Part of Energy Queensland

20 April 2023

Mr Daniel Westerman
Chief Executive Officer
Australian Energy Market Operator
GPO Box 2008
Melbourne VIC 3001

Submitted via email to contact.connections@aemo.com.au

Dear Mr Westerman

Review of technical requirements for connection S5.2 and S5.3a - Draft Report

Ergon Energy Corporation Limited (Ergon Energy) and Energex Limited (Energex), both distribution network service providers (DNSPs) operating in Queensland, welcome the opportunity to provide comment to the Australian Energy Market Operator (AEMO) on its *Review of technical requirements for connection S5.2 and S5.3a - Draft Report* (the Draft Report).

Feedback and comments on the Draft Report questions are included in the attached response template.

Should AEMO require additional information or wish to discuss any aspect of this response, please contact me on 0429 394 855 or Laura Males on 0429 954 346.

Yours sincerely,

Alena Chrismas
Acting Manager Regulation

Telephone: 0429 394 855
Email: alena.chrismas@energyq.com.au

Encl: *Ergon Energy and Energex's comments on the consultation questions*

Draft report Stakeholder feedback template:

AEMO Review of technical requirements for connection (NER 5.2.6A)

Stakeholders making a submission on the recommendations set out in the AEMO draft report may use the below template to provide feedback. Please consider the confidentiality disclaimer at the end of this document.

Stakeholder: Organisation name

Ergon Energy and Energex

Contact: Laura Males, 0429 954 346, laura.males@energyq.com.au

Schedule 5.2 Conditions for Connection of Generators

Issue	Schedule 5.2 Generator Recommendation feedback
NER S5.2.1 – Outline of requirements	
Application of Schedule 5.2 based on plant type instead of registration category and extension to synchronous condensers	Ergon Energy and Energex are supportive of consistency in assessing the connection of plant that can have a significant impact on the network such as synchronous condensers.
NER S5.2.5.1 – Reactive power capability	
Voltage range for full reactive power requirement	Ergon Energy and Energex support Option 3 over Option 2 and notes the preference that this requirement continues to apply to distribution connected generation, as noted in our response below on the issue of Simplifying Standards for small connections.
Treatment of reactive power capability considering temperature derating	Ergon Energy and Energex have no objection to the suggested option.
Compensation of reactive power when units are out of service	Networks must maintain compliance with the system standards as specified in Schedule 5.1 (and the relevant jurisdictional requirements) at all times. As such, whether the reactive power injection from ancillary plant is a material issue or not, in our view, it is for the Network Service Provider (NSP) to determine as the network is impacted daily (or regularly) due to the energisation/de-energisation of plant. Ergon Energy and Energex are supportive of the introduction of a material threshold. However, we believe that NSPs should have the responsibility of determining what the materiality for their network is, rather than an arbitrary value at a region or National Electricity Market (NEM) level. Ergon Energy and Energex seek clarification on the use of 'limited compliance' in its Draft Report at page 35 in the last paragraph. A number of solar farms connected to the Ergon Energy and Energex network compensate for their harmonic filters at night with "Q at night mode", with the voltage control in this mode articulated by the voltage control strategy (VCS). We seek clarification whether the changed responses to S5.2.5.5 would also be articulated in this operating mode.

Issue	Schedule 5.2 Generator Recommendation feedback

S5.2.5.1, S5.2.5.5, S5.2.5.7, S5.2.5.8, S5.2.5.10

Simplifying standards for small connections	**S5.2.5.1** Ergon Energy and Energex are strongly opposed to the proposed for changes to S5.2.5.1 for small connections. In our view, applying the proposed changes to all connections in the distribution network is inappropriate. The largest generator connected to Ergon Energy's network is 180MW which is larger than some transmission connected generating systems. Having inconsistent access standards based on which network the system is connecting to rather than any technical basis, is not suitable in our opinion. Further, the Draft Report states 'This considers that reactive power that leads to large changes in voltage on the distribution network is probably not usable, as the distribution network is usually operated to tighter voltage tolerances than the transmission network.'[1] This statement ignores that reactive power is 'used' locally. If the network is sensitive to changes in reactive power, it will also be sensitive to changes of active power, that is, the injection of active power caused by the generating system needs to be managed with commensurate reactive power. It is vital that generators connecting the distribution network are appropriately able to control the voltage at their connection point in order to maintain acceptable power quality for all network users. **S5.2.5.5** The reasoning behind the relaxation of requirements for S5.2.5.5 in terms of reactive current injection appears short sighted. While there may be minimal impact at a system level, the generating system will help to improve recovery in the local network it is connected to. A reduction to 'nil', means that the generating system will worsen the performance of the network during a fault, and worsen fault recovery for network users in the area. If generating systems are not required to articulate a response, or provide any evidence towards this, this effectively reduces the standard. Given that it is anticipated that generating systems will be less centralised in future, it is suggested that every small generating system contributing will improve network resilience. Similarly, given that micro embedded generating units have increasing performance requirements for fault-ride through and -recovery behaviour, it seems incongruous to remove this requirement for larger systems that are more suited to be properly tuned and exhibit controlled responses during a fault. The Draft Report states that the proposed changes to the automatic standard do not contradict the review of the minimum access standard under the Efficient Reactive Current Access Standards for Inverter-based Resources (ERC0272) rule change. However, by removing compliance or evidence requirements for current injection obligations, we suggest that this is in conflict with the review. **AEMO Advisory Matters** In terms of AEMO advisory matters, aside from technical due diligence, a key role for AEMO is to ensure consistency and clarity across the NEM for connections. It is unclear to Ergon Energy and Energex how consistency and clarity will be achieved without AEMO's involvement for these connections. For example, NSPs do not have the required system-level insight to determine whether a proposed negotiated access standard for S5.2.5.11 is appropriate. Should there be a preference to reduce oversight for connections under 30W, AEMO still has the ability to determine the amount of due diligence and review conducted as part of the connection process, without a blanket removal of AEMO advisory matters. Ergon Energy and Energex also question whether AEMO will no longer consult with NSPs on matters of system strength related to clause 5.3.4B for systems less than 30MW, given that this advice is largely based on response to performance standards (for example S5.2.5.5).

