

23 August 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

AEMO review of technical requirements for connection - Draft Recommendations Update Report (Part 1) – Schedules 5.2 & 5.3a of the National Electricity Rules

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 *AEMO review of technical requirements for connection - Draft Recommendations Update Report (Part 1) – Schedules 5.2 & 5.3a of the National Electricity Rules* (the Update Report).

Feedback and comments on the Update 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 [REDACTED] or Laura Males on [REDACTED].

Yours sincerely,

[REDACTED]

Alena Christmas
Acting Manager Regulation

[REDACTED]

Email: alena.christmas@energyq.com.au

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

Update report Stakeholder feedback template:

AEMO Review of technical requirements for connection

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: Ergon Energy and Energex

Schedule 5.2 Conditions for Connection of Generators

NER Schedule 5.2 issue	Schedule 5.2 (Generators) – feedback on revised recommendations and relevant draft NER amendments
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 make no comment.
NER S5.2.5.1 – Reactive power capability	
Voltage range for full reactive power requirement	Ergon Energy and Energex agree that a graph would be useful for interpretation. However, we note the “centre point” concept could introduce challenges in future due to the dynamic nature of networks. In our view, it would be simpler to specify that for voltages in the range 0.95pu to 1.10pu, reactive absorption requirement of $-0.395 \times P_{max}$, and for voltages 0.90-1.05pu, specify a reactive injection requirement of $0.395 \times P_{max}$.
Treatment of reactive power capability considering temperature derating	Ergon Energy and Energex support option 1 to require the same reactive power regardless of temperature derating.
Compensation of reactive power when units are out of service	Ergon Energy and Energex welcome clarity around compliance with clauses. However, we do not consider that a fixed voltage figure (such as the 0.5% proposed) is universally applicable. We suggest it should be within the Network Service Provider’s (NSP’s) discretion to determine appropriate voltage figures for specific locations in their network.
S5.2.5.7, S5.2.5.8, S5.2.5.13	
Simplifying small connections	Ergon Energy and Energex are strongly opposed to the blanket exclusion of all connections under 30MW from Australian Energy Market Operator (AEMO) Advisory Matters. As referenced in our April 2023 submission ¹ to AEMO’s Draft Report, along with technical due diligence, a key role for AEMO is to ensure consistency and clarity in relation to the technical requirements for connections across the National Energy Market (NEM), as well as support for ensuring the negotiating framework is applied where relevant. These ‘small connections’ can still be incredibly complex and difficult, as such, losing AEMO’s oversight will be significant. Having DNSPs and connecting applicants to resolve technical requirements, may result in discrepancies in interpretations and potential

¹ https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/aemo-review-of-technical-requirements-for-connection-ner-clause-526a/draft-report-submissions/energy-queensland_submission_draft-report.pdf?la=en

