

19 June 2025

ERC0394 - Improving the NEM access standards - Package 2

Australian Energy Market Commission

Submission made online at www.aemc.gov.au

Dear Sir/Madam

Subject: ERC0394 Improving the NEM access standards – Consultation Paper, Package 2

SA Power Networks welcomes the opportunity to provide feedback on AEMC's Consultation Paper on improving the NEM access standards (package 2).

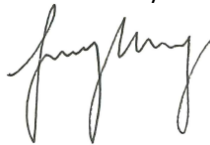
As the operator of a distribution network with one of the highest penetrations of consumer energy resources (CER) in the country, SA Power Networks anticipates continued growth in large inverter-based loads connecting to the distribution network. This growth is expected to support increasing demand driven by digital transformation and the need for expanded data storage capacity. In South Australia, the state's strong focus on renewable energy, combined with its strategic position as a hub for digital infrastructure, positions it as an attractive destination for new inverter-based loads including data centre and hydrogen plant developments.

SA Power Networks acknowledges the growing risks associated with the absence of ride-through requirements for large loads. However, it is critical that the definition and treatment of a 'large load' are carefully considered, including the establishment of appropriate thresholds. Striking the right balance in modelling requirements and technical assessments is crucial to avoid hindering market growth in this sector. Additionally, leveraging insights and lessons learned from the connection of existing large loads within the NEM will provide valuable guidance in shaping these standards.

For further details, please refer to the Attachment 1, which provides our expanded and selected feedback based on the AEMC's structured questions.

We look forward to continuing to engage constructively with AEMC to deliver the lowest cost whole-of-system approach to enabling the energy transition. Should you have questions on any aspect of our submission, please contact Andrew Lim, Connections Engineering Manager, at Andrew.Lim@sapowernetworks.com.au.

Yours sincerely



Andrew Lim

Connections Engineering Manager

Attachment 1

Question 1: Defining large loads in the context of this rule change request

In the context of this rule change request and AEMO's ongoing consideration of the definition for large loads through its Large Loads Review:

1. Are stakeholders supportive of AEMO's ongoing process to address the system security implications and performance standards for large loads, including how large loads ought to be defined in the NER? *Yes, due to the projected increase of large load connections that may have an impact on the security of the power system.*
2. To what extent do stakeholders think that the Commission should consider the definition of 'large loads' in the context of this rule change? *The term "large load" should be explicitly defined for absolute clarity with appropriate registration and technical requirements such that the right level of access standards can be applied consistently across the NEM, analogous to the existing size based (MW) threshold for IRPs and Generators. The thresholds for these requirements should be developed in consultation with the NSPs by considering the risk of these connections relative to the system strength, transfer capability and characteristics of the local network. The revised Rules should also consider and support a level of flexibility for these requirements at discretion of the individual NSPs and AEMO to cater for evolving technologies.*
3. If it is considered, should large loads be defined based on the relevant access standard, or should a large load be more holistically defined in the NER? *The definition of a large load should be explicitly defined in the NER with accompanying registration and technical requirements (such as relevant access standards) to remove any ambiguity on when these new requirements should or shouldn't apply.*
4. Alternatively, should we consider whether to apply guiding principles and timing for AEMO to produce a proposed definition, which is currently being considered in AEMO's Large Loads Review? *Yes, considering that this is a topic that requires more in depth investigation, research and stakeholder consultation. Whilst SA Power Networks acknowledge the need for a level of performance standards for large inverter-based loads due to system security implications, overly conservative and restrictive technical requirements would significantly deter future load connections and discourage further investment in the NEM.*

Question 2: Amending the NER to address the influx of large loads

1. Do stakeholders have any reflections or data and information they wish to share with the AEMC regarding the prospective growth of large loads connecting to the NEM, including from international experience? *SA Power Networks envisages a future growth in large loads being connected to the distribution network, to meet the demand of digital transformation, large centralised Electric Vehicle fast charging stations or data storage capacity. In South Australia specifically, the state's focus on renewable energy and its strategic location as a hub for digital infrastructure will make it an attractive destination for new data centre developments.*
2. Do stakeholders agree with AEMO that the expected growth of large loads may present a risk to power system security? *Yes, the growth of large loads may present a risk to the bulk power system security and could even contribute to localised distribution level constraints and outages. However, the risk would be strongly influenced by factors such as the size, technology, proximity to nearby sources of generation and characteristic of the local network.*

