

POWER SYSTEM OPERATING INCIDENT REPORT

TRIP OF TULLY NO.2 132 KV BUSBAR AND TULLY — INGHAM SOUTH TEE CARDWELL 132 KV LINE ON 9 MAY 2011

PREPARED BY: Electricity System Operations Planning and Performance

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DATE: 9 September 2011

FINAL

Disclaimer

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Abbreviations and Symbols

Abbreviation	Term
AEMO	Australian Energy Market Operator Ltd
CB	Circuit Breaker
EST	Eastern Standard Time
kV	kilovolt
MW	megawatt
MWh	megawatt hour
NEM	National Electricity Market
NER	National Electricity Rules

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1 Introduction

At 2329 hrs on 9 May 2011, the 7134 Tully — Ingham South tee Cardwell 132 kV line in Queensland tripped due to a high voltage fault on the line. The high voltage fault was cleared and the 7134 line successfully auto-reclosed. Coincident with the line trip, the No. 2 132 kV busbar at Tully substation also tripped due to the operation of protection systems. There were no supply interruptions or disconnection of generation as a result of this event.

This report has been prepared under clause 4.8.15 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. Data from AEMO's Energy Management System have also been used in analysing the incident.

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

2 Pre-Contingent System Conditions

Figure 1 below shows the status of the power system prior to the incident. For clarity only system components relevant to this incident has been included in the diagram.

