

# Template for proposed Generator or Integrated Resource Provider Performance Standards

This is a template to assist *Connection Applicants* submit proposed *access standards* for a *generating system* or integrated resource system to be assessed under clause 5.3.4A of the National Electricity Rules (NER). It contains three tables:

- Table 1 – *Connection Applicants* should complete Table 1 to specify the proposed production units and *generating system* or integrated resource system to which the proposed *access standards* are intended to apply.
- Table 2 – AEMO has drafted this to reflect the structure of the technical requirements in Schedule 5.2 of the NER for the *connection* of new generating systems and integrated resource systems *generation*. *Connection Applicants* must complete columns 4 and 5 and indicate in the 4<sup>th</sup> column whether it is proposing an *automatic access standard* (A), or a *negotiated access standard* (N). As a guide for *Connection Applicants*, AEMO has completed the 5<sup>th</sup> column to indicate how a proposed *access standard* should be drafted. For these purposes AEMO has used the relevant *automatic access standard* (or *minimum access standard*, where the NER do not specify automatic). *Connection Applicants* should amend Table 2 as necessary and respond to the comments in square brackets ([ ]) and complete variables highlighted in yellow). Other changes to the text should be minimised. The 'Track Changes' function should be used to highlight changes. AEMO uses the International System of Units to identify quantities.
- Table 3 – *Connection Applicants* and AEMO should complete Table 3 to track changes made to the registered performance standards following the formal acceptance of the *access standards* by the relevant NSP (subject to AEMO's advice).

Where a *Connection Applicant* proposes a *connection* arrangement that does not meet the *automatic access standards*, the information submitted with this document will be used by AEMO and the *connecting Network Service Provider* (NSP) to assess their feasibility in accordance with clause 5.3.4A of the NER. *Connection Applicants* are reminded that proposed *access standards* must be as close as practicable to the automatic access standards – see NER clause 5.3.4A(b1). Any proposed *negotiated access standards* may need to be revised and resubmitted during the assessment process under clause 5.3.4A.

Once formally accepted by the relevant NSP (subject to AEMO's advice), the *access standards* agreed in the *Connection Agreement* will become the registered performance standards for the *generating system* or integrated resource system. For convenience, this document is therefore titled 'Generator Performance Standards'.

All technical enquiries should be directed to [NEM.Connections@aemo.com.au](mailto:NEM.Connections@aemo.com.au).

GPS template updates:

Date	Descriptions
18/12/2020	Updated S5.2.5.11 for PFR Rule change and Table 1: Background. Added a new Revision table for version control.
31/3/2021	General update to S5.2.6.1 and updated S5.2.5.3 frequency ranges for continuous uninterrupted operation to be consistent with the frequency operating standard and considering the "Supply Scarcity" system condition.

<u>15/3/2023</u>	<u>Updated for <i>National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 (commences 3 June 2024), and interim implementation effective 15 March 2023, -and National Electricity Amendment (Efficient management of system strength on the power system) Rule 2021 (commences 15 March 2023).</i></u>
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**Please delete the above instructions when submitting the proposed *access standards*.**

# Generator or Integrated Resource Provider Performance Standards [Delete whichever is not applicable]

Table 1 Background

Name of Applicant & ABN:	[insert company name and ABN of <i>Connection Applicant</i> who will, ultimately, apply for registration as a Generator <u>or Integrated Resource Provider</u> ]
Name of Network Service Provider & ABN:	[insert company name and ABN of NSP] (NSP)
Name of generating system <u>or Integrated Resource System</u> [delete whichever is not applicable]/-IRS:	[insert name of power station / generating system / <u>integrated resource system</u> ]
<u>ProductionGenerating</u> unit designations:	[insert unit designations e.g. Units 1 to 4]
<u>ProductionGenerating</u> unit make(s) and model(s):	[insert unit make and model name/version]
Reactive plant:	[insert make and model name/version, <i>nameplate rating</i> ]
Connection point:	[insert connection point/s] (Connection Point)
Connection point nominal voltage:	[insert <i>connection point nominal voltage</i> ] kV (Nominal Voltage)
Connection point normal voltage	[insert <i>connection point normal voltage</i> ] pu or kV (Normal Voltage)
Nameplate rating:	[insert the <i>nameplate rating</i> of all <u>production generating units</u> this document applies to] MW ([insert the number of units] x [insert unit rating, equipment make(s) and model(s)])
Maximum capacity:	[insert maximum <i>generation</i> of the <i>generating system</i> <u>or integrated resource system</u> , that is, the total capacity at the connection point of all <u>production generating units</u> this document applies to] MW. [Please enter a whole number only.]
System strength remediation scheme:	[insert a description of the system strength remediation scheme or 'Not applicable']
Date of acceptance:	[to be completed by the NSP once final]

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Table 2 Performance Standards<sup>1</sup>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
	S5.2.5.1	Reactive Power Capability	A	<p><i>Generating system's or integrated resource system's rated active power</i> = [insert] MW as measured at the Connection Point, determined by [insert determination method or delete if not applicable]</p> <p>While operating at any level of <i>active power</i> output and at any <i>voltage</i> at the Connection Point within the limits of ±10% of Normal Voltage, the <i>generating system or integrated resource system</i> [delete whichever is not applicable] is capable of supplying and absorbing at the Connection Point an amount of <i>reactive power</i> of at least equal to the product of the <i>rated active power</i> of the <i>generating system or integrated resource system</i> [delete whichever is not applicable] and 0.395, as reflected in Figure 1.</p> <p>Figure 1: <i>Reactive Power Capability</i></p> <p>[Insert reactive power capability diagram]</p> <p>The <i>generating system or integrated resource system</i> [delete whichever is not applicable], while not generating <i>active power</i> and not supplying or absorbing <i>reactive power</i> under an <i>ancillary services agreement</i>, will:</p> <ul style="list-style-type: none"> <li>• When the <i>production generating units</i> are <i>connected</i> and the ambient temperature is less than [50]°C, follow the <i>voltage regulation control</i> requirement specified in the <i>performance standard</i> under clause S5.2.5.13 with a <i>reactive power capability</i> of ±[insert] Mvar for each <i>production generating unit</i>; and</li> <li>• When the <i>production generating units</i> are not <i>connected</i>, not supply at its Connection Point <i>reactive power</i> of more than 0 Mvar and not draw more electricity than [insert] kW of <i>active power</i> and [insert] kvar of <i>reactive power</i>;</li> </ul> <p>If the <i>reactive power</i> supplied or absorbed at the Connection Point falls outside the range that applies when the <i>production generating units</i> are not <i>connected</i>, the <i>generating system or integrated resource system</i> [delete whichever is not applicable] must, where required by the NSP in order to maintain satisfactory <i>voltage</i> levels at the Connection Point or to restore <i>intra-regional or inter-regional power transfer capability</i>, take action to ensure that the <i>reactive power</i> falls within that range within 30 min.</p>

<sup>1</sup> Capitalised terms are defined in Table 1. Italicised terms are defined in the NER.  
GENERATOR PERFORMANCE STANDARDS

