POWER SYSTEM INCIDENT REPORT
TRIP OF THE SNUGGERY – BLANCHE AND SNUGGERY – SOUTH EAST / MAYURRA 132 KV LINES ON 12 MAY 2010

PREPARED BY: Electricity System Operations Planning and Performance

FINAL

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1 Introduction

At 09:28 hrs on 12 May 2010, the Snuggery to Blanche and the Snuggery to South East / Mayurra 132 kV lines tripped on the spurious operation of a circuit breaker fail protection system during planned work at Snuggery. There was no loss of load or generation during this incident.

This report has been prepared under clause 4.8.15 of the National Electricity Rules to assess the adequacy of the provision and response of facilities & services and the appropriateness of actions taken to restore or maintain power system security.

This report is largely based upon information provided by ElectraNet. Data from AEMO's Energy Management System has also been used in analysing the event.

All references to time in this report refer to Market time (Australian Eastern Standard Time).

2 Pre-Contingent System Conditions

The Snuggery substation has a 132 kV ring busbar configuration. The ring busbar configuration had been opened at circuit breaker 6131 prior to the incident to permit servicing and current transformer (CT) oil sampling of the circuit breaker. The Snuggery gas turbines were not in service at the time.

Figure 1 shows the status of the relevant circuit breakers and isolators prior to the event.

