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: Andrew Tuckey, Hitachi Energy Australia Pty Ltd

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	[feedback on draft report recommendation]
NER S5.2.5.1 – Reactive power capability	
Voltage range for full reactive power requirement	
Treatment of reactive power capability considering temperature derating	
Compensation of reactive power when units are out of service	
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	
NER S5.2.5.2 – Quality of electricity generated	
Reference to plant standard	

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	
Requirements for overvoltages above 130%	
Clarification of continuous uninterrupted operation in the range 90% to 110% of normal voltage	
NER S5.2.5.5 – Generating system response to disturbances following contingency events	
Definition of end of a disturbance for multiple fault ride through	
Form of multiple fault ride through clause	
Number of faults with 200 ms between them	
Reduction of fault level below minimum level for which the plant has been tuned	
Active power recovery after a fault	
Rise time and settling time for reactive current injection	
Commencement of reactive current injection	
Clarity on reactive current injection volume and location and consideration of unbalanced voltages	
Metallic conducting path	
Reclassified contingency events	
NER S5.2.5.7 – Partial load rejection	
Application of minimum generation to energy storage systems	
Clarification of meaning of continuous uninterrupted operation for NER S5.2.5.7	
NER S5.2.5.8 – Protection of generating systems from power system disturbances	
Emergency over-frequency response	

Issue	Schedule 5.2 Generator Recommendation feedback

NER S5.2.5.10 – Protection to trip plant for unstable operation

Requirements for stability protection on asynchronous generating systems	I have 2 comments about the suggested rule change: (1) The rules change suggested in the report is easy to misunderstand. Can I ask that it be worded carefully so there is no ambiguity in the reading. Please make a clear distinction between the AAS and the MAS with regard to the following: a. detecting an instability, b. detecting the contribution to the instability, c. the requirements for a PMU for instability analysis, d. a system to automatically disconnect the production unit, e. a system where the NSP or AEMO can disconnect the production unit (remotely), f. the 30MW threshold for automatic/remote disconnection (does it mean a ≥ 30MW unit, or a unit producing ≥ 30MW?). (2) It seems that strict adherence to the automatic detect and disconnect rules could cause the detection and disconnection of too many generators given the below scenarios. This technical aspect should be addressed (but maybe the solution doesn't have to be in the rules): Let's take a very simple case to explain: • one generator is operating fine. • another generator in an adjacent zone goes online, and this causes oscillations between the two. • now both have detectable instability (the first criteria), and both would have a detectable contribution to the instability (the second part), so automatic "detect contribution and disconnect" protection systems for each should disconnect both. This scenario could be extended to 3 generators thus: • two generators are operating fine. • another generator in an adjacent zone goes online, and this causes oscillations between all three generators (between the two zones). • now all have detectable instability (the first criteria), and all would have a detectable contribution to the instability (the second part), so automatic "detect contribution and disconnect" protection systems for each should disconnect all three generators.

NER S5.2.5.13 – Voltage and reactive power control

Voltage control at unit level and slow setpoint change	
Realignment of performance requirements to optimise power system performance over expected fault level (system impedance) range – Voltage control	
Materiality threshold on settling time error band and voltage settling time for reactive power and power factor setpoints	
Clarification of when multiple modes of operation are required	
Impact of a generating system on power system oscillation modes	

Issue	Schedule 5.2 Generator Recommendation feedback
Definition – continuous uninterrupted operation	
Recognition of frequency response mode, inertial response and active power response to an angle jump	

Schedule 5.3a Conditions for connection of MNSPs

Issue	Schedule 5.3a HVDC Recommendation feedback
NER S5.3a.1a Introduction to the schedule	
Alignment of schedule with plant-type rather than registration category	
NER S5.3a.8 – Reactive power capability	
Reactive power	
NER S5.3a.13 – Market network service response to disturbances in the power system	
Voltage disturbances	
Frequency disturbances	
Fault ride through requirements	
NER S5.3a.4 – Monitoring and control requirements	
Remote monitoring and protection against instability	
New standards	
Voltage control	
Active power dispatch	

Multiple Schedules

Issue	Multiple schedule Recommendation feedback
NER Multiple clauses	

Issue	Multiple schedule Recommendation feedback
References to superseded standards	

Confidentiality disclaimer

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