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	S5.2.5.2	Quality of Electricity Generated	A	<p><u>At all times when connected</u>, When generating and when not generating, the generating system <u>or integrated resource system</u> <del>delete whichever is not applicable</del> does not produce at the Connection Point:</p> <p>(a) <i>Voltage</i> fluctuations greater than the limits specified in Table 2.1 by the NSP under clause S5.1.5(a) of the NER, where flicker will be measured in accordance with AS/NZS 61000.3.7:2001:</p> <p style="text-align: center;">Table 2.1: Voltage Fluctuation Limits</p> <table border="1" data-bbox="1223 684 1904 775"> <thead> <tr> <th data-bbox="1223 684 1563 727">P<sub>st</sub></th> <th data-bbox="1563 684 1904 727">P<sub>It</sub></th> </tr> </thead> <tbody> <tr> <td data-bbox="1223 727 1563 775"></td> <td data-bbox="1563 727 1904 775"></td> </tr> </tbody> </table> <p>(b) Harmonic <i>voltage</i> distortion greater than the limits specified in Table 2.2 by the NSP under clause S5.1.6(a) of the NER and will be measured at the Connection Point in accordance with AS/NZS 61000.3.6:2001:</p> <p style="text-align: center;">Table 2.2: Harmonic Voltage Distortion Limits</p> <table border="1" data-bbox="1050 890 2089 1401"> <thead> <tr> <th data-bbox="1050 890 1182 1002">Harmonic Order (h)</th> <th data-bbox="1182 890 1370 1002">Harmonic Voltage Limits (%)</th> <th data-bbox="1370 890 1518 1002">Harmonic Order (h)</th> <th data-bbox="1518 890 1706 1002">Harmonic Voltage Limits (%)</th> <th data-bbox="1706 890 1899 1002">Harmonic Order (h)</th> <th data-bbox="1899 890 2089 1002">Harmonic Voltage Limits (%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="1050 1002 1182 1045">2</td> <td data-bbox="1182 1002 1370 1045"></td> <td data-bbox="1370 1002 1518 1045">19</td> <td data-bbox="1518 1002 1706 1045"></td> <td data-bbox="1706 1002 1899 1045">36</td> <td data-bbox="1899 1002 2089 1045"></td> </tr> <tr> <td data-bbox="1050 1045 1182 1088">3</td> <td data-bbox="1182 1045 1370 1088"></td> <td data-bbox="1370 1045 1518 1088">20</td> <td data-bbox="1518 1045 1706 1088"></td> <td data-bbox="1706 1045 1899 1088">37</td> <td data-bbox="1899 1045 2089 1088"></td> </tr> <tr> <td data-bbox="1050 1088 1182 1131">4</td> <td data-bbox="1182 1088 1370 1131"></td> <td data-bbox="1370 1088 1518 1131">21</td> <td data-bbox="1518 1088 1706 1131"></td> <td data-bbox="1706 1088 1899 1131">38</td> <td data-bbox="1899 1088 2089 1131"></td> </tr> <tr> <td data-bbox="1050 1131 1182 1174">5</td> <td data-bbox="1182 1131 1370 1174"></td> <td data-bbox="1370 1131 1518 1174">22</td> <td data-bbox="1518 1131 1706 1174"></td> <td data-bbox="1706 1131 1899 1174">39</td> <td data-bbox="1899 1131 2089 1174"></td> </tr> <tr> <td data-bbox="1050 1174 1182 1217">6</td> <td data-bbox="1182 1174 1370 1217"></td> <td data-bbox="1370 1174 1518 1217">23</td> <td data-bbox="1518 1174 1706 1217"></td> <td data-bbox="1706 1174 1899 1217">40</td> <td data-bbox="1899 1174 2089 1217"></td> </tr> <tr> <td data-bbox="1050 1217 1182 1260">7</td> <td data-bbox="1182 1217 1370 1260"></td> <td data-bbox="1370 1217 1518 1260">24</td> <td data-bbox="1518 1217 1706 1260"></td> <td data-bbox="1706 1217 1899 1260">41</td> <td data-bbox="1899 1217 2089 1260"></td> </tr> <tr> <td data-bbox="1050 1260 1182 1303">8</td> <td data-bbox="1182 1260 1370 1303"></td> <td data-bbox="1370 1260 1518 1303">25</td> <td data-bbox="1518 1260 1706 1303"></td> <td data-bbox="1706 1260 1899 1303">42</td> <td data-bbox="1899 1260 2089 1303"></td> </tr> <tr> <td data-bbox="1050 1303 1182 1347">9</td> <td data-bbox="1182 1303 1370 1347"></td> <td data-bbox="1370 1303 1518 1347">26</td> <td data-bbox="1518 1303 1706 1347"></td> <td data-bbox="1706 1303 1899 1347">43</td> <td data-bbox="1899 1303 2089 1347"></td> </tr> <tr> <td data-bbox="1050 1347 1182 1390">10</td> <td data-bbox="1182 1347 1370 1390"></td> <td data-bbox="1370 1347 1518 1390">27</td> <td data-bbox="1518 1347 1706 1390"></td> <td data-bbox="1706 1347 1899 1390">44</td> <td data-bbox="1899 1347 2089 1390"></td> </tr> </tbody> </table>	P <sub>st</sub>	P <sub>It</sub>			Harmonic Order (h)	Harmonic Voltage Limits (%)	Harmonic Order (h)	Harmonic Voltage Limits (%)	Harmonic Order (h)	Harmonic Voltage Limits (%)	2		19		36		3		20		37		4		21		38		5		22		39		6		23		40		7		24		41		8		25		42		9		26		43		10		27		44	
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				<p>Notes: <sup>(1)</sup> THD is calculated considering the complete spectrum of harmonic <i>voltage</i> distortion at the Connection Point.</p> <p>(c) <i>Voltage</i> unbalance greater than the limits specified in Table 2.3 by the NSP under clause S5.1.7(c) of the NER and will be measured in accordance with AS/NZS 61000.3.6:2001:</p> <p>Table 2.3: Voltage Unbalance Limits</p> <table border="1"> <thead> <tr> <th rowspan="3">Nominal Supply Voltage (kV)</th> <th colspan="4">Maximum Negative Sequence Voltage (% of Nominal Voltage)</th> </tr> <tr> <th>No <i>contingency event</i></th> <th><i>Credible contingency event</i></th> <th>General</th> <th>Once per hour</th> </tr> <tr> <th>30-min average</th> <th>30-min average</th> <th>10-min average</th> <th>1-min average</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>								Nominal Supply Voltage (kV)	Maximum Negative Sequence Voltage (% of Nominal Voltage)				No <i>contingency event</i>	<i>Credible contingency event</i>	General	Once per hour	30-min average	30-min average	10-min average	1-min average					
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	S5.2.5.3	<del>Generating System</del> Response to Frequency Disturbance	A	<p>Unless the rate of change of <i>frequency</i> is outside the range of <math>\pm 4</math> Hz/s for more than 0.25 s, <math>\pm 3</math> Hz/s for more than 1.00 s, the <i>generating system</i> <del>or <i>integrated resource system</i></del> <del>[delete whichever is not applicable]</del> and each of its <del><i>production-generating units</i></del> is capable of <i>continuous uninterrupted operation</i> for <i>frequencies</i> in the ranges indicated in Table 2.4:</p> <p>Table 2.4: Frequency Limits for Continuous Uninterrupted Operation</p>																									

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				<table border="1"> <thead> <tr> <th data-bbox="900 499 1384 608">Frequency range<sup>(1)</sup> (Hz) [Mainland, delete column if not applicable]</th> <th data-bbox="1384 499 1718 608">Frequency range<sup>(1)</sup> (Hz) [Tasmania, delete column if not applicable]</th> <th data-bbox="1718 499 2051 608">Duration<sup>(1)</sup></th> </tr> </thead> <tbody> <tr> <td data-bbox="900 608 1384 651">47 to 48</td> <td data-bbox="1384 608 1718 651">47 to 48</td> <td data-bbox="1718 608 2051 651">2 min</td> </tr> <tr> <td data-bbox="900 651 1384 694">48 to 49.5</td> <td data-bbox="1384 651 1718 694">48 to 49</td> <td data-bbox="1718 651 2051 694">10 min<sup>(2)</sup></td> </tr> <tr> <td data-bbox="900 694 1384 737">49.5 to 50.5</td> <td data-bbox="1384 694 1718 737">49 to 51</td> <td data-bbox="1718 694 2051 737">continuous</td> </tr> <tr> <td data-bbox="900 737 1384 780">50.5 to 52</td> <td data-bbox="1384 737 1718 780">51 to 52</td> <td data-bbox="1718 737 2051 780">10 min<sup>(3)</sup></td> </tr> <tr> <td data-bbox="900 780 1384 831">[delete row if not applicable]</td> <td data-bbox="1384 780 1718 831">52 to 55</td> <td data-bbox="1718 780 2051 831">2 min</td> </tr> </tbody> </table>	Frequency range <sup>(1)</sup> (Hz) [Mainland, delete column if not applicable]	Frequency range <sup>(1)</sup> (Hz) [Tasmania, delete column if not applicable]	Duration <sup>(1)</sup>	47 to 48	47 to 48	2 min	48 to 49.5	48 to 49	10 min <sup>(2)</sup>	49.5 to 50.5	49 to 51	continuous	50.5 to 52	51 to 52	10 min <sup>(3)</sup>	[delete row if not applicable]	52 to 55	2 min			
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[delete row if not applicable]	52 to 55	2 min																							
	S5.2.5.4	Generating System Response to Voltage Disturbances	A	<p>The <i>generating system or integrated resource system</i> [delete whichever is not applicable] and each of its <i>production generating units</i> is capable of <i>continuous uninterrupted operation</i> where a <i>power system</i> disturbance causes the <i>voltage</i> at the Connection Point to vary within the ranges indicated in Table 2.5:</p> <p>Table 2.5: Voltage Limits for Continuous Uninterrupted Operation</p> <table border="1"> <thead> <tr> <th data-bbox="1144 1102 1601 1145">Voltage range (% of Normal Voltage)</th> <th data-bbox="1601 1102 1960 1145">Duration</th> </tr> </thead> <tbody> <tr> <td data-bbox="1144 1145 1601 1189">&gt; 130%</td> <td data-bbox="1601 1145 1960 1189">0.02 s<sup>(1)</sup></td> </tr> <tr> <td data-bbox="1144 1189 1601 1232">125% to 130%</td> <td data-bbox="1601 1189 1960 1232">0.2 s<sup>(1)</sup></td> </tr> <tr> <td data-bbox="1144 1232 1601 1275">120% to 125%</td> <td data-bbox="1601 1232 1960 1275">2.0 s<sup>(1)</sup></td> </tr> <tr> <td data-bbox="1144 1275 1601 1318">115% to 120%</td> <td data-bbox="1601 1275 1960 1318">20 s<sup>(1)</sup></td> </tr> <tr> <td data-bbox="1144 1318 1601 1361">110% to 115%</td> <td data-bbox="1601 1318 1960 1361">20 min<sup>(1)</sup></td> </tr> <tr> <td data-bbox="1144 1361 1601 1412">90% to 110%</td> <td data-bbox="1601 1361 1960 1412">continuous</td> </tr> </tbody> </table> <p>Notes: <sup>(1)</sup> Based on the <i>frequency operating standard</i> effective 1 January 2020.  <sup>(2)</sup> 10 min, including any time spent in the range 47-48 Hz.  <sup>(3)</sup> 10 min, including any time spent in the range 52-55 Hz [Tasmania, delete if not applicable].</p>				Voltage range (% of Normal Voltage)	Duration	> 130%	0.02 s <sup>(1)</sup>	125% to 130%	0.2 s <sup>(1)</sup>	120% to 125%	2.0 s <sup>(1)</sup>	115% to 120%	20 s <sup>(1)</sup>	110% to 115%	20 min <sup>(1)</sup>	90% to 110%	continuous				
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				<table border="1" data-bbox="1144 499 1960 592"> <tr> <td data-bbox="1144 499 1601 544">80% to 90%</td> <td data-bbox="1601 499 1960 544">10 s<sup>(2)</sup></td> </tr> <tr> <td data-bbox="1144 544 1601 592">70% to 80%</td> <td data-bbox="1601 544 1960 592">2 s<sup>(2)</sup></td> </tr> </table> <p data-bbox="913 600 2181 659">Notes: <sup>(1)</sup> After the Connection Point <i>voltage</i> first varied above 110% of Normal Voltage before returning to between 90% and 110% of Normal Voltage.</p> <p data-bbox="987 667 2181 726"><sup>(2)</sup> After the Connection Point <i>voltage</i> first varied below 90% of Normal Voltage before returning to between 90% and 110% of Normal Voltage.</p> <p data-bbox="913 738 2181 834">[Insert any operational arrangements necessary to ensure the <i>generating system or integrated resource system</i> [delete whichever is not applicable] and each of its <i>production/generating units</i> will meet these levels under abnormal <i>network or generating system/integrated resource system</i> conditions].</p>	80% to 90%	10 s <sup>(2)</sup>	70% to 80%	2 s <sup>(2)</sup>								
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	S5.2.5.5	<b>Generating System Response to Disturbances following Contingency Events</b>	A	<p data-bbox="920 852 2130 879">For the purposes of this <i>performance standard</i>, a fault includes a fault of the relevant type having a metallic conducting path.</p> <p data-bbox="920 890 1608 917"><i>Fault clearance times</i> for relevant equipment are specified in Table 2.6:</p> <p data-bbox="920 928 1480 956">Table 2.6: Fault Clearance Times for Specified Equipment</p> <table border="1" data-bbox="913 963 2186 1270"> <thead> <tr> <th data-bbox="913 963 1263 1034"></th> <th data-bbox="1263 963 1724 1034">Transmission system fault clearance time<sup>(1)</sup></th> <th data-bbox="1724 963 2186 1034">Distribution system fault clearance time<sup>(1)</sup></th> </tr> </thead> <tbody> <tr> <td data-bbox="913 1034 1263 1078">Primary protection system</td> <td data-bbox="1263 1034 1724 1078">[Insert time] ms</td> <td data-bbox="1724 1034 2186 1078">[Insert time] ms</td> </tr> <tr> <td data-bbox="913 1078 1263 1123">Breaker fail protection system</td> <td data-bbox="1263 1078 1724 1123">[Insert time] ms</td> <td data-bbox="1724 1078 2186 1123">[Insert time] ms</td> </tr> <tr> <td data-bbox="913 1123 1263 1270">Automatic reclose equipment</td> <td data-bbox="1263 1123 1724 1270">[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]</td> <td data-bbox="1724 1123 2186 1270">[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]</td> </tr> </tbody> </table> <p data-bbox="920 1278 2159 1305">[Note: <sup>(1)</sup> Specify clearance times as per Table S5.1a.2 of the NER, or as applicable in the local <i>network</i>, whichever is the longest.]</p> <p data-bbox="913 1316 1471 1343">Single disturbance (reflects clause S5.2.5.5(c) of the NER):</p> <p data-bbox="913 1355 2181 1414">Provided that the event is not one that would <i>disconnect the generating system or integrated resource system</i> [delete whichever is not applicable] from the <i>power system</i> by removing <i>network elements</i> from service, the <i>generating system or integrated resource</i></p>		Transmission system fault clearance time <sup>(1)</sup>	Distribution system fault clearance time <sup>(1)</sup>	Primary protection system	[Insert time] ms	[Insert time] ms	Breaker fail protection system	[Insert time] ms	[Insert time] ms	Automatic reclose equipment	[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]	[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]
	Transmission system fault clearance time <sup>(1)</sup>	Distribution system fault clearance time <sup>(1)</sup>														
Primary protection system	[Insert time] ms	[Insert time] ms														
Breaker fail protection system	[Insert time] ms	[Insert time] ms														
Automatic reclose equipment	[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]	[Insert characteristics (single phase and three phase, if fitted), dead time in seconds, number of reclose shots, reclaim time in seconds, specifying if not greater than]														

