

# Draft report Stakeholder feedback:

## 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: Amp Power Australia**

### Schedule 5.2 Conditions for Connection of Generators

Issue	Schedule 5.2 Generator Recommendation feedback
<b>NER S5.2.1 – Outline of requirements</b>	
<b>Application of Schedule 5.2 based on plant type instead of registration category and extension to synchronous condensers</b>	We support AEMO’s recommendations
<b>NER S5.2.5.1 – Reactive power capability</b>	
<b>Voltage range for full reactive power requirement</b>	<p>We support the introduction of the 10% voltage band around a centre point and reduced reactive power capability requirement at high voltage level (injection) and low voltage level (absorption). However, we would like to express our concern regarding the introduction of a voltage “centre point” which is determined by the NSP as we believe it will introduce additional uncertainty to the connection process (e.g., design uncertainty, potentially longer negotiation process) in the absence of a well-defined methodology to determine what this centre point is for each connection point. Furthermore, if the centre point is too high it may require primary plant to be rated higher than 110% of the normal voltage.</p> <p>We would propose to fix the centre point at the nominal voltage or at least introduce a requirement to limit the centre point to 95% to 105% of the nominal voltage.</p>
<b>Treatment of reactive power capability considering temperature derating</b>	We generally support AEMO’s recommendation. However, in our view the automatic access standard should only apply up to a certain temperature such as 35° C to ensure no unnecessary oversizing is required at very high temperature.
<b>Compensation of reactive power when units are out of service</b>	We generally support AEMO’s recommendation. The voltage threshold should be set by the NSP and communicated at the connection enquiry or as soon as practicable to allow connection applications to plan for and design their systems.
<b>S5.2.5.1, S5.2.5.5, S5.2.5.7, S5.2.5.8, S5.2.5.10</b>	
<b>Simplifying standards for small connections</b>	We have no comment on this item.

Issue		Schedule 5.2 Generator Recommendation feedback
<b>NER S5.2.5.2 – Quality of electricity generated</b>		
Reference to plant standard	We have no comment on this item.	
<b>NER S5.2.5.4 – Generating system response to voltage disturbances</b>		
Overvoltage requirements for medium voltage and lower connections	We have no comment on this item.	
Requirements for overvoltages above 130%	We welcome the inclusion of an upper limit for voltages greater than 130%	
Clarification of continuous uninterrupted operation in the range 90% to 110% of normal voltage	We generally support AEMO's recommendation however the term "not substantially reduced" for active power should be clarified (e.g., 5% or 10%). It is also important to clarify the requirement is to prevent sustained change in output, not transient variations in active or reactive power.	
<b>NER S5.2.5.5 – Generating system response to disturbances following contingency events</b>		
Definition of end of a disturbance for multiple fault ride through	We generally support AEMO's recommendation.	
Form of multiple fault ride through clause	We have no comment on this item.	
Number of faults with 200 ms between them	We have no comment on this item.	
Reduction of fault level below minimum level for which the plant has been tuned	We would like to express our concern with the enablement of an NSP to require retuning of plant since it would require significant time and cost to generators/IRPs over the life of the plant. Will there be a cost recovery mechanism for this? Further consideration and consultation is required.	
Active power recovery after a fault	We have no comment on this item.	
Rise time and settling time for reactive current injection	We generally support AEMO's recommendation however the term "adequately controlled" requires further clarification. A definition of "adequately controlled" is probably required in the NER to avoid inconsistent interpretations.	
Commencement of reactive current injection	We have no comment on this item.	
Clarity on reactive current injection volume and location and consideration of unbalanced voltages	We would suggest to not record any settings in the GPS as this will significantly increase the risk of modifying GPS in the future which can be a time consuming and expensive process. Only performance is to be recorded	
Metallic conducting path	This wording should be retained in that the intent is to capture non high impedance faults. Removal of this would likely require the number of assessments to increase.	
Reclassified contingency events	We generally support AEMO's recommendation.	
<b>NER S5.2.5.7 – Partial load rejection</b>		
Application of minimum generation to energy storage systems	We have no comment on this item.	

Schedule 5.2 Generator Recommendation feedback	
<b>Issue</b>	
<b>Clarification of meaning of continuous uninterrupted operation for NER S5.2.5.7</b>	We have no comment on this item.
<b>NER S5.2.5.8 – Protection of generating systems from power system disturbances</b>	
<b>Emergency over-frequency response</b>	We have no comment on this item.
<b>NER S5.2.5.10 – Protection to trip plant for unstable operation</b>	
<b>Requirements for stability protection on asynchronous generating systems</b>	<p>We would strongly suggest further work to be done for this clause.</p> <p>Automatic disconnection of generators/IRPs need to be treated carefully until such a scheme is proven. An alarm should be raised followed by manual operator disconnection until the need and practicality of an automatic tripping scheme is proven.</p> <p>Identifying whether a generator/IRP is contributing to an instability or not is not a simple exercise and to the best of our knowledge there isn't an accepted and proven solution in the NEM (although some are currently being trialled for certain types of oscillations).</p> <p>There are also a lot of details require further discussion and consultation with the wider industry such as:</p> <ul style="list-style-type: none"> <li>• The nature of data (quantify and frequency of) to be sent to a central system,</li> <li>• Disconnection and reconnection timing and protocol,</li> <li>• Provision of timestamped data to AEMO – it is not clear whether this is in real time or offline (or both). The resolution (and hence quantity) should be clarified as excessive data transfer requirements could adversely affect communications systems, especially if real-time data is required.</li> </ul>
<b>NER S5.2.5.13 – Voltage and reactive power control</b>	
<b>Voltage control at unit level and slow setpoint change</b>	We have no comment on this item.
<b>Realignment of performance requirements to optimise power system performance over expected fault level (system impedance) range – Voltage control</b>	We welcome the recognition of aligning performance requirements with the best practical engineering approach. We propose the AAS to focus towards both stability and speed of response rather than speed of response only.
<b>Materiality threshold on settling time error band and voltage settling time for reactive power and power factor setpoints</b>	We support AEMO's recommendation.
<b>Clarification of when multiple modes of operation are required</b>	We have no comment on this item.
<b>Impact of a generating system on power system oscillation modes</b>	We propose that more clarity and certainty should be provided on the need for system strength-sensitive oscillation damping and developing controls to damp such oscillations
<b>Definition – continuous uninterrupted operation</b>	
<b>Recognition of frequency response mode, inertial response and active power response to an angle jump</b>	We welcome AEMO's review of the CUO definition.

## Schedule 5.3a Conditions for connection of MNSPs

Issue	Schedule 5.3a HVDC Recommendation feedback
<b>NER S5.3a.1a Introduction to the schedule</b>	
Alignment of schedule with plant-type rather than registration category	We have no comment on this item.
<b>NER S5.3a.8 – Reactive power capability</b>	
Reactive power	We have no comment on this item.
<b>NER S5.3a.13 – Market network service response to disturbances in the power system</b>	
Voltage disturbances	We have no comment on this item.
Frequency disturbances	We have no comment on this item.
Fault ride through requirements	We have no comment on this item.
<b>NER S5.3a.4 – Monitoring and control requirements</b>	
Remote monitoring and protection against instability	We have no comment on this item.
<b>New standards</b>	
Voltage control	We have no comment on this item.
Active power dispatch	We have no comment on this item.

## Multiple Schedules

Issue	Multiple schedule Recommendation feedback
<b>NER Multiple clauses</b>	
References to superseded standards	

## 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.