

# ALAN SHERRIFF 132 KV BUSBAR NO.1 TRIP ON THE 21 NOVEMBER 2009

PREPARED BY: Electricity System Operations Planning and Performance

DOCUMENT NO: 1

VERSION NO: 1

FINAL

# 1. Introduction

On the 21<sup>st</sup> November 2009 at 12:50 hrs (AEST), the No.1 132kV busbar at Alan Sherriff 132 kV (T150) substation in northern Queensland tripped due to operation of one of its protection systems. This caused a load interruption of 9 MW for approximately 54 seconds until the 11 kV bus section breaker was closed to restore the load. There was no loss of generation 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

The Alan Sherriff 132 kV substation comprises of two 132 kV busbar sections connected by a bus section circuit breaker. Each busbar is protected by duplicated X and Y protection systems.

Figure 1 below shows the single line diagram of the T150 Alan Sherriff substation including the status of plant prior to the event.

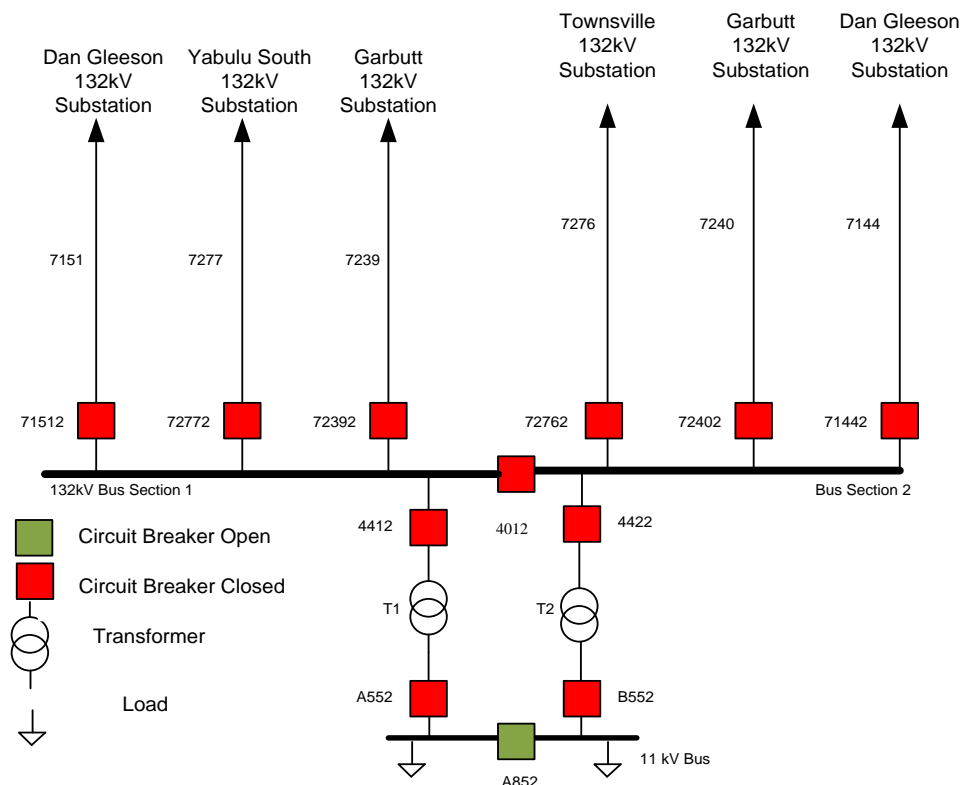


Figure 1 - Single Line Diagram of Alan Sherriff 132kV (T150) Substation Including the Status of Plant Prior to the Event

