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AGL Energy (AGL) welcomes the opportunity to comment on the Australian Energy Market Commission's (AEMC) Generator Technical Performance Standards rule change consultation paper (the consultation paper).

AGL is one of Australia's largest integrated energy companies and the largest ASX listed owner, operator and developer of renewable generation. Our diverse power generation portfolio includes base, peaking and intermediate generation plants, spread across traditional thermal generation, battery storage and renewable sources. AGL is also a significant retailer of energy, providing energy solutions to approximately 3.6 million retail customers throughout the National Electricity Market (NEM).

We understand that the Australian Energy Market Operator (AEMO) is seeking changes to the negotiation framework used by operators and Network Service Providers (NSPs). This includes changes to specific levels of technical performance in the operation of connected generating systems. AEMO have also requested significant revisions to a range of access standards which, when combined, would be used to measure the performance of a generation system.

AGL believes that there is some merit in reviewing specific technical parameters across the minimum and automatic access standards, and the negotiation framework more broadly. However, overall, we do not support this rule change in its entirety.

In our view, the proposed changes in the Consultation Paper seek to introduce and manage the operations of a hypothetical power system, in response to the extreme weather events that occurred during the South Australian blackouts in 2016. While we acknowledge that several of the proposed changes have been implemented by the Essential Services Commission of South Australia, we do not believe that harmonising the South Australian approach (that is, increasing the technical requirements across the NEM) as proposed, will address the identified problems.

Instead, it will unnecessarily result in the selection of technological winners and very real commercial and technical barriers to entry for prospective generators. In AGL's view, such an approach would not align with the National Electricity Objective, would lead to significant increases in costs with potentially limited system or site benefit, and will be operationally complex (and in some cases, technically impossible) to implement.

AGL also does not consider that AEMO have clearly evidenced, including quantitatively, why its suite of proposed technical requirements are necessary to "ensure ongoing security in an evolving power system". To implement these technical changes, including via retrospective application, would likely impact the commercial viability of existing and planned generation projects, particularly where additional equipment, modifications or time delays are proposed. AGL considers that several the proposed changes would be

better addressed via the NSP, AEMO or market solutions, for example voltage and/or frequency control services.

Conversely, AGL supports a review of the connection negotiating framework, to ensure that it remains a fair and reasonable pathway for discussion between each counterpart and delivers outcomes which are technically, operationally and financially favourable to both sides. In particularly, AGL encourages the AEMC to:

- clarify the role of AEMO, and its interactions with prospective generators and NSPs;
- improve transparency and accountability on each counterparty; and
- address other general governance and consequential arrangements to incentivise counterparties to resolve issues in a timely manner, and to minimise operational and financial risks that may arise due to unforeseen project delays.

AGL also supports robust stakeholder consultations on the implementation arrangements of any new rule, including a clearly defined effective date, and suitable grandfathering arrangements for impacted generation projects. We believe providing a transitional window of at least 12 months will provide industry with suitable notice to familiarise and account for possible changes to the negotiations framework and performance standards.

AGL has provided specific comments on the categories of technical performance, the negotiating framework, and implementation options in Annex A.

Should you wish to discuss our submission in further detail, please contact Dan Mascarenhas on 03 8633 7874 or at DMascare@agl.com.

Yours sincerely,

Meng Goh

Senior Manager, Wholesale Market Regulations

Annex A

AGL View on the Consultation Paper

AGL has provided views on each of the main draft recommendations below.

1. Implementation of 'fit for purpose' performance standards

AGL understands that the primary basis for the rule change, as proposed by AEMO, is to ensure that the security of the power system is not impacted by changes in the generation mix, namely the move to larger amounts of asynchronous generation. AEMO have therefore indicated that the current access standard requirements and the framework to negotiate performance of generating systems is *"not adequate to ensure ongoing security in an evolving power system"*[1]. As such they have proposed several changes as outlined in the Consultation Paper.

