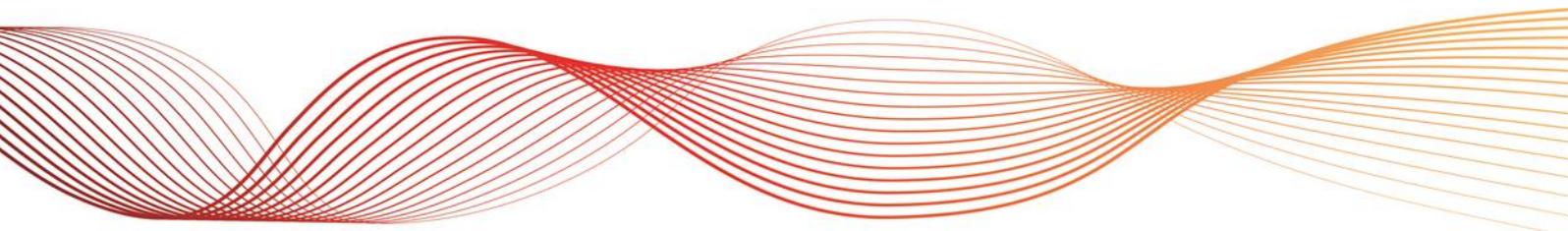




TRIP OF ROWVILLE NO. 1 220 KV BUSBAR ON 27 JUNE 2015

AN AEMO POWER SYSTEM OPERATING INCIDENT REPORT
FOR THE NATIONAL ELECTRICITY MARKET

Published: **October 2015**





VERSION RELEASE HISTORY

VERSION	DATE	BY	CHANGES	CHECKED BY	AUTHORISED BY
1	7 October 2015	R Burge	FINAL	S Darnell	J Lindley

INCIDENT CLASSIFICATIONS

Classification	Details
Time and date of incident	1429 hrs Saturday 27 June 2015
Region of incident	VIC
Affected regions	VIC
Event type	BB – Busbar Trip
Generation Impact	Nil
Customer Load Impact	Nil
Associated reports	Nil

ABBREVIATIONS

Abbreviation	Term
AEMO	Australian Energy Market Operator
CB	Circuit Breaker
kV	Kilovolt
MW	Megawatt
NER	National Electricity Rules
No.1 Busbar	Rowville No.1 220 kV busbar
SVC	Static VAR Compensator



IMPORTANT NOTICE

Purpose

AEMO has prepared this document to provide information about this particular Power System Operating Incident.

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1. OVERVIEW

This report reviews a power system operating incident that occurred on Saturday 27 June at Rowville Terminal Station (Rowville) in Victoria. This incident involved the trip of a 220 kV busbar at Rowville. No customer load or generation was lost as a result of this incident.

The power system is operated such that it will remain in a satisfactory operating state¹ for the loss of single elements in the transmission network. Such events are defined as credible contingency² events. AEMO considers the occurrence of these events to be reasonably possible and ensures contingency plans are in place to minimise the impact on the power system following a credible contingency event. A non-credible contingency event is a contingency event other than a credible contingency event and usually involves multiple elements or major elements such as busbars.

AEMO is required to assess power system security over the course of this incident as the incident is classified as a non-credible contingency under the National Electricity Rules (NER).³ Specifically, AEMO is required to assess the adequacy of the provision and response of facilities and services and the appropriateness of actions taken to restore or maintain power system security.⁴

AEMO concluded that:

1. No.1 busbar tripped due to human error while staff were working on secondary systems at Rowville Terminal Station.
2. The provision and response of facilities and services were appropriate and power system security was maintained over the course of the incident.

This report is based on information provided by AusNet⁵ and AEMO. National Electricity Market time (Australian Eastern Standard Time) is used in this report.