NER Schedule 5.2 issue	Schedule 5.2 (Generators) – feedback on revised recommendations and relevant draft NER amendments
	<p>commercial pressures in the determination of matters related to system security. This will not have an immediate impact, but will gradually occur over several years, meaning that any impacts will be difficult to identify early. This is very similar to the compliance considerations of small-scale embedded generation.</p> <p>Given the forecasted impacts of aggregated storage systems in the NEM over the next few years, it seems short-sighted to exclude these from AEMO oversight. It was stated in AEMO’s Update Report Forum held on 9 August 2023 that “most connections of this size apply for exemption”. We suggest this does not cover battery systems, as these are not eligible for exemption. In our view, having an exemptions framework would have little strain on AEMO’s resources.</p> <p>Further, we have seen varied compliance of very small embedded generators, that trying to resolve compliance or technical matters post construction is complex, difficult and often very expensive. We do not see any benefit in omitting connections of less than 30MWs from AEMO advisory matters, especially based on evidence and AEMOs learnings on a market segment that is only expected to grow in the distribution network. Notwithstanding, should these amendments proceed, Ergon Energy and Energex question why these systems/proponents should need to register with AEMO at all. If the assessment, monitoring and ongoing compliance sits with the DNSP to manage and maintain, then there appears to be no value to the proponent or market for any proponent being registered in the range of 5-30MW, for any technology, including energy storage.</p> <p>Ergon Energy and Energex have no objection to the proposed changes to S5.2.5.7 or S5.2.5.8.</p>
NER S5.2.5.2 – Quality of electricity generated	
Reference to plant standard	Ergon Energy and Energex have no objection to the removal of the reference to AS1359.101.
NER S5.2.5.4 – Generating system response to voltage disturbances	
Overvoltage requirements for medium voltage and lower connections	Ergon Energy and Energex consider that there are few cases where this would be appropriate, and the reason for changing the automatic access standard is unclear, instead of allowing this nomination under the Negotiated Access Standard. Removal to the nearest bus over 66kV may represent two or three transformations, and significant network – masking the potential impact where the voltage excursion occurs in the distribution network. Given that this clause relates to power system resilience, it appears to be making a change to accommodate a minority of cases where this would be appropriate, rather than the whole system. We instead recommend that AEMO consider, with the NSP’s and AEMO’s approval, the ability to negotiate on the assessment point.
Requirements for overvoltages above 130%	The amended rule wording should provide clarification as to whether these voltages are root mean squared voltages.
Clarification of continuous uninterrupted operation (CUO) in the range 90% to 110% of normal voltage	Ergon Energy and Energex make no comment.
NSP Obligations under S5.1.4(a1) and 5.7.2	Ergon Energy and Energex note that under IEC60071.1, switching impulses are not considered for voltages under 275kV, only lightning impulse withstand and short-duration power-frequency withstand voltages. We would appreciate AEMO’s views on whether our assessment aligns with AEMO’s intended changes.
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 make no comment.
Form of multiple fault ride through clause	Ergon Energy and Energex make no comment.
Number of faults with 200 ms between them	Ergon Energy and Energex make no comment.
Reduction of fault level below minimum level for which the plant has been tuned	Ergon Energy and Energex make no comment.

NER Schedule 5.2 issue	Schedule 5.2 (Generators) – feedback on revised recommendations and relevant draft NER amendments
Active power recovery after a fault	Ergon Energy and Energex make no comment.
Rise time and settling time for reactive current injection	Ergon Energy and Energex make no comment.
Commencement of reactive current injection	Ergon Energy and Energex make no comment.
Clarity on reactive current injection volume and location and consideration of unbalanced voltages	Ergon Energy and Energex make no comment.
Metallic conducting path	Ergon Energy and Energex has no objection to the removal of this statement.
Reclassified contingency events	Ergon Energy and Energex make no comment.
NER S5.2.5.7 – Partial load rejection	
Application of minimum generation to energy storage systems	Ergon Energy and Energex make no comment.
Clarification of meaning of CUO for NER S5.2.5.7	Ergon Energy and Energex make no comment.
NER S5.2.5.8 – Protection of generating systems from power system disturbances	
Emergency over-frequency response	Ergon Energy and Energex make no comment.
NER S5.2.5.10 – Protection to trip plant for unstable operation	
Requirements for stability protection on asynchronous generating systems	Ergon Energy and Energex are supportive of the hierarchy of actions and agree that technology maturity of these detection systems is a challenge. We note that the definition of ‘instability’ must be clear for the NSP, the proponent and AEMO to effectively facilitate performance standard negotiation and design works. We support further clarification be provided in guidelines or in updates to the Power System Stability Guidelines.
NER S5.2.5.13 – Voltage and reactive power control	
Voltage control at unit level and slow setpoint change	In our view, is not clear what a “step-like change” is. Ergon Energy and Energex seek clarity from AEMO on what this means.
Realignment of performance requirements to optimise power system performance over expected fault level (system impedance) range – Voltage control	While Ergon Energy and Energex acknowledge the power system is dynamic, in that the pattern of generation and load operating at any particular time can change how the settling time of the generating system presents, this change may introduce additional complexity in terms of assessment and ongoing compliance. Rather than assessment on the basis of an ‘apparent impedance’, we consider that it may be more appropriate to refine the way that compliance with this clause is assessed. For example, a simple 5% step may no longer be appropriate, given the volume of generation in the system. Rather, we suggest this should be tested in a similar way to compliance with S5.2.5.5 and matching the model performance to actual network conditions to demonstrate compliance.
Materiality threshold on settling time error band and voltage settling time for reactive power and power factor setpoints	Ergon Energy and Energex have no objection to a materiality threshold. However, we consider that it should be in relation to the size of the plant, rather than a fixed 3 MW limit. It would be inappropriate to assign a 3 MW limit to a 5 MW plant.
Clarification of when multiple modes of operation are required	Ergon Energy and Energex consider that if a secondary mode is required, that adequate tuning of that mode should be demonstrated.