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard										
				<p><i>system</i> [delete whichever is not applicable] and each of its <i>production generating</i>-units will remain in <i>continuous uninterrupted operation</i> for any disturbance caused by:</p> <ol style="list-style-type: none"> <li>(1) A <i>credible contingency event</i>;</li> <li>(2) A three-phase fault in a <i>transmission system</i> cleared by all relevant primary <i>protection systems</i>;</li> <li>(3) A two-phase-to-ground, phase-to-phase or phase-to-ground fault in the <i>transmission system</i> cleared in: <ol style="list-style-type: none"> <li>(i) the longest time expected to be taken for a relevant <i>breaker fail protection system</i> to clear the fault; or</li> <li>(ii) if a <i>breaker fail protection system</i> is not installed, the greater of the time specified in Table 2.7</li> </ol> <p>Table 2.7: Fault Clearance Times</p> <table border="1" data-bbox="1070 778 1879 1002"> <thead> <tr> <th>Nominal voltage at fault location (kV)</th> <th>Time (ms)</th> </tr> </thead> <tbody> <tr> <td>≥ 400kV</td> <td>175</td> </tr> <tr> <td>≥ 250kV and &lt; 400kV</td> <td>250</td> </tr> <tr> <td>&gt; 100kV and &lt; 250kV</td> <td>430</td> </tr> <tr> <td>≤ 100kV</td> <td>430</td> </tr> </tbody> </table> </li> </ol> <p>and the longest time expected to be taken for all relevant primary <i>protection systems</i> to clear the fault; or</p> <ol style="list-style-type: none"> <li>(4) a three-phase, two-phase-to-ground, phase-to-phase or phase-to-ground fault in a <i>distribution network</i> cleared in: <ol style="list-style-type: none"> <li>(i) the longest time expected to be taken for a relevant <i>breaker fail protection system</i> to clear the fault; or</li> <li>(ii) if a <i>breaker fail protection system</i> is not installed, the greater of 430 ms and the longest time expected to be taken for all relevant primary <i>protection systems</i> to clear the fault.</li> </ol> </li> </ol> <p>Multiple disturbances (reflects clause S5.2.5.5(d), (s) and (t) of the NER):  When assessing multiple disturbances, a fault that is re-established following operation of <i>automatic reclose equipment</i> is counted as a separate disturbance.</p> <p>The <i>generating system</i> or <i>integrated resource system</i> [delete whichever is not applicable] and each of its <i>production generating units</i> will remain in <i>continuous uninterrupted operation</i> for a series of up to 15 disturbances within any 5-min period caused by any combination of the events described above where:</p>	Nominal voltage at fault location (kV)	Time (ms)	≥ 400kV	175	≥ 250kV and < 400kV	250	> 100kV and < 250kV	430	≤ 100kV	430
Nominal voltage at fault location (kV)	Time (ms)													
≥ 400kV	175													
≥ 250kV and < 400kV	250													
> 100kV and < 250kV	430													
≤ 100kV	430													

