POWER SYSTEM INCIDENT REPORT

KOOLKHAN 132 KV BUSBAR TRIP ON 17 JUNE 2010

PREPARED BY: ESOPP

FINAL

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1. Introduction

At 1540 hrs on 17 June 2010, 132 kV busbar sections 1 to 5 at Koolkhan substation in New South Wales (NSW) region tripped and, as a result, the 132 kV lines from Koolkhan to Coffs Harbour and Armidale were off-loaded. Approximately 34 MW of customer load was interrupted.

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 and services and the appropriateness of actions taken to restore and maintain power system security.

Information for this report has been obtained largely from TransGrid, AEMO's Market Management System (MMS) and Energy Management System (EMS).

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

2. Summary of events

On Thursday 17 June 2010 at 1540 hrs, 132 kV busbar sections 1 to 5 at Koolkhan substation tripped. Consequently, the Koolkhan to Coffs Harbour (96H) and Koolkhan to Armidale (966) 132 kV lines opened at Koolkhan. Supply to the Koolkhan 66 kV busbar was also disconnected interrupting approximately 34 MW of customer load. The Koolkhan to Lismore (967) 132 kV line was out of service for a planned outage prior to the busbar trip. Constraint set N-KKLS_967 had already been invoked for this planned outage. Figures 1 and 2 illustrate the switching arrangements at Koolkhan substation before and after the busbar trip respectively.

At 1555 hrs, the constraint sets N-ARKK_966 and N-CHKK_96H were invoked to reflect the off-loading of the two 132 kV lines from Koolkhan to Armidale and Coffs Harbour (966 and 96H) respectively.

All the affected equipment was returned to service at 1607 hrs, and constraint sets N-ARKK_966 and N-CHKK_96H were revoked at 1615 hrs. All customer loads were restored by 1618 hrs. The Koolkhan to Lismore (967) 132 kV line was returned to service at 1659 hrs as planned, and the constraint set N-KKLS_967 was revoked at 1705 hrs.

At the time of the incident, protection work at Koolkhan associated with a new installation was being undertaken by a TransGrid contractor and the protection schemes of 132 kV busbar sections were temporarily configured as a single bus zone due to control system limitations.

TransGrid investigation revealed that the 132 kV busbar trip was caused by the operation of protection schemes when two low voltage wires at an out of service panel came into accidental fleeting contact. The wires had been connected at the far end to the busbar

section 5 protection panel as part of the new installation and had not yet been terminated at the out of service panel.

