

6 February 2025

Australian Energy Market Commission

By email: [submissions@aemc.gov.au](mailto:submissions@aemc.gov.au)

Dear Sir/ Madam

**Re: Improving the NEM access standards – Package 2 – ElectraNet Comments**

ElectraNet welcomes the opportunity to comment on the 2025 rule change draft around the Improving the NEM access standards – Package 2 inclusive of the Rod Hughes review.

ElectraNet shares the view that the intent of Improving the NEM package 2 specifically around placing guidance and rules around large loads is timely and necessary to help the energy transition.

While the draft rules pose a good direction for the industry, please see comments regarding some of the specific issues ElectraNet wish to raise for consideration.

**Comments**

**Load**

Clause S5.3.3 (c) –some guidance on this to ensure customers have clarity of the application of this change as it seems to introduce negotiations in respect to the access standards – this will link with S5.3.4A.

Clause S5.3.4A – The removal of the use of “If provided” defeats the purpose for defining it in the rules. The minimum would be “to supply” the information to enable effective modelling and assessment with further definition in the Power System Modelling Guide allowing for more technical specification when and where appropriate.

Sub-paragraph (c)(4)(2) would expressly allow inverter-based plant to remain online “beyond limits where it is not required to disconnect under any performance standard.” While this may improve availability, it also risks dynamic instability in weak-grid conditions for PLL-based technologies and in strong grid conditions for swing-equation (dual-loop voltage-vector) GFM inverters that haven’t been assessed by the Connection Applicant.

1. **Slow and dynamically changing SCR:** As the short-circuit ratio slowly fluctuates with the ever-changing system-strength landscape, inverter controls can lose damping and give rise to sustained oscillations—especially since system-strength obligations focus on specific nodes, yet strength continuously redistributes across the network, exposing untested scenarios for both PLL-based and swing-equation dynamics.
2. **Untested envelope:** The Applicant's performance tests typically cover only the pass/fail trip thresholds, not extended operation under progressively weaker SCR.

#### **Recommendations:**

- Extended connectivity testing: Require Applicants to include "extended connectivity" scenarios in their compliance tests, sweeping system strength down to the lowest credible SCR – Noting the difference between this requirement to S5.2.5.15 is the control settings must be consistent with the tuned site-specific settings.
- Minimum stability margin: Define a minimum SCR or damping margin that must be demonstrated for continuous operation beyond ride-through thresholds.
  - PLL-based inverter damping: For PLL-based inverters, when defining the minimum SCR, also require demonstration of a minimum damping ratio at the plant's maximum active-power transfer.
  - GFM dual-loop control requirements: For grid-forming inverters employing dual-loop voltage-vector control with swing-equation dynamics, specify both an upper SCR limit (to avoid over-stiffening) and a minimum damping margin at rated power.
- NSP/AEMO discretion: Retain the discretion for the Network Service Provider or AEMO to enforce disconnection or mandate additional studies if stable operation cannot be proven.

Clause S5.3.4A – The inclusion of Disturbance Ride Through Capability within S5.3.4A should be removed and established as a standalone provision, directly mirroring the structure and requirements of clause s5.2.5 for generation to ensure consistency and clarity.

Clause S5.3.10 – Clarification is required on:

(a)(1) disconnection would define the total load rejection while as per clause 4.3.5 a 60% rule should apply.

(a)(2) definition of fast reduction (definition needed as to guide customers and allow NSP evaluation or consideration)

Clause S5.3.12 – Unstable plant should not be limited to Inverter Based Load (IBL) as some traditional loads can do this to a lesser extent, but the risk is still the same.

Additional Requirement for Load connections like generators that could help manage stability or security issues:

- Compulsory PQ meter installation
- Compulsory PMU installation
- Type test certificate for IBL inverters

## **Protection**

Appreciate the work that Rod Hughes has proposed but what issues are being fixed by the proposed rules changes – there are no examples of NSP's failing the good engineer practise or NSP system standards for protection in recent history.

Clause S5.1.9 & S5.2.5.9 wording change from "Primary" to "Main" is unclear with the premise that there is a risk requiring correcting – noting this has not materialised so why change the wording while the industry understand primary and backup protection definition under good engineer practise.

Current concerns on the propose s5.1.9 changes will remove the opportunity for NSP's to utilise discretion in design, increasing costs and complexity for customers. If the rules are too specific this will lock in a response removing a risk-based approach to design.

As proposed in Section 4 – addition of the specific wording and definition will limit both customer and NSP use of discretion or negotiation increasing costs and protection complexity moving away from good industry practise.

## **Generation**

Clause S5.2.5.5 changes will limit any studies that could be conducted to ensure stability or system security issues if not defined or acceptable to AEMO.

At present the use of suitable engineering judgement to further extend contingency studies to better understand plant performance when issues or unexpected behaviours have materialised allows the NSP to fully consider plant performance and behaviour. The definition and clarity as defined will remove the engineering judgement and further understanding of plant performance.

Clarification on the limitations without justification can be accepted but the current wording does not allow for that discretion.

Clause s5.7.3 – updates to the rights of testing mainly general updates nothing significant or impacting what we do more on the customer side and increasing AEMO's involvement. Test to demonstrate compliance (note only for registered) it might be hard for Santos and BHP to enforce anything.



ElectraNet appreciates the opportunity to provide feedback on the draft 2024 AEMO review of technical requirements for connection. Should you have any queries, please contact Lucas Millmore in the first instance on (08) 8404 7255.

Yours sincerely,

A handwritten signature in black ink, appearing to read "LM", with a stylized flourish at the end.

Lucas Millmore

**Manager Network Connections**