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
				<p>(1) up to 6 of the disturbances cause the Connection Point <i>voltage</i> to drop below 50% of Normal Voltage;</p> <p>(2) in parts of the <i>network</i> where three-phase automatic reclosure is permitted up to two of the disturbances are three phase faults, and otherwise up to one three phase fault where the Connection Point <i>voltage</i> drops below 50% of Normal Voltage;</p> <p>(3) up to one disturbance is cleared by a <i>breaker fail protection system</i> <u>or</u> similar back-up <i>protection system</i>;</p> <p>(4) up to one disturbance causes the Connection Point <i>voltage</i> to vary within the ranges under clause S5.2.5.4(a)(7) and (8) of the NER;</p> <p>(5) the minimum clearance from the end of one disturbance and commencement of the next disturbance may be zero milliseconds; and</p> <p>(6) all remaining disturbances are caused by faults other than three-phase faults, provided that none of the events would result in:</p> <p>(7) the islanding of the <i>generating system</i> <u>or</u> <i>integrated resource system</i> <b>[delete whichever is not applicable]</b> or cause a material reduction in <i>power transfer capability</i> by removing <i>network elements</i> from service;</p> <p>(8) the cumulative time that the Connection Point <i>voltage</i> is lower than 90% of Normal Voltage exceeding 1,800 milliseconds within any 5-min period; or</p> <p>(9) within any 5-min period, the time integral of the difference between 90% of Normal Voltage and the Connection Point <i>voltage</i> when the Connection Point <i>voltage</i> is lower than 90% of Normal Voltage exceeding 1 pu second.</p> <p>The <i>generating system</i> <u>or</u> <i>integrated resource system</i> <b>[delete whichever is not applicable]</b> will not, as a consequence of its <i>connection</i>, cause other generating <i>plant</i> <u>or</u> <i>loads</i> to trip as a result of an event, when they would otherwise not have tripped for the same event.</p> <p><b>[Insert any operational arrangements or conditions necessary to ensure the <i>generating system</i> <u>or</u> <i>integrated resource system</i> <b>[delete whichever is not applicable]</b> and each of its <i>production generating units</i> will meet its agreed performance levels under abnormal <i>network</i> <u>or</u> <i>generating system</i> conditions].</b></p> <p>For <i>synchronous generating systems</i> <u>or</u> <i>integrated resource systems</i> or <i>synchronous production generating units</i> (reflects clause S5.2.5.5(e), (v) and (w) of the NER):  <b>[Delete any inapplicable paragraph]</b></p>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
				<p>Subject to any changed <i>power system</i> conditions or energy source availability beyond the <i>Generator's or Integrated Resource Provider's</i> <del>delete whichever is not applicable</del> reasonable control, in respect of the fault types described in clause S5.2.5.5(c)(2) to (4) of the NER, the <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del>, including all operating <i>synchronous production-generating units</i> (in the absence of a disturbance), will supply to, or absorb from, the <i>network</i>:</p> <ol style="list-style-type: none"> <li>(1) capacitive reactive current of at least the greater of its pre-disturbance reactive current and 4% of its maximum continuous current for each 1% reduction (from the level existing just prior to the fault) of Connection Point <i>voltage</i> during the fault, to assist the maintenance of <i>power system voltages</i> during the fault;</li> <li>(2) after clearance of the fault, <i>reactive power</i> sufficient to ensure that the Connection Point <i>voltage</i> is within the range for <i>continuous uninterrupted operation</i> under the <i>performance standard</i> under clause S5.2.5.4 of the NER; and</li> <li>(3) from 100 ms after clearance of the fault, <i>active power</i> of at least 95% of the level existing just prior to the fault.</li> </ol> <p>For <i>asynchronous generating systems or integrated resource systems</i> (reflects clause S5.2.5.5(f)-(i) and (u) of the NER):</p> <p>Subject to any changed <i>power system</i> conditions or energy source availability beyond the <i>Generator's or Integrated Resource Provider's</i> <del>delete whichever is not applicable</del> reasonable control, the <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del>, including all operating <i>asynchronous production-generating units</i> (in the absence of a disturbance), in respect of fault types described in clause S5.2.5.5(c)(2) to (4) of the NER, will supply to, or absorb from, the <i>network</i>:</p> <ol style="list-style-type: none"> <li>(1) during the disturbance and maintained until the Connection Point <i>voltage</i> recovers to between 90% and 110% of Normal Voltage, to assist the maintenance of <i>power system voltages</i> during the fault: <ol style="list-style-type: none"> <li>(i) capacitive reactive current in addition to its pre-disturbance level of at least 4% of its maximum continuous current for each 1% reduction of the Connection Point <i>voltage</i> below the range of 85% to 90% of Normal Voltage up to its maximum continuous current. <del>If the generating system or integrated resource system is directly connected to the power system with no step-up or connection transformer, insert next sentence: The generating system or integrated resource system may cease capacitive reactive current injection if the Connection Point voltage &lt;[0-5%, please specify] of Normal Voltage;</del></li> <li>(ii) inductive reactive current in addition to its pre-disturbance level of at least 6% of its maximum continuous current for each 1% increase of the Connection Point <i>voltage</i> above the range of 110% to 115% of Normal Voltage up to <del>sufficient current, please specify if possible</del> to maintain its rated apparent power;</li> </ol> </li> </ol>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard																												
				<p>(iii) the reactive current response will have a <i>rise time</i> of no greater than 40 ms and a <i>settling time</i> of no greater than 70 ms and will be <i>adequately damped</i>; and</p> <p>(iv) the reactive current contribution is calculated using [delete whichever not applicable] [phase-to-phase], [phase-to-ground] or [sequence components, the ratio of positive to negative sequence components must be agreed with AEMO and the NSP for the types of disturbances listed in clause S5.2.5.5].</p> <p>(2) from 100 ms after clearance of the fault, <i>active power</i> of at least 95% of the level existing just prior to the fault.</p>																												
	S5.2.5.6	Quality of Electricity Generated and Continuous Uninterrupted Operation	MN	<p>The <i>generating system or integrated resource system</i> [delete whichever is not applicable] -and each of its operating <i>production generating-units</i> and <i>reactive plant</i>, will not <i>disconnect</i> from the <i>power system for voltage</i> fluctuation, harmonic <i>voltage</i> distortion and <i>voltage</i> unbalance at the Connection Point within the levels specified:</p> <p>(i) For <i>voltage</i> fluctuations at the Connection Point, in the "compatibility levels" set out in Table 1 of AS/NZS 61000.3.7:2001.</p> <p>(ii) For harmonic <i>voltage</i> distortion at the Connection Point, in the "compatibility levels" defined in Table 1 of AS/NZS 61000.3.6:2001.</p> <p>(iii) a negative sequence <i>voltage</i> at the Connection Point, in Table S5.1a.1 of the NER and shown in Table 2.8:</p> <p>Table 2.8: Negative Sequence Voltages</p> <table border="1" data-bbox="1010 999 2031 1370"> <thead> <tr> <th rowspan="3">Nominal Supply Voltage (kV)</th> <th colspan="4">Maximum Negative Sequence Voltage (% of Nominal Voltage)</th> </tr> <tr> <th>No Contingency Event</th> <th>Credible Contingency Event</th> <th>General</th> <th>Once Per Hour</th> </tr> <tr> <th>30-Minute Average</th> <th>30-Minute Average</th> <th>10-Minute Average</th> <th>1-Minute Average</th> </tr> </thead> <tbody> <tr> <td>&gt; 100</td> <td>0.5</td> <td>0.7</td> <td>1.0</td> <td>2.0</td> </tr> <tr> <td>&gt; 10 and ≤ 100</td> <td>1.3</td> <td>1.3</td> <td>2.0</td> <td>2.5</td> </tr> <tr> <td>&lt;10</td> <td>2.0</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> </tr> </tbody> </table> <p>[Delete rows for voltage levels not applicable]</p>	Nominal Supply Voltage (kV)	Maximum Negative Sequence Voltage (% of Nominal Voltage)				No Contingency Event	Credible Contingency Event	General	Once Per Hour	30-Minute Average	30-Minute Average	10-Minute Average	1-Minute Average	> 100	0.5	0.7	1.0	2.0	> 10 and ≤ 100	1.3	1.3	2.0	2.5	<10	2.0	2.0	2.5	3.0
Nominal Supply Voltage (kV)	Maximum Negative Sequence Voltage (% of Nominal Voltage)																															
	No Contingency Event	Credible Contingency Event	General	Once Per Hour																												
	30-Minute Average	30-Minute Average	10-Minute Average	1-Minute Average																												
> 100	0.5	0.7	1.0	2.0																												
> 10 and ≤ 100	1.3	1.3	2.0	2.5																												
<10	2.0	2.0	2.5	3.0																												

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	S5.2.5.7	Partial Load Rejection	A	<p>For the purposes of this <i>performance standard</i>:</p> <p>Minimum generation means the minimum <i>sent out generation</i> for continuous stable operation, <math>P_{MIN} =</math> [insert] MW.</p> <p>The <i>generating system or integrated resource system</i> [delete whichever is not applicable] is capable of <i>continuous uninterrupted operation</i> during and following a <i>power system load</i> reduction of 30% from its pre-disturbance level or equivalent impact from separation of part of the <i>power system</i> in less than 10 s, provided that the <i>loading level</i> remains above <math>P_{MIN}</math>.</p>
	S5.2.5.8	Protection of Generating Systems from Power System Disturbances		<p>(a) Subject to paragraphs (b) [delete reference to (b) if <i>generating system or integrated resource system</i> [delete whichever is not applicable] is &lt;30MW or distribution connected] and (e) where the <i>generating system or integrated resource system</i> [delete whichever is not applicable] or any of its <i>production-generating units</i> that is required by the NSP, or <i>Generator or Integrated Resource Provider</i> to be automatically <i>disconnected</i> from the <i>power system</i> in response to abnormal conditions arising from the <i>power system</i>, the relevant <i>protection system or control system</i> does not <i>disconnect</i> the <i>generating system or integrated resource system</i> [delete whichever is not applicable] for:</p> <ul style="list-style-type: none"> <li>(i) conditions for which it must remain in <i>continuous uninterrupted operation</i>; or</li> <li>(ii) conditions it must withstand under the NER.</li> </ul> <p>(b) [Delete all of paragraph (b) if <i>generating system or integrated resource system</i> is &lt;30MW or distribution connected] The <i>generating system or integrated resource system</i> has <i>facilities</i> to automatically and rapidly reduce its <i>generation</i>: [Delete non-applicable paragraphs below (either (i) or (ii)), include any limitations e.g. minimum generation level]</p> <ul style="list-style-type: none"> <li>(i) by at least half, if the <i>frequency</i> at the Connection Point exceeds [a level nominated by AEMO (not less than the upper limit of the operational frequency tolerance band)] and the duration above this <i>frequency</i> exceeds a value nominated by AEMO where the reduction may be achieved by [delete (A) or (B)]: <ul style="list-style-type: none"> <li>(A) reducing the <i>output level</i> of the <i>generating system or integrated resource system</i> [delete whichever is not applicable] within 3 s, and holding the <i>output level</i> at the reduced level until the <i>frequency</i> returns to within the <i>normal operating frequency band</i>; or</li> <li>(B) <i>disconnecting</i> the <i>generating system or integrated resource system</i> [delete whichever is not applicable] from the <i>power system</i> within 1 s; or</li> </ul> </li> </ul>