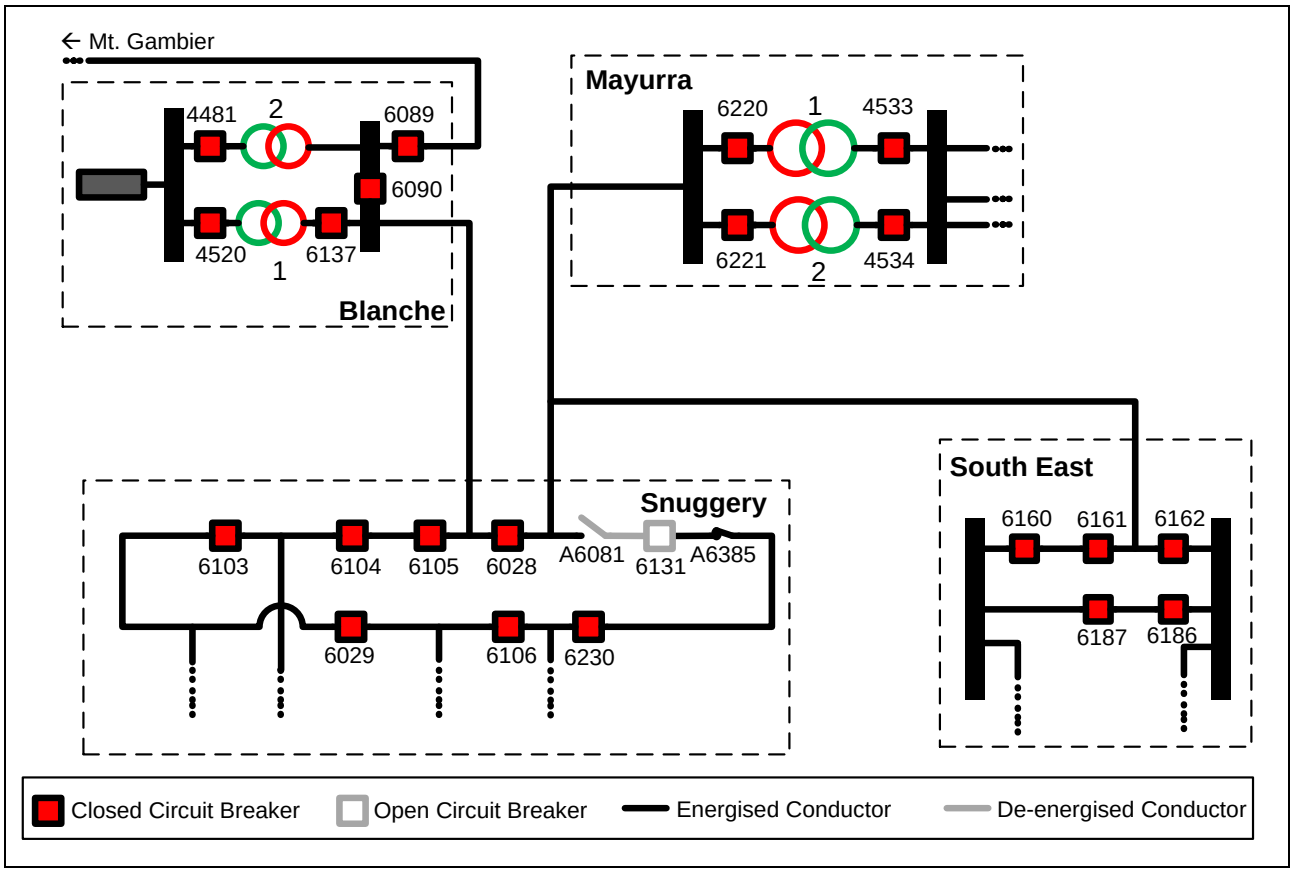

Figure 1 - Status of relevant circuit breakers and conductors prior to the event

3 Summary of Events

At 09:21 hrs on 12 May 2010, the Snuggery 6131 circuit breaker was opened. At 09:26 A6081 isolator was opened to begin the isolation of the circuit breaker 6131 for routine servicing and CT sampling. At 09:28 the A6385 isolator was opened to complete the isolation. This action caused a spurious 'Circuit breaker fail initiate' signal for circuit breaker 6028. The following circuit breakers correctly operated in response to the spurious signal:

- Snuggery busbar section circuit breakers 6105 and 6028
- Blanche No. 1 Transformer 132 kV circuit breaker 6137
- Blanche 132 kV busbar coupler circuit breaker 6090
- Mayurra No. 1 Transformer 132 kV circuit breaker 6220
- Mayurra No. 2 Transformer 132 kV circuit breaker 6221
- South East to Snuggery/Mayurra circuit breakers 6161 and 6162 at South East

The operation of these circuit breakers left the following lines de-energised:

- Snuggery to South East / Mayurra 132 kV line
- Snuggery to Blanche 132 kV line

Figure 2 shows the status of the relevant 132 kV circuit breakers and transmission lines after the circuit breakers tripped.

The Snuggery to Blanche 132 kV line was returned to service at 10:50 hrs and the Snuggery to South East / Mayurra 132 kV line was returned to service at 11:09 hrs.