NER S5.2.5.2 – Quality of electricity generated

Reference to plant standard	Ergon Energy and Energex have no comments.

[1] Table 9, page 38.

Issue	Schedule 5.2 Generator Recommendation feedback
NER S5.2.5.4 – Generating system response to voltage disturbances	
Overvoltage requirements for medium voltage and lower connections	The Draft Report notes, the purpose behind this clause is to target power system resilience. Ergon Energy and Energex seeks clarification whether studies have been conducted to demonstrate that high voltages are non-credible in the subtransmission or distribution networks.
Requirements for overvoltages above 130%	Ergon Energy and Energex have no comments.
Clarification of continuous uninterrupted operation in the range 90% to 110% of normal voltage	Ergon Energy and Energex have no comments.
NER S5.2.5.5 – Generating system response to disturbances following contingency events	
Definition of end of a disturbance for multiple fault ride through	Ergon Energy and Energex have no comments.
Form of multiple fault ride through clause	Ergon Energy and Energex have no comments.
Number of faults with 200 ms between them	Ergon Energy and Energex have no comments.
Reduction of fault level below minimum level for which the plant has been tuned	Ergon Energy and Energex have no comments.
Active power recovery after a fault	Ergon Energy and Energex have no comments.
Rise time and settling time for reactive current injection	Both Ergon Energy and Energex acknowledge the challenge in measuring the settling time in an actual fault.
Commencement of reactive current injection	Ergon Energy and Energex have no comments.
Clarity on reactive current injection volume and location and consideration of unbalanced voltages	Ergon Energy and Energex have no comments.
Metallic conducting path	Ergon Energy and Energex has no objection to removal of this statement.
Reclassified contingency events	Ergon Energy and Energex have no comments.
NER S5.2.5.7 – Partial load rejection	
Application of minimum generation to energy storage systems	Ergon Energy and Energex have no comments.
Clarification of meaning of continuous uninterrupted operation for NER S5.2.5.7	Ergon Energy and Energex have no comments.

Issue	Schedule 5.2 Generator Recommendation feedback
NER S5.2.5.8 – Protection of generating systems from power system disturbances	
Emergency over-frequency response	Ergon Energy and Energex have no comments.
NER S5.2.5.10 – Protection to trip plant for unstable operation	
Requirements for stability protection on asynchronous generating systems	Ergon Energy and Energex note that AEMO is developing a S5.2.5.10 Guideline which has not yet been published. We suggest it would be beneficial for the Guideline to address the identified challenges, and if required, align with the changes proposed in this review. Also, Ergon Energy and Energex are not opposed to the removal of the reference to AS/NZS61000.3.7. However, if this occurs, we suggest a clear definition of stability, and unacceptable oscillations is required. Presently, in our view, the definitions in both the National Electricity Rules and the Power System Stability Guidelines (PSSG) are ambiguous and do not lend themselves to practical outcomes for design or compliance. We are keen to understand how the threshold of 20MW (for reduced requirements) was determined. Finally, Ergon Energy and Energex support a review of the PSSG and improved clarifications of requirements.
NER S5.2.5.13 – Voltage and reactive power control	
Voltage control at unit level and slow setpoint change	Ergon Energy and Energex have no comments.
Realignment of performance requirements to optimise power system performance over expected fault level (system impedance) range – Voltage control	Ergon Energy and Energex have no comments.
Materiality threshold on settling time error band and voltage settling time for reactive power and power factor setpoints	Ergon Energy and Energex have no comments.
Clarification of when multiple modes of operation are required	Ergon Energy and Energex support this clarification.
Impact of a generating system on power system oscillation modes	Ergon Energy and Energex have no comments.
Definition – continuous uninterrupted operation	
Recognition of frequency response mode, inertial response and active power response to an angle jump	Ergon Energy and Energex have no comments.

Ergon Energy and Energex have no comment on the questions for schedule 5.3a Conditions for connection of MNSPs.

Confidentiality disclaimer

Under clause 5.2.6A(d)(2), AEMO is required to publish all submissions received about this Review on its website. Please identify any part of your submission that is confidential, which you do not wish to be published. Please note that if material identified as confidential cannot be shared and validated with other interested persons, then it may be accorded less weight in AEMO's decision-making process than published material. AEMO prefers that submissions be forwarded in electronic format.