While AGL acknowledge that the AEMC's Security System Market Framework Review and the Independent review into the Future Security of the NEM both recommended further consideration of changes to the technical parameters covered by a generator performance standard[2], we do not believe that AEMO have adequately justified, in technical terms, that such changes are necessary. In addition, we do not believe that AEMO have sufficiently demonstrated that the rule, where amended as requested, would provide the lowest cost solution to improving system security. Rather, it appears AEMO have instead quoted the South Australian blackout as its driver for the Consultation Paper. This event has been largely recognised as a 1 in 100 year event, and the result of a number of factors occurring at the same time – the probability of which was significantly low.

At a point in time, where regulatory certainty is more important than ever, the proposed rule will superfluously increase the level of subjectivity in rule application and compliance. Reducing the level of objectivity and opening technical discussions up to subjective interpretations will result in delays to new infrastructure investments and significantly increase the costs of these projects, altering its feasibility. For example, large scale generation systems typically are backed by financiers who require a level of comfort on build and operation. Unreasonable changes to the technical requirements will directly impact the level of funding that can be secured.

AGL believes that the existing performance standards framework, designed to meet the needs of the existing power system and current energy policy design, is both adequate and sufficient to continue to maintain power stability and security in the NEM. We are cognisant that some changes to specific access standards will better ensure that generating systems can withstand and support the system during periods of distress.

AGL has provided a view on each of the technical access standards below:

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[1] AEMC, Generator Technical Performance Standards, Consultation Paper, executive summary.
[2] AEMC, Generator Technical Performance Standards, Consultation Paper, page 2.

- Voltage control and reactive power control (Clause S5.2.5.13)
    - AGL does not support the proposed changes prepared by AEMO. While we consider that the control of voltage is achievable by generating systems, it will result in high costs to those located in strong network locations where larger amounts of reactive power is necessary to control voltage. This will create a financial barrier to entry at these geographical locations, particularly for smaller generating systems where the cost impact erodes its feasibility, therefore potentially impacting local system security.
    - AGL also notes that the proposal suggests that voltage regulation is the best control mechanism for each situation. However, depending on the technology deployed, for example large scale solar, voltage control could actually lead to reduced power system security in the event of a generator trip.
    - AGL also points out that obligating multiple generators at a geographical location to manage voltage will result in an over-investment in capability. Instead, the market should look for more efficient solutions to manage voltage, such as the creation of ancillary service markets or NSP procured voltage support.
    - If generating systems are required to regulate voltage, AGL proposes the following amendments:
        - voltage is regulated under the minimum access standard to within 2% of the set-point *under system normal conditions*[3]. and
        - the provision of remote control equipment to change the set-point ~~and mode of regulation~~ under the negotiated access standard is *applicable where AEMO accept responsibility for the risk of reduction in power system security*.
    - Irrespective, AGL does not support AEMO having remote control of the mode of regulation because of the potential damages this may create to generating system infrastructure.

- Disturbance ride through (Clause S5.2.5.4-5)
    - While we appreciate that AEMO's revised position[4] has clarified that Continuous Uninterrupted Operation (CUO) during a disturbance will only apply to reactive power, and not generation (i.e. MW), we do not support these proposals.
    - The revised position does not address the issue that voltage regulation during a fault is technically impossible. A close-up 3 phase fault will result in a voltage drop to zero, irrespective of the contribution of reactive power. Therefore, the provision of reactive power in this circumstance would provide no benefit or security to the system.

