TRIP OF JEERALANG (JLTS) NO.2 220 KV BUSBAR ON 22 MARCH 2016

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

Published: June 2016

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

VERSION RELEASE HISTORY

VERSION	DATE	BY	CHANGES	CHECKED BY	AUTHORISED BY
1	8 June 2016	N Modi	Initial	P Biddle	M.Stedwell

INCIDENT CLASSIFICATIONS

Classification	Detail
Time and date of incident	1908 hrs Tuesday 22 March 2016
Region of incident	Victoria
Affected regions	Victoria
Event type	Busbar trip (BB)
Generation Impact	No generation was disconnected as a result of this incident
Customer Load Impact	No customer load was disconnected as a result of this incident
Associated reports	Nil

ABBREVIATIONS

Abbreviation	Term
AEMO	Australian Energy Market Operator
CB	Circuit Breaker
kV	Kilovolt
MW	Megawatt
NER	National Electricity Rules
No.2 Busbar	JLTS No.2 220kV busbar
JLTS	Jeeralang 220kV terminal station

IMPORTANT NOTICE

Purpose

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

Disclaimer

This document or the information in it may be subsequently updated or amended. This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law, the National Electricity Rules, or any other applicable laws, procedures or policies. AEMO has made every effort to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it.

1. OVERVIEW

This report reviews a power system operating incident that occurred on 22 March 2016 at Jeeralang 220kV terminal station (JLTS) in Victoria. This incident involved the trip of the No.2 220kV busbar and Jeeralang – Hazelwood (JLTS-HWPS) No.2 220kV transmission line.

AEMO is required to assess power system security over the course of this incident as the incident was a non-credible contingency event[1] under the National Electricity Rules (NER).[2] 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.[3]

For this incident AEMO concluded that:

1. The incident was caused by a faulty surge diverter associated with the Jeeralang Power Station A2 unit transformer.
2. Power system security was maintained over the course of the incident.
3. There was no loss of load as a result of this incident.

This report is based on information provided by AusNet Services[4] and AEMO. National Electricity Market time (Australian Eastern Standard Time) is used in this report.

2. THE INCIDENT

On Tuesday, 22 March 2016 at 1908 hrs, the Jeeralang (JLTS) No.2 220kV busbar (No.2 busbar) tripped. As a consequence, the Jeeralang to Hazelwood No.2 220kV transmission line was de-loaded and remained unavailable during the No.2 220kV bus outage. At the time all generating units at Jeeralang 'A' Power Station were off line.

As a result of this incident no generation was lost, and there was no loss of customer load.

The No.2 busbar and the JLTS-HWPS No.2 transmission line were returned to service by 2105 hrs the same day.

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 trip is a non-credible contingency event. The probability of a busbar fault is very low and so is an unexpected event known in power system security terms as a non-credible contingency event.[5]

[1] The power system is operated such that it will remain in a satisfactory operating state (NER clause 4.2.2) for the loss of single elements in the transmission network. Such events are defined as credible contingency events (NER clause 4.2.3). 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.

[2] NER Clause 4.8.15(a)(1)(i) and AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

[3] NER Clause 4.8.15(b)

[4] 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).

[5] 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 SERVICES INVESTIGATION

AusNet Services, as owner of the 220kV busbars and associated switchgear at JLTS, investigated this incident and provided the following information.

The trip of the JLTS No.2 220k busbar was the result of a failed surge diverter (blue phase) on the Jeeralang Power Station A2 unit transformer. The trip of the busbar resulted in the de-loading of the JLTS-HWPS No.2 transmission line. This is an expected outcome for this type of fault.

Jeeralang Power Station staff isolated the faulty equipment in a timely manner and the JLTS No.2 220kV busbar and JLTS-HWPS No.2 transmission line were restored to service at 2105 hrs.

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 state and return the power system to a secure operating state following a contingency event. This section assesses how AEMO managed power system security over the course of this incident[6].

To ensure the power system was returned to and was maintained in a secure operating state[7], AEMO invoked constraint set V-JL_BUS2[8] within an acceptable 12 minutes of the incident.

