether these potentially costly measures are fit for purpose. EnergyAustralia understands that following the events of 28 September 2016 that some action was justified to reduce the likelihood of repetition, yet we strongly consider that any actions taken should be based on appropriate analysis of their effectiveness, risks, and cost to consumers, including customers willingness to pay.

Without detailed understanding of the above, we would have concerns around introducing an FFR market or requirement when its effectiveness is not clear. We wish to avoid a situation where the proposed service adds additional cost and complexity and is either incapable of meeting the requirements to arrest a frequency deviation, or is not required due to other market solutions or AEMO actions. Given the potential lead time in setting up any such

[1] http://www.aemo.com.au/-/media/Files/PDF/Joint-AEMO-ElectraNet-Report_19-February-2016L.ashx

scheme, there are likely to be substantial changes to the market before the service is implemented. These changes may include new network solutions, technological advances and increased penetration of behind the meter generation and storage.

Furthermore, if the FFR requirement is to be progressed, there needs to be greater understanding of its interaction with existing FCAS services, in particular those provided on a 6 second basis. At this stage it is not entirely clear what level of substitutability FFR would have with regard to these 6 second services. This interaction could degrade the value of 6 second services, or it could lead to coordination issues given the potential for overlap between these two types of faster frequency response.

The requirement for inertia also needs to be explored further; in terms of the specific requirements under a wide array of scenarios. Our understanding is that any requirement for inertia is likely to be a dynamic requirement, rather than a set limit. In order to ensure that measures to maintain system security are imposed at least cost, any mechanism to obtain inertia should require the minimum amount needed to ensure that emergency frequency control schemes can operate as intended during a non-credible contingency. Again this relies on more detailed understanding of generator performance and impact of RoCoF.

Mechanisms for procuring FFR and inertia

Any mechanisms established to procure the relevant services need to be least cost and fit for purpose. This purpose can only be established upon improved understanding of the above issues. As a general rule, any mechanisms should be both technology and participant neutral. Market solutions that allow for innovation in the supply of the required services should be prioritised over non-competitive mechanisms. These mechanisms should also be able to ensure that services can be procured on a dynamic basis, and only to the minimum level required.

Of the four options proposed in the Interim Report, contracting by either network businesses or AEMO is likely to be the least flexible option. If a similar mechanism to that used in the procurement of System Restart Ancillary Services (SRAS) was utilised we have concerns that this would result in a more static means of obtaining the relevant services. This would require a set level of inertia to be identified and contracted for on a fixed term basis. As with SRAS, the there is a risk of either over- or under-procuring and market concentration of service providers. The latter would give service providers the ability to increase costs to the point that the proposed services are a less optimal solution to system security. Market concentration could also increase as more as more synchronous sources exit markets, particularly in any inertia market. We also highlight that FFR and inertia are not binary services, as is System Restart, which is either required or not required based on a specific system-black event.

Therefore EnergyAustralia considers locking in significant costs associated with a pre-determined standard over an extended, fixed period is not likely to be in the best interests of consumers. Utilising the proposed option of a TNSP-led approach, similar to Network Support and Control Ancillary Services (NSCAS) presents similar issues in relation to fixed procurement levels. If this approach was used in relation to inertia, further complications arise due to inertia also being capable of being provided through other technologies such as synchronous condensers. This equipment may be installed as part of network businesses network augmentations for the purpose of voltage control, required as part of their obligations[2,3] to plan and operate their network in a way to reduce the risk of cascading failures for any credible or non-credible event. A corollary benefit would be the provision of

[2] S5.1.8 NER
[3] S5.1.8 NER

inertia when the condenser is in operation. However, consideration should be given to ensuring that benefits of such installations can be captured, without market distortion from allowing monopoly asset owners to be involved in a competitive element of the market.

New design standards for intermittent generation to provide inertia or FFR could be a less complex mechanism, avoiding the need to establish a new market or procurement methodology. However, there exists the risk that additional requirements could significantly increase the costs of either inertia or FFR. Further, it may be technically infeasible to impose the requirements, or cost-prohibitive to retrofit the required equipment on some existing plant. This would leave new plant, or existing plant capable of retrofitting, to bear these increased costs. For new entrants this could be a significant barrier to entry. The risks of poor outcomes on a cost-benefit basis are increased in an environment where structural solutions, whether network or non-network, are still being considered.

A five-minute dispatch mechanism creating a more market-based approach, as per the existing dynamic FCAS markets, still relies upon creating an effective market signal based on a specific requirement of the given service. The complexity in providing the required information to market participants would need to be overcome in order to implement such a mechanism. At this stage we consider that this mechanism could be the most appropriate means to balance procuring the necessary amount of each service in a competitive and dynamic way, if these complexities can be overcome.

As a general conclusion, EA sees the priority order of considerations in regards to the System Security Market Review to be:

- understanding the capability of existing power system equipment and power stations to deal with high RoCoF;
- understanding the risks of non-credible events occurring and minimising them where possible;
- determining a suitable RoCoF standard;
- ensuring emergency frequency control schemes are suitably designed and implemented to deal with the RoCoF standard;
- understanding how recent changes affecting system security are impacting the power system and the market;
- ensuring existing FCAS markets are appropriately designed to ensure pricing signals exist for valued services; and only then
- considering the introduction of new (dynamic) markets for FFS or inertia, or system security driven RIT-T investment, as necessary or proven to be prudent and efficient.

If you would like to discuss this submission, please contact Chris Streets on (03) 8628 1393.

Regards

Melinda Green

Industry Regulation Leader