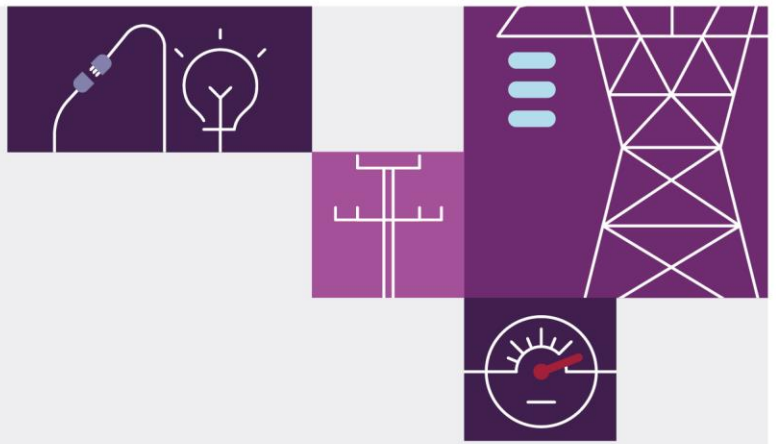


# Trip of the Liddell – Muswellbrook 330 kV line at Liddell end only on 14 July 2022

December 2022

Reviewable Operating Incident  
Report under the National Electricity  
Rules





# Important notice

## Purpose

AEMO has prepared this report in accordance with clause 4.8.15(c) of the National Electricity Rules, using information available as at the date of publication, unless otherwise specified.

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If you have any questions or comments in relation to this report, please contact AEMO at [system.incident@aemo.com.au](mailto:system.incident@aemo.com.au).

The NEM operates on Australian Eastern Standard Time (AEST). All times in this report are in AEST.

# Abbreviations

Abbreviation	Term
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
CB	circuit breaker
FOS	Frequency Operating Standard
kV	kilovolt
NEM	National Electricity Market
NER	National Electricity Rules
TNSP	Transmission Network Service Provider

# Incident review

This reviewable operating incident<sup>1</sup> report is prepared in accordance with clause 4.8.15(c) of the National Electricity Rules (NER). It has been prepared using information provided by Transgrid<sup>2</sup>, AGL<sup>3</sup> and from AEMO systems.

**Table 1 Summary of event – Trip of Liddell – Muswellbrook 330 kilovolt (kV) 83 line**

Details	
<b>Reviewable operating incident type</b>	Non-credible contingency event impacting critical transmission elements.
<b>Incident details</b>	This report relates to a reviewable operating incident <sup>4</sup> that occurred on 14 July 2022 in New South Wales. The incident involved the trip of the Liddell – Muswellbrook 330 kV 83 line at the Liddell end only.
<b>Incident classification</b>	Unknown – the cause of this incident cannot be identified.
<b>Generation impact</b>	Nil.
<b>Customer load impact</b>	Nil.
<b>Pre-incident conditions</b>	<ul style="list-style-type: none"> <li>On 14 July 2022, AGL staff at Liddell Power Station were in the process of reconnecting the Liddell No. 4 Generator to the network. Prior to the incident AGL staff were working on the 330 kV slave relay control panel associated with the Liddell No. 4 Generator.</li> <li>To facilitate work on Liddell No. 4 Generator, the Liddell circuit breaker (CB) 5042 was opened. This left the Liddell – Muswellbrook 330 kV 83 line connected to the Liddell 330 kV substation via CB 832 only. Figure 1 shows the configuration at the Liddell 330 kV substation immediately prior to the incident.</li> </ul>
<b>Incident key events</b>	<ul style="list-style-type: none"> <li>At 1215 hrs on 14 July 2022, Liddell CB 832 unexpectedly tripped. This CB trip caused the Liddell – Muswellbrook 330 kV 83 line to be off-loaded at the Liddell 330 kV substation end (see Figure 2).</li> <li>Approximately one minute later, Liddell CB 832 was manually closed by the Transgrid control room. This returned the Liddell – Muswellbrook 330 kV 83 line to service.</li> </ul>
<b>Incident cause</b>	<p>The cause of this incident has not been determined. However, the following information has been provided by Transgrid and AGL:</p> <ul style="list-style-type: none"> <li>Post incident investigation by Transgrid has confirmed that the trip of Liddell CB 832 was not due to the operation of any protection systems and there were no Transgrid staff performing any work at the time of the incident.</li> <li>AGL has reviewed the work and actions of its staff and contractors on the day of the incident and AGL does not believe there is any connection between their works and the trip of the Liddell – Muswellbrook 330 kV 83 line.</li> </ul>
<b>Power system response (facilities and services)</b>	There were no other material impacts on the broader power system, load, or generation.
<b>Rectification</b>	<p>Following the incident on 14 July 2022, Transgrid has taken the following actions:</p> <ul style="list-style-type: none"> <li>As Liddell CB 832 operation was not caused by a protection operation and the Liddell – Muswellbrook 330 kV 83 line remained energised, Transgrid returned Liddell CB 832 to service immediately.</li> <li>Transgrid has updated its operational procedures to include a physical isolation between Liddell Power Station and the Liddell substation when AGL notifies Transgrid that it is working on Liddell Generator slave circuits.</li> </ul>

