Power System Operating Incident Report – Trip of Nebo No. 1 275 kV Busbar on 26 March 2014

PREPARED BY: AEMO Systems Capability

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STATUS: FINAL

Version Release History

VERSION	DATE	BY	CHANGES	CHECKED BY	AUTHORISED BY
1	22 May 2014	S Darnell	FINAL	S Darnell	P Biddle

Incident Classifications

Time and date and of incident	1053 hrs Wednesday 26 March 2014
Region of incident	Queensland
Affected regions	Queensland
Event type	BB – Busbar Trip
Primary cause	PTN & CTR – Protection and Control
Impact	Nil
Associated reports	Nil

Abbreviations

Abbreviation	Term
AEMO	Australian Energy Market Operator
CB	Circuit Breaker
EMMS	Electricity Market Management System
EMS	Energy Management System
kV	Kilovolt
MW	Megawatt
NER	National Electricity Rules

1 Introduction

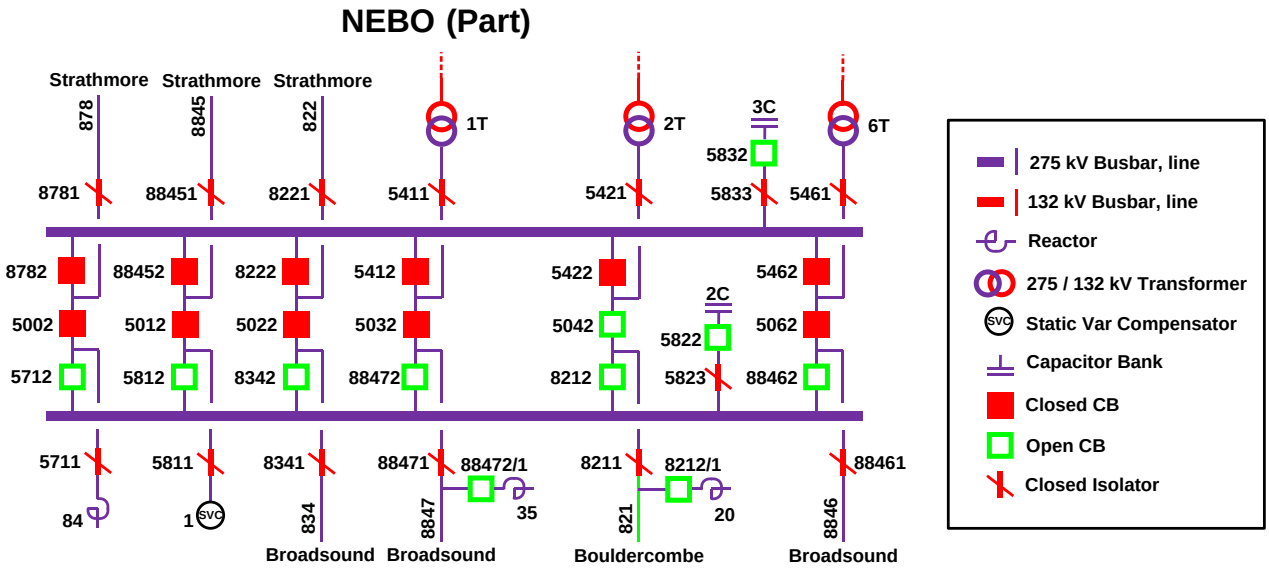
This report reviews a power system operating incident[1] that occurred on Wednesday 26 March 2014 at Nebo Substation in Queensland. The purpose of this incident review is to assess power system security over the course of the incident[2]. This report is based upon information provided by Powerlink[3]. National Electricity Market time (Australian Eastern Standard Time) is used in this report.

2 The Incident

On Wednesday 26 March 2014 at 1053 hrs the Nebo No.1 275 kV busbar tripped in the absence of a power system fault. As a result of the busbar trip the Nebo-Bouldercombe (821) 275 kV Transmission Line was off-loaded. There was no loss of load or generation and the power system remained secure. The busbar and transmission line were returned to service at 1100 hrs seven minutes after the trip.

The reason for investigating this incident is that a 275 kV 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.

The status of the power system after the incident is shown below. The diagram shows all circuit breakers connected to the No.1 275 kV busbar open. Circuit breaker 5042 was open prior to the incident as part of planned maintenance work.



3 Investigation

For this incident the busbar circuit breakers tripped due to the unexpected operation of the busbar trip relay. The relay was operated during protection system tests at Nebo Substation. Powerlink found that the panel wiring for an isolation link was incorrect. The link had been opened to facilitate protection system tests. The incorrect wiring resulted in a trip signal being sent to the trip relay when the link was open.

[1] AEMO is required to review this incident as it is classified as a non-credible contingency that satisfies the requirements of a reviewable operating incident under the National Electricity Rules (NER) - NER Clause 4.8.15(a)(1)(i) and AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.

[2] The NER requires AEMO 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 - NER Clause 4.8.15 (b)

[3] Powerlink is the Transmission Network Service Provider in Queensland.

Powerlink promptly identified the cause of the trip, and then returned the busbar to service. Powerlink corrected the wiring on the same day.

4 Power System Security

This section assesses how AEMO managed power system security over the course of the incident[4].

Powerlink identified the cause of the incident, and then returned the busbar to service within seven minutes.

AEMO did not invoke any constraint sets for this incident because the busbar and the off-loaded transmission line were promptly returned to service.

AEMO issued Market notice 45443 at 1341 hrs to notify the market:

- Of the non-credible contingency[5] event.
- That AEMO had not reclassified the incident as a credible contingency.

AEMO did not reclassify the incident because the cause of the incident had been identified, and AEMO considered the incident unlikely to reoccur.[6]

AEMO issued Market Notice 45443 two hours and fifty minutes after the event which is not within the required period of two hours of the event[7].

Power system security was maintained over the course of the incident.

5 Conclusions

1. The Nebo No. 1 275 kV busbar tripped due incorrect secondary wiring.
2. AEMO issued Market Notice 45443 late.
3. Power system security was maintained over the course of the incident.

6 Recommendations

There are no recommendations arising from this incident.

[4] 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.

[5] AEMO, *Power System Security Guidelines,* Section 10.3

[6] For a non credible contingency AEMO is required to assess whether or not to reclassify a non credible contingency event as a credible contingency (NER Clause 4.2.3A (c)) and to report how re-classification criteria were applied NER Clause 4.8.15 (ca). AEMO has to determine if the condition that caused the non-credible contingency event has been resolved.

[7] AEMO 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