POWER SYSTEM OPERATING INCIDENT REPORT - TRIP OF TARONG NO.2 275 KV BUS ON 29 APRIL 2013

PREPARED BY: Systems Capability

DATE: 17 June 2013

FINAL

Disclaimer

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Abbreviations and Symbols

Abbreviation	Term
AEMO	Australian Energy Market Operator
BB	Busbar Trip
CB	Circuit Breaker
EMMS	Electricity Market Management System
EMS	Energy Management System
kV	Kilovolt
MW	Megawatt
PTN & CTR	Protection and Control

Contents

Disclaimer 2

Abbreviations and Symbols 3

Incident summary 5

1 Introduction 6

2 Pre-Contingent System Conditions 6

3 Summary of Events 8

4 Immediate Actions Taken 10

5 Follow-up Actions 10

6 Power System Security Assessment 10

7 Conclusions 10

8 Recommendations 10

Incident summary

Date and time of incident	29/04/2013 2125 hrs
Region of incident	Queensland
Affected regions	Queensland
Event type	Busbar trip (BB)
Primary cause	Protection and Control (PTN & CTR)
Impact	Nil (No Impact)
Associated reports	N/A

1 Introduction

At 2125 hrs on 29 April 2013, the No.2 275 kV busbar at H18 Tarong Substation in Queensland tripped due to operation of the busbar protection system. This occurred during restoration of the planned outage of the No.1 275/132 kV transformer at H18 Tarong Substation. There was no loss of generation or load as a result of this incident.

At 2208 hrs on 29 April 2013, the No.2 275 kV busbar at H18 Tarong Substation was returned to service.

This report has been prepared under clause 4.8.15 (c) of the National Electricity Rules (NER) 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.

This report is largely based upon information provided by Powerlink Queensland. Data from AEMO's Energy Management System (EMS) and Electricity Market Management System (EMMS) has also been used in analysing the incident.

All references to time in this report are to National Electricity Market time (Australian Eastern Standard Time).

