TRIP OF CAPITAL WIND FARM A AND C 330 KV BUSES ON 27 MAY 2015

AN AEMO POWER SYSTEM OPERATING INCIDENT REPORT FOR THE NATIONAL ELECTRICTY MARKET

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AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

VERSION RELEASE HISTORY

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1	30 June 2015	J Duque	FINAL	J Lu	P Biddle

INCIDENT CLASSIFICATIONS

Time and date of incident	1134 hrs Wednesday 27 May 2015
Region of incident	NSW
Affected regions	NSW
Event type	BB – Busbar Trip
Generation Impact	No generator was disconnected or limited as a result of this incident
Customer Load Impact	No customer load was disconnected as a result of this incident
Associated reports	Nil

ABBREVIATIONS

Abbreviation	Term
AEMO	Australian Energy Market Operator
kV	Kilovolt
NER	National Electricity Rules
NOS	Network Outage Scheduler

IMPORTANT NOTICE

Purpose

AEMO has prepared this document to provide information about this particular Power System Operating Incident.

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1. OVERVIEW

This report reviews a power system operating incident that occurred on 27 May 2015 at Capital Wind Farm in NSW. The incident involved the trip of the A and C 330 kV buses and was caused by procedural issues during planned maintenance.

No customer load was lost as a result of this incident and no generation was lost as both Capital Wind Farm and Woodlawn Wind Farm were out of service at the time of the event.

AEMO is required to assess power system security over the course of this incident as the incident is classified as a non-credible contingency under the National Electricity Rules (NER)[1]. Specifically, AEMO is required 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 [2].

AEMO concluded that:

1. The Capital Wind Farm A 330 kV bus was inadvertently tripped while performing planned maintenance on the wind farm's 330/33 kV transformers.
2. Power system security was adequately maintained over the course of the incident.

This report is based on information provided by TransGrid[3] and Infigen Energy[4] .National Electricity Market time (Australian Eastern Standard Time) is used in this report.

2. THE INCIDENT

On Wednesday 27 May 2015 at 1134 hrs the Capital Windfarm A and C 330kV buses tripped during planned maintenance of the transformers at Capital Windfarm. Personnel involved in the planned maintenance failed to open associated trip links before installing testing equipment required for the work.

After the trip, the A and C buses were left out of service for inspection and alarm resetting, and were returned to service at 1433 hrs on the same day.

No load or generation was lost as a result of this incident. See Appendix 1 for a power system diagram illustrating the incident and Appendix 2 for a chronological log of the incident.

The reason for investigating this incident is that the probability of a busbar fault (or trip) is very low and is thereby an unexpected event known in power system security terms as a non-credible contingency[5].

3. PARTICIPANTS INVESTIGATION

TransGrid has reported that the trip was caused by incorrect protection isolation by wind farm personnel while carrying out protection maintenances on the transformers.

[1] Clause 4.8.15(a)(1)(i) and AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.
[2] NER Clause 4.8.15 (b)
[3] TransGrid is the Transmission Network Service Provider in NSW.
[4] Infigen Energy is the Registered Participant for Capital Wind Farm.
[5] NER Clause 4.2.3 - Credible and non-credible contingency events; *AEMO Power System Security Guidelines,* Section 10 - Definition of a non-credible contingency events

Infigen Energy advised that the transformer overcurrent protection was inadvertently triggered during the planned maintenance of the 330/33 kV transformers at Capital Wind Farm, which resulted in the trip of the A and C 330 kV buses.

To prevent similar issues from occurring again, Infigen Energy has modified their test procedures to ensure the protection trip links are opened prior to the connection of any test equipment.

4. POWER SYSTEM SECURITY

This section assesses how power system security was managed over the course of the incident[6].

For this incident the power system remained in a secure operating state over the course of the incident. Power system frequency[7], and voltage[8] remained within limits. AEMO correctly assessed the incident and did not reclassify the incident as a credible contingency.