2. THE INCIDENT

On Saturday 27 June 2015, at 1429 hrs, the Rowville No.1 220 kV busbar (No.1 Busbar) tripped. This trip opened seven circuit breakers and disconnected a static VAR compensator⁶ (SVC). No load or generation was lost as a result of this incident.

The busbar was returned to service one hour later at 1527 hrs. See Appendix A for a power system diagram illustrating the incident and Appendix B for a chronological log of the incident.

The reason for investigating this incident is that a busbar tripped. The probability of a busbar fault is very low and is thereby an unexpected event known in power system security terms as a non-credible contingency.⁷

¹ Refer to NER Clause 4.2.2

² Refer to NER Clause 4.2.3

³ Clause 4.8.15(a)(1)(i) and AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

⁴ Refer to NER Clause 4.8.15 (b)

⁵ AusNet is the Transmission Network Service Provider that operates Rowville Terminal Station. Information provided by AusNet Services has been provided on a without prejudice basis and nothing in this report is intended to constitute, or may be taken by any person as constituting, an admission of fault, liability, wrongdoing, negligence, bad faith or the like on behalf of AusNet Services (or its respective associated companies, businesses, partners, directors, officers or employees).

⁶ A static VAR compensator is a set of electrical devices for providing fast-acting reactive power on high-voltage electricity transmission networks

⁷ Refer to NER Clause 4.2.3 - Credible and non-credible contingency events; *AEMO Power System Security Guidelines*, Section 10 - Definition of a non-credible contingency events



3. AUSNET INVESTIGATION

AusNet investigated this incident and found that the busbar tripped due to human error whilst AusNet staff were working on a protection upgrade in Rowville substation. AusNet testers were proving a new protection circuit when they inadvertently operated the trip coil of the No.1 busbar protection relay.

4. POWER SYSTEM SECURITY

AEMO is responsible for power system security in the NEM. This means AEMO is required to operate the power system in a secure operating state⁸ and return the power system to a secure state following a contingency event.⁹ This section assesses how AEMO managed power system security over the course of this incident.

For this incident the power system was in a secure state following the trip of No.1 Busbar. AEMO did not need to invoke any constraint sets to maintain power system security. AEMO then assessed whether to reclassify the incident as a credible contingency. For this incident AEMO did not reclassify the incident because the reason for the trip had been identified and resolved. AEMO considered that the incident was unlikely to reoccur.

Over the course of the incident power system security was maintained.

5. MARKET INFORMATION

AEMO is required by the NER and operating procedures to inform the market about power system operating incidents as they progress. Generally AEMO informs the market of operational issues by issuing market notices.¹⁰ This section assesses how AEMO informed the market over the course of this incident.

For this incident AEMO issued one market notice (MN 49215). AEMO issued the notice at 1501 hrs (approximately 32 minutes after the incident) to notify the market:

- of a non-credible contingency event
- that No.1 busbar had tripped and an SVC had been disconnected
- that the cause of the trip had been identified

Over the course of this incident AEMO informed the market as required with appropriate and timely information.

⁸ Refer to NER Clause 4.2.4 (a). AEMO must ensure that the power system is maintained in, or returned to, a secure operating state following a contingency event.

⁹ Refer to NER Clause 4.2.6 (b). AEMO is required to return the power system to a secure state within thirty minutes following a contingency event.

¹⁰ Market notices are issued by AEMO to notify the market of a range of operational issues. See AEMO's market notice web page: <http://www.aemo.com.au/Electricity/Data/Market-Notices>