Question 3: HVDC links to procure system strength services from third parties (Not applicable to SA Power Networks)

Question 4: Limiting short circuit ratio requirements for customer loads to IBR, and introducing flexibility to the access standard

In relation to AEMO's proposal to limit the application of short circuit ratio requirements under clause S5.3.11 to large inverter-based resources that is IBL:

1. Do stakeholders consider it an issue that the short circuit ratio requirements under clause S5.3.11 apply to all IBR plant without any size threshold? [Yes, as blanket application of onerous technical requirements without consideration of the likely risk and impact on the network could significantly deter future load connections and investment in the NEM.](#)

[As noted by AEMO in the "Overview of rule change proposals to improve NEM access standards" document, it should be noted that the extent which the access standards are expected to apply to retailer market participants connected to the distribution network is not clear which could lead to a large number of distribution connected loads effectively bypassing this requirement.](#)

[SA Power Networks suggests that some level of threshold for screening methodology based on the size, type of load and local characteristic of the network should be developed, accompanied by an appropriate registration requirement to avoid any ambiguity for when these new requirements should apply.](#)

a. Should it only apply to large inverter-based resources as defined in AEMO's SSIAG? [Yes, which will include IBL.](#)

b. Is the definition of a large inverter-based resource in the SSIAG sufficient for the purposes of this proposal? [It is recommended to standardise the definition \(e.g. based on nameplate MVA only\) for consistency, rather than allowing the use of both MW and MVA.](#)

2. Are there alternative solutions stakeholders consider would be more effective? [SA Power Networks supports the application of short circuit ratio requirements however we are willing to consider other practical or alternative solutions that can simplify the modelling and technical assessment, based on learnings and future research.](#)

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning. [Consideration of industry and market readiness is important to ensure industry can meet the AEMO's proposed rules.](#)

In relation to AEMO's proposal to amend the NER to introduce flexibility in clause S5.3.11 to allow the NSP and AEMO discretion to agree to a minimum short circuit ratio requirement above the minimum requirement of 3.0:

1. Do stakeholders agree there should be flexibility to agree to higher short circuit ratio requirements? Could there be unintended consequences? [Flexibility will allow NSP and AEMO to agree on higher minimum short circuit ratio based on risk, technology and capability of the connecting plant.](#)

2. Are there alternative solutions stakeholders consider would be more effective? [N/A](#)

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning [N/A](#)

Question 5: New definitions for protection systems

In relation to Rod Hughes Consulting's Definitions of protection system requirements rule change request:

1. Do stakeholders agree that the requirements for generator protection systems are currently unclear? If so, what are the impacts of this lack of clarity? a. Similarly, do stakeholders consider the requirements for loads' and HVDC links' protection systems are currently unclear?

SA Power Networks doesn't believe the requirements at present are necessarily unclear but agree that the proposed changes make requirements more specific. We can't see how the proposed changes would result in different protection solutions but should reduce the amount of back-and-forth required with proponents when arriving on a suitable protection arrangement.

2. Do stakeholders support the proposal to update and add new NER definitions for types of protection systems? a. Do stakeholders have feedback on the proposed new definitions themselves?

SA Power Networks support the inclusion of new definitions, e.g. "main protection", "back-up protection" and "independent alternative main protection". Noting that these definitions are not different from current understanding.

3. Do stakeholders have any concerns or suggestions in relation to this element of Rod Hughes Consulting's proposed rule? If so, please describe your concerns and any related suggestions and reasoning.

Regarding the concerns around the "connection point"; SA Power Networks has always understood that the requirement for redundant protection does not apply where there is no possibility to impact the stability/security of the network and as such we do not enforce this requirement on the distribution network.

Question 6: Conditions for generator protection systems

These questions relate to Rod Hughes Consulting's Conditions for generator protection systems rule change request.

1. Regarding the proposal to remove paragraph (b) of clause S5.2.5.9: a. Do stakeholders agree that paragraph (b) is redundant and/or misleading, or do stakeholders have a different interpretation? b. Do stakeholders support Rod Hughes Consulting's proposal to remove paragraph (b)?