5. CONCLUSIONS

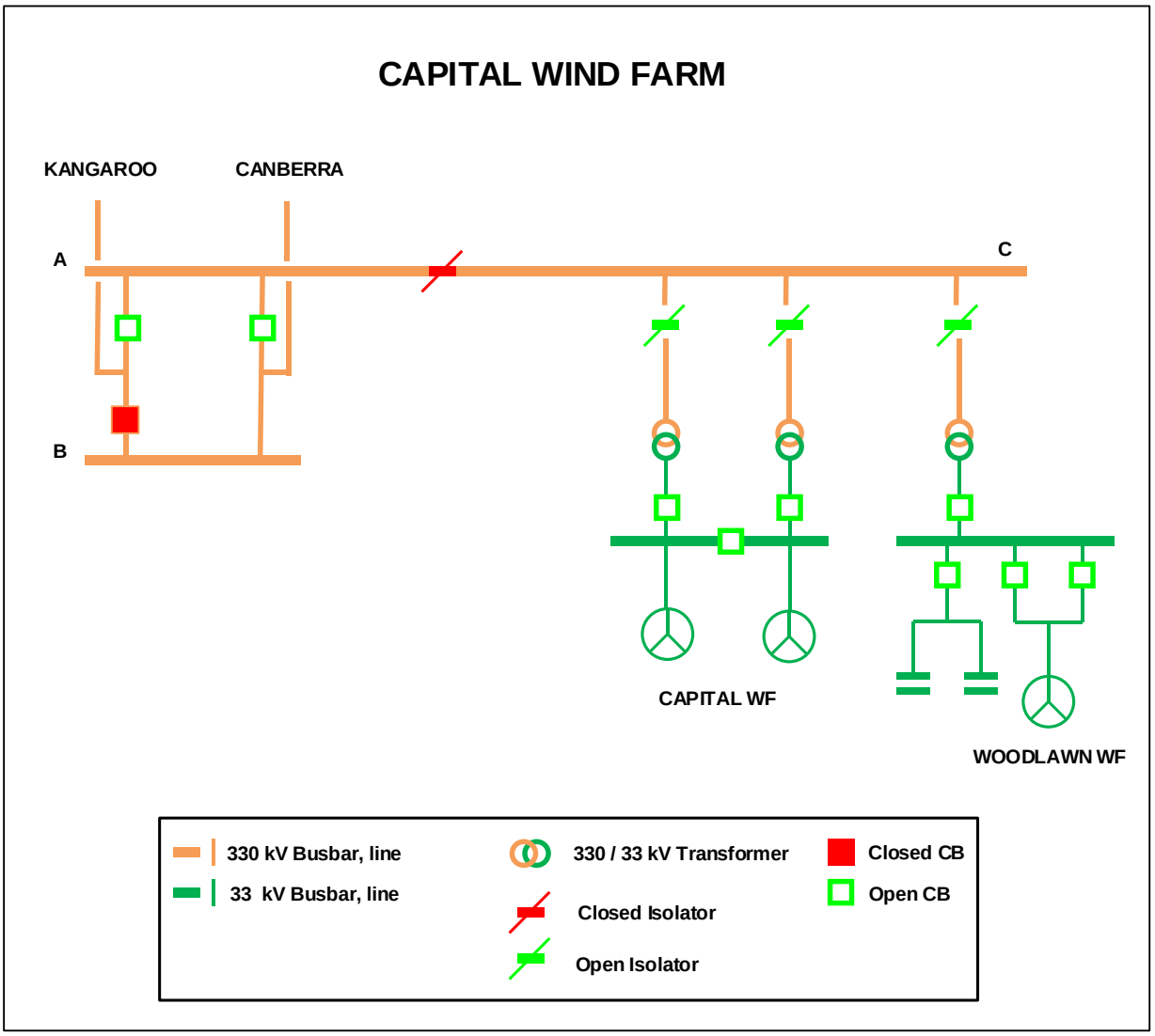
AEMO concluded that:

1. The trip of the A and C 330 kV buses at Capital Wind Farm was due to correct operation of the transformer protection in response to a fault signal from testing equipment, which was inadvertently triggered before the required trip links were opened.
2. Infigen Energy has modified its test procedures to ensure correct protection isolation before connecting any test equipment.
3. The provision and response of facilities and services were appropriate and power system security was maintained over the course of the incident.
4. There are no outstanding issues to resolve as a result of this incident.

[6] AEMO is responsible for power system security in the NEM and is required to operate the power system in a secure operating state (NER Clause 4.2.4 (a)). AEMO must thereby ensure that the power system is maintained in, or returned to, a secure operating state following a contingency event.
[7] Operating Frequency Tolerance Band specified in AEMC Reliability Panel Frequency Operating Standards
[8] NER Schedule 5.1a System Standards Clause S5.1a.4 - Power frequency voltage

APPENDIX A. – POWER SYSTEM DIAGRAM

The power system immediately after the incident



APPENDIX B. – INCIDENT EVENT LOG

Table 1 Incident Log

Time and Date	Event
1134 hrs 27 May 2015	Capital Wind Farm A and C 330 kV buses tripped
1202 hrs 27 May 2015	Capital Wind Farm A 330 kV bus outage submitted to NOS
1433 hrs 27 May 2015	Capital Wind Farm A 330 kV bus outage completed. Buses A and C returned to service.