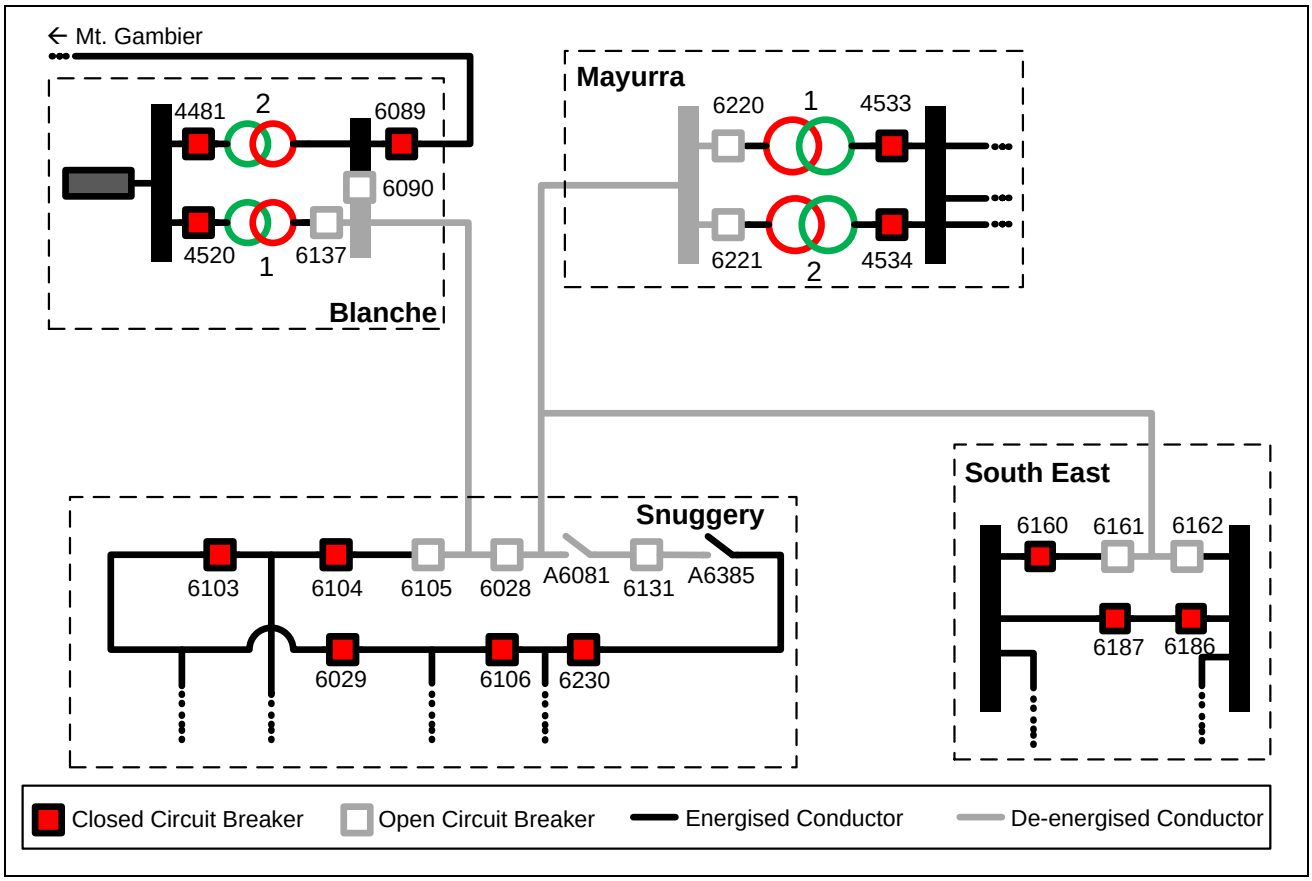

Figure 2 - Status of relevant circuit breakers and conductors after the event

4 Power System Security Assessment

The circuit breakers that operated are protected with circuit breaker fail protection. When a trip signal is sent to a circuit breaker and if the protection systems detect current flows through that circuit breaker for some set time after the trip signal was issued, circuit breaker failure protection sends a signal to trip all of the relevant circuit breakers to isolate the circuit breaker in question.

When isolator A6385 was opened, a spurious circuit breaker fail initiate signal (as described above) for Snuggery 132 kV circuit breaker 6028 caused the surrounding circuit breakers to trip. There were no high voltage power system faults identified at the time of this incident.

The Snuggery to Blanche 132 kV line was returned to service at 10:50 hrs and the Snuggery to South East / Mayurra 132 kV line was returned to service at 11:09 hrs. No security issues were identified during these unplanned outages.

There was no loss of load or generation as a result of this incident. The power system frequency and voltages remained within the normal operating frequency and voltage bands during the event.

5 Immediate Actions

Following the event, ElectraNet undertook an investigation of the event and found that the instigating cause of the incident was a spurious circuit breaker fail protection trip from Snuggery circuit breaker 6028. ElectraNet advised that the subsequent protection operation correctly operated to open the other relevant circuit breakers.

6 Follow-up Action

Testing of the Snuggery circuit breaker 6028 management relay confirmed that the relay was not defective. However the relay was left isolated until the cause of the spurious circuit breaker fail trip signal was determined.

Further investigation into the programming of the management/CBF relay for CB 6028 revealed it was issuing the Circuit Breaker Fail (CBF) trips for the condition when both isolators A6081 and A6385 were open. Modifying the programming logic of the relay will correct the design issue and ensure the CBF relay does not issue a CBF trip for the identical condition. ElectraNet plan to complete all necessary design changes by the end of October 2010.

AEMO was satisfied that the event did not require reclassification of the loss of the Snuggery to Blanche 132 kV line and the Snuggery to South East / Mayurra 132 kV lines as a credible contingency event.

At 16:49 hrs, AEMO control room issued a market notice 31760, advising the occurrence of this incident.

7 Conclusion

The simultaneous trip of the Snuggery to Blanche 132 kV line and the Snuggery to South East / Mayurra 132 kV line occurred due to a spurious circuit breaker fail trip signal. The associated management relay was tested and found to function as designed, however subsequent investigations found a deficiency in the programming logic of the relay.

8 Recommendations

ElectraNet will advise AEMO once the design changes on the management/CFB relay have been completed.