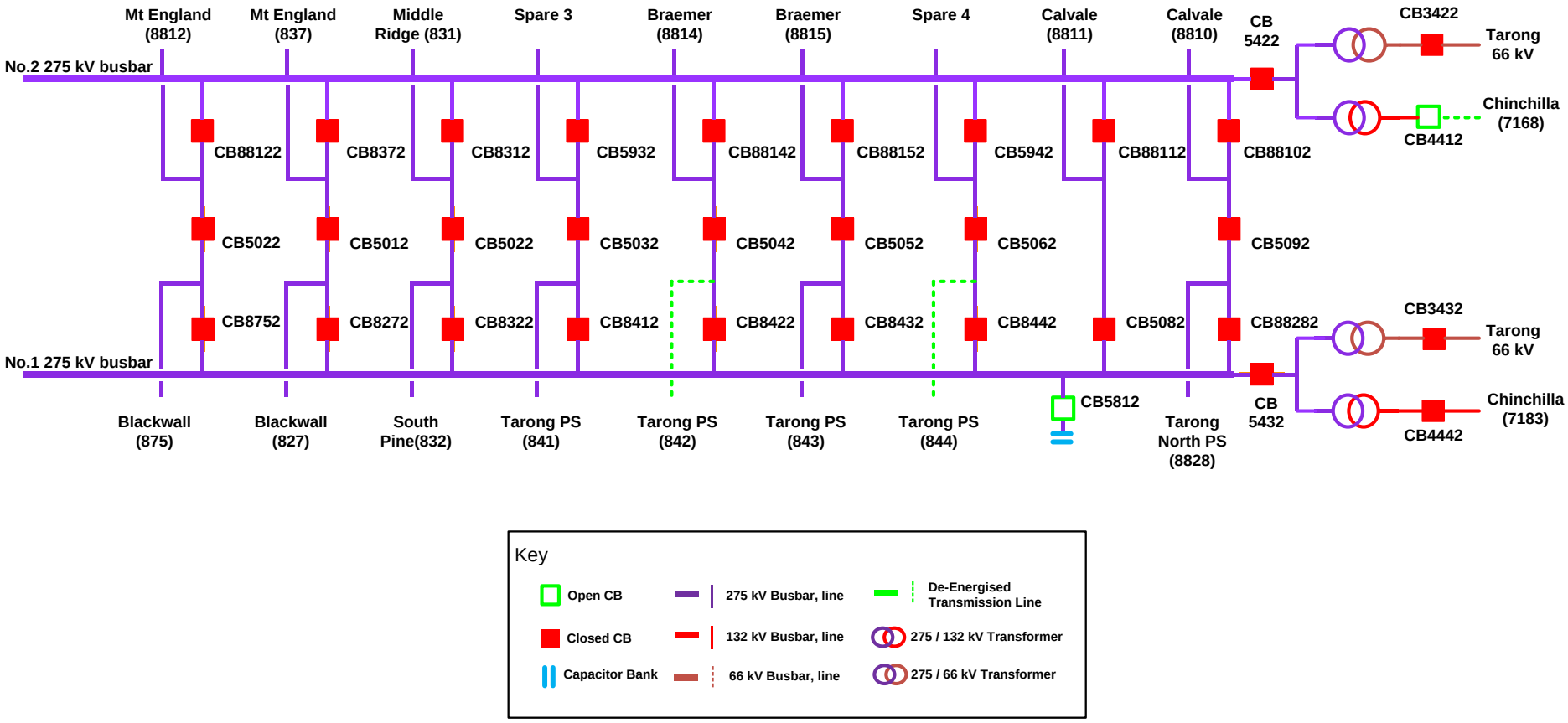
2 Pre-Contingent System Conditions

At 0935 hrs on 29 April 2013, planned maintenance commenced on the 275 kV circuit breaker 5422 at H18 Tarong Substation. This work involved taking out of service the No.1 275/132 kV transformer and No.2 275/66 kV transformer at H18 Tarong substation.

At the time of the incident, planned switching was underway to return to service the No.1 275/132 kV transformer at H18 Tarong Substation.

The status of the power system just prior to the incident is shown in Figure 1. For clarity only equipment relevant to this incident has been included in the diagram.

Figure 1 - Status of the power system prior to the incident



3 Summary of Events

The key events that took place during the incident are summarised in Table 1 below.

Date/Time	Events
29/04/2013 21:25 hrs	H18 Tarong 132 kV circuit breaker 4412 closed, to return the No.1 275/132 kV transformer to service.
29/04/2013 21:25 hrs	H18 Tarong No.2 275 kV busbar tripped due to the operation of the busbar protection system.
29/04/2013 21:55 hrs	Constraints Q-TR_CB88102 and Q-TR_CB88122 were invoked.
29/04/2013 22:01 hrs	AEMO issued the Electricity Market Notice No.42257.
29/04/2013 22:08 hrs	H18 Tarong No.2 275 kV busbar was returned to service.
29/04/2013 22:15 hrs	Constraints Q-TR_CB88102 and Q-TR_CB88122 were revoked.
29/04/2013 22:53 hrs	AEMO issued the Electricity Market Notice No.42259.

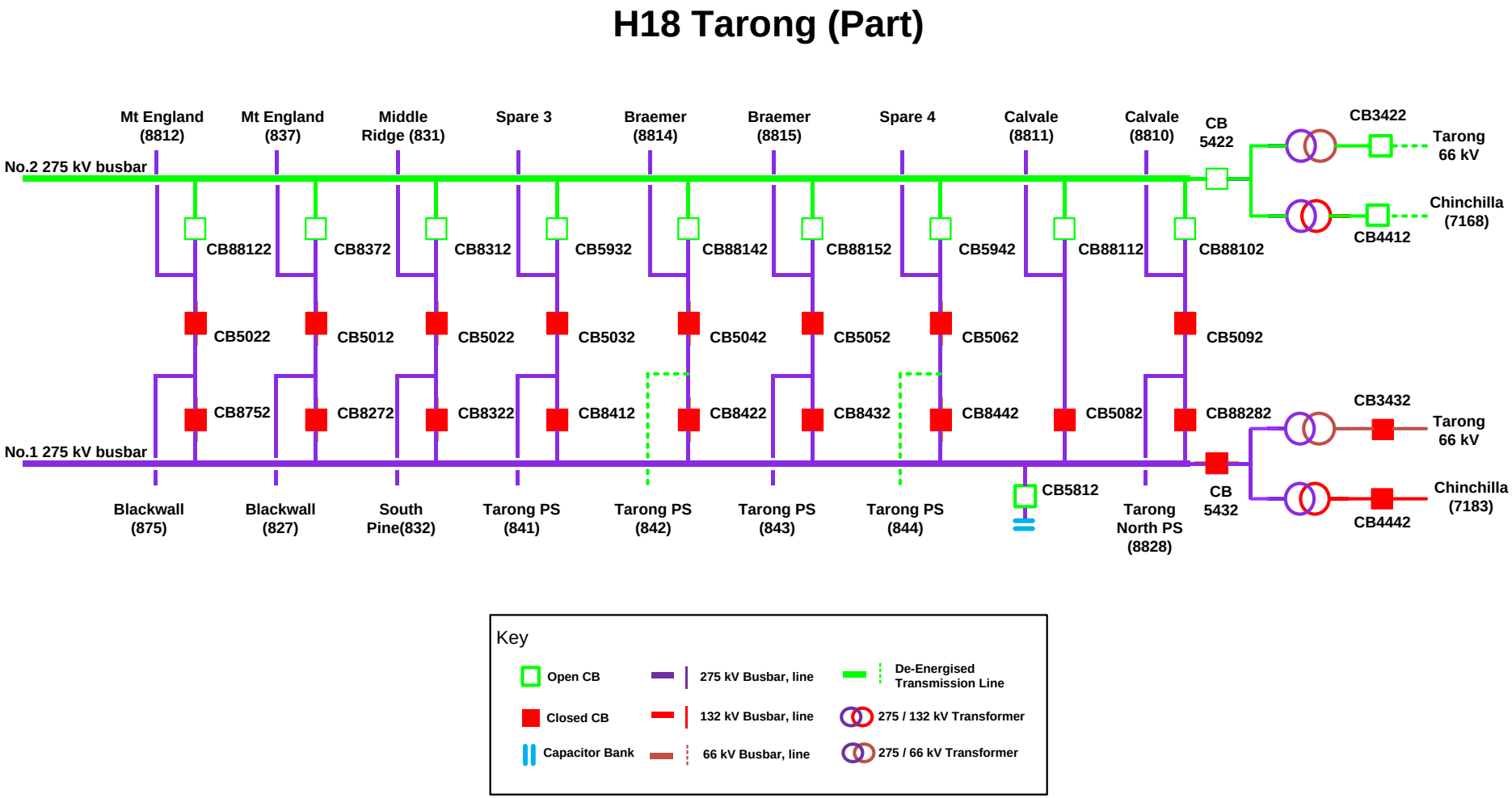
Powerlink advised that the No.2 275 kV busbar at H18 Tarong Substation tripped due to the operation of the busbar protection system. This occurred during restoration of the planned outage of the No.1 275/132 kV transformer.

