

POWER SYSTEM INCIDENT REPORT: TRIP OF B1 132KV BUSBAR AT SYDNEY EAST ON 20 OCTOBER 2009

PREPARED BY: Electricity System Operations Planning and Performance

FINAL



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1. Introduction

At 13:16 hrs on 20 October 2009, the B1 132kV busbar at Sydney East substation tripped. The incident occurred while preparing for maintenance testing work on the No.1 capacitor (C1) at the substation.

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.

Information for this report has been supplied to AEMO by TransGrid. Data from AEMO's Energy Management and Market Systems has also been used in analysing the event.

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

2. Summary of Events

At 13:16 hrs on 20 October 2009, the B1 132kV busbar at Sydney East substation tripped while preparing for maintenance testing on the No.1 capacitor. The network topology at Sydney East station before and after the trips is shown in Figures 1-2 below.

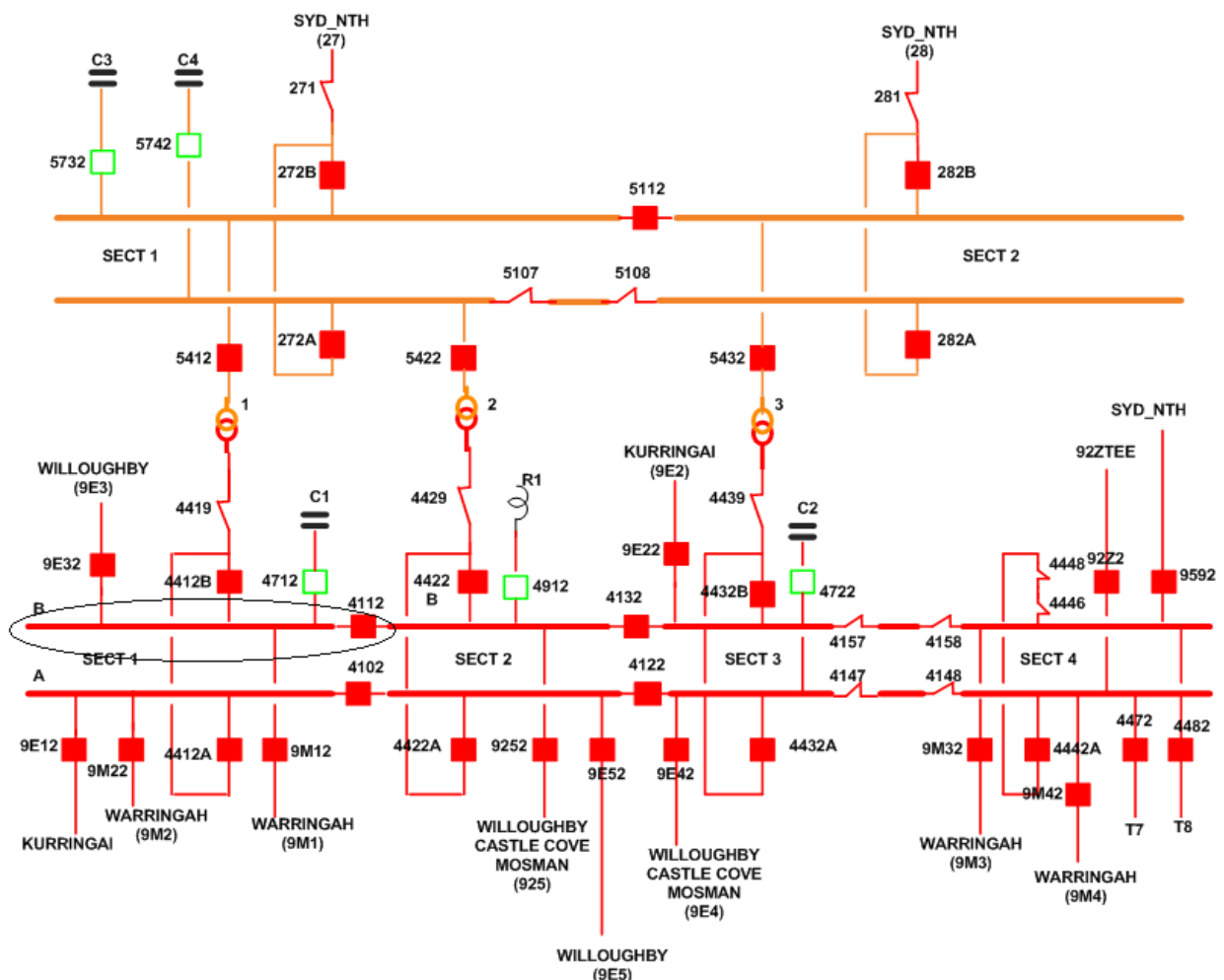


Figure 1: Network Topology at Sydney East before Busbar B1 trip

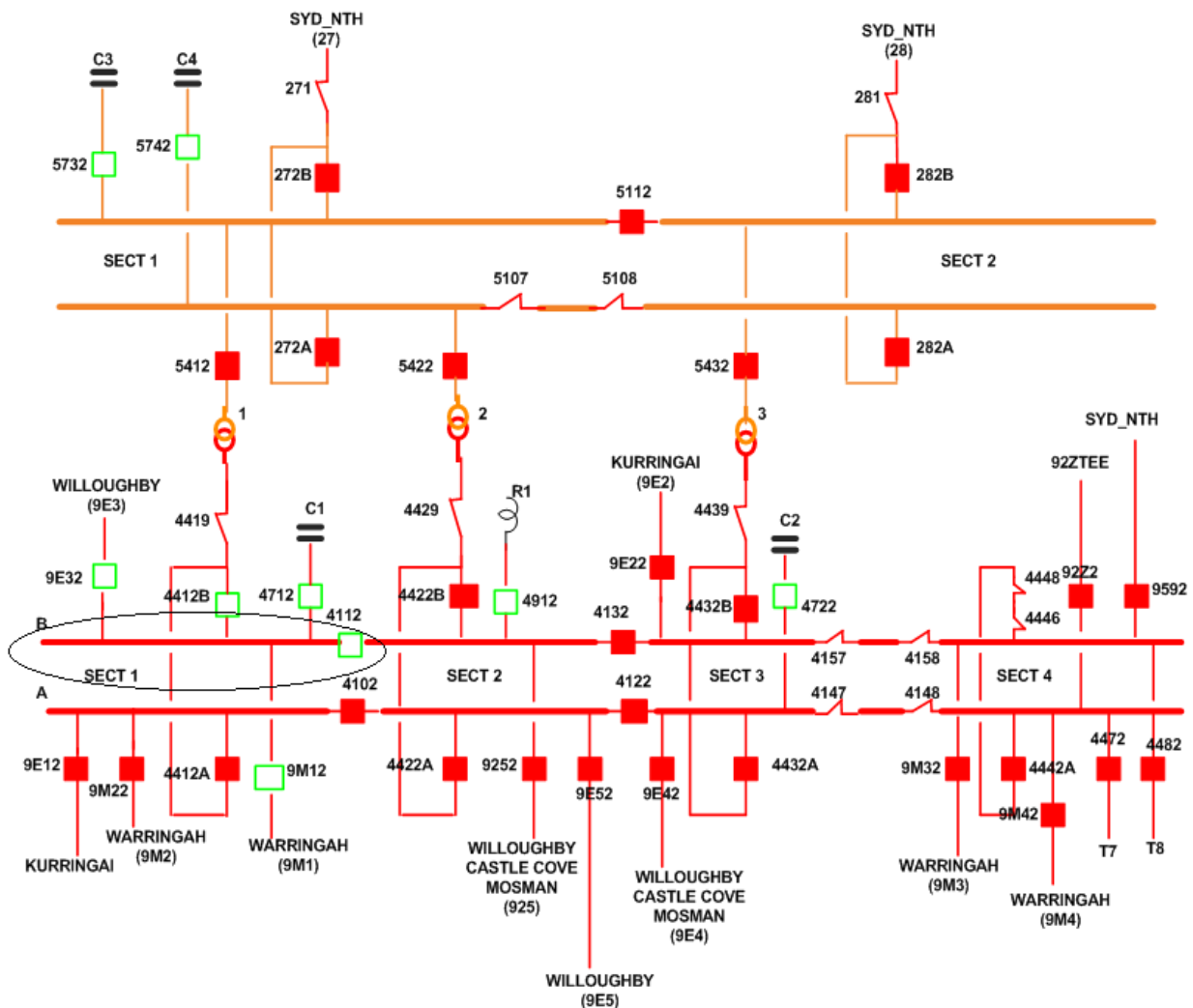


Figure 2: Network Topology at Sydney East after Busbar B1 trip

The incident occurred when TransGrid maintenance staff were preparing for maintenance testing of the No.1 capacitor connected to 132kV B1 bus section. After the capacitor was taken out of service in preparation for Insulation Resistance (IR) tests, maintenance staff started isolating the secondaries of the current transformer (CT) associated with the No.1 capacitor. The order in which the CT secondaries of metering, indication and protection CTs were isolated caused 260mA current to flow through the No.2 protection circuits of the No.1 capacitor. This residual