[3] Where reference to normal conditions, refers to operations at nominal voltage.
[4] AEMO, Generator Technical Requirements: Supplementary Material to the Rule Change Proposal

- AGL also does not support AEMO's changes to the definition of CUO. It is not clear why a change is required to this definition to support AEMO's proposal.
- With respect to LV disturbance ride through, AEMO's proposal requires generating systems to maintain CUO where a disturbance causes variances in voltage. However, 'normal voltage' has not been defined and would need to be guaranteed by the NSP and AEMO. It is therefore difficult to determine if generating systems could meet the requirements for minimum and automatic access levels. Further, obligating generating systems to ride through to 70% of normal voltage may not be technically achievable for some technologies such as large thermal stations.
- AGL notes that AEMO's proposal for multiple fault ride through seeks to mandate CUO for up to 15 voltage disturbances over a 5 minute period. We do not believe that it would be technically possible for a number of generating technologies to meet this requirement. In addition, at 15 faults, the strain on NSP infrastructure would be severe enough to result in numerous damage to their assets.
- AGL encourages the AEMC to ensure that an appropriate balance is struck in the rule, where a change is to be made to ensure that a generating system facing damage is not unnecessarily forced to continue operating.
    - AGL believe it may be possible for most technologies to ride through between 7 faults without sustaining serious operational damage.
    - The AEMC should also seek further clarity from AEMO on how compliance with this requirement would be demonstrated by a generating system during negotiations.

- Partial Load Rejection (Clause S5.2.5.7)
    - AGL supports the proposed changes. We believe that both synchronous and asynchronous generating systems can meet these requirements with minimal commercial and operation risk.

- Active Power Recovery (Clause S5.2.5.5)
    - AGL does not support this change and does not believe that AEMO have provided sufficient justification to demonstrate why such a change is necessary. AGL notes that the existing negotiating process will not allow the minimum standard to be agreed if the generating system will have an unacceptable effect on system performance.
    - The proposed change would require generating systems, in line with the minimum standard, to recover 95% of active power level within 1000ms. AGL points out that as a minimum standard, meeting this requirement would create significant ramp up (i.e. timing) challenges for synchronous generating systems and output challenges for asynchronous generating systems.

- Imposing this minimum requirement is likely to also increase business capital and operating expenses, which ultimately would increase costs to consumers without any real or justified benefit to the system.
- AGL therefore encourage the AEMC to further consider whether a change to active power recovery settings is necessary.

- Rate of Change of Frequency (ROCOF) withstand capability (Clause S5.2.5.3)
  - Although AGL supports the proposal in principle, we encourage AEMO to provide greater clarity on the benefit and rationale for splitting the requirement between synchronous and asynchronous generating systems.

- System Strength (S5.2.5.15)
  - AGL does not support this proposal and notes that the AEMC have already concluded that Short Circuit Ratio (SCR) is not an adequate measure of system strength. Further, we note that some manufacturers may not be able to adequately meet the minimum SCR requirement of 3.0 at the connection point.
  - AGL supports the AEMC's view, in its final determination on the Managing Power System Fault Levels rule change that:

    "….short circuit ratios are an overly simplistic measure of system strength and that may not always be a good indication of system security risks, including the potential impacts of connecting generators".

    "System security (is better maintained) at an efficient cost by considering system strength in a region as opposed to at each generator connection point.

    Maintaining a short circuit ratio for all connected generators would inefficiently over-emphasise the risk to system security of certain generators not operating in a stable manner".[5]

- Frequency Response Mode Capability (S5.2.5.11)
  - AGL does not support this proposal. Forcing delivery of a technical capability (and unnecessarily increasing business cost) to create or widen a market, directly impacts with the principle and objectives of a de-regulated energy market, and provides no additional assurance that generating systems will participate in the existing ancillary market.
  - AGL believes that mandating this capability would also not align with the NEO.

[5] AEMC 2017, Managing power system fault levels, Rule Determination, page vi

- If there is a need for greater frequency response in the market, AGL strongly believes this should be procured by AEMO or the NSP through ancillary markets.

