



In reply please quote record number D17016183

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

System Security Market Frameworks Review – Draft Rule Determinations

Dear Mr Pierce

The Energy and Technical Regulation Division of the Department of the Premier and Cabinet, South Australia (Division) congratulates the Australian Energy Market Commission (Commission) for completing the System Security Market Frameworks Review (SSMF) Review's Final Report, which takes a holistic view of the most suitable regulatory framework to address power system security and also covers the rule change proposals raised by the South Australian Government in July 2016. The Division takes this opportunity to provide feedback on the draft rule determinations as an outcome of the SSMF Review.

The Division is still concerned about placing obligations on TNSPs for the provision of inertia or other services through building assets or procurement of long-term contracts that may lead to inefficient investment, which may be locked in for a long time. It is the opinion of the Division that, in the absence of an open market, AEMO is better placed to procure such services (as it currently manages similar contracted services), which are better dynamically coordinated with changing system conditions.

The attached submission focusses on how the Division sees the draft rule determinations resolve the issues raised in the related components of the package of rule changes proposed by the South Australian Government in July 2016 and provides some feedback, where appropriate, on alternative solutions for consideration by the Commission.

The Division will offer feedback on other issues raised in the SSMF Review's Final Report during the relevant future work streams on the issues.

Should you wish to discuss any of the content of the submission, please feel free to call Ms Rebecca Knights, Director - Energy and Technical Regulation Division, on (08) 8226 5500.

Yours sincerely

Vince Duffy
EXECUTIVE DIRECTOR

14 August 2017

System Security Market Frameworks Review

Submission to Draft Rule Determinations

Energy and Technical Regulation Division

Department of the Premier and Cabinet, South Australia

August 2017

ERC0211 – MANAGING POWER SYSTEM FAULT LEVELS

Within a package of rule change requests submitted to the Australian Energy Market Commission (Commission) in July 2016, the South Australian Government addressed the management of low system strength so that network protection systems operate correctly, generators can still meet their performance standards and regional power system transient voltage stability is not compromised.⁷ The relevant component of the rule change request proposed amending the National Electricity Rules (Rules) to:

- Establish standards for low fault levels and the associated requirements of operation under a new system strength regime.
- Allocate responsibility for setting fault levels at different parts of the network, taking into account cost, incentives and allocation of risk.

As stated in the draft rule determination (Determination), the Commission has decided to make a draft rule that it sees as addressing the issues raised in the rule change request and is justified to contribute to the achievement of the National Electricity Objective (NEO).

The draft rule aims to:

- Allocate responsibility to Network Service Providers (NSPs) to maintain system strength (by means of setting short circuit ratios) at generator connection points at an agreed minimum level, at or above which generators are required to meet their performance standards.
- Introduce a requirement on new connecting generators to 'do no harm' to the existing minimum level of system strength so that existing generators can still maintain their performance standards at their connection points.
- Establish a remedial process if a new generation connection will result in the reduction of system strength below the prescribed short circuit ratio at the connection point. In this case, the NSP will need to negotiate some remediation works with the new generator for lifting system strength to the minimum level, at the expense of the new connecting generator.
- Introduce a process for the NSPs to negotiate with existing generators and agree a minimum short circuit ratio to be registered with the Australian Energy Market Operator (AEMO) and maintained by the NSP.
- Allocate responsibilities to AEMO to identify locations where system strength is below, or likely to be below, the registered short circuit ratio and advise affected parties of low system strength in the operational timeframe. AEMO is also required to establish a guideline for calculating the short circuit ratio at connection points.

The Energy and Technical Regulation Division (Division) supports the purpose of the draft rules. The Division wishes to provide feedback on some points for further consideration.

As NSPs, in conjunction with AEMO, have oversight of fault levels across their networks, the Division agrees that NSPs are suitably placed to maintain minimum system strength, expressed as a registered minimum short circuit ratio at the connection point.

⁷ South Australian Minister for Mineral Resources and Energy, *Managing power system fault levels rule change request - attachment D*, 12 July 2016, p. 1.

Power system conditions for which the minimum short circuit ratio is to be maintained (under secure operating state, after credible contingencies following a secure operating state and following protected events) are considered adequate to cover foreseeable circumstances of normal system operation. The balance of such time to cover all system conditions would constitute times of system operation following non-credible contingency events, which are expected to be addressed by AEMO in its contingency management procedures.

The Division would like to confirm that the intent of the draft rule is to mitigate the effects of low system strength in terms of:

- The effectiveness of network protection settings, by obliging NSPs to maintain a minimum short circuit ratio at connection points but leave them to take responsibility of making sure that their protection system operate correctly (no changes in the Rules in regards to protection settings).
- The ability of inverter-connected generators to operate as designed in a stable manner for fault-ride through and during steady-state operation by stipulating that new generators meet their performance standards under a short circuit ratio guaranteed by the NSP (under conditions stated above). In addition, new generators must 'do no harm' to existing generators by not degrading previously negotiated short circuit ratios for existing generators (and hence meeting their own performance standards), or accept remediation works at their expense to guarantee a minimum short circuit ratio at the connection point.
- Increase in robustness of the network against transient voltage instability prevalent in weak systems and reducing the spread and depth of voltage dips during network faults by including AEMO's consent in the conditions of accepting the registered minimum short circuit ratio at a connection point.

With regards to roles and responsibilities, the Division considers that allocating new roles to AEMO for both real-time monitoring of system strength and developing guidelines for short circuit ratios at connection points is a positive step towards keeping the power system in a satisfactory operating state. In particular, the provision for AEMO to monitor and take action (if necessary) is essential when detailed modelling by AEMO of complex interaction of generation systems shows reduction in system security.

With regards to the decision by new generators to locate new plant and the associated cost incentives relating to system strength, the draft rules may encourage new generators to connect at points in the network where there is sufficient system strength rather than bear the extra costs of being compliant to the minimum system strength requirements. In this case, the Commission needs to consider the effect of clustering of new generators up until a strong point in the network becomes weak and eventually the last connecting generator bearing the brunt of remediation, a point raised by some stakeholders. A NSP cannot guarantee that system strength will remain sufficient for the life of the generating system (as claimed in page 45 of the Determination). The most common cause of losing system strength is the withdrawal of a synchronous generator at the connection point.

Another point to consider is the effect of such clustering of generators at a connection point on power flows and network congestion. An analogy to constrained access to networks can be drawn here, apart from the fact that the withdrawal of generators relieves the constraint on generation congestion but adversely increases the constraints on system strength requirements.