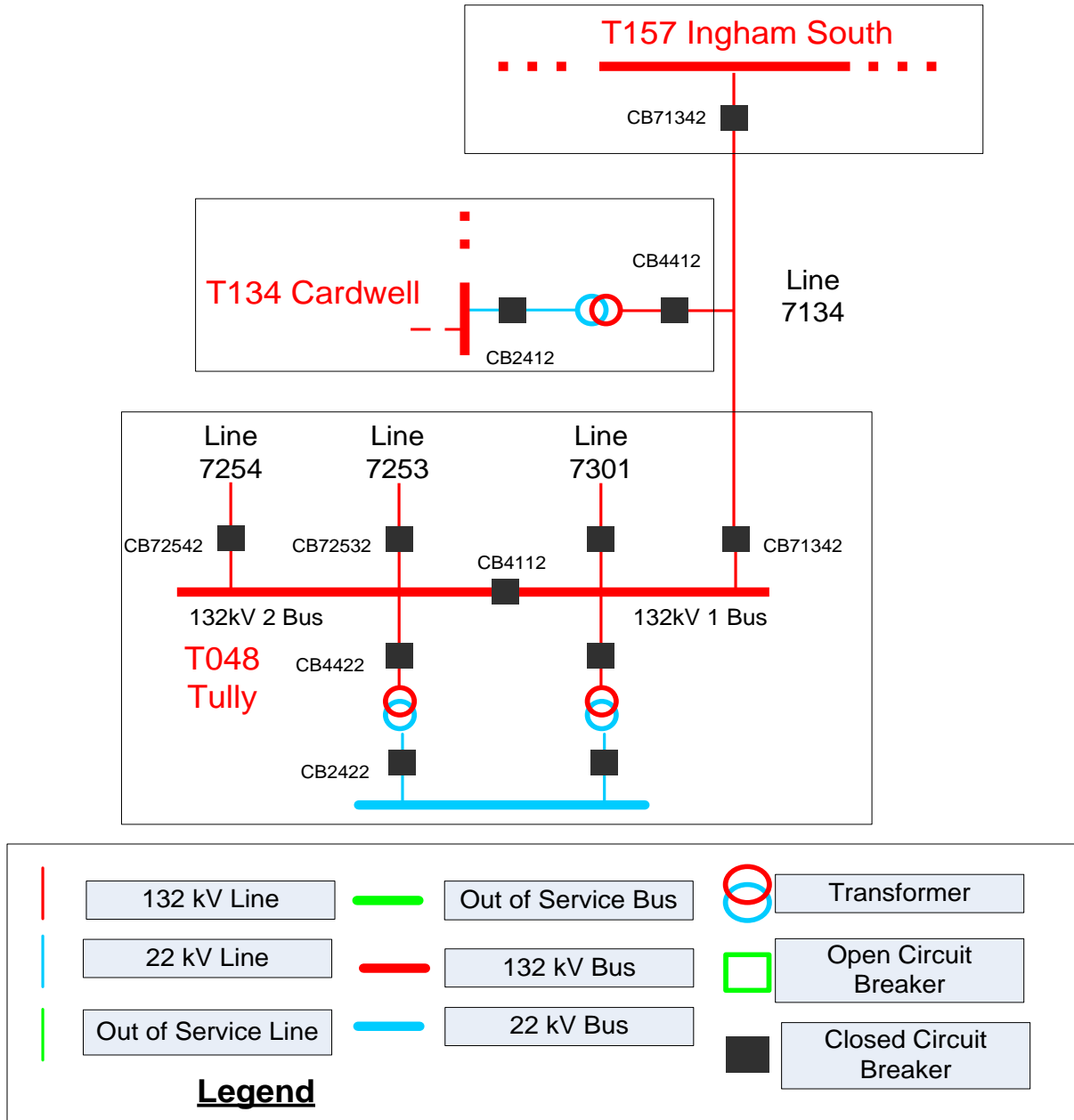


Figure 1: Status of power system prior to the system incident

3 Summary of Events

At approximately 2329 hrs on 9 May 2011, the 7134 Tully — Ingham South tee Cardwell 132 kV line tripped. Figure 2 below shows the status of the power system immediately after the line trip. The trip was caused by one phase to ground fault on 7134 line. The high voltage fault was cleared and the line was auto-reclosed within five seconds.

The No.2 132 kV busbar at Tully substation tripped immediately following the high voltage fault on 7134 line. This was due to the operation of circuit breaker fail protection associated with the bus section CB 4112. The busbar trip resulted in the off-loading of transmission lines connected to the No.2 busbar and No. 2 transformer. Figure 2 below shows the status of power system immediately after the busbar trip. Figure 3 shows the status of the power system after 7134 line was successfully auto-reclosed. The operation of the circuit breaker fail protection was not expected.

At 2352 hrs, the No.2 busbar at Tully substation was returned to service. The 132/22 kV No.2 transformer at Tully substation was returned to service at 2355 hrs. There was no load interruption or disconnection of generation as a result of this system incident.

