

26 February 2014

Mr Neville Henderson
Chairman
The Reliability Panel
Australian Energy Market Commission
PO Box A2449
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Submitted online: www.aemc.gov.au

Dear Mr Henderson

REL0052 - Annual Market Performance Review 2013 - Draft Report

The privately owned companies listed (Private Generators Group or PGG) appreciate the opportunity to provide comments to the Australian Energy Market Commission (AEMC) Reliability Panel (the Panel) Annual Market Performance Review 2013, Draft Report. The Private Generators Group understands the Panel is required to review the performance of the National Electricity Market (NEM) in terms of reliability standards, power system security and safety in accordance with National Electricity Rule 8.8.3(b).

Changing market conditions in the NEM have altered what may have impacted reliability, security and safety when the Panel commenced the annual market review process in 2006. The NEM is currently over supplied through a combination of declining demand, the up-take of solar PV and wind generation. The current over-supply means that the NEM is more likely to meet the required reliability standard.

The NEM also largely operates in a secure state due to system, access and plant standards, notwithstanding the occurrence of credible and non-credible contingency events. The Private Generators Group considers AEMO has operated the NEM effectively to date enabling the power system to be operated in a secure operating state ensuring the safe, secure and reliable supply of electricity to consumers.

The challenges to operating the power system, however, are shifting as evolving technologies are connecting to the grid. Changes driven by the RET have seen the uptake of solar PV and other renewable energy, notably wind generation with AEMO estimating current installed capacity of over 2.5GW with additional wind generation expected by 2020.¹ AEMO has identified operational challenges from integrating high levels of wind generation through undertaking technical studies to investigate potential power system impacts from integrating high levels of wind generation.² The Private Generators Group considers that the system security assessment in the market performance review should include consideration of any operational or other market changes needed to preserve the security of the power system.

¹ AEMO, National Transmission Network Development Plan 2013, Melbourne, 2013. p. 6.

² AEMO, Integrating Renewable Energy - Wind Integration Studies Report, Melbourne, 2013.

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AEMO noted in the wind integration study that “there are many questions around potential impacts, technical specifications, costs and funding arrangements, and regulatory arrangements for some of [the] options”³ to address the operational changes for maintaining the power system in a secure operating state. Where the cost of renewable generation and the cost of integrating renewable generation is passed on to consumers to maintain the power system in a secure operating state, there is a requirement for these activities to be transparent and consistent with the Panel’s obligations under the Rules.

Integrating wind generation

The RET has driven significant change in the NEM. The RET target of 41TWh of energy to be supplied by renewable energy by 2020 has driven significant investment in wind generation with AEMO estimating approximately 2.67GW of installed capacity as at May 2013 with significant further investment in wind generation expected by 2020.⁴ This level of wind generation has distorted spot price outcomes leading to the displacement of conventional thermal generation, particularly in Tasmania and South Australia, with AEMO identifying potential power system impacts posing challenges for the operation of the NEM.

AEMO has identified some of the following operational impacts from integrating wind generation in the NEM:

- A reduction in power system inertia from a withdrawal of synchronous generation making frequency control in South Australian and Tasmania more challenging;
- High levels of wind generation can reduce interconnector transfer limits over low demand periods when wind generation forms a large percentage of generation; and
- High levels of wind generation could lower fault levels at some locations with wind generation possessing lower fault levels than conventional synchronous generation.⁵

In assessing the impact of some of these challenges for the operation of the NEM, AEMO observed:

Conditions of high wind generation, low demand and low synchronous generation can result in low power system inertia, high [Rate of Change of Frequency] levels, high contingency [Frequency Controlled Ancillary Services (FCAS)] requirements and low fault levels. As wind generation levels increase, it is still unclear which of these issues will ultimately form the most material limit on NEM power system operation.⁶

The Private Generators Group are supportive of the technical studies undertaken by AEMO and welcomes ongoing studies to enable AEMO and market participants to gain a greater understanding of the technical interaction between integrating wind generation and power system security. As this directly relates to the security of the NEM, the AEMO studies should be recognised and any operational or market changes that ensue should be identified and reported in the Panel’s Annual Market Performance Review.