NER Schedule 5.2 issue		Schedule 5.2 (Generators) – feedback on revised recommendations and relevant draft NER amendments
In the MAS: • Allow a higher settling time longer than 7.5s to be agreed with the NSP for a voltage disturbance up to 5%	Ergon Energy and Energex do not support an open-ended settling time 'limit'. Ergon Energy and Energex are not aware of any technical reason why a 7.5s settling time cannot be achieved by new plant.	
Impact of a generating system on power system oscillation modes	Ergon Energy and Energex agree it is reasonable to include the performance of the system strength service provider, where relevant. We consider that plant should not reduce the damping of any oscillations and are supportive of removal of the reference to “is not adequately damped”.	
Definition – continuous uninterrupted operation		
Recognition of frequency response mode, inertial response and active power response to an angle jump	Ergon Energy and Energex are supportive of inclusion of provisions for inertial response.	

Schedule 5.3a Conditions for connection of MNSPs

Issue		Schedule 5.3a (HVDC links) – feedback on revised recommendations and relevant draft NER amendments
NER S5.3a.1a Introduction to the schedule		
Alignment of schedule with plant-type rather than registration category	Ergon Energy and Energex make no comment.	
NER S5.3a.8 – Reactive power capability		
Reactive power	Ergon Energy and Energex make no comment.	
NER S5.3a.13 – Market network service response to disturbances in the power system		
Voltage disturbances	Ergon Energy and Energex make no comment.	
Frequency disturbances	Ergon Energy and Energex make no comment.	
Fault ride through requirements	Ergon Energy and Energex make no comment.	
NER S5.3a.4 – Monitoring and control requirements		
Remote monitoring and protection against instability	Ergon Energy and Energex make no comment.	
New standards		
Voltage control	Ergon Energy and Energex make no comment.	

Issue	Schedule 5.3a (HVDC links) – feedback on revised recommendations and relevant draft NER amendments
Active power dispatch	Ergon Energy and Energex make no comment.

Multiple Schedules

Issue	Multiple schedules – feedback on revised recommendations and relevant draft NER amendments
NER Multiple clauses	
References to superseded standards	Ergon Energy and Energex are supportive of removal of dates, regarding referenced standards.

NER structural amendments

Issue	NER structural amendments – feedback on revised recommendations and relevant draft NER amendments
NER structural amendments	
Drafting principles	Ergon Energy and Energex make no comment.
Proposed approach	Ergon Energy and Energex make no comment.

Consequential amendments

Issue	Consequential amendments – feedback on revised recommendations and relevant draft NER amendments
Definitions	
Definitions changes	Ergon Energy and Energex make no comment.
Technical changes	
Incorporating 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.
Additions to information provision	Ergon Energy and Energex make no comment.
Relevant system – in relation to small plants exempt from some requirements	Ergon Energy and Energex make no comment.

Issue	Consequential amendments – feedback on revised recommendations and relevant draft NER amendments
S5.2.5.8 Over-frequency emergency generation reduction requirements	Ergon Energy and Energex make no comment.
S5.2.5.8 Protection settings and relationship to ride through clauses	Ergon Energy and Energex make no comment.
S5.2.5.8 Conditions for which the plant may trip and recording of conditions	Ergon Energy and Energex make no comment.
S5.2.5.8 Network Service Provider liability	Ergon Energy and Energex have no objection to this move.
S5.2.5.11 Minimum operating level	Ergon Energy and Energex make no comment.
S5.2.5.11 Response direction for bidirectional units taking power from the system	Ergon Energy and Energex are supportive of this change.
Drafting changes	
Drafting changes	Ergon Energy and Energex make no comment.