13 July 2018

Ms Anne Pearson

Chief Executive

Australian Energy Market Commission

PO Box A2449

Sydney South NSW 1235

Electronic Lodgement: ERC0222

Dear Ms Pearson

Generator Technical Performance Standards – Draft Determination

Energy Networks Australia appreciates the opportunity to respond to the Australian Energy Market Commission (AEMC) regarding the Draft Rule Determination, Generator Technical Performance Standards released on 31 May 2018.

Energy Networks Australia is the national industry body representing businesses operating Australia's electricity transmission and distribution and gas distribution networks. Member businesses provide energy to virtually every household and business in Australia.

Energy Networks Australia note the considerable work undertaken by Australian Energy Market Operator (AEMO) and the AEMC to get to this stage in the consultation. It is important to recognise the changing needs of the power system whilst maintaining the objective of power system security and quality of supply at the lowest cost to consumers.

Our detailed response is provided in the Attachment, in summary:

- Energy Networks Australia is supportive of the negotiation framework where the applicant needs to provide justification for the variation from the automatic access standards. AEMO and Network service providers also need to provide justification where the negotiated access that is being sought is not accepted. The draft rules relating to the timeframe of the network providers response need to clearly take into account having received a response from AEMO.
- The draft rules uses the term 'have the capability', however it is not clear whether the generating systems needs to have the capability in the procured product or whether it needs to have the capability in the installed product which is commissioned, tested, ensures operational compliance with other access standards and is then turned off. It would be useful if the AEMC clarified the intent of this term in its final determination.

- Energy Networks Australia recognises the value of increased communications as smart technologies and smaller non-scheduled generators continue to grow in numbers. In conjunction with an expected increase in communication requirements and volume, we would expect traffic volume analysis, including priority level traffic and control be undertaken ahead of AEMO requesting the fuller set of values.
- At this stage, Energy Networks Australia only support the requirement to have the capability of all three modes – voltage control, power factor and reactive control, and have the ability to switch between them in the automatic access standards at the transmission level, and in those jurisdictions where there is not expected to be a significant level of synchronous generation operating into the future. This is technically feasible, is already in operational at the transmission level in SA and has not detrimentally impacted the volume of connection enquiries at the transmission level. However, Energy Networks Australia only supports generators operating in one mode in the distribution system in the first instance until full testing of the alternative modes has been approved. Energy Networks Australia also has reservations about providing the ability for AEMO to change the operating state of distribution networks it has no visibility of.
- Energy Networks Australia is supportive of the consequential changes proposed.
- Energy Network Australia supports the 8 weeks as being a suitable timeframe between the final rule being made and commencement of the rule. The AEMC has undertaken extensive consultation and the where the full access standards are not agreed or the there is no offer to connect provided, they will be under the new rules. Extending the transition period by a month over the Christmas period is unlikely to make a material difference to applicants being able to progress under the old rules.
- There can be a significant number of connection enquiries that do not result in a connection application and do not meet the AEMC criteria of an ongoing connection process. Our preferred drafting is to remove 11.107.2 (b) (3) (ii) as the AEMC has undertaken extensive consultation over a lengthy period and held a number of workshops. Connection applicants at the enquiry stage would be advised that their enquiries would need to proceed under the new rules and negotiating framework, this would allow resources to better assist the 'in progress applications' to connect to update to the new access requirements.
- AEMO recently proposed that they receive all connection enquiry forms, this has been introduced late in the consultation process given it was not even part of the Draft Determination and would benefit from further detail. If this type of obligation were to be placed on network service providers it should only be placed on fully formed connection enquiries after the connection applicant has signed up to the connection enquiry processing fee(s) in rule 5.3.2 (g) and where the applicant will be a National Electricity Market (NEM) registered generator and not an exempt generator.
- Energy Networks Australia supports a consistent national technical framework for the connection and operation of generation throughout the NEM. To support this

it would be helpful to participants for the final determination to clearly summarise in tabular form the relationships between AEMO's rule change request, the Essential Services Commission of South Australia (ESCOSA) requirements, the final rule and the related system strength and inertia rule changes.(b) (3) (ii).

» Energy Networks Australia seeks guidance in the rules on these accountabilities for large dedicated connection assets (DCA) connections.

Given the importance of power system security and quality of supply in light of the changing mix of generation and the volume of connections being progressed, a number of member businesses will be lodging separate submissions to focus on issues specific to their businesses.

Please do not hesitate to contact Verity Watson on 03 9103 0407 or vwatson@energynetworks.com.au if you would like further information.

