

Update report Stakeholder feedback template:

AEMO Review of technical requirements for connection

Stakeholder: TasNetworks

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	TasNetworks is supportive of the broad principle of applying Schedule 5.2 based on plant type rather than registration category. We remain concerned that there may be situations where basing standards solely on the type of technology could be unnecessarily restrictive. The same technology could operate in different ways depending on whether it is a load/generation or a network and therefore the performance expectations may be different and should be reflected in the ability to apply Schedule 5.2.
NER S5.2.5.1 – Reactive power capability	
Voltage range for full reactive power requirement	TasNetworks supports this proposed change.
Treatment of reactive power capability considering temperature derating	TasNetworks has applied temperature derating consistent with Option 3 in the past, where we have maintained the ability to direct generators to reduce their active power output to a level that meets $0.395 \cdot P_{max}(T)$. It remains critical that the maximum temperature at which no derating occurs must be set in such a way as to prevent inadvertent reduction in reactive power capability during high temperature events, when cooling load is largest.
Compensation of reactive power when units are out of service	While TasNetworks generally supports the change, it is our experience that the fixed limit may not be appropriate in all cases. While limiting the voltage impact to 0.5% is reasonable in most cases, this may not be the case in weaker parts of a network. Allowing the Network Service Providers (NSP) to set the limit to a lower value in limited circumstances should be included in the rule drafting to allow better management of these parts of the network.
S5.2.5.7, S5.2.5.8, S5.2.5.13	
Simplifying small connections	TasNetworks is supportive of setting the threshold to the minimum of 30MW or 5% of any maximum credible contingency event size specified in the frequency operating standards for the relevant region.
NER S5.2.5.2 – Quality of electricity generated	
Reference to plant standard	TasNetworks supports this proposed change.
NER S5.2.5.4 – Generating system response to voltage disturbances	
Overvoltage requirements for medium voltage and lower connections	TasNetworks supports this proposed change.
Requirements for overvoltages above 130%	TasNetworks agrees with the principle of points 1, 4 and 5. We would like to confirm that the first point should read “Require CUO for peak voltages less than 184 %” so as to be consistent with the fourth dot point. The draft rule should clarify whether the waveform measurement is phase-to-ground or phase-to-phase. NSPs should use good electrical industry practice when designing the insulation coordination of the network. This does not mean that every switching surge events will not lead to a peak voltage increase above 184%. Indeed there is no way to guarantee this exceedance will never occur. Furthermore, with

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		appropriately sized surge arrestors, spark gaps, etc, the risk to equipment can be acceptably reduced. TasNetworks does not believe NSPs will be able to meet this obligation under S5.1.4(a1), without significant investment.	
Clarification of continuous uninterrupted operation (CUO) in the range 90% to 110% of normal voltage		TasNetworks supports this proposed change. We believe the statement in the second dot point should read “voltage reductions greater than 10%...” rather than “voltage variations greater than 10% ...”.	
NER S5.2.5.5 – Generating system response to disturbances following contingency events			
Definition of end of a disturbance for multiple fault ride through		TasNetworks supports this proposed change.	
Form of multiple fault ride through clause		TasNetworks supports this proposed change. The first dot point provides TasNetworks with the flexibility required to adequately assess multiple fault ride through in Tasmania.	
Number of faults with 200 ms between them		TasNetworks supports this proposed change.	
Reduction of fault level below minimum level for which the plant has been tuned		Generators should be required to nominate a minimum guaranteed floor for stable operation (down to a short circuit ratio of 3) and a level where they would be permitted to disconnect.	
Active power recovery after a fault		TasNetworks supports this proposed change.	
Rise time and settling time for reactive current injection		As per our previous submission, the standard definitions from control theory for “rise time” and “settling time” should remain. The Dynamic Model Acceptance Test (DMAT) use a passive single machine infinite bus (SMIB) arrangement when assessing performance. Under this arrangement, any dynamic response observed can only be due to the equipment under test and in this setting, the control theory terms are appropriate. For on-site “R2” testing, and in full model verification when other voltage regulation devices can impact the voltage profile, there is justification to relax the wording.	
Commencement of reactive current injection		TasNetworks supports this proposed change.	
Clarity on reactive current injection volume and location and consideration of unbalanced voltages		TasNetworks supports this proposed change.	
Metallic conducting path		TasNetworks supports the removal of this clause.	
Reclassified contingency events		TasNetworks supports this proposed change.	
NER S5.2.5.7 – Partial load rejection			
Application of minimum generation to energy storage systems		TasNetworks supports this proposed change.	
Clarification of meaning of CUO for NER S5.2.5.7		TasNetworks supports this proposed change.	
NER S5.2.5.8 – Protection of generating systems from power system disturbances			
Emergency over-frequency response		TasNetworks supports this proposed change.	
NER S5.2.5.10 – Protection to trip plant for unstable operation			
Requirements for stability protection on asynchronous generating systems		TasNetworks agrees that actions to mitigate oscillatory behaviour should be agreed on by the NSP and AEMO, and agrees with the proposed structure of the minimum and automatic access standards (MAS and AAS). The meaning of “promptly” is vague and should be avoided. It is crucial that concurrent tripping of	