SA Power Networks agrees that the AAS requires sufficient redundancy and circuit breaker failure protection, therefore the clause itself is redundant.

2. Regarding the proposal to add a new provision in the minimum access standard: a. Do stakeholders agree that the minimum access standard may create risks to power system security because it does not require additional redundancy in protection systems? b. Do stakeholders support Rod Hughes Consulting's proposal to give AEMO and the NSP discretion to increase redundancy requirements in the minimum access standard if required to prevent adverse impacts on power system security?

SA Power Networks believes there is a place for non-redundant protection systems where alternative fail-safe protection schemes are implemented, e.g. Automatic disconnection of the generating system on relay watchdog operation, communications failure, DC supply failure, etc (noting failure must be detected and action implemented by an independent control scheme).

While this can lead to unplanned loss of the generating system, we believe it is fit for purpose when the generator connection is itself non-redundant, i.e. when supplied via radial feeder, as is common for connections to the distribution network.

3. Do stakeholders have any concerns or suggestions in relation to this element of Rod Hughes Consulting's proposed rule? If so, please describe your concerns and any related suggestions and reasoning.

As above.

Question 7: Provision of information on ride-through capability

In relation to AEMO's proposed changes to enable NSPs to request information on loads' ride through capability:

1. Do stakeholders agree that NSPs and AEMO lack visibility of loads' ride-through capability and that this creates a challenge for system security? [SA Power Networks acknowledges the increasing risk associated with the absence of ride-through requirements for large loads. However, the definition and treatment of a 'large load' must be carefully considered including threshold definition to ensure that the proposed risk management approach strikes the right balance without adversely impacting or disincentivizing the market.](#)

2. Do stakeholders support AEMO's proposed rule to require network users to provide information about connecting load's ride-through capability to the NSP on request? [Yes, providing information about a connecting load's ride-through capability for large IBLs enables NSPs and AEMO to establish an appropriate negotiated access standard, taking into account the various factors that may influence the connection's risk profile. Striking the right balance in modelling requirements and technical assessments is crucial to avoid unnecessary extended timeframes for current connection process and hindering market growth in this sector. Leveraging risk insights and connection learnings from existing large loads that have already been connected in the NEM would also provide valuable information.](#)

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? [When developing the right threshold and requirements, AEMC must consider the practicality and challenges of associated technologies, equipment and brownfield load sites that may not be able to provide adequate information.](#)

Question 8: Protection settings to maximise ride-through performance

In relation to AEMO's proposed changes to amend clause S5.3.3(c) of the NER to encourage protection settings that maximise loads' ride-through capability:

1. Do stakeholders agree that the current arrangements allow conservative load protection settings that may unnecessarily reduce loads' ride-through capability?

[Yes, we have noted many large loads disconnect on very short voltage/frequency disturbances caused by transmission or sub-transmission faults. At present we don't feel we have the ability to enforce protection settings to maximise ride through. While we have highlighted the sensitivity of certain settings and the risk of unnecessary tripping, customer's engineers will often suggest their necessity to "protect sensitive equipment", which we are forced to accept or otherwise put ourselves at risk should the customer's equipment experience failure coinciding with network events.](#)

2. Do stakeholders support AEMO's proposed rule requiring cooperation between the NSP and the network user in the design of protection systems and settings to maximise ride-through capability?

Yes

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning.

Consideration of potential impacts on the availability of load to the underfrequency load shedding scheme – suggest prioritising UFLS performance.

Question 9: New access standard for detection and response to instability

In relation to AEMO's proposed new access standard for detection and response to instability that would apply to large inverter-based loads:

1. Do stakeholders agree that there is an emerging need for large inverter-based loads to play a role in managing instability in the NEM? Yes

2. Do stakeholders support AEMO's proposed new access standard for instability detection and response by loads as set out in Box 4? a. Which parts of the proposal do stakeholders support, or oppose? b. Do stakeholders agree with the materiality thresholds for application of the automatic access standard and minimum access standard (see Table 4.2)? SA Power Networks is generally supportive of the proposed monitoring requirements outlined in Box 4. However, we believe it would be important to engage in consultation with the industry to fully assess the feasibility and potential market implications of the proposal.

