20 October 2016

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, ERC0208, ERC0214, ERC0211)

AEMC 2016, System Security Market Frameworks Review, 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.

The following submission sets out EnergyAustralia's responses to the System Security Market Frameworks Review (Review) consultation paper. We have also provided a submission in respect of the NEM Wide Inertia Ancillary Service (ERC0208) as appended to this submission. We have not provided specific submissions to the Rule changes proposals from the South Australian government relating to managing frequency and power system fault levels (ERC0214, ERC0211). Our comments relating to the Review are, however, relevant to those two Rule change proposals.

System Security Market Frameworks Review – (EPR0053)

EnergyAustralia welcomes the opportunity to provide input to the Review. We support the focus on conducting a detailed assessment on the current state of system security, issues that may arise in future and solutions to identified issues. However, as we recently stated in our submission[1] to the Australian Energy Market Operator (AEMO) Future Power System Security (FPSS) August progress report, we have concerns surrounding the potential for inconsistent messaging to participants about threats to system security. Clarity is required to minimise confusion and reduce the likelihood of poor decisions being made due to not fully understanding the risks and consequences of system security issues.

This is particularly the case given the numerous market structure and technical reviews being conducted by the AEMC (the Commission), Council of Australian Governments Energy Council and AEMO covering overlapping or interacting topics. This review environment is further complicated by the recently announced Finkel review. Further, the extent to which the

[1] http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/-/media/D48661F87E47460E9E1E16520D78695A.ashx

Australian Energy Regulator will also perform its own investigations into recent events in South Australia may reveal additional information on system security, and how actions taken by participants may have affected security.

In addition to these broader reviews there are presently multiple system security Rule change proposals before the Commission and we are aware that AEMO is also assessing the need for further Rule change proposals. In particular, we have concerns that some of these Rule change proposals being reviewed by the Commission may pre-empt some of the alternate technical solutions currently under consideration by AEMO. We consider that until the suite of technical reviews on foot are concluded there is risk in assuming the benefits put forward in the Rule change proposals are likely to be realised.

To begin changing Rules prior to market problems being reviewed in detail and appropriate solutions being identified risks sub-optimal solutions being implemented. This Review has significant cost implications, both in implementing new Rules and the associated market or system changes. If such Rules are implemented in the short term, this may also create a potential need to unwind these changes if other more effective solutions are later identified as being preferable. In wake of the SA events it could be particularly premature to implement any solution yet, especially when these are potentially costly or short term solutions.

Additionally, we note that there are potential measures under development that overlap with aspects of the overall review or Rule changes under assessment by the AEMC. Specifically, AEMO have commenced design work with ElectraNet to implement an over frequency generation shedding (OFGS) scheme in South Australia, as outlined in their 2016 update to their report into Renewable Energy Integration in South Australia.[2] Further, ElectraNet are engaged in a process of consulting with the market to review options for corrective action aimed at providing improved voltage control in parts of South Australia.[3] This consultation process is due to finish in November this year.

Importantly, investigation of the SA black system event of 28th September 2016 is highly likely to provide additional information required in properly assessing solutions to system security issues, particularly in South Australia. The suite of Rule change proposals from AGL on a NEM wide inertia market and the South Australian Government on Power System Frequency and Power System Fault Levels, as well as under- and over-frequency control systems may be more appropriately dealt with following a detailed review of the performance of the SA region of the NEM during the events of 28th September.

The following sections present our responses to a number of the questions contained within the consultation paper.

Do you consider that the issues outlined above cover the matters that need to be considered going forward in managing changes in system frequency?

We note the proposal from AEMO for the establishment of a new category of protected event. This category is intended to allow for some level of mitigation to be implemented for events previously classified as non-credible.

We believe that prior to introducing a new category, exploration of Rule 4.2.3A and AEMOs existing ability to reclassify non-credible contingency events as credible in the face of abnormal conditions, should be undertaken. A review of the reclassification schedule under the relevant Rule may be used as a first step before a new classification category is introduced. This review could examine whether AEMO currently has the appropriate powers

[2] http://www.aemo.com.au/-/media/Files/PDF/Joint-AEMO-ElectraNet-Report_19-February-2016L.ashx
[3] https://www.aemo.com.au/Stakeholder-Consultation/Consultations/ElectraNet-Project-Specification-Consultation-Report-PSCR

and operating procedures to treat conditions such as those on the 28th of September in South Australia as abnormal.

Do you consider it beneficial to set a standard for Rate of Change of Frequency (RoCoF)? What format should this standard take and what factors should be taken into account when setting the standard? Who should set it? Would the establishment of a new standard trigger significant additional costs to comply?

Protection schemes such as under-frequency load shedding (UFLS) and over-frequency generation shedding (OFGS) should be the key protection mechanisms in respect of frequency limits. High RoCoF degrades or eliminates the ability of these protection systems to act as required. We consider that there may be merit to limiting RoCoF, in the event it cannot be otherwise managed. However, the precise level needs to be determined and the lowest cost mechanism for limiting it utilised.