Yours sincerely,

Dr Stuart Johnston

GM Network Transformation

Attachment

Negotiating Process for connections (5.3.4A)

The draft rule requires that where a connection applicant proposes a negotiated access standard it must be as close as practical to the automatic access standard having regard to the power systems security and taking into account the commercial and technical feasibility of complying with the automatic access standard. The applicant must also provide reasons and evidence why the negotiated access standard is appropriate.

Energy Networks Australia supports the AEMC view that connection applicants need to undertake due diligence upfront on the connection locations and the likely performance requirements at that location and then provide justification for any variance from the automatic access standards. Many of Energy Networks Australia members welcome discussions with applicants prior to an application being lodged on the likely requirements. The primary objective of the negotiating framework is to ensure the maintenance of system security – economic consideration for individual proposals should not be valued above the overall security of the power system as this has a far wider impact on costs across the NEM which are ultimately borne by customers.

AEMO can reject some negotiated access standards based on power system security considerations and can ignore the applicants commercial concerns, similarly networks (or in the case of Victoria, AEMO for transmission connections) need to consider maintenance of the system standards (S5.2.1) . It will be a matter of opinion as to what is a fair commercial and technical outcome and this has the potential to protract negotiations. The AEMC is clear that networks can consider technical matters based on current power system/networks concerns, including proposed future projects. The AEMC is also clear that maintaining system standards was for N-1 with planned outages. This may assist to remove ambiguity of the negotiation.

Energy Networks Australia members are concerned regarding the level of detail that may be required to substantiate a variation up from a proposed negotiated standards and the requirement to provide evidence may conflict with confidentiality requirements of other applications seeking to connect in the vicinity. Where there are multiple connections in varying stages, this may be difficult to manage in practice. The AEMC suggests that the reasons or detail to be provided in response to a negotiated access standard will become standardised over time and will become a quicker process for both the applicant and networks. Energy Networks Australia is hopeful that this is the case despite the variation in generator type, size and location.

Negotiated access standards in rule 5.3.4A(d) requires AEMO to provide a response within 20 business days of an applicant providing all information required by AEMO before AEMO respond to the networks with their view on acceptance or rejection of the AEMO advisory matters. Networks are expected to provide a response back to connection applicants within 30 business days under rule 5.3.4A (e) on whether they accept or reject the negotiated access standard. However, there is no clear drafting link to the network having received the AEMO information provided for in (d) and

(d1). Given the obligation on the networks in this rule is a civil penalty clause there should be a clear link to the receipt of the AEMO decision and material on the AEMO advisory matters. Rule 5.3.4A (e) should include a new sub clause (3) receipt of all information to be provided by AEMO under 5.3.4A (d) and 5.3.4A (d1).

We note a number of concerns were raised at the AEMC Information Forum regarding whether the AEMO and network responses operate in parallel or were sequential processes. There may be benefit in the final determination providing clarification on this matter based on AEMO feedback and whether they are prepared to do their assessment in parallel with the network service provider. It is very difficult for the network service provider to achieve the 30 business days turn around if the network service provider is required to complete its due diligence before AEMO will commence their review of the AEMO advisory matters. Energy Networks Australia notes that at least for some 5MW-30MW generating systems the AEMO exemptions guideline appears to require a sequential approach.

Application of New Rules should be clear

Where a generator has capacity in the range 5-30MW and exports above 20GWhr per year then it needs to be registered in the NEM and as a registered generator the Schedule 5.2 access standards will apply. Where a generating system with a nameplate rating 5MW-30MW and is expected to export less than 20GWHr in a year then these generators are not automatically exempt from the requirement to comply with the technical requirements in Schedule 5.2 of the National Electricity Rules (NER). When applying to AEMO for an exemption the applicant will need to provide a copy of the performance standards agreed with their connecting NSP or a letter from the NSP stating that their generating system is unlikely to cause a material degradation in the quality of supply to other network users. In this situation, AEMO may choose to grant an exemption. Batteries that are 5MW and above, whether stand alone or within a generating system must be registered and NER Schedule 5.2 does apply.

Some of the Chapter 5 connection processes may be used for sub 5 MW generator applications if the connection applicant sought to use Chapter 5 connections processes, rule 5.3.1A, in preference to Chapter 5A. Generally, for these sub 5MW generators the local network service provider will determine the necessary standards. For the exempt generators we would expect that the work being undertaken to provide nationally consistent technical guidelines that Energy Networks Australia is currently developing in consultation with a broad range of stakeholders would apply.

There is benefit if the AEMC provided a table of generator size/type, export and registration categories so it is clear how the draft rules in chapter 5 and the revised Schedule 5.2 apply to each category of connection applicant. It is important that the final rule provides access standards to better manage power system security and quality of supply that are suitable for the various generator types and do not adversely impact new synchronous plant e.g. coal and are appropriate for battery storage 5MW and above.