4.1 Reclassification

In accordance with clause 4.2.3A of the NER, AEMO considered whether to reclassify this non-credible contingency event as a credible contingency event. As the cause of the contingency was known, AEMO was satisfied that the non-credible contingency event was unlikely to re-occur, and so did not reclassify it as a credible contingency event.

For this incident, AEMO took appropriate action to ensure the power system returned to a secure operating state following the No.2 Busbar trip. No further action was required to maintain power system security.

5. MARKET INFORMATION

AEMO is required by the NER to inform the market about incidents as they progress. This section assesses how AEMO informed the market[9] over the course of this incident.

Occurance of a non-credible contingency within two hours.

- At 2050 hrs, AEMO issued market notice 52498 to advise the market of the occurrence of the non-credible contingency event,the constraint sets invoked and that reclassification was not required.

Over the course of this incident AEMO issued appropriate, timely and sufficiently detailed market information.

[6] AEMO is responsible for power system security in the NEM and is required to operate the power system in a secure operating state (NER Clause 4.2.4 (a)). AEMO must thereby ensure that the power system is maintained in, or returned to, a secure operating state following a contingency event.
[7] AEMO is required to return the power system to a secure state within thirty minutes following a contingency event - NER Clause 4.2.6 (b)
[8] Outage of JLTS No2 220KV Bus. Limits generation at Jeeralang 'A' Power Station to zero.
[9] AEMO generally informs the market about operating incidents as the progress by issuing Market Notices – see AEMO website

6. CONCLUSIONS

AEMO has assessed this incident in accordance with clause 4.8.15(b) of the NER. In particular, AEMO has assessed the adequacy of the provision and response of facilities or services, and the appropriateness of actions taken to restore or maintain power system security.

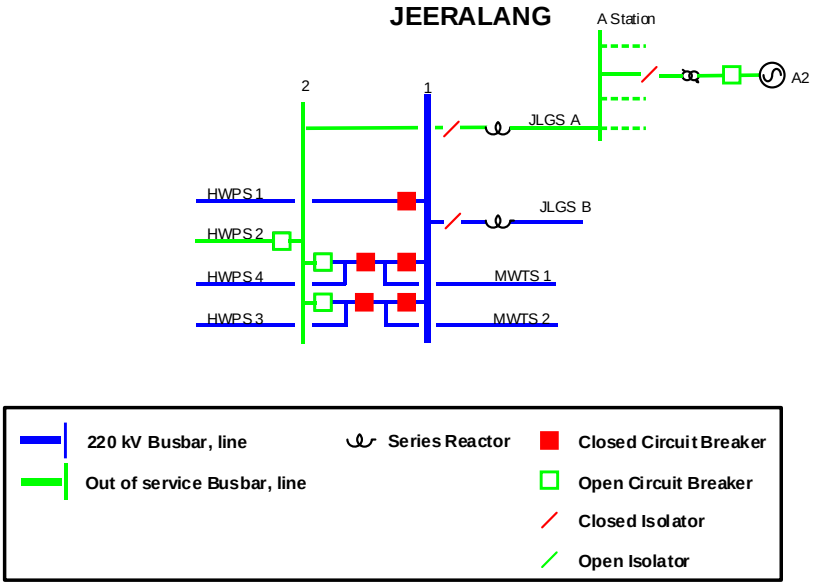
AEMO concluded that:

1. The Jeeralang terminal station No. 2 220KV busbar tripped when a surge diverter associated with the Jeeralang Power Station A2 generating unit transformer failed.
2. The provision and response of facilities and services were appropriate and power system security was maintained over the course of the incident

The are no outstanding issues to resolve as a result of this incident.

APPENDIX A. – POWER SYSTEM DIAGRAM

The power system immediately after the incident



APPENDIX B. – INCIDENT EVENT LOG

Chronological Log of Incident

Time and Date	Event
19:08 22 March 2016	Jeeralang (JLTS) No.2 220 kV bus tripped
19:20 22 March 2016	Constraint set V-JL_BUS2 invoked
20:50 22 March 2016	Market Notice 52498 issued for Non-credible contingency event
21:04 22 March 2016	Jeeralang (JLTS) No.2 220 kV bus was returned to service
21:10 22 March 2016	Constraint set V-JL_BUS2 revoked