current triggered the earth fault relay of No.2 protection to operate which subsequently resulted in the operation of B1 busbar protection and thus tripping circuit breakers 9E32, 4412B, 4112 and 9M12. No constraints were invoked and Market Notice 28310 was issued at 13:57 hrs.

There was 72MW flowing to Willoughby via the 9E3 line prior to the incident. No load was interrupted since the 925, 9E4 and 9E5 alternate lines to Willoughby took on the extra load after the busbar trip.

Restoration of the B1 bus section was initiated at 16:28 hrs. Line 9E3 to Willoughby (CB 9E32), CBs 4412B and 4112 were restored by 16:30 hrs. Line 9M1 to Warringah (CB 9M12) was restored at 17:24 hrs.

Based on advice received from TransGrid, AEMO deemed there was no above normal risk and hence reclassification of the busbar trip was not required.

3. Power System Security Assessment

There was no loss of load or generation as a result of this incident. There were no power system security violations during the event. The voltage at the Sydney East substation was within normal operating limits.

4. Follow-Up Actions

In response to this incident, TransGrid has updated its service instructions and reviewed technical training to clarify the requirements for similar testing to be conducted in future.

5. Conclusion

On 20 October 2009 at 13:16 hrs, an unplanned outage of B1 132kV busbar occurred while preparing for maintenance testing of No.1 capacitor. The sequence of isolating the CT secondaries followed caused the operation of the earth fault relay of No. 2 protection of the capacitor thus tripping B1 busbar section. TransGrid has since updated its service instructions and reviewed technical training to clarify requirements for similar testing to be conducted in future.