Registration of 5MW batteries was required given that a battery could move rapidly from a charge to release and generate a 10MW shift in load. We note that small scale

virtual power plants (VPPs) are already being installed and switched remotely. Any small generator aggregator (SGA) could remotely switch multiple small generators whose generation capacity in aggregate can easily exceed 5MW or 10MW. To the extent that these small generators are remotely switched in a localised area of a distribution network they can equally generate the same load shift as has raised the concern and caused registration requirement for 5MW batteries. Even without the wholesale demand response mechanism rule change occurring these switching arrangements are already in place and will continue to grow. This will occur whether there is an on market or off market trading system in place or not.

Victorian smart meters can also provide load control or limit supply to some 2 million households. The technology capability is currently being installed in the field, supported by customer contracts and head end control systems. The time when "centralised" load control of appliances (pool pumps, air conditioners and not just hot water) and load switching can generate more than a 5MW- 10MW load shift is rapidly approaching.

Energy Networks Australia is continuing to work with AEMO in regard to orchestrated demand response requirements that will need to be considered in an appropriate framework in the future to ensure system security and quality of supply is managed by all connections.

The policy and rules frameworks seem to be encouraging and supporting the introduction of more micro grids. If this is the intention, then any rules aimed at improving system security and quality of supply need to consider the responsibility for voltage regulation across the distribution network service providers but also across these exempt or partially licenced network operators.

Frequency response and active power control (S5.2.5.11 and S5.2.5.14)

The draft rule requires all generating systems to have the capability to operate in frequency response mode. The draft rules uses the term 'have the capability' however it is not clear whether the generating systems needs to have the capability in the procured product or whether it needs to have the capability in the installed product which is commissioned, tested, ensures operational compliance with other access standards and is then turned off. It would be useful if the AEMC clarified the intent of the term 'must have the capability' in its final determination.

Remote Monitoring and control (S5.2.6)

The draft rule amends the automatic access standards to expand its application to include all non-scheduled generator units/systems regardless of whether they are above or below 30MW to have remote monitoring equipment, remote control equipment to transmit to and receive from AEMO control centres in real time certain information. The draft rule also amends the minimum access standards to expand its application to include all non-scheduled generator systems regardless of size to have remote monitoring equipment.

Energy Networks Australia supports the draft rule and recognises the value of increased communications as smart technologies and smaller non-scheduled generators continue to grow in numbers. AEMO "may" request a number of quantities, however we would expect that AEMO would limit their requested values if there might be adverse supervisory control and data acquisition (SCADA) communication impacts. In conjunction with an expected increase in communication requirements and volumes, we would expect traffic volume analysis, including priority level traffic and control was undertaken ahead of AEMO requesting the fuller set of values.

Reactive Power Control (S5.2.5.13)

The draft rule includes:

- under the automatic access standard, the capability to operate in all modes and switch between them (in accordance with a procedure agreed with AEMO and the network service provider), and
- under the minimum access standard, the capability to either operate in voltage control mode, or otherwise in any other reactive power control mode with the agreement of AEMO and the network service provider (regardless of the size of the generating system and the connection point voltage).

The general approach the AEMC has adopted is that minimum access standards should be a subset of the capability required for automatic access standards. This approach will facilitate more effective negotiation on a more limited number of variables, and hence is supported.

Energy Networks Australia notes that ESCOSA requirements are the same and have been in operation for some time. The ability to have the capability of all three modes – voltage control, power factor and reactive control and to be able to switch between them is technically feasible and is already in operation in SA.

Connection applicants concerns have been noted, however this flexibility of operational modes is available and operational in SA. ESCOSA has, after public consultation, seen that this is a required operational capability in light of the learnings of the various SA system events.

Energy Networks Australia is supportive of the requirements defined in S5.2.5.13(b)(2A), however we recommend some drafting amendments to promote flexibility in meeting remote switching capability requirements. There will be jurisdictions that will have a significant level of synchronous generation operating for some time, these will most likely operate in voltage control mode making the need to remotely change the control mode unnecessary. Tasmania is likely to continue having high synchronous generation into the future.

The proposed amendment would aid clarity and increased flexibility regarding remote changes to control modes and set points:

(2A) a generating system must have facilities with a control system to regulate voltage, reactive power or power factor, with the ability to:

(i) operate in any control mode; and

(ii) switch between control modes,

in accordance with a procedure agreed with AEMO and the Network Service Provider. Remote control equipment to change the setpoint and control mode must be provided unless otherwise agreed with AEMO and the Network Service Provider.