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning. No comment.

Question 10: Under-frequency ramp down of large loads

In relation to AEMO's proposed changes to amend the NER to facilitate the ability for loads to ramp down:

1. Do stakeholders agree some loads may be more flexible with the ability to ramp down their load in an emergency rather than disconnecting in blocks? No comment.

2. Do stakeholders agree that the NER should be amended to allow for the provision of interruptible load by way of fast ramp down? No comment.

3. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning. No comment.

Question 11: Clarification of credible contingency definition for disturbance ride-through

In relation to AEMO's proposed changes to amend clause S5.2.5.5 of the NER to clarify the scope of contingency events that a schedule 5.2 plant must be able to ride through:

1. Do stakeholders agree that the current definition for the types of credible contingencies in relation to disturbance ride-through requirements for schedule 5.2 plant is unbounded/implicit to be unbounded and that this presents an issue? [No comment.](#)
2. Do stakeholders agree that arrangements poorly define the types of credible contingencies in relation to disturbance ride-through requirements for schedule 5.2 plant? [No comment.](#)
3. Do stakeholders support AEMO's proposed rule to clarify the types of contingency events that a schedule 5.2 plant must be able to ride through? [No comment.](#)
4. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning [No comment.](#)

Question 12: Testing and commissioning

1. Do stakeholders support AEMO's proposed amendments to clause 5.7.3 to refer to schedule 5 plant in respect of AEMO's ability to request compliance tests for registered plant? [Yes.](#)
2. Do stakeholders support AEMO's proposed changes to clauses 5.7.2 and 5.7.3 to extend the rights for testing of power system plant to apply to non-registered schedule 5 plant? [Yes, provided the size threshold is appropriately defined based on risk and impact assessments.](#)
3. Do stakeholders support AEMO's proposed changes to the NER to extend the requirement for coordinating commissioning procedures for non-registered schedule 5 plants with a maximum capacity equal to or greater than 30MW or 30MVA? [Yes, provided that the justification for the proposed 30MW or 30MVA threshold is clearly demonstrated and supported by robust evidence.](#)
4. Should the Commission consider extending enforceability and compliance requirements under rules 4.14 and 4.15 to all 'schedule 5 participants', which includes non-registered participants? [Yes.](#)
5. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning. [Consideration of appropriate thresholds with clear supporting justification to ensure the proposed rule changes are proportionate and effective. Additionally, further discussion is needed regarding legacy or brownfield sites, as these sites may face challenges in meeting current requirements without significant investment. It is important to assess the feasibility and potential impacts on these sites to ensure the proposed changes are practical and equitable.](#)

Question 13: Extension of time for complex issues in future access standards reviews

In relation to AEMO's proposal to amend clause 5.2.6A of the NER to allow flexibility for extending the time limit for completing each review:

1. Do stakeholders agree that the requirement to complete each review within 12 months of the approach paper being published is too inflexible or may inhibit proper analysis and consultation? [No comment.](#)
2. Do stakeholders consider that AEMO should be responsible for setting a new date for publication of the final report? Is there an alternative approach that would better address the issue? [No comment.](#)
3. Do stakeholders agree that AEMO should publish a notice when an extension is needed, outlining the reasons as they may relate to complexity/difficulty, or a material change in circumstances? [Yes. In addition, the progress of the](#)

extension should be transparent, well-documented, and easily accessible to ensure accountability and maintain stakeholder confidence.

4. Do stakeholders have any concerns or suggestions in relation to this element of AEMO's proposed rule? If so, please describe your concerns and any related suggestions and reasoning? [No comment.](#)

Question 14: Assessment framework

Do you agree with the proposed assessment criteria? Are there additional criteria that the Commission should consider or criteria included here that are not relevant? [Yes, the proposed assessment criteria are generally appropriate; however, it is recommended to include additional criteria such as practicality and efficiency, with a focus on market readiness. This would ensure that any proposed changes are not only theoretically sound but also feasible to implement within the current market environment. It is equally important to assess whether the industry has the necessary tools, resources, and capabilities to adapt to the changes effectively.](#)