<sup>1</sup> Reviewable operating incidents are defined by NER clause 4.8.15(a) and the Australian Energy Market Commission (AEMC) Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

<sup>2</sup> Transgrid is the Transmission Network Service Provider (TNSP) for the Liddell and Muswellbrook 330 kV substations.

<sup>3</sup> AGL is the owner of the Liddell Power Station.

<sup>4</sup> See NER clause 4.8.15(a)(1)(i), as the event relates to a non-credible contingency event; and the AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

Details	
<b>Power system security</b>	The power system remained in a secure operating state throughout this incident and the Frequency Operating Standard (FOS) <sup>5</sup> was met for this incident.
<b>Reclassification</b>	AEMO assessed whether to reclassify this incident as a credible contingency event <sup>6</sup> . The cause of this non-credible contingency event is not known at this stage. AEMO is not satisfied that this non-credible contingency is unlikely to reoccur. Therefore, AEMO reclassified this event as credible on 14 July 2022 until further notice.
<b>Market information</b>	For this incident, AEMO issued the following market notices (all market notices for this incident were issued in accordance with NER requirements): <ul style="list-style-type: none"> <li>• AEMO issued Market Notice 100247 at 1340 hrs on 14 July 2022 – Advice of non-credible contingency event. The cause of this non-credible contingency was not known at this stage.</li> <li>• AEMO issued Market Notice 100248 at 1346 hrs on 14 July 2022 – Advice that this incident had been reclassified from 1345 hrs until further notice. The cause of the incident was unknown and AEMO was not satisfied that the non-credible contingency event was unlikely to re-occur.</li> </ul>
<b>Conclusions</b>	AEMO has concluded that: <ol style="list-style-type: none"> <li>1. The trip of the Liddell – Muswellbrook 330 kV 83 line at the Liddell end only was caused by the unexpected trip of the Liddell 330 kV CB 832. The root cause of this incident could not be identified.</li> <li>2. Transgrid operators immediately closed Liddell CB 832 and returned the Liddell – Muswellbrook 330 kV 83 line to service.</li> <li>3. AEMO correctly identified the need to reclassify this incident as a credible contingency. The reclassification remains in place as the root cause of the incident has not yet been identified.</li> <li>4. The power system remained in a secure operating state throughout this incident and the FOS was met for this incident.</li> </ol>
<b>Recommendations</b>	AEMO recommends that: <ol style="list-style-type: none"> <li>1. Transgrid carries out maintenance on Liddell CB 832 and associated protection and inform AEMO once maintenance is completed.</li> <li>2. The reclassification of this incident as a credible contingency will remain in place until Liddell CB 832 maintenance is completed. AEMO will then re-assess whether the reclassification should remain in place.</li> </ol>

<sup>5</sup> Frequency Operating Standard, effective 1 January 2020, available at <https://www.aemc.gov.au/media/87484>.