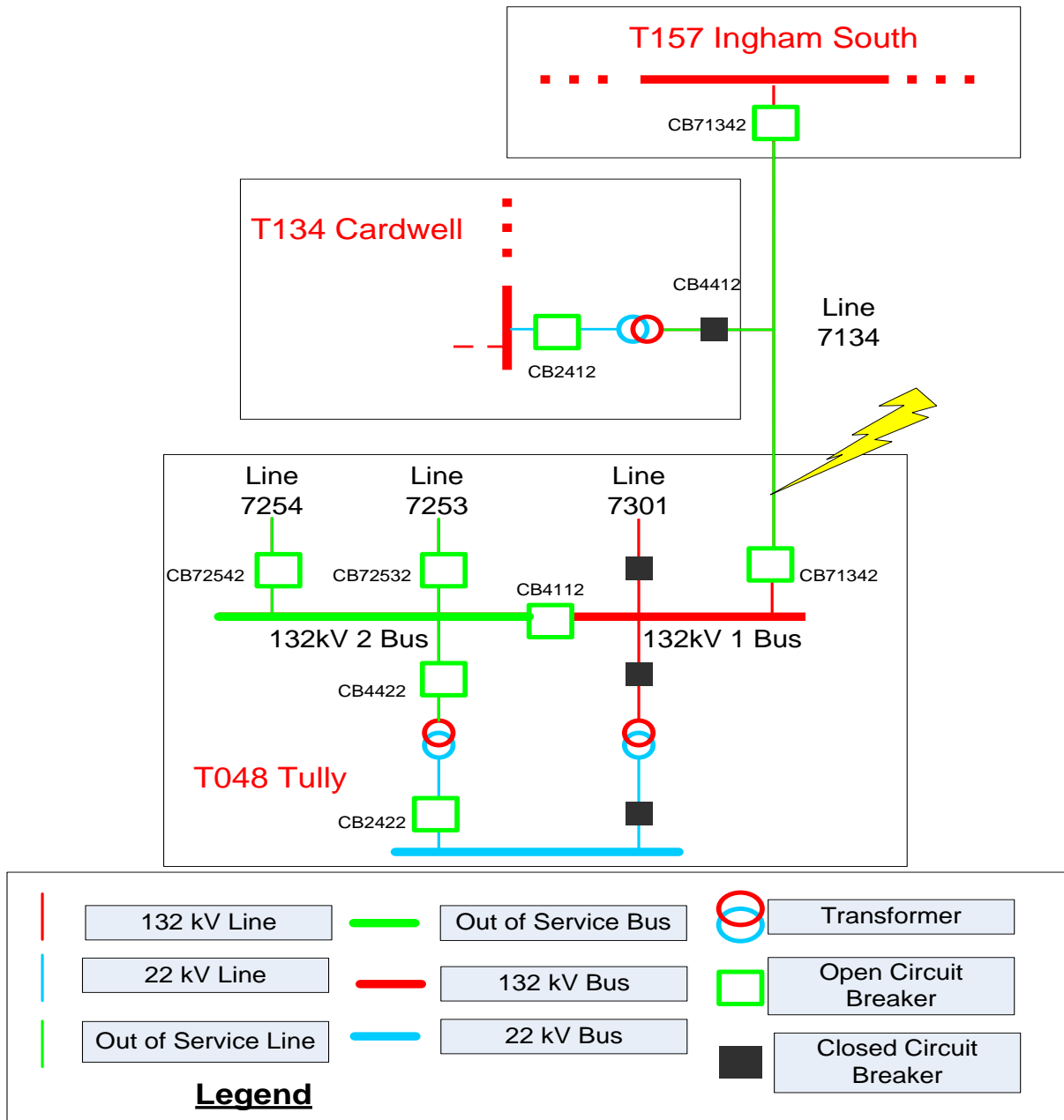


Figure 2: Status of power system immediately after the tripping of 7134 line and the Tully No.2 busbar

