Trip of Nebo No1 275kV busbar on 23 September 2018

February 2019

Reviewable Operating Incident Report under the National Electricity Rules

INCIDENT CLASSIFICATIONS

Classification	Detail
Time and date of incident	1618 hrs on 23 September 2018
Region of incident	Queensland
Affected regions	Queensland
Event type	Human error
Generation Impact	No generator was disconnected or had its output limited 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

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

AEMO has made every reasonable effort 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.

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

- 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.

COPYRIGHT

© 2019 Australian Energy Market Operator Limited. The material in this publication may be used in accordance with the copyright permissions on AEMO's website.

Contents

1. Overview

This report relates to a reviewable operating incident[1] that occurred on 23 September 2018 in North Queensland. The incident involved the trip of the Nebo No1 275kV busbar (No1 busbar) and occurred during planned secondary systems replacement work on the 8846 Broadsound-Nebo 275kV transmission line (8846 line).

No generation or customer load was lost as a result of the incident.

As this was a reviewable operating incident, 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[2].

AEMO has concluded that:

1. The trip of the No1 busbar was due to insufficient isolation of protection systems on the 8846 line during planned secondary systems work.
2. The power system remained in a secure operating state during this incident.
3. AEMO correctly determined that reclassification of the No1 busbar as a credible contingency event was not required.

This report is prepared in accordance with clause 4.8.15(c) of the National Electricity Rules (NER). It is based on information provided by Powerlink[3] and AEMO.

National Electricity Market time (Australian Eastern Standard Time) is used in this report.

2. The incident

2.1 Pre-event conditions

The 8846 line was taken out of service on 20 September 2018 for planned secondary systems upgrade works by Powerlink. Constraint set Q-BSNE[4] was invoked for this outage.

The Nebo No2 275kV capacitor was also out of sevice for maintenance works.

2.2 The incident

At 1618 hrs on 23 September 2018 the No1 busbar tripped. No other transmission equipment was removed from service as a result of the trip of the busbar and there was no loss of generation or customer load.

The No1 busbar was returned to service at 1650 hrs on 23 September 2018.

[1] 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.

[2] See NER clause 4.8.15(b).

[3] Powerlink is the relevant Transmission Network Service Provider for the area in question.

[4] Out= any one of either 834, 8846 or 8847 Broadsound – Nebo 275kV lines.

2.3 Powerlink investigation

This section is based on information provided by Powerlink as Transmission Network Service Provider for Queensland.

The No1 busbar tripped due to operation of circuit breaker fail protection during planned secondary systems replacement works associated with the 8846 line. This was not an expected outcome. The protection operation occurred as a result of insufficient isolation of the 8846 line protection systems. Field personnel had not identified all of the required secondary isolations while following established procedures, due to unfamiliarity with the legacy circuitry design.

Prior to restoring the No1 busbar to service additional secondary system isolations were carried out to minimise the risk of further unexpected protection operations.

2.4 Power system security

AEMO is responsible for power system security in the National Electricity Market (NEM). This means AEMO is required to operate the power system in a secure operating state to the extent practicable and take all reasonable actions to return the power system to a secure operating state following a contingency event in accordance with the NER[5].

The power system remained in a secure operating state during this incident and no action was required by AEMO.

2.4.1 Reclassification

AEMO assessed whether or not to reclassify this incident as a credible contingency event[6].

Prior to the No1 busbar being returned to service Powerlink advised AEMO the cause of the trip had been identified and action taken to prevent a recurrence. On the basis of this information and that a further trip of the busbar was unlikely, AEMO correctly determined that reclassification of the trip of the No1 busbar as a credible contingency event was not required.

2.5 Market information

AEMO is required by the NER and operating procedures to inform the market about incidents as they progress. This section assesses how AEMO informed the market[7] over the course of this incident.

For this incident, AEMO informed the market on the following matters:

1. A non-credible contingency event – notify within two hours of the event[8].
   - AEMO issued Market Notice 64331 at 1654 hrs – 36 minutes after the event.

[5] Refer to AEMO's functions in section 49 of the National Electricity Law and the power system security principles in clauses 4.2.6 and 4.3.2 of the NER.

[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).

[7] AEMO generally informs the market about operating incidents as the progress by issuing Market Notices – see AEMO website at https://www.aemo.com.au/Market-Notices.

[8] AEMO is required to notify the market of a non-credible contingency event within two hours of the event – AEMO, Power System Security Guidelines, Section 10.3.

3. 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 has concluded that:

1. The trip of the No1 busbar was due to insufficient isolation of protection systems on the 8846 line during planned secondary systems work.
2. The power system remained in a secure operating state during this incident.
3. AEMO correctly determined that reclassification of the No1 busbar as a credible contingency event was not required.