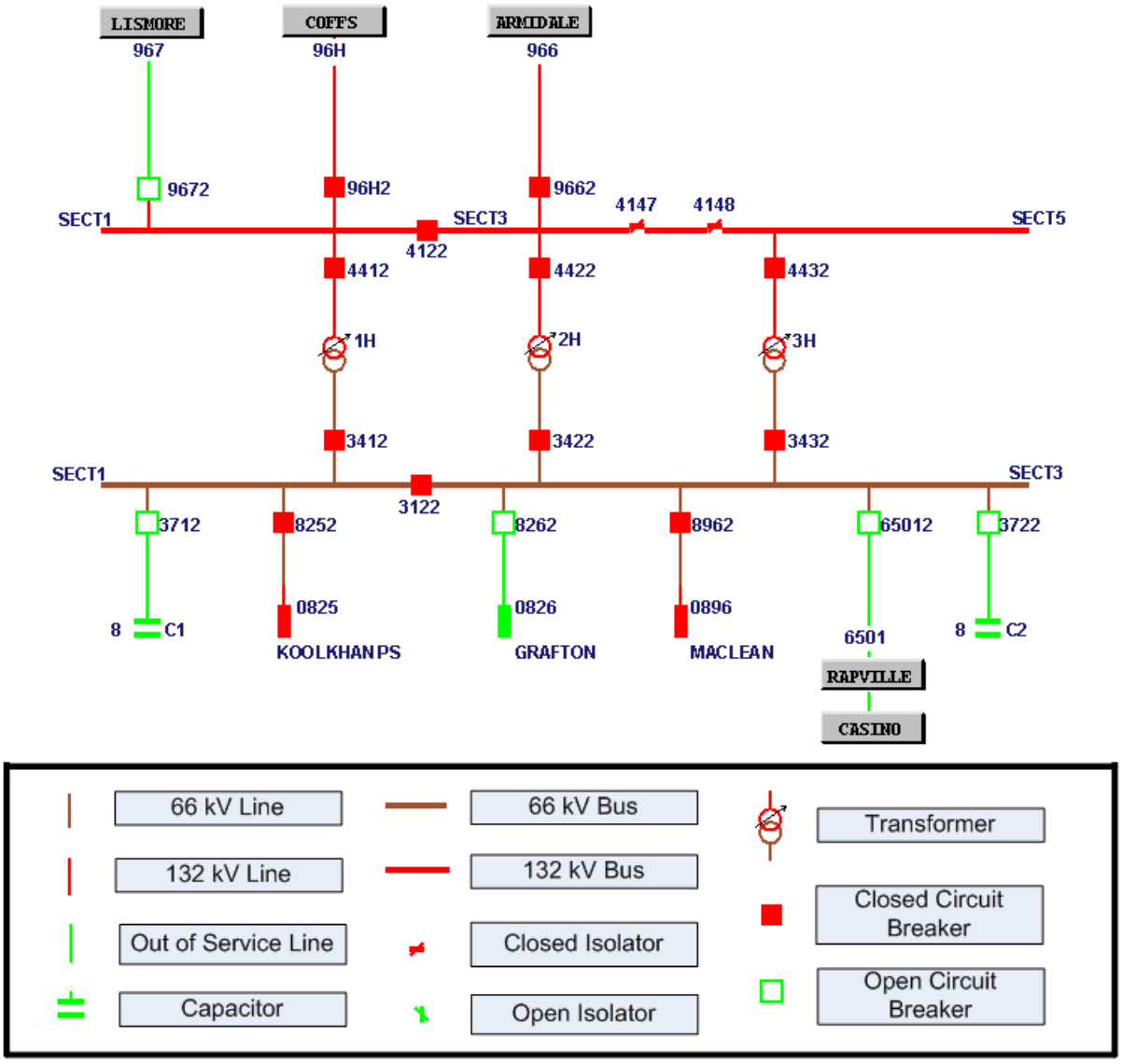

FIGURE 1. KOOLKHAN SUBSTATION BEFORE THE INCIDENT

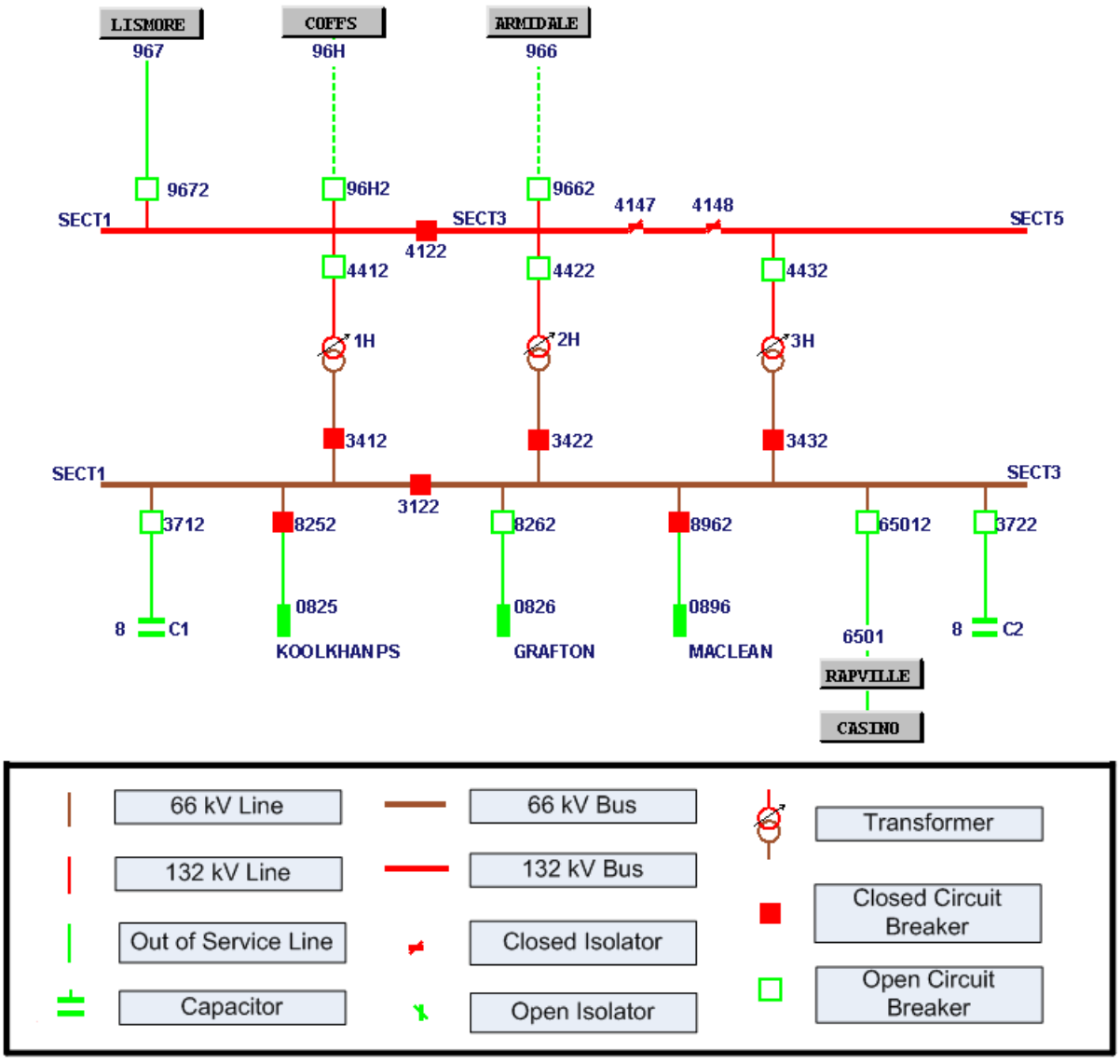

FIGURE 2. KOOLKHAN SUBSTATION AFTER THE INCIDENT

3. Follow up action

Since the incident, TransGrid has amended its procedure for protection commissioning to explicitly state precautions to be taken during staged commissioning, to avoid similar events in future works involving staged commissioning.

4. Power System Security Assessment

AEMO's investigation confirmed that the individual outage constraint sets invoked while the Koolkhan to Armidale, Coffs Harbour and Lismore 132kV lines were out of service were adequate for managing power system security during this power system incident. In addition, there were no power system security issues flagged in AEMO's real-time power system security monitoring applications. The power system frequency remained well within the frequency operating standard. All affected equipment was returned to service promptly after the incident.

5. Conclusions

On 17 June 2010 at 1540 hrs, accidental contact of two unterminated low voltage wires during new installation works initiated the busbar protection scheme which in turn tripped the entire Koolkhan 132 kV busbar. The busbar trip offloaded two 132 kV lines to Armidale and Coffs Harbour, and also interrupted the 66 kV supply at Koolkhan. As a result, approximately 34 MW of customer load was interrupted.

TransGrid has since amended its procedures for protection commissioning to prevent a recurrence of similar events in future.

6. Recommendations

Nil.