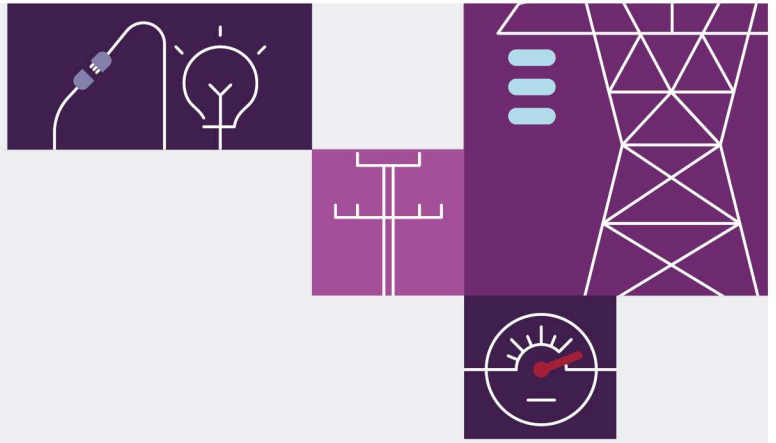


Trip of Liddell – Tomago 330 kV line and Liddell 330/33 kV transformer on 8 June 2023

November 2023

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.

Disclaimer

To inform its review and the findings expressed in this report, AEMO has been provided with data by registered participants as to the status or response of some facilities before, during and after the reviewable incident, and has also collated information from its own observations, records and systems. Any views expressed in this report are those of AEMO unless otherwise stated and may be based on information given to AEMO by other persons. AEMO has made reasonable efforts to ensure the quality of the information in this report but cannot guarantee its accuracy or completeness. Any views expressed in this report may be based on information given to AEMO by other persons.

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Contact

If you have any questions or comments in relation to this report, please contact AEMO at 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
CBF	circuit breaker fail
kV	kilovolt
MW	megawatts
NEM	National Electricity Market
NER	National Electricity Rules
TNSP	Transmission Network Service Provider

Incident review

This reviewable operating incident¹ 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 Transgrid², AGL Macquarie Pty Ltd³ and from AEMO systems.

Table 1 Summary of event

	Details
Reviewable operating incident type	Non credible contingency event impacting critical transmission elements.
Incident details	This report relates to a reviewable operating incident ⁴ that occurred on 8 June 2023 in New South Wales. This incident involved the trip of the Liddell – Tomago 330 kilovolt (kV) 82 line and the Liddell 330/33 kV 1A transformer.
Incident classification	Other causes – human error - incorrectly applying an earth to an in-service cable core.
Generation impact	No generation was lost as a result of this event.
Customer load impact	No customer load was tripped or automatically shed in response to this incident.
Pre-incident conditions	Prior to the event, the Liddell – Tomago 330 kV 82 line and Liddell 1A transformer were in service and operating normally. A contractor representing Transgrid was undertaking secondary testing works near the No. 1 protection equipment of the Liddell – Tomago 330 kV 82 line.
Incident key events	On 8 June 2023, the following events occurred: <ul style="list-style-type: none"> At 1433 hrs the Liddell – Tomago 330 kV 82 line and the Liddell 330/33 kV 1A transformer tripped (see Figure 1). At 1521 hrs the Liddell – Tomago 330 kV 82 line was returned to service. At 1710 hrs the Liddell 330/33 kV 1A transformer was returned to service.
Incident cause	Post incident investigation by Transgrid has confirmed that: <ul style="list-style-type: none"> At 1433 hrs on 8 June 2023, the Liddell – Tomago 330 kV 82 line and the Liddell 330/33 kV 1A transformer tripped. The incident occurred when a contractor at Liddell was undertaking secondary cable continuity testing of newly installed cables near the No. 1 protection equipment of the Liddell – Tomago 330 kV 82 line. There were two control cables with identical core numbers where the testing was taking place; one cable was in service the other was a new cable. The contractor did not verify which cable was in service and incorrectly applied an earth to an in-service cable core. This caused the CB 5002 circuit breaker failure (CBF) protection to initiate from the Liddell – Tomago 330 kV 82 line No. 1 protection system. Once triggered, the CBF protection operated and tripped the Liddell – Tomago 330 kV 82 line and the Liddell 1A transformer as expected.
Power system response (facilities and services)	There was no other material impact on the broader power system, load or generation.
Rectification	Immediately following the trip of the Liddell – Tomago 330 kV 82 line and 1A transformer, all secondary testing works ceased. The Transgrid project team, including the contractor, held a toolbox meeting in the following days, where the need to ensure the positive identification of a cable prior to testing and to follow existing work procedures was reinforced before secondary testing works were resumed.

¹ Reviewable operating incidents are defined by NER 4.8.15(a) and the AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

² Transgrid is a transmission network service provider (TNSP) for New South Wales.

³ AGL Macquarie Pty Ltd is the owner of the Liddell Power Station in New South Wales.

⁴ See NER 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	
Power system security	The power system remained in a secure operating state throughout this incident and the Frequency Operating Standard ⁵ was met for this incident.
Reclassification	AEMO assessed whether to reclassify this incident as a credible contingency event ⁶ . The cause of this incident was identified and AEMO was satisfied that another occurrence of this event was unlikely under the current circumstances. Therefore, AEMO appropriately identified that reclassification was not required.
Market information	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"> • AEMO issued Market Notice 108414 at 1456 hrs on 8 June 2023 – advice of non-credible contingency event in New South Wales involving the Liddell – Tomago 330 kV 82 line and Liddell 330 kV CB 5412. • AEMO issued Market Notice 108415 at 1458 hrs on 8 June 2023 – advice of Inter-regional transfer limit variation due to the unplanned outage of the Liddell – Tomago 330 kV 82 line. • AEMO issued Market Notice 108536 at 1729 hrs on 8 June 2023 – confirming that the Liddell – Tomago 330 kV 82 line and Liddell 330 kV CB 5412 had been returned to service, the root cause of the incident had been identified, and the event was unlikely to reoccur.
Conclusions	AEMO has concluded that: <ol style="list-style-type: none"> 1. At 1433 hrs on 8 June 2023, the Liddell – Tomago 330 kV 82 line and the Liddell 330/33 kV 1A transformer tripped. The cause of this incident has been identified as human error. 2. The cause of this incident was identified by Transgrid and AEMO was satisfied that the event was unlikely to reoccur under the current circumstances. Therefore, AEMO appropriately identified that reclassification was not required. 3. The power system remained in a secure operating state and the Frequency Operating Standard was met throughout this incident.
Recommendations	Nil

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

⁶ 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 Post-incident diagram Liddell – Tomago 330 kV 82 line and 1A 330/33 kV transformer trip

