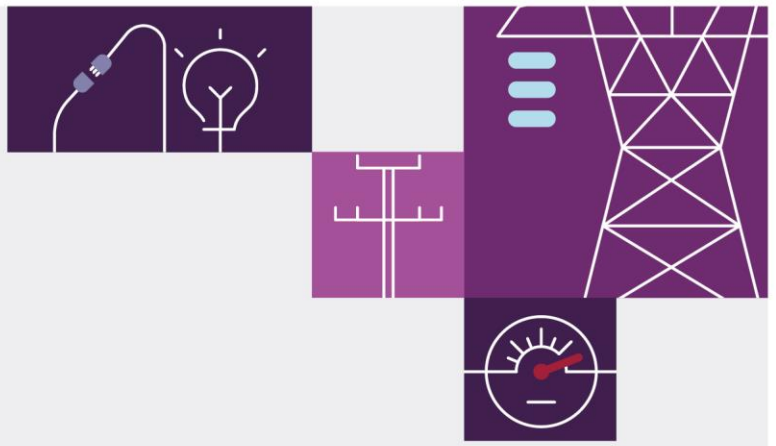


Trip of Moorabool Terminal Station 220 kV No. 1 busbar on 29 May 2023

October 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
CBF	circuit breaker fail
kV	kilovolt/s
MLTS	Moorabool Terminal Station
MN	market notice
NEM	National Electricity Market
NER	National Electricity Rules
PSSWG	Power System Security Working Group
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 AusNet² 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 ³ that occurred on 29 May 2023 in Victoria. The incident involved the trip of the Moorabool Terminal Station (MLTS) No. 1 220 kilovolt (kV) busbar.
Incident classification	Other causes – Human error. Failure to follow isolation procedures and miscommunication between working parties.
Generation impact	No generation was lost as a result of this incident.
Customer load impact	No load was lost as a result of this incident.
Pre-incident conditions	Prior to the event, there was a planned outage of the MLTS No. 1 220 kV capacitor bank for protection and control system upgrades.
Incident key events	On 29 May 2023, the following events occurred: <ul style="list-style-type: none"> • At 0941 hrs the MLTS No. 1 220 kV busbar tripped (see Figure 1). • At 0945 hrs AEMO gave AusNet Permission to Restore (PTR) the MLTS No. 1 220 kV busbar. • At 0951 hrs the MLTS No. 1 220 kV busbar was returned to service.
Incident cause	AusNet has confirmed that at 0941 hrs on 29 May 2023, staff representing AusNet were carrying out a planned outage on the MLTS No. 1 220 kV capacitor bank for protection and control system upgrades. During these works, a live low voltage protection cable was disconnected from the capacitor bank’s protection panel and two of the cores within the cable came into contact. The short of the two cores caused the circuit breaker fail (CBF) protection system of the MLTS No. 1 220 kV capacitor bank to operate. The Capacitor’s CBF protection operated the MLTS busbar protection system, tripping the MLTS No. 1 220 kV busbar.
Power system response (facilities and services)	There was no other material impact on the broader power system, load, or generation.
Rectification	Following the incident, the live MLTS No. 1 220 kV capacitor bank protection cable that caused the trip was identified and isolated. Onsite staff then identified and reset the latched MLTS busbar protection relays and at 1951 hrs, approximately 10 minutes after the initial incident, AusNet restored the MLTS No. 1 220 kV busbar. AusNet has since revised standard operating procedures to include additional process mapping information to assist with future planned works, and ensured all working party members were aware of planned activities and specific isolation requirements prior to recommencing works.
Power system security	The power system remained in a secure operating state throughout this incident and the Frequency Operating Standard ⁴ was met for this incident.
Reclassification	AEMO assessed whether to reclassify this incident as a credible contingency event ⁵ . At 0945 hrs on 29 May 2023, AusNet advised AEMO that the root cause of the non-credible contingency event had been identified and that it was unlikely to re-occur in the present conditions. At 0951 hrs MLTS No. 1 220 kV busbar returned to service. As the cause of the incident had been identified prior to the MLTS No. 1 220 kV busbar’s return

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

² AusNet is the Victoria Declared Transmission System Operator

³ 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.

⁴ See <https://www.aemc.gov.au/sites/default/files/2020-01/Frequency%20operating%20standard%20-%20effective%201%20January%2020%20-%20TYPO%20corrected%2019DEC2019.PDF>.

⁵ AEMO is required to assess whether or not to reclassify a non-credible contingency event as a credible contingency event – NER 4.2.3A(c) – and to report how the reclassification criteria were applied – NER 4.8.15(ca).

Details	
	to service, AEMO appropriately applied the reclassification criteria and determined the reclassification criteria were not met based on the information available to AEMO at the time.
Market information	<p>For this incident, AEMO issued the following market notice (in accordance with NER requirements):</p> <ul style="list-style-type: none"> AEMO issued Market Notice (MN) 108259 at 1017 hrs on 29 May 2023 to advise the market of the non-credible contingency event involving the trip of the MLTS No. 1 220 kV busbar. The MN also advised the market that the root cause of the non-credible contingency event had been identified and that it was unlikely to re-occur in the present conditions.
Conclusions	<p>AEMO has concluded that:</p> <ol style="list-style-type: none"> On 29 May 2023, the MLTS No. 1 220 kV busbar tripped due to the operation of the MLTS No. 1 220 kV capacitor bank's CBF protection. The CBF protection operated because a live protection cable was disconnected from the capacitor bank's protection panel and two of the cores within the cable came into contact. The cause of this incident was identified by AusNet and AEMO was satisfied that the event was unlikely to reoccur under the current circumstances. Therefore, AEMO appropriately applied the reclassification criteria and determined the reclassification criteria were not met based on the information available to AEMO at the time. The power system remained in a secure operating state and the Frequency Operating Standard was met throughout this incident.
Recommendations	AEMO and AusNet to share the findings of the investigation of the incident at Power System Security Working Group (PSSWG) by Q4 2023.

Figure 1 Post-incident diagram