- Capability for Active Power Control via Automatic Generator Control
  - AGL accepts this proposal

- Capability to Limit Active Power and Ramp Rate
  - AGL has no objections with this proposed change

- Remote monitoring and Control
  - AGL accepts the proposal for additional remote monitoring requirements.
  - However, we do not support the proposed control requirements, including the mode of voltage regulation. Refer above to our position on Voltage Control for further details on our position.
  - AGL also queries, with respect to control requirements, how AEMO intend to use Automatic Generator Control (AGC) to increase power output for a semi-scheduled generator. We note that given the nature of asynchronous semi-scheduled generating systems, it is likely they will always be running at maximum output. Anything less than this output level impact the operational economics at site.

2. A balanced negotiation framework

The current negotiation framework provides generators with suitable flexibility to determine whether it is able to meet the automatic standard or negotiate a level between the minimum and automatic levels. In AGL's experience, proponents (including AGL) aim for the automatic standard or as close to this level. However, this assessment must also take into account the project economics and the intended operational circumstances. Therefore, while AGL support in principle AEMO's proposal to ensure that the negotiated access standard must be "as close as practicable to the automatic access standard and no less than the corresponding minimum access standard", we do not support the level of subjectivity and ambiguity that this proposed process would introduce. In addition, requiring generators to submit evidence to AEMO (and the NSP) removes a generators ability to negotiate openly on a mutually achievable and beneficial performance standard.

AGL strongly believes in the principle of the open negotiation framework – that is the fair and reasonable discussion between two parties to deliver outcomes which are technically, operationally and financially favourable to both sides. Requiring generators to "provide evidence to AEMO's reasonable satisfaction that

it is not practicable to achieve the relevant automatic standard"[6] will introduce regulatory bias into the process, by providing AEMO with a greater level of bargaining power and undisputed decision making powers.

AGL strongly believes that the negotiated standard should support a reasonable assessment of a generating system's connection relative to its connection to the NSP system. Agreement on the access standards should therefore be based on the best technical arrangement which minimises adverse impact on system performance, system security, without compromising and generator operation and commercial arrangements.

AGL also believes that clarification on the role, responsibilities and interactions of each party requires further clarification. Specifically, we understand that AEMO's role in the negotiation framework is to provide advice to NSPs on the impact of connection arrangements on system security. However, in our experience, AEMO appears to hold, greater authority to persuasively mandate technical requirements or delay execution of connection agreements. Such process creates an "ultimatum" situation, by unnecessarily increasing the level of technical capability, operational complexity and/or costs associated with generating systems without clearly defining or rationalising the benefit to the wider market. This approach does not align with the NEO.

AGL therefore requests the AEMC to review the existing negotiating framework with a view to:

- clarify the role of AEMO, and its interactions with prospective generators and NSPs;
- improve the level of transparency and accountability on each counterparty, including assessing whether sufficient incentives exist to ensure each party acts fairly and reasonably in negotiations; and
- address other general governance and consequential arrangements to incentivise counterparties to resolve issues in a timely manner, and to minimise operational and financial risks that may arise due to unforeseen project delays.

3. Suitable transitional arrangements

AGL agrees with AEMC's assessment that it does not have the power to make retrospective rules. Irrespective, AGL does not believe that retrospectively applying the proposed rule to existing generating systems would improve system security. In fact, the proposed rule (where technically achievable) is likely to result in significant cost impacts and could render existing generating systems unviable. Further, the increased uncertainty surround which projects may be impacted and which performance standards need to be re-negotiated will also negatively impact project development and financial backing.

However, we do support some changes to technical capability and greater clarity and transparency in the negotiation framework. Should these changes process, AGL encourages the AEMC to undertake robust stakeholder consultations on the implementation arrangements of any new rule, including a clearly defined

[6] AEMC, Generator Technical Performance Standards, Consultation Paper, page 22.

effective date, and suitable grandfathering arrangements for impacted generation projects (if applicable). We believe providing a transitional window of at least 12 months will provide industry with suitable notice to familiarise and account for possible changes to the negotiations framework and performance standards.