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				<p>(ii) in proportion to the difference between the <i>frequency</i> at the Connection Point and a level nominated by AEMO (not less than the upper limit of the <i>operational frequency tolerance band</i>) such that the <i>generation</i> is reduced, by at least half, within 3 s of the <i>frequency</i> reaching the upper limit of the <i>extreme frequency excursion tolerance limits</i>.</p> <p>(c) [Delete paragraph (c) if AEMO or the NSP do not require it.] The <i>generating system or integrated resource system</i> [delete whichever is not applicable] must be automatically <i>disconnected</i> by a local or remote control scheme whenever the part of the <i>network</i> to which it is <i>connected</i> has been <i>disconnected</i> from the <i>national grid</i> and has formed an island <i>that supplies load supplying a Customer</i>.</p> <p>(d) The conditions for which the <i>generating unit, or generating system, bidirectional unit or integrated resource system</i> [delete whichever is not applicable] must trip and must not trip are: [specify the conditions to facilitate AEMO and NSP maintaining power system security].</p> <p>(e) Notwithstanding the <i>performance standards</i> under clauses S5.2.5.3, S5.2.5.4, S5.2.5.5, S5.2.5.6 and S5.2.5.7 of the NER the <i>generating system or integrated resource system</i> [delete whichever is not applicable] may be automatically <i>disconnected</i> from the <i>power system</i> under any of the following conditions [delete inapplicable sub-paragraphs]:</p> <ol style="list-style-type: none"> <li>(1) in accordance with the <i>ancillary services agreement</i> dated [insert date] between the <i>Generator or Integrated Resource Provider</i> and AEMO for the provision of [insert type of ancillary services] [delete if no <i>ancillary services agreement</i> exists]</li> <li>(2) where a <i>source of load</i> that is not part of the <i>generating system or integrated resource system</i> [delete whichever is not applicable] has the same <i>connection point</i> as the <i>generating system or integrated resource system</i> [delete whichever is not applicable] and AEMO and the NSP agree that the <i>disconnection</i> would in effect be under-frequency <i>load shedding</i>; [delete if none exists]</li> <li>(3) where the <i>generating system or integrated resource system</i> [delete whichever is not applicable] is automatically <i>disconnected</i> under paragraphs (a), (b) [deleted reference to (b) if <i>generating system</i> is &lt;30MW or distribution connected] or the <i>performance standard</i> under clause S5.2.5.9 of the NER;</li> <li>(4) where the <i>generating system or integrated resource system</i> [delete whichever is not applicable] is automatically <i>disconnected</i> under the <i>performance standard</i> under clause S5.2.5.10 of the NER; or</li> </ol>

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				<p>(5) in accordance with an agreement between the <i>Generator or Integrated Resource Provider</i> [delete whichever is not applicable] and the NSP (including an agreement in relation to an emergency control scheme under clause S5.1.8 of the NER) to provide a service that AEMO agrees is necessary to maintain or restore <i>power system security</i> in the event of a specified <i>contingency event</i>. [delete if none exists]</p> <p>(6) Where the <i>generating system or integrated resource system</i> [delete whichever is not applicable] is automatically disconnected from the <i>power system</i> via an <i>emergency frequency control scheme</i> (EFCS) in accordance with an <i>EFCS settings schedule</i> as maintained by AEMO and notified to the <i>Generator or Integrated Resource Provider</i> [delete whichever is not applicable] from time to time.</p>
	S5.2.5.9	Protection Systems that Impact on Power System Security	A	<p>(a) The <i>generating system or integrated resource system</i> [delete whichever is not applicable] has primary protection systems to disconnect from the <i>power system</i> any faulted element within the <i>generating system or integrated resource system</i> [delete whichever is not applicable] and in the protection zones that include the Connection Point, within the <i>fault clearance times</i> specified in Table 2.9 [insert fault clearance times determined under clause S5.1.9(a)(1) of the NER, but subject to clauses S5.1.9(k) and (l) in the table below].</p> <p>(b) Each <i>primary protection system</i> has sufficient redundancy to ensure that a faulted element within its protection zone is disconnected from the <i>power system</i> within the applicable <i>fault clearance time</i> with any single protection element (including any communications facility on which that <i>protection system</i> depends) out of service.</p> <p>(c) <i>Breaker fail protection systems</i> are provided to clear faults that are not cleared by the circuit breakers controlled by the <i>primary protection system</i>, within the <i>fault clearance times</i> in Table 2.9: [insert fault clearance times determined under clause S5.1.9(a)(1) of the NER]</p> <p>Table 2.9: Protection and Breaker Fail System Fault Clearance Times</p>



NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard									
				<table border="1"> <thead> <tr> <th></th> <th>[Insert voltage level] kV</th> <th>[Insert voltage level] kV</th> </tr> </thead> <tbody> <tr> <td>Primary <i>protection systems</i></td> <td>[Insert time] ms</td> <td>[Insert time] ms</td> </tr> <tr> <td>Breaker fail <i>protection systems</i></td> <td>[Insert time] ms</td> <td>[Insert time] ms</td> </tr> </tbody> </table> <p>(d) The <i>protection system</i> design will be coordinated with other <i>protection systems</i>, avoid consequential <i>disconnection</i> of other <i>Network Users' facilities</i> and take into account the NSP's existing obligations under their <i>connection agreements</i> with other <i>Network Users</i>.</p>		[Insert voltage level] kV	[Insert voltage level] kV	Primary <i>protection systems</i>	[Insert time] ms	[Insert time] ms	Breaker fail <i>protection systems</i>	[Insert time] ms	[Insert time] ms
	[Insert voltage level] kV	[Insert voltage level] kV											
Primary <i>protection systems</i>	[Insert time] ms	[Insert time] ms											
Breaker fail <i>protection systems</i>	[Insert time] ms	[Insert time] ms											
	S5.2.5.10	Protection to Trip Plant for Unstable Operation	A	<p>[If the <i>generating system</i> or <i>integrated resource system</i> <del>[delete whichever is not applicable]</del> is <i>synchronous</i>, the first paragraph applies; if it is <i>asynchronous</i>, the second applies. Delete the inapplicable paragraph and then complete the applicable one by specifying the type of <i>protection system</i> installed.]</p> <p>Each <i>production generating unit</i> has the following <i>protection system</i> to <i>disconnect</i> it promptly when a condition that would lead to pole slipping is detected, to prevent pole slipping or other conditions where a <i>production generating unit</i> causes <i>active power</i>, <i>reactive power</i> or <i>voltage</i> at the Connection Point to become unstable as assessed in accordance with AEMO's Power System Stability Guidelines (established under clause 4.3.4(h) of the NER):</p> <ul style="list-style-type: none"> <li>[Specify the type of <i>protection system</i> installed, e.g. loss of field, reverse power, etc.]</li> </ul> <p>[Each <i>production generating unit</i>, or where this is impractical, the <i>generating system</i> or <i>integrated resource system</i> <del>[delete whichever is not applicable]</del> has the following <i>protection system</i> to <i>disconnect</i> its <i>production generating units</i> promptly for conditions where the <i>active power</i>, <i>reactive power</i> or <i>voltage</i> at the Connection Point becomes unstable as assessed in accordance with AEMO's Power System Stability Guidelines (established under clause 4.3.4(h) of the NER):</p> <ul style="list-style-type: none"> <li>[Specify the type of <i>protection system</i> installed and the corresponding operating time]</li> </ul>									
	S5.2.5.11	Frequency Control	A	<p>For the purposes of this <i>performance standard</i>:</p> <p>'Maximum operating level' = [Insert] MW.</p> <p>'Minimum operating level' = [Insert] MW.</p>									

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				<p>'droop' means, in relation to <i>frequency response mode</i>, the percentage change in <i>power system frequency</i> as measured at the Connection Point, divided by the percentage change in <i>power transfer</i> of the <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del>, expressed as a percentage of the maximum operating level of the <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del>. Droop must be measured at <i>frequencies</i> that are outside the deadband and within the limits of <i>power transfer</i>.</p> <p><i>Power system frequency</i> is measured at the Connection Point.</p> <p><u>(1) The generating system's power transfer to the power system will not:</u></p> <p><del>(1) power transfer to the power system from a The generating system's or integrated resource system</del> <del>[delete whichever is not applicable]</del>, power transfer to the power system will not:</p> <ul style="list-style-type: none"> <li>(i) increase in response to a rise in <i>power system frequency</i>; or</li> <li>(ii) decrease in response to a fall in <i>power system frequency</i>; and</li> </ul> <p>(2) The <i>generating system</i> is capable of operating in <i>frequency response mode</i> such that it automatically provides a proportional:</p> <ul style="list-style-type: none"> <li>(i) decrease in <i>power transfer</i> to the <i>power system</i> in response to a rise in <i>power system frequency</i>; and</li> <li>(ii) increase in <i>power transfer</i> to the <i>power system</i> in response to a fall in <i>power system frequency</i>,</li> </ul> <p>sufficiently rapidly and sustained for a sufficient period for the <i>Generator-or-Integrated Resource Provider</i> <del>[delete whichever is not applicable]</del> to be in a position to offer measurable amounts all <i>market ancillary services</i> for the provision of <i>power system frequency control</i>.</p> <p><u>(3) an integrated resource system, to the extent it comprises production units, must be capable of operating in frequency response mode such that it automatically provides a proportional:</u></p> <ul style="list-style-type: none"> <li>(i) decrease in <i>power transfer</i> to the <i>power system</i>, with a continuous shift from one to the other mode, in response to a rise in the <i>frequency</i> of the <i>power system</i> as measured at the <i>connection point</i> accompanied by a smooth change in <i>bidirectional unit operating mode</i> between production and consumption; and</li> <li>(ii) increase in <i>power transfer</i> to the <i>power system</i> in response to a fall in the <i>frequency</i> of the <i>power system</i> as measured at the <i>connection point</i> accompanied by a smooth change in <i>bidirectional unit operating mode</i> between production and consumption.</li> </ul>

