TRIP OF BOTH COLONGRA – MUNMORAH 330KV TRANSMISSION LINES ON 7 MAY 2017

REVIEWABLE OPERATING INCIDENT REPORT UNDER THE NATIONAL ELECTRICITY RULES

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AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

INCIDENT CLASSIFICATIONS

Classification	Detail
Time and date of incident	1318 hrs Sunday 7 May 2017
Region of incident	New South Wales
Affected regions	New South Wales
Event type	Multiple line trip
Generation Impact	No loss of generation
Customer Load Impact	No loss of customer load
Associated reports	Nil

IMPORTANT NOTICE

Purpose

AEMO has prepared this report in accordance with clause 4.8.15(c) of the National Electricity Rules, using information available as at the date of publication, unless otherwise specified.

Disclaimer

AEMO has made every effort to ensure the quality of the information in this report but cannot guarantee its accuracy or completeness. Any views expressed in this report are those of AEMO unless otherwise stated, and may be based on information given to AEMO by other persons.

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1. OVERVIEW

This report relates to a reviewable operating incident[1] that occurred at 1318 hrs on Sunday 7 May 2017 in New South Wales, where the Colongra – Munmorah C1 and C3 330kV lines tripped 28 seconds apart. Colongra Power Station was not generating at the time of the incident.

There was no loss of generation or customer load as a result of this incident.

As a reviewable operating incident, AEMO is required to assess power system security over the course of this incident, and 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 has concluded that:

1. The Colongra – Munmorah C1 and C3 330kV transmission lines tripped as a result of malicious damage to the No. 2 protection cabling between Colongra Power Station and Munmorah Switchyard.
2. The Power System was maintained in a secure operating state during the incident.
3. The cause of the incident was identified and AEMO was satisfied that reoccurrence of this incident was unlikely, therefore this incident was not reclassified as a credible contingency.

This report is prepared in accordance with clause 4.8.15 of the National Electricity Rules (NER). It is based on information provided by AEMO and TransGrid and Snowy Hydro.

Australian Eastern Standard Time (AEST) is used in this report.

2. THE INCIDENT

On Sunday 7 May 2017 at 1318 hrs, the Colongra – Munmorah C1 330 kV line (C1 line) tripped. Approximately 28 seconds later, the parallel Colongra – Munmorah C3 330 kV line (C3 line) also tripped.

There was no loss of generation or customer load as a result of this incident.

The C1 and C3 lines were returned to service at 1830 hrs and 1835 hrs respectively on 7 May 2017.

See Appendix A for a diagram of the relevant parts of the power system prior to and immediately after the incident.

The reason for investigating this incident is that trip of the two lines within 30 minutes of each other is considered a multiple contingency event.

[1] See NER clause 4.8.15
[2] See NER clause 4.8.15(b).

3. SNOWY HYDRO'S INVESTIGATION

This section is based on information provided by Snowy Hydro.

At 1318 hrs on 7 May 2017, the C1 and C3 lines tripped 28 seconds apart. TransGrid advised that the lines tripped on receipt of an intertrip signal from the Colongra No. 2 protection system. Initial investigations confirmed that the Colongra intertrip send relays had not activated. Following a review of the events by TransGrid and Snowy Hydro, both parties were satisfied that no primary fault had occurred and the lines were returned to service.

Further investigation on Monday 8 May 2017 led to the inspection of protection cables between Colongra Power Station and the Munmorah Switchyard where it was identified that the No. 2 protection cables had been deliberately cut. The No. 2 protection cables run from Colongra Power Station to Munmorah Switchyard through the decommissioned Munmorah Power Station site, which is currently being demolished. The contractors responsible for the demolition of Munmorah Power Station advised that intruders had been caught on the site near the damaged cables and were believed to have intentionally cut the cables while attempting to steal copper.

Temporary repairs were made to the No. 2 protection system on 12 May, with its full restoration completed by 18 May. The No. 1 protection system was not impacted and remained fully operational during this incident.

To prevent reoccurrence, additional signage has been installed near where the No. 2 protection cables were damaged to indicate the cables are live and not associated with the decommissioned Munmorah Power Station. Snowy Hydro is working with the relevant parties to explore further short term improvements to the security of the protection cables, including assessing the viability of additional fencing and mechanical protection, recommissioning of the site security gate and increased security patrols. An assessment of the viability of these measures will be completed by 31 August 2017.