Whilst Energy Networks Australia is supportive of the capability of interchangeable control modes at the transmission level, this can cause concerns at the distribution level where networks may be less strong, have a higher number of generators and end use customers connected. The cost and difficulty of applying this capability would be different, with the complexity of managing the switching much higher in the distribution network. Therefore, even if generators have the ability to operate in more than one mode of reactive power control they should only be commissioned in one mode in the first instance in the distribution system (66kV and below), until full testing of an alternate mode is approved, including the analysis of all potential impacts.

Energy Networks Australia has reservations about AEMO being granted the ability to change the operating state of distribution networks it has no visibility of. Any procedure agreed to between AEMO and the distribution network service provider needs to consider the increasing level of smaller non-scheduled generating on 11/22kV distribution feeders and any remote changes in the voltage control model, when distribution network service providers are responsible for the management of local voltage and thermal limits.

Reactive Current response during fault disturbances (S5.2.5.5)

Energy Networks Australia supports the consistency of the drafting with the ESCOSA requirements and the clarification of the expectations, however, we consider the drafting of S5.2.5.5 (b) (1A) may be better drafted in a table.

Continuous uninterrupted operation (S5.2.5.5 (b) (1A) and (c) (1A))

While we agree with the need for the changes to S5.2.5.5 (b)(1A) and (c)(1A), some guidance on how the proposed multiple voltage disturbance ride-through should be assessed would be appreciated.

Systems strength (S5.2.5.4 and new definition)

There is currently no explicit system strength access standard as part of the generator access standards in the NER. AEMO has proposed introducing a minimum access standard specifying that a generating system and each of its generating units must be capable of continuous uninterrupted operation for a short circuit ratio of 3.0 at the connection point. The AEMC made the Managing power system fault levels rule on 19 September 2017 to address system security issues related to reductions in system strength in the power system. That rule commences in full on 1 July 2018.

Energy Networks Australia notes that the draft rule does not contain a system strength access standard on the basis AEMC considers the framework created by the Managing power system fault levels rule is likely to be sufficient to address risks to

power system security from reductions in system strength. Some Energy Networks Australia members have raised issues regarding potential limitations to the Managing power system fault levels rule and intend to address these matters specifically in their own submissions to this rule change.

Consequential Changes (5.2.6A, 4.14 and 5.3.9)

The draft rule includes a number of additional changes that are consequential to making the rule, including:

- introducing a framework for the regular review of access standards
- introducing clear obligations for AEMO to provide the Australian Energy Regulator (AER) with information on generator performance standards, and
- clarifying the operation of existing arrangements for renegotiation of performance standards when equipment is altered.

Regular review of access standards

Energy Networks Australia supports AEMOs review of access standards at least every 5 years. This provides AEMO with the flexibility to ensure that the access standards can be adapted to respond to evolving power system conditions on a more frequent basis if needed. However, this flexibility means that the access standards need to be reasonable for some 7 years into the future and not just consider committed projects but also reduction in output or closure of large synchronous generators during this period. The Distributed Energy Resource (DER) rule change is likely to commence in 2021 and the orchestration/optimisation of DER will need to be facilitated via improvements in technology, standards, system architecture and encouraged as a viable option in meeting the National Energy Guarantee reliability framework. Access standards being implemented through this rule change need to ensure power system security and quality of supply can be maintained through at least this period and beyond.

AEMO provision of performance standard register to AER

AEMO obligations to provide the AER with a copy of the register of performance standards in 4.14 (n3) should link to the sub clause in 4.14. (n2). The (n1) and (n2) references in (n3) should refer to (n2) (1) and (n2) (2).

Clarification of alteration at existing plant

Energy Network Australia is supportive of the draft rule changes to improve the clarity for older plant upgrades.

Transitional Arrangements

Final rule and commencement date

The current draft of the rule provides for the rules to commence from the date that is 8 weeks from the date of the final determination. Energy Network Australia broadly supports the 8 weeks as being a suitable transition period

For negotiations that, on the date of commencement, have a full set of access standards agreed for a proposed connection, these projects will be based on the rules that were in force immediately prior to the commencement date. The final rule would not affect existing connection agreements or offers to connect.