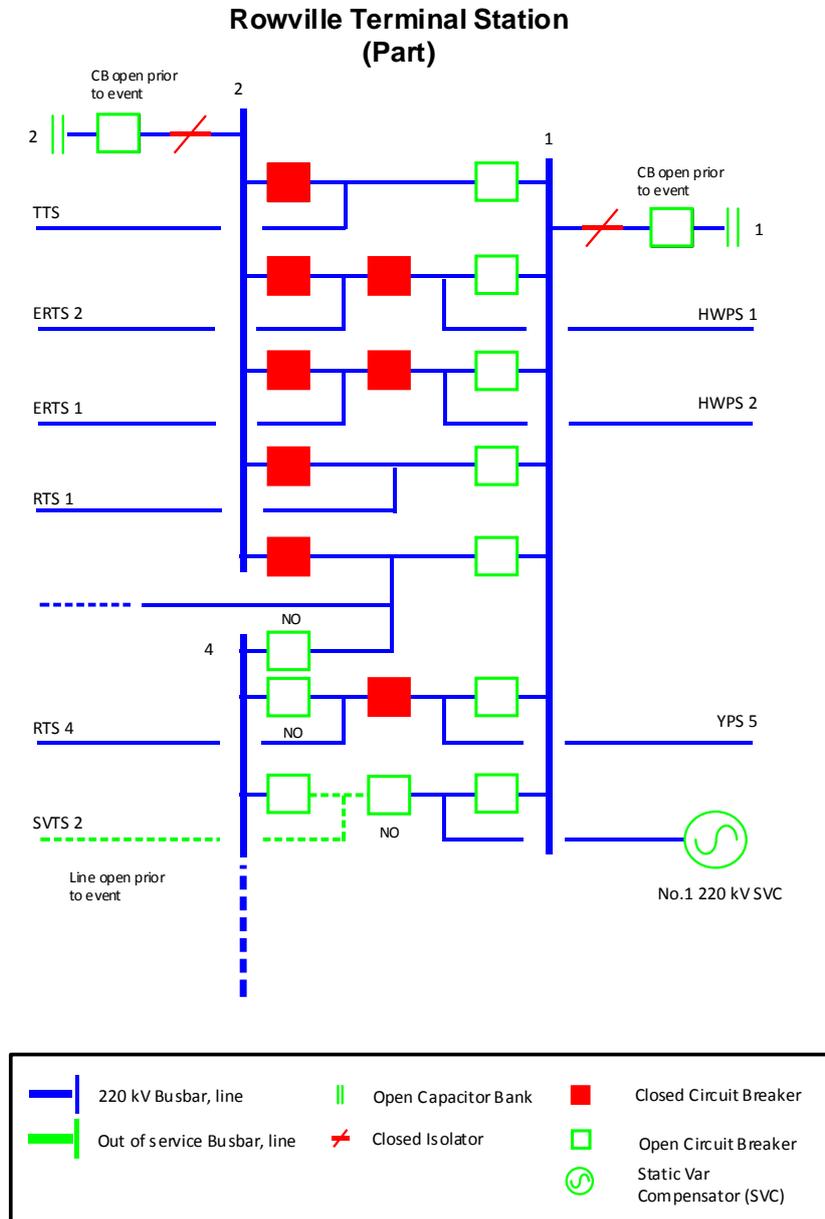
6. CONCLUSIONS

AEMO concluded that:

1. No.1 busbar tripped due to human error while staff were working on secondary systems at Rowville Terminal Station.
2. The provision and response of facilities and services were appropriate and power system security was maintained over the course of the incident.

APPENDIX A. – POWER SYSTEM DIAGRAM

Figure 1 The power system immediately after the incident





APPENDIX B. – CHRONOLOGICAL LOG

Table 1 Incident Log

Time and Date	Event
0710 hrs 27 June 2015	Springvale No.2 220 kV busbar and Rowville – Springvale No.2 220 kV line taken out of service for planned maintenance
1429 hrs 27 June 2015	Rowville No.1 220 kV busbar tripped.
1440 hrs 27 June 2015	AusNet notified AEMO that the trip was caused by staff working at Rowville Terminal Station
1501 hrs 27 June 2015	AEMO issued Market Notice 49215 to inform the market of the non-credible contingency event.
1527 hrs 27 June 2015	AusNet restored Rowville No.1 220 kV busbar to service