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				<p><u>sufficiently rapidly and sustained for a sufficient period for the <i>Integrated Resource Provider</i> (as relevant) to be in a position to offer measurable amounts of all <i>market ancillary services</i> for the provision of <i>power system frequency control</i>.</u></p> <p><del>(3)</del>(4) Nothing in paragraph (2) <u>or (3)</u> requires the <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> to operate below its minimum operating level in response to a rise in <i>power system frequency</i>, or above its maximum operating level in response to a fall in <i>power system frequency</i>.</p> <p><del>(4)</del>(5) The change in <i>power transfer</i> to the <i>power system</i> will occur with no delay beyond that required for stable operation, or inherent in the <i>plant</i> controls, once <i>power system frequency</i> leaves a deadband around 50 Hz.</p> <p><del>(5)</del>(6) The <i>generating system's or integrated resource system's</i> <del>[delete whichever is not applicable]</del>:</p> <p>(i) deadband can be set within the range of 0 to ± 1.0 Hz <del>[different deadband settings may be applied for a rise or fall in the frequency of the power system as measured at the Connection Point – delete if one deadband applies for rise and fall];</del> and</p> <p>(ii) droop can be set within the range of <del>[1.7% delete if not a BESS supporting FCAS]</del> 2% to 10%. <del>[For Bi-directional unit, reflect the recommended droop as outlined in the BESS guide for contingency FCAS registration];</del></p> <p><del>(6)</del>(7) Each control system used to satisfy this performance standard is adequately damped.</p> <p><del>(7)</del>(8) The amount of relevant <i>market ancillary service</i> for which the <i>plant</i> is registered will not exceed the amount that would be consistent with this <i>performance standard</i>.</p>
	S5.2.5.12	Impact on Network Capability	A	<p>The <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> has <i>plant</i> capabilities and <i>control systems</i> that are sufficient so that when <i>connected</i> to the <i>power system</i> it does not reduce any <i>inter-regional</i> or <i>intra-regional power transfer capability</i> below the level that would apply if the <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> were not <i>connected</i>.</p>

<sup>2</sup> BESS guide for contingency FCAS registration: [https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security\\_and\\_Reliability/Ancillary\\_Services/Battery-Energy-Storage-System-requirements-for-contingency-FCAS-registration.pdf](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Ancillary_Services/Battery-Energy-Storage-System-requirements-for-contingency-FCAS-registration.pdf)

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	S5.2.5.13	Voltage and Reactive Power Control	A	<p>(1) The <i>generating system or integrated resource system</i> [delete whichever is not applicable] has <i>plant capabilities and control systems</i> sufficient to ensure that:</p> <ul style="list-style-type: none"> <li>(i) <i>power system</i> oscillations, for the frequencies of oscillation of the <i>productiongenerating-unit</i> against any other <i>productiongenerating-unit</i> or <i>system</i>, are <i>adequately damped</i>;</li> <li>(ii) operation of the <i>generating system or integrated resource system</i> [delete whichever is not applicable] does not degrade the damping of any critical mode of oscillation of the <i>power system</i>; and</li> <li>(iii) operation of the <i>generating system or integrated resource system</i> [delete whichever is not applicable] does not cause instability (including hunting of <i>tap-changing transformer control systems</i>) that would adversely impact other <i>Registered Participants</i>.</li> </ul> <p>(2) The <i>control systems</i> used with this <i>generating system or integrated resource system</i> [delete whichever is not applicable] have:</p> <ul style="list-style-type: none"> <li>(i) for the purposes of disturbance monitoring and testing, permanently installed and operational, monitoring and recording <i>facilities</i> for key variables including each input and output; and</li> <li>(ii) <i>facilities</i> for testing the <i>control system</i> sufficient to establish its dynamic operational characteristics.</li> </ul> <p>(3) The <i>generating system or integrated resource system</i> [delete whichever is not applicable] has <i>facilities</i> with a <i>control system</i> to regulate <i>voltage, reactive power</i> and <i>power factor</i>, with the ability to operate in any control mode and to switch between control modes, as shown in [specify the manufacturer's and/or design specifications of the relevant equipment and demonstrated to the reasonable satisfaction of the NSP and AEMO] [delete if not applicable].</p> <p>(4) The <i>generating system or integrated resource system</i> [delete whichever is not applicable] has a <i>voltage control system</i> that:</p> <ul style="list-style-type: none"> <li>(i) regulates <i>voltage</i> at [the Connection Point or [specify agreed location in the <i>power system</i> (including within the <i>generating system or integrated resource system</i> [delete whichever is not applicable])]] [delete if not applicable, or if applicable, delete reference to Connection Point] to within 0.5% of the setpoint [where that setpoint is adjusted to incorporate any <i>voltage</i> droop or reactive current compensation agreed with AEMO and the NSP, delete if not applicable];</li> <li>(ii) regulates <i>voltage</i> in a manner that helps to support <i>network voltages</i> during faults and does not prevent the NSP from achieving the requirements under clause S5.1a.3 and S5.1a.4 of the NER;</li> </ul>

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				<p>(iv) allows the <i>voltage</i> setpoint to be continuously controllable in the range of at least 95% to 105% of the target <i>voltage</i> at [the Connection Point (as recorded in the <i>connection agreement</i>) or the agreed location in the <i>power system</i>] <b>[adjust to align with sub-paragraph (i)]</b>, without reliance on a <i>tap-changing transformer</i> and subject to the <i>reactive power</i> capability referred to in the <i>performance standard</i> under clause S5.2.5.1;</p> <p>(v) has limiting devices to ensure that a <i>voltage</i> disturbance does not cause the <i>production-generating unit</i> to trip at the limits of its operating capability. The limiting devices:</p> <p>(A) do not detract from the performance of any power system stabiliser or power oscillation damping capability; and</p> <p>(B) are co-ordinated with all <i>protection systems</i>.</p> <p><b>[If the <i>generating system</i> or <i>integrated resource system</i> <del>[delete whichever is not applicable]</del> is <i>synchronous</i>, paragraph (5) applies; if it is <i>asynchronous</i>, paragraph (6) applies. Delete the inapplicable paragraph and then complete the applicable one by specifying the type of <i>voltage and reactive power control system</i> installed.]</b></p> <p>(5) the <i>generating system</i> or <i>integrated resource system</i> <del>[delete whichever is not applicable]</del> has an <i>excitation control system</i> that:</p> <p>(i) can operate the stator continuously at 105% of Nominal Voltage with <i>rated active power output level</i>;</p> <p>(ii) has an excitation ceiling <i>voltage</i> of at least: <b>[delete whichever not applicable]</b></p> <p>(A) for a static excitation system, 2.3 times; or</p> <p>(B) for other <i>excitation control systems</i>, 1.5 times,</p> <p>the excitation required to achieve <del><i>transfer of power generation</i></del> at the <i>nameplate rating</i> for <i>rated power factor</i>, <i>rated speed</i> and <i>Nominal Voltage</i>;</p> <p>(iii) has <i>settling times</i> for a step change of <i>voltage</i> setpoint or <i>voltage</i> at the location agreed in paragraph (4)(i) of:</p> <p>(A) generated <i>voltage</i> less than 2.5 s for a 5% <i>voltage</i> disturbance with the <i>production-generating unit</i> not <i>synchronised</i>;</p> <p>(B) <i>active power, reactive power</i> and <i>voltage</i> less than 5.0 s for a 5% <i>voltage</i> disturbance with the <i>production-generating unit</i> <i>synchronised</i>, from an operating point where the <i>voltage</i> disturbance would not cause any limiting device to operate; and</p>