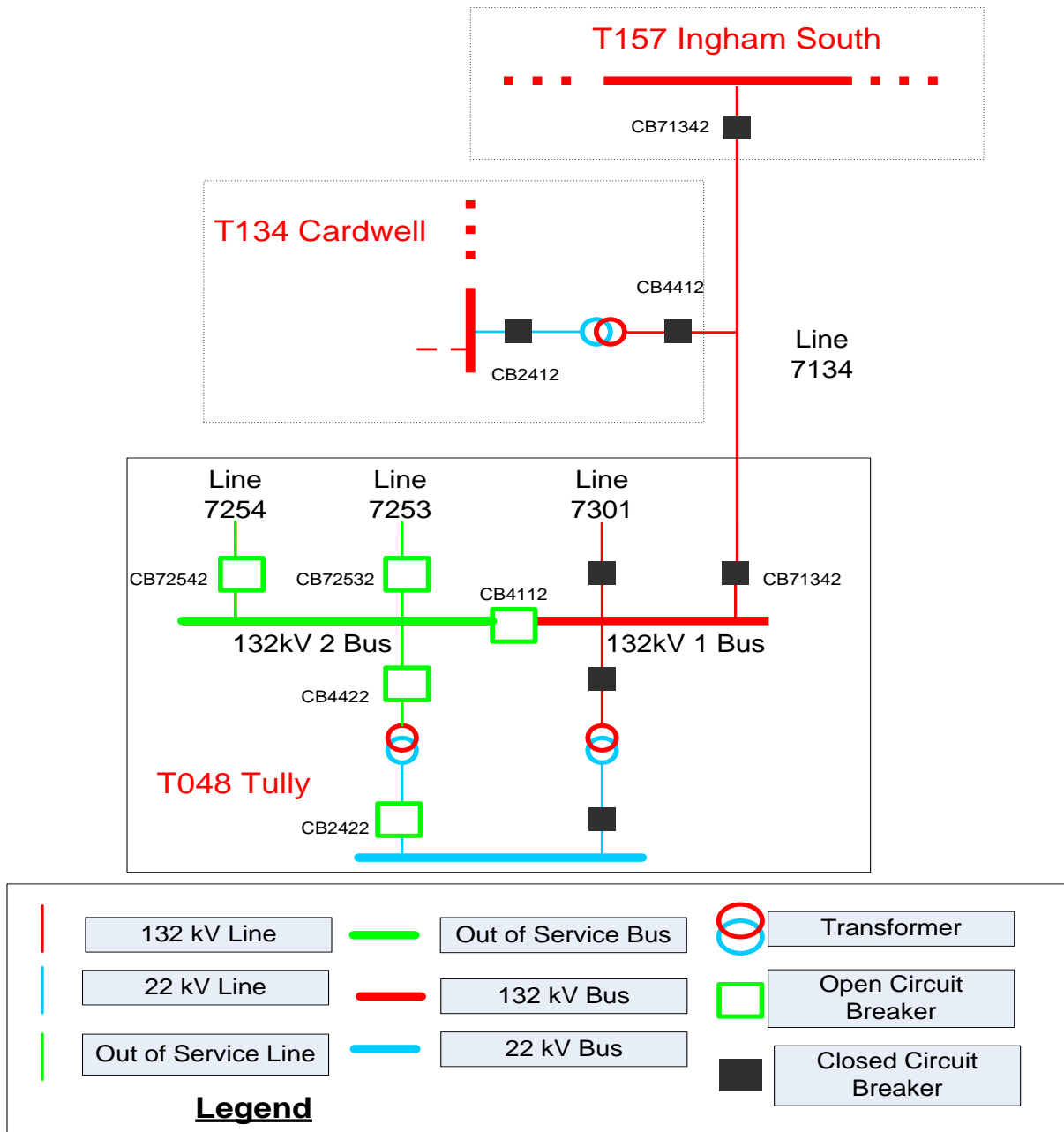


Figure 3: Status of the power system after auto-reclosing of the 7134 line

4 Immediate Actions Taken

At 0035 hrs on 10/05/2011 AEMO issued Market Notice No. 35203 to advise the occurrence of this non-credible contingency event.

AEMO considered the available information on the cause of this non-credible contingency event and assessed that it would be appropriate to declare the loss of 7134 line and the No.2 132 kV busbar at Tully substation as a credible contingency¹. At 0204 hrs Market Notice No. 35204 was issued to reclassify the incident as a credible contingency event.

¹ The section 11 of the AEMO Operating Procedure SO_OP 3715 Power System Security Guidelines explains the assessment AEMO would make in determining whether the occurrence of the same non-credible contingency is reasonably possible and it is appropriate to reclassify it as a credible contingency. This procedure is available at: <http://www.aemo.com.au/electricityops/3715.html>

5 Follow-up Actions

A line patrol of 7134 line that was carried out did not find evidence of a fault. Following the trip of No. 2 132 kV Tully busbar, Powerlink investigated the cause of the trip. This investigation revealed that the circuit breaker fail protection associated with Tully 132 kV bus section CB 4112 operated unexpectedly due to an issue with its settings. Powerlink implemented the correct setting and the relay was returned to service shortly after the event.

At 1421 hrs on 20 May 2011, Market Notice No. 35277 was issued to cancel the reclassification invoked on 10 May 2011. The reclassification was determined to be unnecessary after Powerlink advised AEMO on 20 May 2011 that the issue resulting in the trip of No. 2 132 kV Tully Busbar was rectified.

6 Power System Security Assessment

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

7 Conclusions

At 2329 hrs on 9 May 2011, 7134 Tully — Ingham South tee Cardwell 132 kV line tripped and auto-reclosed. The No. 2 busbar at Tully substation tripped coincidentally with the high voltage fault on 7134 line due to unexpected operation of the CB fail protection system. After identifying the cause of the trip, the No.2 busbar was returned to service. Powerlink corrected the settings in the protection relay that operated unexpectedly immediately after the incident.

AEMO is satisfied that appropriate actions have been taken to restore power system security and that appropriate works have been undertaken to mitigate the risk of a similar incident occurring in the future.

AEMO correctly applied the criteria published in section 11 of its Power System Security Guidelines procedure in assessing that the circumstances of this incident warranted reclassifying the non-credible contingency as a credible contingency event.

8 Recommendations

There are no recommendations arising from this incident.