

GLEN INNES 132 KV BUSBAR TRIP ON THE 10 JANUARY 2011

PREPARED BY: Electricity System Operations Planning and Performance

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FINAL

1. Introduction

On 10 January 2011 at 0708 hrs (AEST), the 132 kV busbar at Glen Innes substation in northern New South Wales tripped during the installation of current transformer (CT) secondary wiring associated with an augmentation of the substation. There was a loss of 2 MW of Country Energy load supplied from its Glen Innes 66 kV zone substation.

Please note that Essential Energy is the new name of the former Country Energy who own the distribution assets related to this power system incident. AEMO has referred to Country Energy in this report as the owner of the distribution assets for convenience.

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 TransGrid.

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

2. Pre-Contingent System Conditions

Figure 1 below shows the single line diagram of the Glen Innes substation as at 10 January 2011 and prior to the incident.

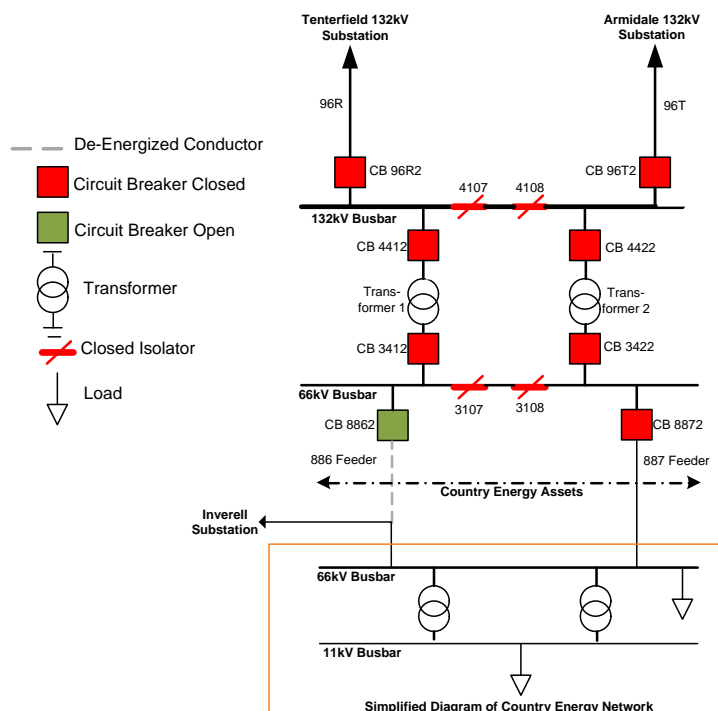


Figure 1: Status of Equipment at Glen Innes substation Prior to the Incident

3. Summary of Events

At 0708 hrs on 10 January 2011 the Glen Innes substation 132 kV busbar No.2 protection system operated, resulting in the opening of circuit breakers 96T2, 96R2, 4412, 4422, 3412 and 3422. This resulted in off-loading of the Armidale to Glen Innes (96T) and Glen Innes to Tenterfield (96R) 132 kV transmission lines, as well as tripping of the Glen Innes No.1 and No.2 132/66 kV transformers. As a consequence Country Energy 66 kV feeder 887 was off-loaded interrupting approximately 2 MW of load supplied from Country Energy's Glen Innes 66 kV zone substation. Note that Country Energy 66 kV feeder 886 was open at Glenn Innes substation at the time since the connection of this feeder to the Glen Innes 66 kV busbar had not been commissioned by TransGrid.

At the time of this incident, TransGrid was completing the construction of a new 132 kV switch bay associated with the future Glen Innes to Inverell 132 kV transmission line. Part of this work involved the installation of secondary wiring to the 132 kV busbar protection kiosks which contained the CT connections for both the No.1 and No.2 132 kV busbar protections.

Both No.1 and No.2 protections of the 132 kV busbar were in service at the time. The No.2 busbar protection operated when an electrical fitter was tightening a cable tie within the 132 kV busbar protection kiosk and a CT summation connection wire came loose from the connection link set, initiating the operation of the 132kV busbar No.2 protection.

Figure 2 below shows the status of equipment at Glen Innes substation as at 10 January 2011 after the incident.

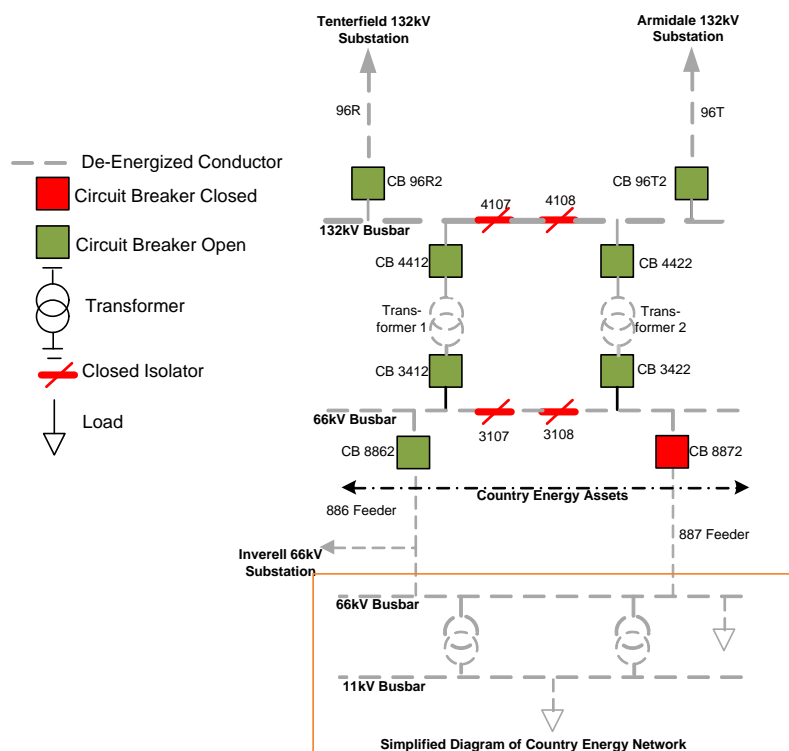


Figure 2: Status of Equipment at Glen Innes substation after the Incident

Following preliminary investigations, the CT connections to the 132 kV busbar protection were checked, all the link set screws holding connections were tightened prior to returning the busbar to service.

At 0713 hrs, circuit breaker 8872 was opened in preparation for energising the 66 kV busbar.

At 0718 hrs, the Glen Innes 132 kV busbar was energised via the 96T transmission line by closing circuit breaker 96T2. The 96R transmission line was then placed on load by closing circuit breaker 96R2. The Glen Innes No. 1 and No.2 transformers were placed back to service and 66 kV Glen Innes busbar was energised. The 66 kV 886 feeder was then returned to service to restore load supplied from Country Energy's Glen Innes 66 kV zone substation.

All relevant equipments associated with this incident were returned to service by 0719 hrs.

At 0716 hrs AEMO invoked constraint set "N-GITN_96R" for the period 1720 hrs to 1725 hrs (one dispatch interval) to cover the outage of the 96R transmission line, but the constraint equations had no impact on dispatch outcomes.

At 0820 hrs AEMO issued Market Notice No. 33993 advising of the incident.

4. Power System Security Assessment

The power system remained in a secure operating state throughout the incident. The power system frequency and voltage remained within the normal operating frequency band and voltage band respectively.

5. Recommendations

In light of this power system incident, TransGrid will review its work practices to ensure the integrity of secondary wiring prior to commencing work on any secondary circuits and advise AEMO after any updates to its relevant procedures, by the end of May 2011.