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		<p>asynchronous generators with the ability to detect these oscillations does not occur, and while the NSP and AEMO are involved in the determination of the hierarchy, this issue should be avoidable. Additionally, the connecting plant's ability to determine whether it is contributing to an oscillation would be difficult for it to determine with certainty.</p> <p>Currently TasNetworks requires installation of phasor measurement unit (PMU) facilities for any asynchronous generator connection, regardless of size. PMUs are not just used for network monitoring, but also for anti-islanding schemes, and TasNetworks has required their use for both purposes previously. The proposed change to the AAS to only make this a requirement for plant with an active power capability of 100 MW is problematic in Tasmania. Using the same reasoning used to set the threshold for small connections TasNetworks requests the threshold is set to the minimum of 100MW or 5% of any maximum credible contingency event size specified in the frequency operating standards for the relevant region).</p>
NER S5.2.5.13 – Voltage and reactive power control		
Voltage control at unit level and slow setpoint change		TasNetworks supports this proposed change.
Realignment of performance requirements to optimise power system performance over expected fault level (system impedance) range – Voltage control		TasNetworks supports this proposed change.
Materiality threshold on settling time error band and voltage settling time for reactive power and power factor setpoints		TasNetworks supports this proposed change.
Clarification of when multiple modes of operation are required		TasNetworks supports this proposed change.
Impact of a generating system on power system oscillation modes		TasNetworks supports this proposed change.
Definition – continuous uninterrupted operation		
Recognition of frequency response mode, inertial response and active power response to an angle jump		TasNetworks supports this proposed change.

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		TasNetworks supports this proposed change.
NER S5.3a.8 – Reactive power capability		
Reactive power		TasNetworks supports this proposed change.

Issue	Schedule 5.3a (HVDC links) – feedback on revised recommendations and relevant draft NER amendments
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NER S5.3a.13 – Market network service response to disturbances in the power system

Voltage disturbances	TasNetworks supports this proposed change.
Frequency disturbances	TasNetworks supports this proposed change.
Fault ride through requirements	TasNetworks supports this proposed change.

NER S5.3a.4 – Monitoring and control requirements

Remote monitoring and protection against instability	TasNetworks supports this proposed change.
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New standards

Voltage control	TasNetworks supports this proposed change.
Active power dispatch	TasNetworks supports this proposed change.

Multiple Schedules

Issue	Multiple schedules – feedback on revised recommendations and relevant draft NER amendments
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NER Multiple clauses

References to superseded standards	TasNetworks supports this proposed change.
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NER structural amendments

Issue	NER structural amendments – feedback on revised recommendations and relevant draft NER amendments
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NER structural amendments

Drafting principles	TasNetworks supports this proposed change.
Proposed approach	TasNetworks supports this proposed change.

Consequential amendments

Issue	Consequential amendments – feedback on revised recommendations and relevant draft NER amendments
Definitions	
Definitions changes	TasNetworks disagrees with changing the definition of “rise time”. The proposed definition is open to different interpretations on how to calculate the mean sustained change. Unless the definition can be modified to remove this ambiguity TasNetworks recommends the definition is left unchanged.
Technical changes	
Incorporating synchronous condensers	TasNetworks supports this proposed change.
Additions to information provision	TasNetworks supports this proposed change.
Relevant system – in relation to small plants exempt from some requirements	TasNetworks supports this proposed change.
S5.2.5.8 Over-frequency emergency generation reduction requirements	TasNetworks supports this proposed change.
S5.2.5.8 Protection settings and relationship to ride through clauses	TasNetworks supports the redrafting of S5.2.5.8.
S5.2.5.8 Conditions for which the plant may trip and recording of conditions	TasNetworks supports this proposed change.
S5.2.5.8 Network Service Provider liability	TasNetworks supports this proposed change.
S5.2.5.11 Minimum operating level	TasNetworks supports this proposed change.
S5.2.5.11 Response direction for bidirectional units taking power from the system	TasNetworks supports this proposed change.
Drafting changes	
Drafting changes	

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