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Tuesday, 8 August 2017

John Pierce
Chairman
Australian Energy Market Commission
Lodged Electronically

Dear Mr Pierce,

RE: ERC0214 Managing the rate of change of power system frequency draft rule

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in solar, wind, energy efficiency, hydro, bioenergy, energy storage, geothermal and marine along with more than 4,000 solar installers. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner.

As previously noted, the CEC agrees that the National Electricity Market (NEM) is changing, and supports the need to adapt the market in a way that moves away from a reliance on ageing generators, many of which are slated for closure in the coming decade. However, as with our previous submission, the CEC reminds the Commission that around 94 per cent of generation in the NEM is synchronous and that current arrangements have led to major frequency control issues. The driver of these issues is clearly a steady decline in the primary frequency control capability of existing synchronous generators since 2014[1]. This lack of primary control plays directly into the determination of minimum levels of system inertia as proposed in the draft rule and therefore should be addressed in the first instance.

In addition to the above, there are some major inconsistencies with basic control system theory and the position being put forward by the Commission. In general, a system with lower inertia requires less effort to control (smaller adjustments lead to larger changes). The reduction in effort implies that the frequency control regime *should* require lower service

[1] AEMO, August 2017, SUMMARY OF DIGSILENT INVESTIGATION INTO FREQEUNCY CONTROL IN THE NEM UNDER NORMAL CONDITIONS.

levels, leading to lower costs to consumers. The fact that this is not the case and FCAS costs have risen dramatically, alongside stark declines in frequency control performance, demonstrates that the Commission should be focusing its attention on the Frequency Control Ancillary Services (FCAS) regime ahead of implementing this rule change.

Key changes required to the FCAS regime include mandating appropriate governor settings and the creation of a fast-response market to encourage sufficient levels of Fast Frequency Response into the market. These are significant issues and indicate that the implementation of this rule change should be delayed until the completion of the Frequency Control Frameworks Review and any consequential changes.

In addition to these general concerns, more specific feedback on the Draft Rule is provided below. However, we note that there is a great deal of work being undertaken in this space. Most notably the Australian Energy Market Operator's Ancillary Services Technical Advisory Group is meeting for the second time on August 10, one day after submission are due to this rule change. As such, the information and views provided here are based on currently available information and may change with new information.

Determination of sub-networks requires more consideration and a transparent framework

In addition to providing sufficient inertial response, sub-networks would also be required to maintain continuous operation in an islanded state. This would require providing AEMO with sufficient certainty that the sub-network also held sufficient:

- regulation and contingency FCAS, which can be met within the sub-network to control frequency following separation
- fault current, which will be sufficient to maintain stable operation of plant
- generation to meet demand
- reserve margins
- any other parameters required to ensure stable continuous operation.

Recent experience in South Australia has seen AEMO implement a constraint to ensure FCAS services are available from local sources, with limited notice given to the market when first initiated. The implications have been dramatic increases in FCAS costs for the region, and no change in competition for the service. In the absence of a proper and transparent assessment and decision on sub-network selection and planning, the risk includes increased continued use of inefficient constraints, such as the South Australian local regulation constraint, in more locations in the NEM.

The identification and determination of 'inertia sub-networks' will have to account for the provision of all the other services needed to maintain continuous operation in the determination of sub-networks. Investors looking to provide these services require some certainty and AEMO's constraint equations would not provide this. Sub-networks must be assessed and planned for transparently and through the NTNDP and ESOO as appropriate.

Transparency is paramount in the assessment of inertia requirements

While the NTNDP is a reasonable platform for publishing the anticipated inertia requirements, this assessment would benefit from greater transparency provisions such that an independent view can be formed on the likelihood of forecasted inertia requirements being realised. At the most fundamental level, the NTNDP should also clearly state the assumptions made for the sub-network that has led to the calculation of inertia levels (for example this should include assumed generator control system settings, ROCOF responses, FCAS performance and plant retirement and investment decisions). Where these assumptions are significantly uncertain, AEMO should outline the required work undertaken or planned to reduce the level of uncertainty.

Rate of Change of Frequency withstand capability must be understood to register to provide inertia services

The Commission has noted that the ROCOF withstand capability of generating units commissioned prior to 2007 is undocumented and largely assumed based on experience (although operating point influence on ROCOF withstand capability remains unknown). Inertial contribution from these units to meet a minimum inertia level requires greater confidence in performance, given the fundamental nature of system security. Therefore, it is unacceptable that generating units within unknown or undeclared ROCOF withstand capability might contribute to firm inertia limits that underpin system security.

The National Electricity Rules must be clear that only a Registered Participant's generating units with clearly stated and known ROCOF performance standards may register as an inertia service provider. Testing must be a requirement register.

Significant generator closure timeframes are not aligned to investment timeframes to replace inertial or fault level contributions

The Commission has established that TNSPs would be accountable for replacing any lost inertial capability or fault current as a result of generator closures. Investments of this nature are likely to exceed the threshold to apply the regulatory investment test meaning that a lengthy RIT-T process would delay the investment decision. The equipment required to meet

the needs of local market participants would take 12-24 months to be deployed, while the generator closure notice and closure may be completed in less than half this time. This misalignment could lead to protracted periods where a region or sub-network is operated inefficiently and under significant constraints before the TNSP deploys and commissions inertia assets (assuming the RIT-T delivers a positive outcome).

The Commission must extend the draft rule to ensure that planned generator closure timeframes from notice to closure are restricted to at least the minimum timeframe possible for a RIT-T to be undertaken[2]. Failing to address this misalignment alongside this rule change will lead to major risks to the efficiency of the NEM as large thermal generators close.

The NEO would be met where existing facilities can be re-purposed

A long-term view of the NEM would logically conclude that significant volumes of existing thermal generation will retire in the coming decade. With this in mind, there is likely to be significant advantage in converting existing assets into synchronous condensing capability where available (and RoCoF withstand capability can be demonstrated). Despite this clear advantage to consumers, the draft rule contemplates incremental additional investment in new synchronous condensers to be in place prior to the retirement of thermal plant.

The long-term interests of consumers would be best met where AEMO identifies that re-purposing of existing assets is preferred. However, the draft rule appears to promote incremental investments in inertia services that would be insufficient to achieve this long-term outcome. The obvious investment choice would likely be unrealisable and the draft rule does not make sufficient provisions to meet the long-term interests of consumers.

The rules should make express provisions that enable TNSP procurement of existing synchronous condensing assets, even where these assets provide inertia services above the minimum level calculated by AEMO. This measure would take a long-term view of the increasing deployment of non-synchronous generation technologies alongside a growing demand base and economy.

[2] Noting that the Finkel Review recommended an enforced three year notice period for generator closures.

AEMO should be permitted to make a determination on supplementing minimum inertia levels with new technologies

The draft rule sets out that minimum inertial requirements can only be met by mechanical inertia, while security requirements could be met by other technologies which AEMO determines capable of supplementing mechanical inertia. There does not appear to be a sound case for omitting the potential role of supplementary technologies in the minimum inertial requirements, given that AEMO would be determining the viability of this.

AEMO's mandate to ensure a secure power system would deliver the minimum system security requirement at lowest cost where other lower-cost technologies can be used. Explicitly omitting this opportunity from the National Electricity Rules will omit the potential for lowest cost solutions to be used in the future.

We thank the Commission for the opportunity to provide our views on these matters. Please contact the undersigned or Emma White (03 9929 4107) for any queries regarding this submission.

Sincerely,

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