<sup>6</sup> AEMO is required to assess whether or not to reclassify a non-credible contingency event as a credible contingency event – NER clause 4.2.3A(c) – and to report how the reclassification criteria were applied – NER clause 4.8.15(ca).

Figure 1 Pre-incident diagram – Liddell 330 kV substation

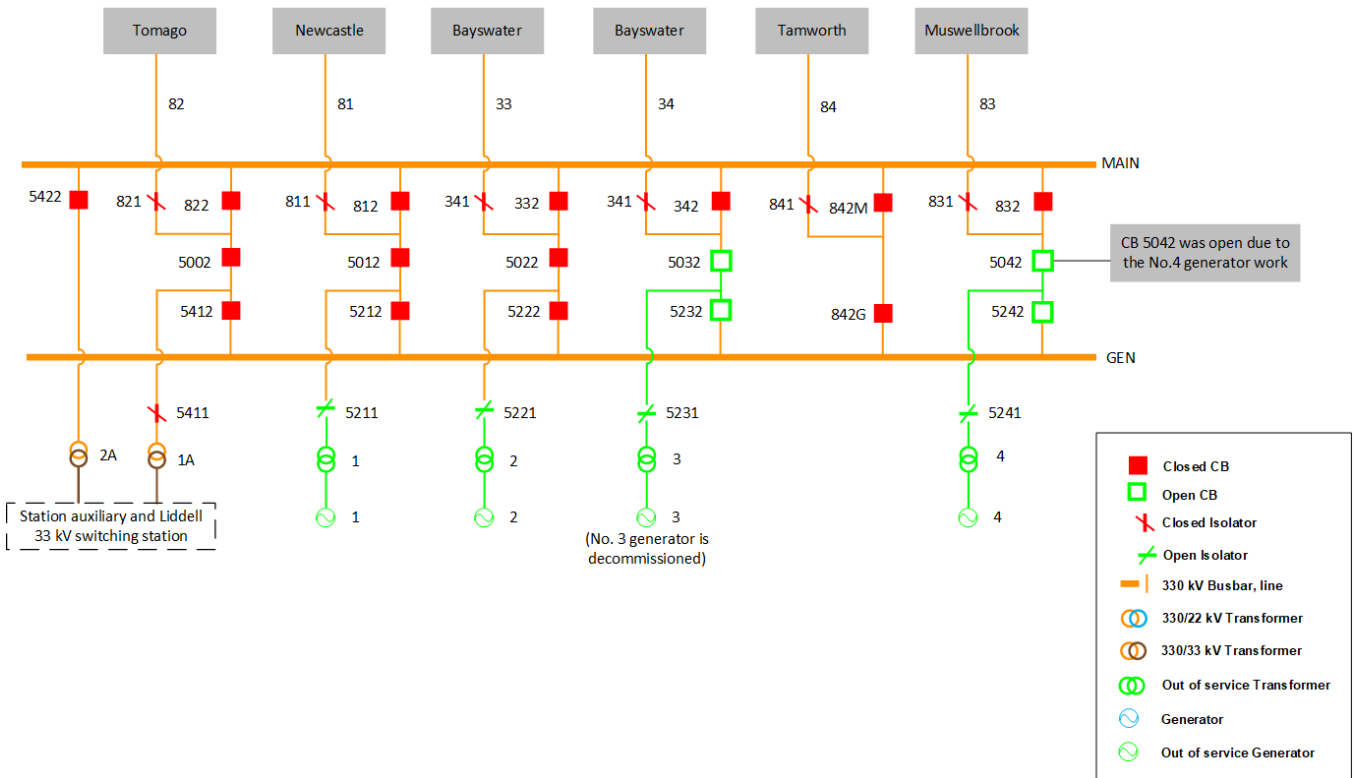


Figure 2 Post-incident diagram – Liddell 330 kV substation