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				<p>(C) in respect of each limiting device, <i>active power, reactive power and voltage</i> less than 7.5 s for a 5% <i>voltage</i> disturbance with the <i>production generating unit synchronised</i>, when operating into a limiting device from an operating point where a <i>voltage</i> disturbance of 2.5% would just cause the limiting device to operate;</p> <p>(iv) can increase field <i>voltage</i> from rated field <i>voltage</i> to the excitation ceiling <i>voltage</i> in less than:</p> <p>(A) 0.05 s for a static excitation system; or</p> <p>(B) 0.5 s for other <i>excitation control systems</i>; and</p> <p>(ix) has a <i>power system</i> stabiliser with sufficient flexibility to enable damping performance to be maximised, with characteristics as described in paragraph (7); and</p> <p>(6) The <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del> has a <i>voltage control system</i> that:</p> <p>(i) with the <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del> connected to the <i>power system</i>, has <i>settling times</i> for <i>active power, reactive power and voltage</i> due to a step change of <i>voltage</i> setpoint or <i>voltage</i> at <del>insert the location agreed under subparagraph (4)(i)</del>, of less than:</p> <p>(A) 5.0 s for a 5% <i>voltage</i> disturbance with the <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del> connected to the <i>power system</i>, from an operating point where the <i>voltage</i> disturbance would not cause any limiting device to operate; and</p> <p>(B) 7.5 s for a 5% <i>voltage</i> disturbance with the <i>generating system or integrated resource system</i> <del>delete whichever is not applicable</del> connected to the <i>power system</i>, when operating into any limiting device from an operating point where a <i>voltage</i> disturbance of 2.5% would just cause the limiting device to operate;</p> <p>(ii) for a 5% step change in the <i>voltage</i> setpoint, has <i>reactive power</i> rise time, of less than 2 s;</p> <p>(iii) has power oscillation damping capability with sufficient flexibility to enable damping performance to be maximised with characteristics as described in paragraph (7).</p> <p>(7) The <i>power system</i> stabiliser or power oscillation damping device has <del>delete paragraph (7) if power system stabiliser is not provided</del>:</p>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
				<ul style="list-style-type: none"> <li>(i) <del>[For a synchronous production generating unit]</del> measurements of rotor speed and active power <del>level/output level</del> of the <i>production generating unit</i> as inputs, and otherwise, measurements of power system frequency and active power <del>level/output level</del> of the <i>production generating unit</i> as inputs <del>[delete for asynchronous production generating unit];</del></li> <li>(ii) two washout filters for each input, with ability to bypass one of them if necessary;</li> <li>(iii) <del>[Insert number not less than two]</del> lead-lag transfer function blocks (or equivalent number of complex poles and zeros) with adjustable gain and time-constants, to compensate fully for the phase lags due to the <i>generating plant</i>;</li> <li>(iv) an <del>output level</del> limiter, which for a <i>synchronous production generating unit</i> is continually adjustable over the range of <math>\pm 10\%</math> of stator voltage <del>[delete for asynchronous production generating unit];</del></li> <li>(v) monitoring and recording <i>facilities</i> for key variables including inputs, <del>output level</del> and the inputs to the lead-lag transfer function blocks; and</li> <li>(vi) <i>facilities</i> to permit testing of the <i>power system</i> stabiliser in isolation from the <i>power system</i> by injection of test signals, sufficient to establish the transfer function of the <i>power system</i> stabiliser.</li> </ul> <p>(8) A reactive power or power factor control system provided under paragraph (3) will:</p> <ul style="list-style-type: none"> <li>(i) regulate reactive power or power factor at [the Connection Point or <del>[specify agreed location in the power system (including within the generating system or integrated resource system [delete whichever is not applicable])]</del>], to within: <ul style="list-style-type: none"> <li>(A) for a <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> operating in reactive power mode, 2% of the <i>generating system's</i> rating (expressed in Mvar); or</li> <li>(B) for a <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> operating in power factor mode, a power factor equivalent to 2% of the <i>generating system's or integrated resource system's</i> <del>[delete whichever is not applicable]</del> rating (expressed in Mvar);</li> </ul> </li> <li>(ii) allow the reactive power or power factor setpoint to be continuously controllable across the reactive power capability range established under the <i>performance standard</i> under clause S5.2.5.1; and</li> <li>(iii) with the <i>generating system or integrated resource system</i> <del>[delete whichever is not applicable]</del> connected to the <i>power system</i>, and for a step change in setpoint of at least 50% of the reactive power capability agreed with AEMO and the NSP under clause S5.2.5.1 of the NER, or a 5% voltage disturbance at the location agreed under subparagraph (i):</li> </ul>

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				<p>(A) have <i>settling times</i> for <i>active power, reactive power</i> and <i>voltage</i> of less than 5.0 s from an operating point where the <i>voltage</i> disturbance would not cause any limiting device to operate; and</p> <p>(B) have <i>settling times</i> for <i>active power, reactive power</i> and <i>voltage</i> of less than 7.5 s when operating into any limiting device from an operating point where a <i>voltage</i> disturbance of 2.5% would just cause the limiting device to operate.</p> <p>[Include any requirements for the design and operation of the <i>control systems</i> of the <i>production generating unit, or generating system or integrated resource system</i> to be coordinated with the existing NSP <i>voltage control systems</i> of and those of other <i>Network Users</i> and any requirements relating to inclusion in AEMO's Var Dispatch Schedule system]</p>
	S5.2.5.14	Active Power Control	A	<p>[Delete paragraph (1), (2) or (3), as applicable – (1) applies to <i>scheduled production generating units/systems</i>, (2) applies to <i>non-scheduled production generating units/systems</i> and (3) applies to <i>semi-scheduled production generating units/systems</i>.]</p> <p>(1) The <i>production generating unit, or generating system or integrated resource system</i> [delete whichever not applicable] has an <i>active power control system</i> that is <i>adequately damped</i> and capable of:</p> <ul style="list-style-type: none"> <li>(i) maintaining and changing its <i>active power level-output level</i> in accordance with its <i>dispatch instructions</i>;</li> <li>(ii) ramping its <i>active power level-output level</i> linearly from one <i>dispatch level</i> to another; and</li> <li>(iii) receiving and automatically responding to signals delivered from the <i>automatic generation control system</i>, as updated at a rate of once every 4 s [or insert other period specified by AEMO].</li> </ul> <p>(2) Subject to the energy source availability, the <i>production unit, generating system or integrated resource system</i> [delete whichever not applicable] has an <i>active power control system</i> that is <i>adequately damped</i> and capable of:</p> <ul style="list-style-type: none"> <li>(i) automatically reducing or increasing its <i>active power level-output level</i> within 5 min at a constant rate, to or below the level specified in an instruction electronically issued by a <i>control centre</i>, subject to subparagraph (iii),</li> <li>(ii) automatically limiting its <i>active power output level level</i>, to below the level specified in subparagraph (i); and</li> <li>(iii) not changing its <i>active power output level level</i> within 5 min by more than the raise and lower amounts specified in an instruction electronically issued by a <i>control centre</i>.</li> </ul> <p>(3) Subject to energy source availability, the <i>production unit, generating system or integrated resource system</i> [delete whichever not applicable] has an <i>active power control system</i> that is <i>adequately damped</i> and capable of:</p>



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				<p>(i) automatically reducing or increasing its <i>active power</i> <del>outputlevel_level</del> within 5 min at a constant rate, to or below the level specified in an instruction electronically issued by a <i>control centre</i>;</p> <p>(ii) automatically limiting its <i>active power</i> <del>leveloutputlevel_</del> to or below the level specified in subparagraph (i);</p> <p>(iii) not changing its <i>active power</i> <del>level_outputlevel</del> within 5 min by more than the raise and lower amounts specified in an instruction electronically issued by a <i>control centre</i>;</p> <p>(iv) ramping its <i>active power</i> <del>level_outputlevel</del> linearly from one level of <i>dispatch</i> to another; and</p> <p>(v) receiving and automatically responding to signals delivered from the <i>automatic generation control system</i>, as updated at a rate of once every 4 s <b>[or insert other period specified by AEMO]</b>.</p>
	S5.2.5.15	Short circuit ratio	N	<p><b>[Highlighted text below is for reference only and is not part of S5.2.5.15 clause description]</b></p> <p><b>This standard:</b></p> <ul style="list-style-type: none"> <li><b>applies to a <i>generating system</i> or <i>integrated resource system</i> that is comprised solely of <i>asynchronous production units</i>; and</b></li> <li><b>for a <i>generating system</i> or <i>integrated resource system</i> that is comprised of both <i>synchronous</i> and <i>asynchronous production units</i>, applies only to the <i>asynchronous production units</i> and to the <i>generating system</i> or <i>integrated resource system</i> to the extent it relates to its <i>asynchronous production units</i>.</b></li> </ul> <p>The <i>generating system</i> or <i>integrated resource system</i> <b>[delete whichever is not applicable]</b> comprised of <i>asynchronous generating units</i> must have plant capability sufficient to operate stably and remain connected at a <b>short circuit ratio (SCR)</b> of <b>[insert number not higher than 3.0 (representing SCR withstand capability of plant)]</b>, assessed in accordance with the methodology prescribed in the <b>system strength impact assessment guidelines</b>, where:</p> <p><b>(1) the rated active power for calculating the SCR value is [insert number];and</b></p> <p><b>(2) [Delete if not applicable] the agreed arrangements under S5.2.5.15(e) to achieve this performance standard are:</b></p> <ul style="list-style-type: none"> <li><b>[If applicable, record details of arrangements necessary for plant to operate stably and remain <i>connected</i> at agreed SCR value]</b></li> </ul>
	S5.2.5.16	Voltage phase angle shift	N	<p><b>[Highlighted text below is for reference only and is not part of S5.2.5.15 clause description]</b></p> <p><b>This standard:</b></p>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard						
				<ul style="list-style-type: none"> <li>• <del>applies to a <i>generating system or integrated resource system</i> that is comprised solely of <i>asynchronous production units</i>; and</del></li> <li>• <del>for a <i>generating system or integrated resource system</i> that is comprised of both <i>synchronous</i> and <i>asynchronous production units</i>, applies only to the <i>asynchronous production units</i> and to the <i>generating system or integrated resource system</i> to the extent it relates to its <i>asynchronous production units</i>.</del></li> </ul> <p><del>The <i>generating system or integrated resource system</i> [delete whichever is not applicable] and each of its <i>asynchronous production units</i> must not include any vector shift or similar relay or protective function that acts upon <i>voltage</i> phase angle which might operate for phase angle changes less than 20 degrees at the <i>connection point</i>.</del></p> <p><del>[The agreed value of the settings of any protection system must be recorded in the performance standards].</del></p>						
	S5.2.6.1 and 4.11.1	Remote Monitoring	A	<p><del>[Delete rows in Table 2.10 where the type of plant is not applicable]</del></p> <p>The <i>generating system, integrated resource system or production generating-unit</i> (as applicable) has <i>remote monitoring equipment</i> and <i>remote control equipment</i> to transmit to, and receive from, AEMO's control centres the quantities specified in Table 2.10 in real-time in accordance with clause 4.11 of the NER:</p> <p>Table 2.10: Remote Monitoring Equipment and Remote Control Equipment Quantities required by AEMO</p> <table border="1" data-bbox="913 965 2190 1398"> <thead> <tr> <th data-bbox="913 965 1279 1010">Type of Plant</th> <th data-bbox="1279 965 1809 1010">Remote Monitoring Quantities</th> <th data-bbox="1809 965 2190 1010">Remote Control Quantities</th> </tr> </thead> <tbody> <tr> <td data-bbox="913 1010 1279 1398"><del><i>Generating systems or integrated resource systems</i></del></td> <td data-bbox="1279 1010 1809 1398"> <del>(1) the status of all switching devices that carry the <i>generation or load</i>;</del>  <del>(2) <i>tap-changing transformer</i> tap position(s) and <i>voltages</i>;</del>  <del>(3) <i>active power</i> and <i>reactive power</i> aggregated for groups of identical <i>production generating units</i>;</del>  <del>(4) either the number of identical <i>production generating units operating-generating or operating-generating</i> status of each non-identical <i>generating production unit</i>;</del> </td> <td data-bbox="1809 1010 2190 1398"> <del>(1) <i>voltage, reactive power</i> and <i>power factor control setpoint</i> (delta) (as applicable); and</del>  <del>(2) <i>voltage, reactive power</i> and <i>power factor control mode</i> (where applicable);</del>  <del>(3) [for a non-scheduled <i>generating system or integrated resource system</i> only – delete if inapplicable] to the extent required to manage <i>network flows</i>;</del> </td> </tr> </tbody> </table>	Type of Plant	Remote Monitoring Quantities	Remote Control Quantities	<del><i>Generating systems or integrated resource systems</i></del>	<del>(1) the status of all switching devices that carry the <i>generation or load</i>;</del> <del>(2) <i>tap-changing transformer</i> tap position(s) and <i>voltages</i>;</del> <del>(3) <i>active power</i> and <i>reactive power</i> aggregated for groups of identical <i>production generating units</i>;</del> <del>(4) either the number of identical <i>production generating units operating-generating or operating-generating</i> status of each non-identical <i>generating production unit</i>;</del>	<del>(1) <i>voltage, reactive power</i> and <i>power factor control setpoint</i> (delta) (as applicable); and</del> <del>(2) <i>voltage, reactive power</i> and <i>power factor control mode</i> (where applicable);</del> <del>(3) [for a non-scheduled <i>generating system or integrated resource system</i> only – delete if inapplicable] to the extent required to manage <i>network flows</i>;</del>
Type of Plant	Remote Monitoring Quantities	Remote Control Quantities								
<del><i>Generating systems or integrated resource systems</i></del>	<del>(1) the status of all switching devices that carry the <i>generation or load</i>;</del> <del>(2) <i>tap-changing transformer</i> tap position(s) and <i>voltages</i>;</del> <del>(3) <i>active power</i> and <i>reactive power</i> aggregated for groups of identical <i>production generating units</i>;</del> <del>(4) either the number of identical <i>production generating units operating-generating or operating-generating</i> status of each non-identical <i>generating production unit</i>;</del>	<del>(1) <i>voltage, reactive power</i> and <i>power factor control setpoint</i> (delta) (as applicable); and</del> <del>(2) <i>voltage, reactive power</i> and <i>power factor control mode</i> (where applicable);</del> <del>(3) [for a non-scheduled <i>generating system or integrated resource system</i> only – delete if inapplicable] to the extent required to manage <i>network flows</i>;</del>								