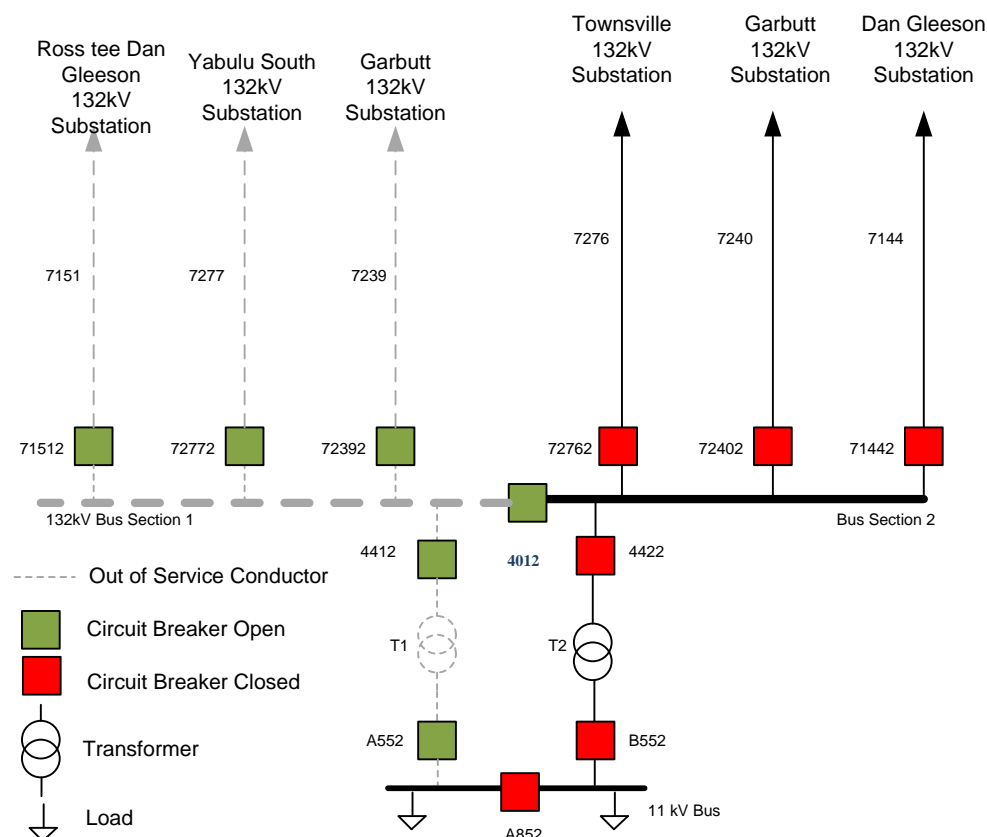
### 3. Summary of Events

At 12:50 hrs, the No.1 132kV busbar at Alan Sheriff 132 kV substation tripped due to operation of its X protection system. As a result, the following circuit breakers at Alan Sherriff substation opened:

- Circuit breaker 71512
- Circuit breaker 72772
- Circuit breaker CB 72392
- Circuit breaker CB 4412
- 132kV No.1 – No.2 bus section CB 4012 at Alan Sheriff substation
- 11kV circuit breaker of No.1 transformer CB A552

At 14:23 hrs, the No.1 132kV busbar at Alan Sherriff substation was returned to service by closing the 132kV bus section circuit breaker CB 4012. All affected network elements were returned to service by 14:26 hrs on the same day.

Figure 2 below shows the single line diagram of the T150 Alan Sheriff substation including the status of plant after the event.



**Figure 2 - Single Line Diagram of the Alan Sherriff 132kv (T150) Substation Including the Status of Plant after the Event**

## **4. Power System Security Assessment**

Immediately following the event, X protection of the No.1 132 kV busbar was isolated and a detailed investigation was performed. The investigation concluded that a relay of the X protection had developed a fault at the time it operated, and that a high voltage fault had not occurred on the busbar. The X protection relay was then isolated and the No.1 busbar was returned to service at 14:23 hrs on the same day. The X protection relay was replaced and put into service on the 22 November 2009. All other affected network elements were returned to service by 14:26 hrs on 21 November 2009.

Following the loss of No.1 132kV busbar, approximately 9 MW of 11 kV load supplied from 11 kV A busbar was interrupted for 54 seconds until the 11 kV bus section breaker (CB 852) was closed.

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

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

## **5. Recommendations**

Nil.