

POWER SYSTEM OPERATING INCIDENT REPORT

TRIP OF TORRENS ISLAND 'A' 275 KV WEST BUSBAR ON 20 MAY 2011

PREPARED BY: Electricity System Operations Planning and Performance

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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 (also MW·h)
NEM	National Electricity Market
NER	National Electricity Rules

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1 Introduction

At 2035 hrs on 20 May 2011 the 275 kV West busbar at Torrens Island 'A' power station (TIPS A) in South Australia tripped following the planned shutdown of the TIPS A1 generating unit. At 2210 hrs the TIPS A West busbar was returned to service. This incident did not cause load interruptions or disconnection of generation.

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 ElectraNet and AGL Energy Limited. Data from AEMO's Energy Management System has also been used in analysing the incident.

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

2 Pre-Contingent System Conditions

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

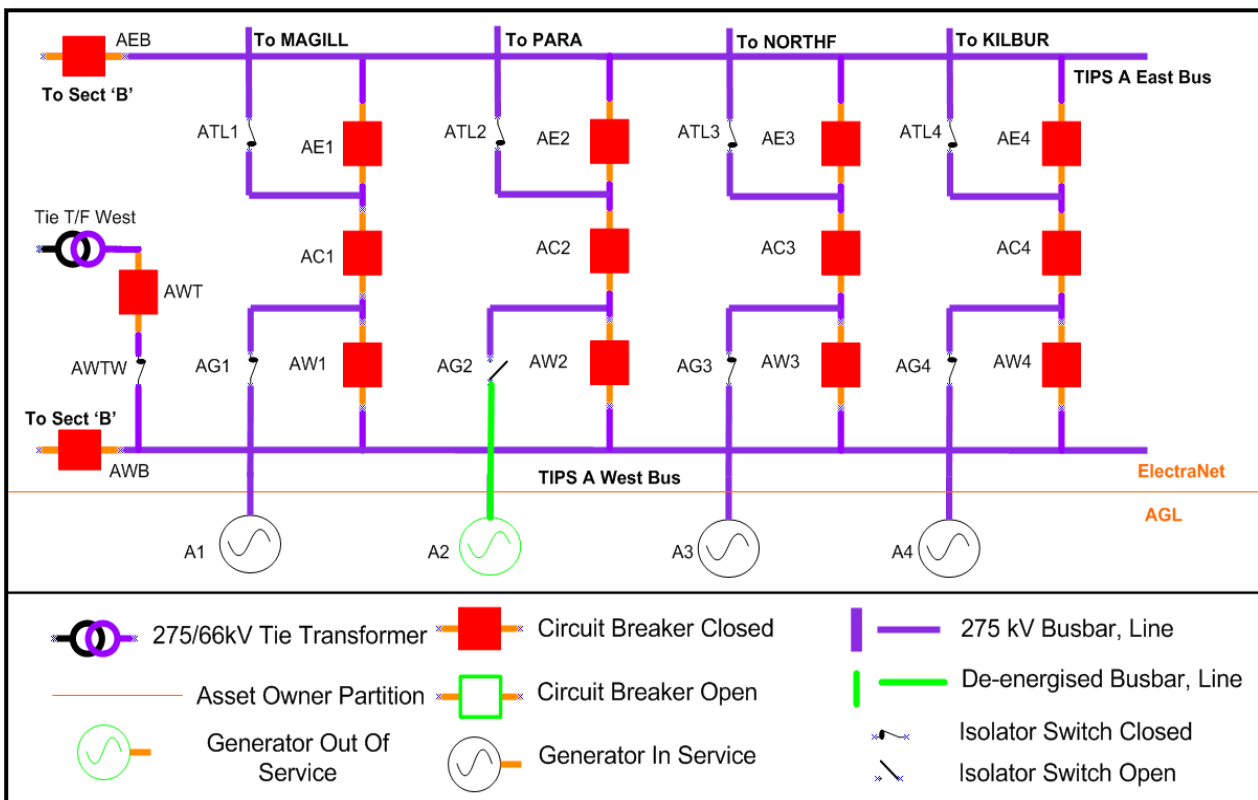


Figure 1 – Status of the power system prior to the incident

3 Summary of Events

At 2035 hrs on 20 May 2011 a non-credible contingency event occurred at TIPS A 275 kV switchyard. Local weather conditions at the time of this incident were fine and mild. The TIPS A 275 kV West busbar tripped following the planned shutdown of the TIPS A1 generating unit.

A trip signals were sent to circuit breakers (CB) AW1 & AC1 as part of the normal shutdown sequence of the TIPS A1 generating unit. CB AC1 tripped immediately, but CB AW1 failed to open within the required time. After a time delay of 250 ms the circuit breaker fail protection operated to trip CBs AW1, AW2, AW3, AW4, AWT and AWB, disconnecting TIPS A 275 kV West busbar from the power system. The slow to open CB AW1 tripped when this protection operated.