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard		
					<p>(5) either the number of identical <i>production generating-units</i> available or the available status of each non-identical <i>production generating-unit</i>;</p> <p>(6) <i>active power</i> and <i>reactive power</i> for the <i>generating system or integrated resource system</i>;</p> <p>(7) <i>voltage, reactive power</i> and <i>power factor control system</i> setpoint and mode (as applicable);</p> <p>(8) the mode of operation of each <i>production generating-unit</i>, turbine control limits, or other information required to reasonably predict the <i>active power</i> response of the <i>generating system or integrated resource system</i> to a change in <i>power system frequency</i> at the Connection Point;</p> <p>(9) any quantities reasonably required by AEMO for the Var Dispatch Scheduling (VDS) system.</p> <p>(10) any quantities reasonably required by AEMO to discharge its <i>market</i> and <i>power system security</i> functions as set out in Chapters 3 and 4 of the NER.</p>	<p>(i) <i>active power</i> limit; and</p> <p>(ii) <i>active power</i> ramp limit.</p>
				<p><i>Generating units with nameplate rating of 30 MW or more, or bidirectional units with nameplate rating of 5 MW or</i></p>	<p>(1) Current;</p> <p>(2) <i>Voltage</i>; and</p> <p>(3) <i>Active power</i> and <i>reactive power</i></p>	

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard		
				<p><u>more</u> in respect of <b>generating unit or bidirectional unit</b> stators or power conversion systems (as applicable)</p>		
				<p><b>Automated generation control system (AGC) – scheduled generating systems, and semi-scheduled generating systems and scheduled integrated resource systems</b></p>	<p>(1) AGC control mode (remote or local);  (2) AGC availability status;  (3) maximum <i>active power</i> limit;  (4) minimum <i>active power</i> limit;  (5) maximum <i>active power</i> raise ramp rate; and  (6) maximum <i>active power</i> lower ramp rate;</p>	<p>(1) AGC <i>active power</i> setpoint</p>
				<p>Auxiliary supply system with a capacity of 30 MW or more associated with the <b>generating unit, or generating system, bidirectional unit or integrated resource system</b></p>	<p><i>Active power and reactive power</i></p>	
				<p>Reactive power equipment that is part of the <b>generating system or integrated resource system</b> but not part of a <b>production generating unit</b></p>	<p><i>Reactive power</i></p>	
				<p><b>Semi-scheduled generating system or a semi-scheduled generating unit in an integrated resource system;</b></p>	<p>All data specified as mandatory in the relevant <i>energy conversion model</i> applicable to that type of <i>semi-scheduled generating system</i>, especially the standing and metered data requirements (see the <a href="#">Semi-Scheduled Energy Conversion Model Guidelines</a> for wind and solar <i>generating systems</i>)</p>	

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
				<p>Runback scheme agreed with the NSP</p> <p>(1) Runback scheme status (enabled/disabled);  (2) Runback scheme operated status; and  (3) <i>active power, reactive power</i> or other control limit, as applicable.</p>
	S5.2.6.2 and 4.11.3	Communications Equipment	A	<p>The <i>Generator or Integrated Resource Provider</i> has provided and will maintain:</p> <p>(1) two separate telephone <i>facilities</i> using independent telecommunications service providers, for the purposes of operational communications between the <i>Generator's or Integrated Resource Provider's</i> responsible operator under clause 4.11.3(a) of the NER and AEMO's <i>control centre</i>; and</p> <p>(2) electricity supplies for <i>remote monitoring equipment</i> and <i>remote control equipment</i> installed in relation to its <i>generating system -or integrated resource system [delete whichever is not applicable]</i> capable of keeping such equipment available for at least 3 hours following total loss of <i>supply</i> at the <i>connection point</i> for a relevant <i>production/generating unit</i>.</p>
	S5.2.7	Power Station Auxiliary Supplies	Not applicable	<p><i>[Only required if the generating system or integrated resource system [delete whichever is not applicable] takes its auxiliary load supplies via a connection point through which its generation is not transferred to the network, in which case, specify performance standard under clause S5.3.5 of the NER as if the Generator or Integrated Resource Provider [delete whichever not applicable] were a Market Customer]</i></p> <p>The <i>generating system or integrated resource system [delete whichever is not applicable]</i> takes its auxiliary supplies via <i>[insert connection point and Nominal Voltage]</i>.</p> <p>The <i>power factor</i> of the <i>generating system or integrated resource system [delete whichever is not applicable]</i> <i>auxiliary loads will be between 0.9 leading to 0.9 lagging [or insert power factor requirement as agreed with NSP]</i>.  <i>[Delete as appropriate]</i></p>
	S5.2.8	Fault Current	A	<p>The <i>generating system or integrated resource system [delete whichever is not applicable]</i> <i>limits its contribution to the fault current at the Connection Point to:</i></p> <p>(a) <i>three-phase</i> fault current, <i>[insert value]</i> kA;  (b) <i>single-phase-to-ground</i> fault current, <i>[insert value]</i> kA;</p>

NER version	NER reference	Description	Automatic- or Negotiated Access Standard (A/ N)	Detailed description of performance standard
				<p>(c) phase-to-phase-to-ground fault current, [insert value] kA.  [Specify calculation basis as necessary]</p> <p>The <i>generating system's or integrated resource system's</i> [delete whichever not applicable] <i>connected plant</i> is capable of withstanding fault current through the Connection Point up to:</p> <p>(a) three-phase fault current [insert value] kA;  (b) single-phase-to-ground fault current [insert value] kA;  (c) phase-to-phase-to-ground fault current [insert value] kA,  for [insert time] ms.</p> <p>The circuit breaker provided to isolate the <i>generating unit, generating system, bidirectional unit or integrated resource system</i> [delete whichever is not applicable] <i>delete-unit/system as appropriate</i> from the <i>network</i> is capable of breaking, without damage or restrike, the maximum fault current of [insert value] kA expected to flow through the circuit breaker for any fault in the <i>network</i> or in the <i>generating unit, generating system, bidirectional unit or integrated resource system</i> or [delete whichever is not applicable] <i>delete-unit/system as appropriate</i>, as specified in the <i>connection agreement</i>.</p>

**Table 3 Revision History [to track changes to registered Generator Performance Standards]**

Revision number	Date	Revision Description
1	28/03/2023	Draft for consultation