Energy Network Australia recognise the need to update the access standards given the changes currently occurring and the transformation that will continue as intermittent generation replaces aging coal fired generation. This rule has been undergoing consultation for some time, any applicants keen to gain a connection offer or a full set of access standards approved have far more than the 8 weeks to prepare complete, quality documentation for connection application documentation to seek to streamline the process. However, we are cognisant that there may be resource constraints (whether it be modelling consultants, AEMO or networks) or other factors that can delay the process for agreeing a full set of access standards within the transitional period. In some instances the process for agreeing a full set of access standards may be beyond the control of negotiating parties. For instance, possible delays associated with modelling issues, availability of models or modelling disputes could occur through the full assessment for system strength impact assessment process. This may result in significant cost and time delays to connection applicants if they are then required to meet new access standards. Given these issues may arise for any proposed commencement date, we don't see the need to extend the 8 weeks although consider there may be reasonable grounds to justify an extension to transitional arrangements, in limited and defined circumstances. Extending the date to include the Christmas and New Near period is unlikely to achieve a significant extra number of approvals.

Application to existing connection enquiries

There can be a significant number of connection enquiries that don't result in a connection application and do not meet the AEMC criteria of an ongoing connection process. Our preferred drafting is to remove 11.107.2 as the AEMC has undertaken extensive consultation over a lengthy period and held a number of workshops. Generation applicants who genuinely wish to participate in the market should be well informed on the implications of this rule through public consultation processes and public information forums.

We understand that this approach may not be acceptable, therefore we suggest that the drafting be limited to advising the connection applicant that the enquiry will be treated as an enquiry under the new Chapter 5 and to provide a link to the final rule drafting and any information packs on the access standards that the network may have updated. Connection applicants who are seeking to connect who do not have a connection offer or full access standards agreed will have undertaken their due diligence and will have taken the opportunity to update their documentation as the revised access standards will be applied anyway and project delays are costly. This approach will allow more time to be spent on the submitted connection applications and to ensure that these further advanced projects are able to be prioritised and can progress in a timely manner under the new standards.

This approach does not prevent a network from providing the more detailed information where there is sufficient time to do so. Noting that the 10 business days and 20 business day obligations on networks are over the Christmas and New Year /January holiday period when resourcing levels in the connections area may be lower than normal. Nor does it waste resource time on connections enquiries that may be cold, or where projects may have to be re-assessed by the applicant, together with their investors, under the new rules.

New proposal from AEMO – provision of all enquiry forms

AEMO have provided a late proposal to the AEMC that networks provide AEMO with all enquiry forms related to a connection enquiry that are the first step in the networks providing a preliminary response to the connection applicant under Schedule 5.4. We understand that AEMO wish to receive these preliminary enquiry forms shortly after they are lodged with the transmission or distribution network service provider for any proposed connections with generation capacity above 5MW.

Energy Networks Australia does not support the proposal being included in the final rule. The proposal has been introduced late in this consultation given it was not even part of the Draft Determination discussion paper and would benefit from further detail

AEMO believe this information is needed to provided them with greater visibility of new generator connections due to their role in broader network and integrated planning and also because AEMO is aware of projects which have commenced development during the connection enquiry stage.

Connection enquiries at the early preliminary stage may not result in a connected generator at all or with the same details as the original enquiry. Any number of details could change regarding a generator application ie location, connected capacity etc. Using this early information as though it is accurate and credible in planning would not be appropriate. Given the competition in generators, the applicants are nervous about commercial information regarding their proposed capacity being made available to other parties.

If this type of obligation were to be placed on network service providers it should only be placed on fully formed connection enquiries after the connection applicant has signed up to the connection enquiry processing fee(s) in rule 5.3.2 (g) and where the applicant will be a NEM registered generator and not an exempt generator.

Any connection applicant who commences development prior to having all access standards agreed and a connection offer does so at their own risk. Provision of all connection enquiries forms to AEMO is unlikely to change this approach.

Other matters

Currently different technical requirements apply to generators in South Australia versus the rest of the NEM. Energy Networks Australia supports a consistent national technical framework for the connection and operation of generation throughout the NEM. To support this framework, it would be helpful to participants for the final determination to clearly summarise in tabular form the relationships between AEMO's

rule change request, the ESCOSA requirements, the final rule and the related system strength and inertia rule changes.

In addition, the Transmission Connection rule change that came into full effect on 1 July 2018, has introduced the dedicated connection asset (DCA) network service provider. For large (>30km) DCA's an access policy is required to be in place for connection of subsequent loads and generators. While generators seeking connection to large DCA's are analogous to embedded generators in distribution networks, the rules do not provide the same level of guidance regarding the accountability for assessing and negotiating technical performance standards. Given the prospect for large DCA's at the edge of grid to provide access to significant renewable resources Energy Networks Australia seeks guidance in the rules on these accountabilities.

This tabular approach, and that referred to in section 3 above, to the various rule changes and obligations may also be helpful from a Northern Territory (NT) Rules perspective and the application of these amendments to NT generator connections.