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

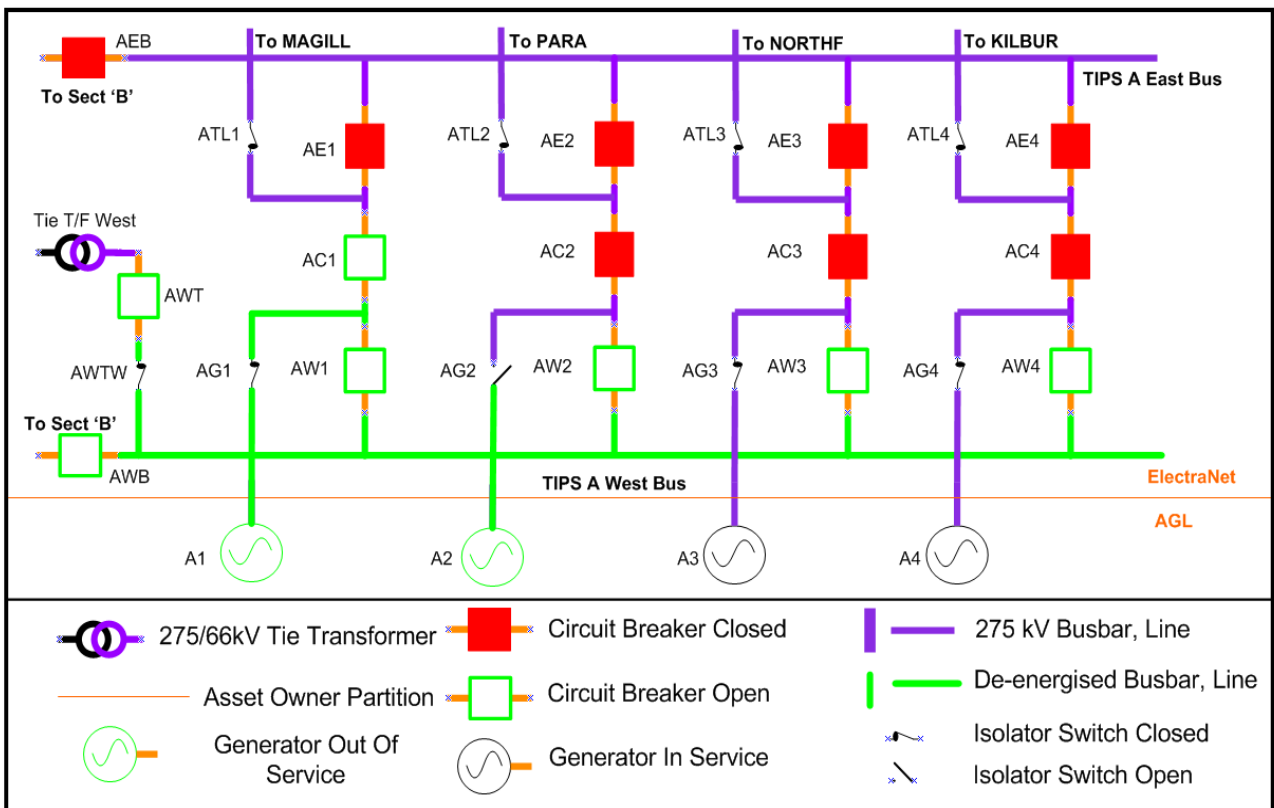


Figure 2 - Status of the power system immediately after the incident

4 Immediate Actions Taken

At 2108 hrs AEMO issued Market Notice No.35282 notifying the occurrence of this incident as a non-credible contingency event and advising that investigations were underway into the cause of the trip.

The main cause of this incident was the failure of CB AW1 to open within the required time when it received a trip signal as a part of the planned shutdown of the TIPS A1 generating unit.

At 2202 hrs ElectraNet isolated the slow to open CB AW1. As CB AW1 remained out of service for maintenance AEMO assessed that there was no above normal risk of trip of the TIPS A 275 kV West busbar, and therefore did not reclassify the trip of that busbar as a credible contingency event.

At 2210 hrs ElectraNet closed CBs on the TIPS A 275 kV West busbar to return the busbar to service. However CB AW1 remained out of service for further investigation.

5 Follow-up Actions

Following the incident ElectraNet undertook the following actions:

- Carried out maintenance of CB AW1.
- Conducted timing and mechanical tests on CB AW1.
- Conducted trip checks on CB AW1.

After completing this work ElectraNet confirmed to AEMO that CB AW1 was functioning correctly.

At 1419 hrs on 23 May 2011 ElectraNet returned CB AW1 to service.

AEMO has checked the shutdown of TIPS A1 generating unit on five occasions since the incident and confirmed that the TIPS A 275 kV busbars did not trip with the shutdown.

6 Power System Security Assessment

The power system voltages and frequencies remained within the normal operating bands and the power system remained in a secure operating state throughout the incident. The incident did not cause load interruptions or disconnection of generation.

7 Conclusions

At 2035 hrs on 20 May 2011 the TIPS A 275 kV West busbar tripped following the planned shutdown of the TIPS A1 generating unit. The busbar tripped on the correct operation of the circuit breaker fail protection which initiated as a CB that was slow to open. ElectraNet rectified the CB issue and returned the CB to service at 1419 hrs on 23 May 2011.

AEMO is satisfied that ElectraNet has carried out the appropriate work 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 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.