TANGKAM 110 KV NO.1 BUSBAR TRIP ON THE 27 JANUARY 2010

PREPARED BY: Electricity System Operations Planning and Performance

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FINAL

1. Introduction

On the 27th January 2010 at 12:59 hrs (AEST), the Tangkam substation (T147) 110 kV No.1 busbar tripped due to the operation of protection systems during planned secondary system work activities at the substation. The trip of the busbar resulted in de-energising the Tangkam – Middle Ridge (732) 110kV feeder and the Tangkam – Oakey Power Station tee Oakey (7246) 110kV feeder. The disconnection of the 7246 feeder from Tangkam substation resulted in the disconnection of the No.2 generating unit at Oakey Power from the transmission network. The unit was generating at 144 MW at the time of the busbar trip. There was no loss of load as a result of this incident.

This report has been prepared under clause 4.8.15 of the Rules 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.

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

2. Pre-Contingent System Conditions

Figure 1 shows the status of relevant circuit breakers at Tangkam 110 kV substation prior to the incident.

The No.2 generating unit at Oakey Power Station connects to the transmission network via the feeder 7246. The No.2 generating unit at Oakey Power Station was generating at 144 MW prior to the busbar trip.

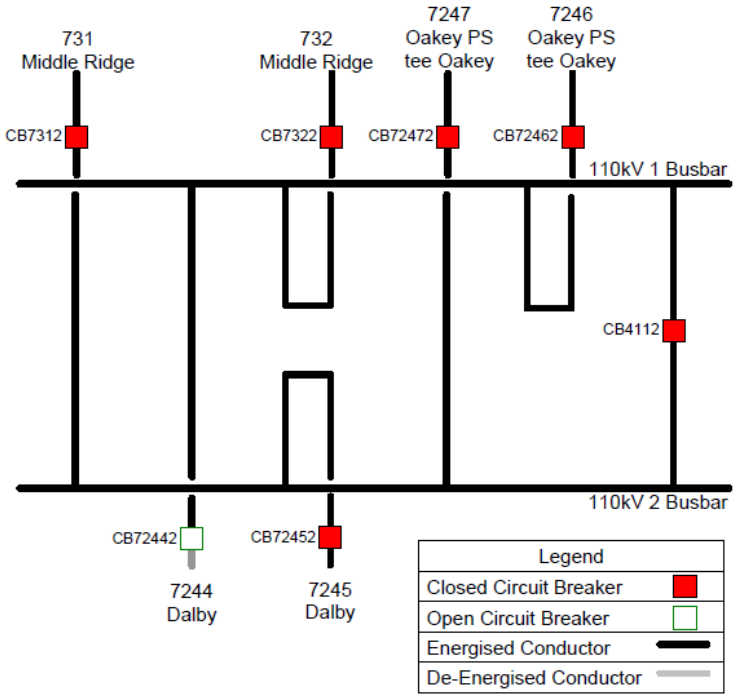

Figure 1: T147 Tangkam 110 kV Substation Circuit Breaker Status Prior to Busbar Trip

3. Summary of Events

At 12:59:42 hrs on the 27th January 2010, the Tangkam substation 110 kV No.1 busbar tripped. The trip occurred due to the operation of the circuit breaker protection system during planned secondary system work within the substation. The following circuit breakers tripped at Tangkam substation:

- CB 4112 (No.1 – No.2 bus section circuit breaker).
- CB 7322 (Tangkam – Middle Ridge (732) 110kV feeder circuit breaker. This resulted in de-energising the feeder).
- CB 72462 (Tangkam – Oakey Power Station tee Oakey (7246) feeder circuit breaker. This resulted in tripping the No.2 generating unit at Oakey power station and de-energisation of the Tangkam – Oakey Power Station tee Oakey (7246) feeder).

Figure 2 shows the statuses of the circuit breakers after the Tangkam substation 110 kV No.1 busbar tripped.

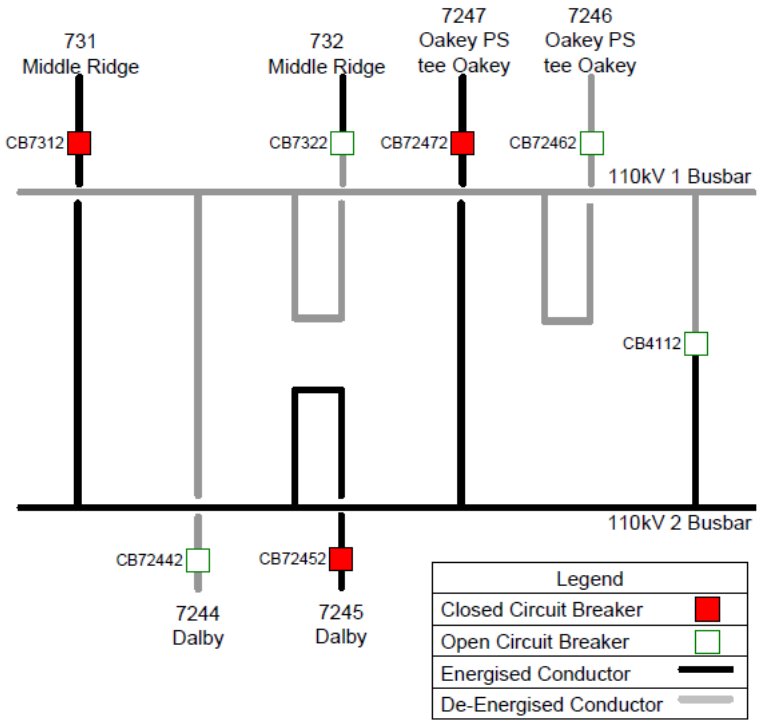

Figure 2: T147 Tangkam 110 kV Substation Circuit Breaker Status after the Busbar Trip

At 13:08 hrs on the 27 January 2010, after the cause of the trip was confirmed the Tangkam 110 kV No.1 busbar was returned to service.

At 13:09 hrs on the 27 January 2010, the Tangkam – Middle Ridge (732) 110 kV feeder was returned to service.

At 13:14 hrs on the 27 January 2010, the Tangkam – Oakey Power Station tee Oakey (7246) 110kV feeder was returned to service.

At 13:34 hrs on the 27 January 2010, the No.2 generating unit at Oakey Power Station was returned to service.

4. Power System Security Assessment

At the time of the operation of circuit breaker fail bus trip protection at Tangkam 110kV substation, planned work on secondary systems was in progress at the substation. The planned work involved the modification of the Tangkam – Dalby 110 kV (7244) feeder protection systems.

Powerlink established that the main cause of this power system incident was the incorrect description of a terminal connection in the Tangkam secondary system diagrams.

This issue has been addressed to avoid any future reoccurrence. A high voltage fault was not present on the transmission network at the time of this event.

The No.2 generating unit at Oakey Power Station was disconnected from the power system while generating at 144 MW as a result of this event.

There was no loss of load as a result of this event.

The power system frequency and voltage remained within the normal operating frequency and voltage band during the event.

5. Recommendations

Nil.