4. POWER SYSTEM SECURITY

AEMO is responsible for power system security in the National Electricity Market (NEM). This means AEMO is required to operate the power system in a secure operating state to the extent practicable and take all reasonable actions to return the power system to a secure state following a contingency event in accordance with the NER.[3] This section assesses how AEMO managed power system security over the course of this incident.

AEMO invoked constraints N-MMCG_C1[4] and N-MMCG_C3[5] at 1325 hrs and constraint F-N_MM_CB_12_32[6] at 1330 hrs. All three constraints were revoked at 1855 hrs on 7 May 2017, after the C1 and C3 lines had been returned to service. No further actions were required by AEMO and the power system remained in a secure operating state during this incident.

[3] Refer to AEMO's functions in section 49 of the National Electricity Law and the power system security principles in clause 4.2.6 of the NER.
[4] Out = Colongra – Munmorah C1 330 kV Line
[5] Out = Colongra – Munmorah C3 330 kV Line
[6] Out = Munmorah Switchyard CB C12 or C32. This outage means all four Colongra units could trip as a result of a single credible contingency

4.1 Reclassification

In accordance with clause 4.2.3A of the NER, AEMO considered whether to reclassify this multiple contingency event as a credible contingency event. The two transmission lines running between Colongra Power Station and Munmorah Substation each connect two of the four Colongra generating units to Munmorah Substation. Accordingly, the loss of two Colongra generating units is always considered credible. If the loss of both C1 and C3 lines is considered credible, then the loss of all four Colongra units could occur as a result of this credible contingency.

AEMO initially did not have sufficient information to determine the cause of the near simultaneous trip of both C1 and C3 lines. However no decision to reclassify was required until three or more generating units at Colongra were on line. There were no Colongra generating units on line at this time. AEMO subsequently received advice from Snowy Hydro that the cause of the near simultaneous trip of both lines had been identified and was not likely to re-occur, therefore AEMO did not re-classify this multiple contingency event as credible.

For this incident, AEMO took appropriate action to ensure that the power system was maintained in a secure operating state.

5. MARKET INFORMATION

AEMO is required by the NER and operating procedures to inform the market about incidents as they progress. This section assesses how AEMO informed the market on the following matters:

- AEMO was not required to advise participants of any matter as a result of this incident.

6. CONCLUSIONS

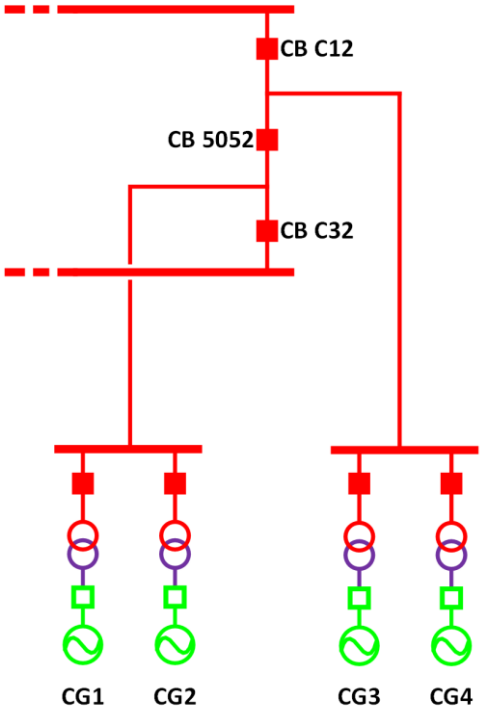
AEMO has assessed this incident in accordance with clause 4.8.15(b) of the NER. In particular, AEMO has assessed the adequacy of the provision and response of facilities or services and, the appropriateness of actions taken to restore or maintain power system security.

AEMO has concluded that:

1. The Colongra – Munmorah C1 and C3 330kV transmission lines tripped as a result of malicious damage to the No. 2 protection cabling between Colongra Power Station and Munmorah Switchyard.
2. The Power System was maintained in a secure operating state during the incident.
3. The cause of the incident was identified and AEMO was satisfied that reoccurrence of this incident was unlikely, therefore this incident was not reclassified as a credible contingency.

APPENDIX A. POWER SYSTEM DIAGRAM

System configuration before the incident. Elements not related to this incident have been omitted for clarity.



System configuration immediately after the incident. Elements not related to this incident have been omitted for clarity.