The operation of the busbar protection system was not an expected outcome of the work being performed at the time of the incident.

The Powerlink investigation found that the secondary circuits of the current transformers associated with the 275 kV circuit breaker 5422 at H18 Tarong Substation were not returned to service prior to restoring the No.1 275/132 kV transformer to service. This triggered the operation of the busbar protection system and tripped the No.2 275 kV busbar. The secondary circuits of the current transformers associated with the 275 kV circuit breaker 5422 were isolated as part of the planned work.

The status of the power system immediately after the incident is shown in Figure 2.

Figure 2 - Status of the power system immediately after the incident



4 Immediate Actions Taken

Following the incident Powerlink staff carried out an investigation. The investigation found that the secondary circuits of the current transformers associated with the 275 kV circuit breaker 5422 at H18 Tarong Substation had not been returned to service prior to restoring the No.1 275/132 kV transformer to service. The secondary circuits were then returned to service.

While Powerlink was carrying out its investigation, AEMO invoked the constraints Q-TR_CB88102 and Q-TR_CB88122 at 2155 hrs on 29 April 2013 to prevent voltage instability issues occurring in South East Queensland.

At 2201 hrs on 29 April 2013, AEMO issued the Electricity Market Notice No.42257 advising of the occurrence of this non-credible contingency event.

At 2208 hrs on 29 April 2013, the No.2 275 kV busbar at H18 Tarong Substation was returned to service. After the busbar was returned to service, AEMO revoked the constraints Q-TR_CB88102 and Q-TR_CB88122 at 2215 hrs on the same day.

At 2253 hrs on 29 April 2013, AEMO issued the Electricity Market Notice No.42259 advising that the No.2 275 kV busbar at H18 Tarong Substation was returned to service.

AEMO did not reclassify the trip of H18 Tarong No.2 275 kV busbar as credible contingency. This was because the cause had been identified and was not considered an ongoing risk.

5 Follow-up Actions

Powerlink reviewed and changed the process in managing the isolation of current transformer secondaries for similar type of work, to ensure that the secondaries are returned to service as part of the planned work.

6 Power System Security Assessment

There was no loss of load or generation as a result of this incident.

Power system voltages and frequencies remained within the normal operating bands and the power system remained in a secure operating state throughout the incident.

7 Conclusions

At 2125 hrs on 29 April 2013, the No.2 275 kV busbar at H18 Tarong Substation in Queensland tripped due to a work practice issue. The secondary circuits of the current transformers associated with the 275 kV circuit breaker 5422 at H18 Tarong Substation was not returned to service prior to restoring the No.1 275/132 kV transformer to service. This triggered the operation of the busbar protection system and tripped the No.2 275 kV busbar.

AEMO is satisfied that Powerlink has taken appropriate measures to mitigate the risk of a similar event occurring in the future.

AEMO correctly applied the criteria published in section 13 of its Power System Security Guidelines in assessing that the circumstances of this incident did not warrant reclassifying similar incidents as a credible contingency event.

8 Recommendations

There are no recommendations arising from this incident.