System security performance assessment

The Annual Market Performance Review provided a high level quantitative system security performance assessment. The brief assessment covered aspects of system stability including frequency, voltage limits, interconnector performance and any directions that may have been issued by AEMO to maintain the power system within defined limits. The PGG considers qualitative information relevant for system stability including the interaction of frequency, voltage control and interconnector performance with market performance in NEM should be reported.

³ Ibid. p. 50.

⁴ Ibid. p. 1.

⁵ Ibid. p. i.

⁶ Ibid. p. 57.

The performance review identified, for example, frequency excursions where the frequency was outside of defined operating boundaries. This is consistent with requirements under the Rules however, the PGG considers how effectively and efficiently the frequency is maintained is as important as reporting on any breaches. There could be value in reporting on any additional measures AEMO took to ensure sufficient contingency FCAS was available beyond capacity that had been bid into FCAS markets including making capacity payments for synchronous generation to be available or where transmission equipment has been installed for this purpose.

The Panel's security assessment of interconnector performance consisted of the identification of any breach of thermal limits over the year. This is, again, consistent with the Panel's obligations under the Rules. The performance of an interconnector is, however, influenced by limits applied through the application of constraint equations including voltage and transient stability limitations, in addition to, thermal limitations. There could be value for the security assessment for interconnector performance to review the impact of wind generation on interconnector limits through the application of voltage and transient stability constraints. This could provide stakeholders with an enhanced understanding where voltage stability limits increase or decrease interconnector limits, for example, beyond the existing N-1 basis for voltage constraint formulation.

Options identified to manage operational challenges

AEMO has identified a range of options available to ensure the power system is operated and maintained in a secure operating state. AEMO has identified operational solutions to these challenges for the formulation of constraint equations to minimise wind output over low demand periods or low levels of traditional synchronous generation. Changes to current market arrangements including options to ensure adequate synchronous generation is available to the installation of additional equipment capable of influencing the frequency of the power system and short-circuit fault levels were also identified.

Developing payments for the capacity of synchronous generation to be available or directing participants to make capacity available would impose a new requirement on the NEM as would installing dedicated equipment to maintain system inertia. As these relate to maintaining the secure operation of the power system above existing obligations then these ought to be reported by the Panel as part of the system security performance assessment in the Annual Market Performance Review.

Operational options, in contrast, including the development and application of constraint equations to limit the dispatch of wind generation is consistent with current practices for limiting the dispatch of generation to maintain the secure operation of the power system. The current practice for constraint formulation, however, relates to generator dispatch for equipment limitations or other regional requirements for transient, thermal or voltage constraints. Where constraint formulation is extended to ensure adequate synchronous generation in a region is available to manage system frequency or to increase fault levels then this should, similarly, be reported on where it is required to maintain power system security.

Conclusion

The NEM has experienced changing market conditions since the Panel commenced the Annual Market Performance Review in 2006. The NEM has become over supplied through a combination of declining demand and the up-take of solar PV and wind generation. The interaction of declining demand and increase in wind generation has distorted spot market outcomes leading to the displacement of traditional forms of generation posing operational challenges to maintaining a safe and secure power system.

The Private Generators Group considers these emerging operational challenges should be reported on by the Panel in the Annual Market Performance Review as they relate to how the security of the power system is maintained, in addition, to providing transparency on any additional measures that

are required to maintain the power system given the additional costs these measures could invariably impose on consumers.

Should you have any questions or wish to discuss this information further, please contact Ashley Kemp on (02) 9503 5061 or ashley.kemp@originenergy.com.au.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Jamie Lowe', written in a cursive style.

Jamie Lowe
Chairman, Private Generators Group
on behalf of the listed companies