If it is possible to manage RoCoF in a manner that allows protection schemes to work as intended, without significant cost impacts, such as through the installation of appropriate high-speed or adaptive RoCoF relays, then this would allow TNSPs to operate their networks in a manner to avoid cascading failures under any credible or non-credible event.

If such options are infeasible we consider that options should be considered to allow a temporary RoCoF limit to be set to assist the UFLS and OFGS schemes operate as intended, while not imposing a system normal RoCoF limit. Any system normal RoCoF limit is likely to have high impacts in terms of costs on the market. Following the events of the 28th of September, RoCoF limits within South Australia have resulted in flows across the Heywood interconnector limited to levels lower than possible prior to the interconnectors augmentation.

We have concerns that a RoCoF standard has already been implemented as an ongoing limit of 3Hz/s, in a non-transparent market intervention. No methodology or technical analysis has been released that supports this current level. While later investigations may determine that this level is appropriate, we are not convinced that this standard is yet justified.

What roles do you consider services such as inertia and fast frequency response should play in maintaining system security in the NEM? How else could RoCoF be managed?

We reiterate that the roles for inertia and fast frequency response (FFR) would need to be assessed in light of any other solutions determined in the current system reviews. The roles for these services may be much reduced, or they may be critical, depending on other mechanisms used to manage RoCoF and system security more broadly.

Other mechanisms for managing RoCoF would need to be viewed with respect to the level of RoCoF that is properly determined as part of the FPSS project. These mechanisms could include:

- Installation of specialised RoCoF relays that automatically trip supply or demand to ensure the RoCoF standard and the frequency operating standards are not breached. The technical feasibility of installing and designing such a RoCoF protection scheme would need to be validated.

- New design standards for intermittent generation to provide inertia or FFR, however this would raise additional issues if applied retrospectively to existing intermittent generators, or alternatively would potentially act as a barrier to entry if it was only applied to new entrants.

- Intra-regional constraints to limit intermittent generation when RoCoF levels are identified as above a certain limit. This is indirectly what AEMO has recently implemented by constraining VIC to SA flows at times of low inertia/high RoCoF threat in SA.

Without further review of these mechanisms, EnergyAustralia does not necessarily support any of these specific options. However we consider that examination of the feasibility to install specialised RoCoF relays may confirm this as a potentially low cost option that would act, in effect, as an extension of the concept adopted for the over and under frequency limits.

What form of mechanism do you consider to be preferable and which services should the mechanism be targeted at? What form of cost recovery do you consider to be preferable in the design of a mechanism to procure additional system security services? Should the cost recovery mechanism be designed to create stronger incentives to provide the required services?

At this time EnergyAustralia considers that the installation of specialised RoCoF relays, implemented by the relevant network businesses, should be prioritised for assessment as an effective and low cost mechanism for ensuring the ongoing viability of UFLS and OFGS schemes.

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

Regards

Melinda Green

Industry Regulation Leader

Appendix A - Proposed Rule Change – NEM Wide Inertia Ancillary Service – (ERC0208)

EnergyAustralia does not support the establishment of a NEM wide inertia ancillary service at this time. As stated in our response to the System Security Market Frameworks Review, we consider that to implement specific solutions to a problem that has not yet been fully defined has the potential to lead to sub-optimal outcomes.

Given the events of 28th September 2016 in South Australia, it would premature to decide on the appropriate market or technical mechanisms that may require implementation without fully assessing all of the options and their interactions.

In terms of general comments on the proposed rule change, there is insufficient information provided to make an assessment of the assumed benefits. The design of any inertia market would have to be not only considered in the context of power system security but also its ability to provide the proposed benefits.

Inertia is not only able to be provided by synchronous generation, but also 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[4,5] 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 inertia when the condenser is in operation. Ensuring that the ability to both capture the benefits of such installations, without potentially distorting the market due to having monopoly asset owners involved in a competitive element of the market would need to be considered.

Further, it remains to be seen whether the proposed market would provide the correct market signals to ensure inertia is sufficient and available and costed appropriately. These signals would also need to be assessed in the context of the issues identified by AEMO in the procurement of other ancillary services such as System Restart Ancillary Services. Market concentration of inertia providers would have the ability to increase costs to the point that an inertia market is a less optimal solution to system security. Such concentration could also increase as more as more synchronous sources exit markets, increased concentration occurs.

While at this time EnergyAustralia does not support the proposed rule change, we also consider that along with the other options being assessed through AEMO's Future Power System Security project and the System Security Market Frameworks Review it may have merit as a solution for security issues. For that reason we support further assessment of an inertia market as part of the suite of possible reforms to ensure system security.

[4] S5.1.8 NER
[5] S5.1.8 NER