# Power System Operating Incident Report – Trip of Murray – Lower Tumut No.66 330 kV Transmission Line at Murray End Only on 18 November 2013

PREPARED BY: AEMO Systems Capability

DATE: 13 December 2013

FINAL

## Version Release History

| VERSION | DATE | BY | CHANGES | CHECKED BY | AUTHORISED BY |
|---|---|---|---|---|---|
| 1 | 9 Dec 2013 | Peter McEniery | Final | Steven Darnell | Peter Biddle |

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## Incident Classifications

| | |
|---|---|
| Time and date and of incident | 1729 hrs Monday 18 November 2013 |
| Region of incident | NSW |
| Affected regions | NSW |
| Event type | OTH - Other |
| Primary cause | OE & CON – Operating Error and Non-conformance |
| Impact | Nil - No Impact |
| Associated reports | Nil |

## Abbreviations and Symbols

| Abbreviation | Term |
|---|---|
| AEMO | Australian Energy Market Operator |
| CB | Circuit Breaker |
| CVT | Capacitor Voltage Transformer |
| EMMS | Electricity Market Management System |
| EMS | Energy Management System |
| kV | Kilovolt |
| MSS | Murray Switching Station |
| NEM | National Electricity Market |
| NER | National Electricity Rules |

# 1 Introduction

This report reviews a power system operating incident that occurred on 18 November 2013 in the New South Wales region at Murray Switching Station (MSS). AEMO is required to review this incident as it satisfies the requirements of a reviewable operating incident under the National Electricity Rules[1] (NER).

The purpose of this incident review is to assess power system security over the course of the incident. The NER requires AEMO 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].

This report is based upon information provided by TransGrid. Data from AEMO's Energy Management System (EMS) and Electricity Market Management System (EMMS) has also been used in analysing the incident.

All references to time in this report are to National Electricity Market time (Australian Eastern Standard Time).

# 2 The Incident

On Monday 18 November 2013, at 1729 hrs, a 330 kV circuit breaker at MSS tripped. This trip offloaded the Murray – Tumut 3 No.66 330 kV transmission line.

This was an unexpected event as there was no fault on the transmission system, and the Murray – Tumut 3 No.66 330 kV transmission line remained energised from Tumut 3 Terminal Station (transmission lines usually trip at both ends).

No load or generation was lost as a result of this incident, and the tripped circuit breaker (CB 662B) was returned to service within two minutes.

# 3 TNSP Investigation

On Monday 18 November 2013 TransGrid were undertaking planned work at MSS. The planned work required 5A1 330 kV busbar to be removed from service. As part of this work the secondary links of the busbar capacitor voltage transformer (CVT) were to be isolated. Instead the secondary links of a CVT on the No. 66 330 kV Murray – Tumut 3 transmission line was inadvertently isolated.

The CVT provides voltage measurements to protection controlling the 330 kV CB 662B at MSS. The apparent failure of the CVT initiated the trip of the 330 kV CB 662B at MSS.

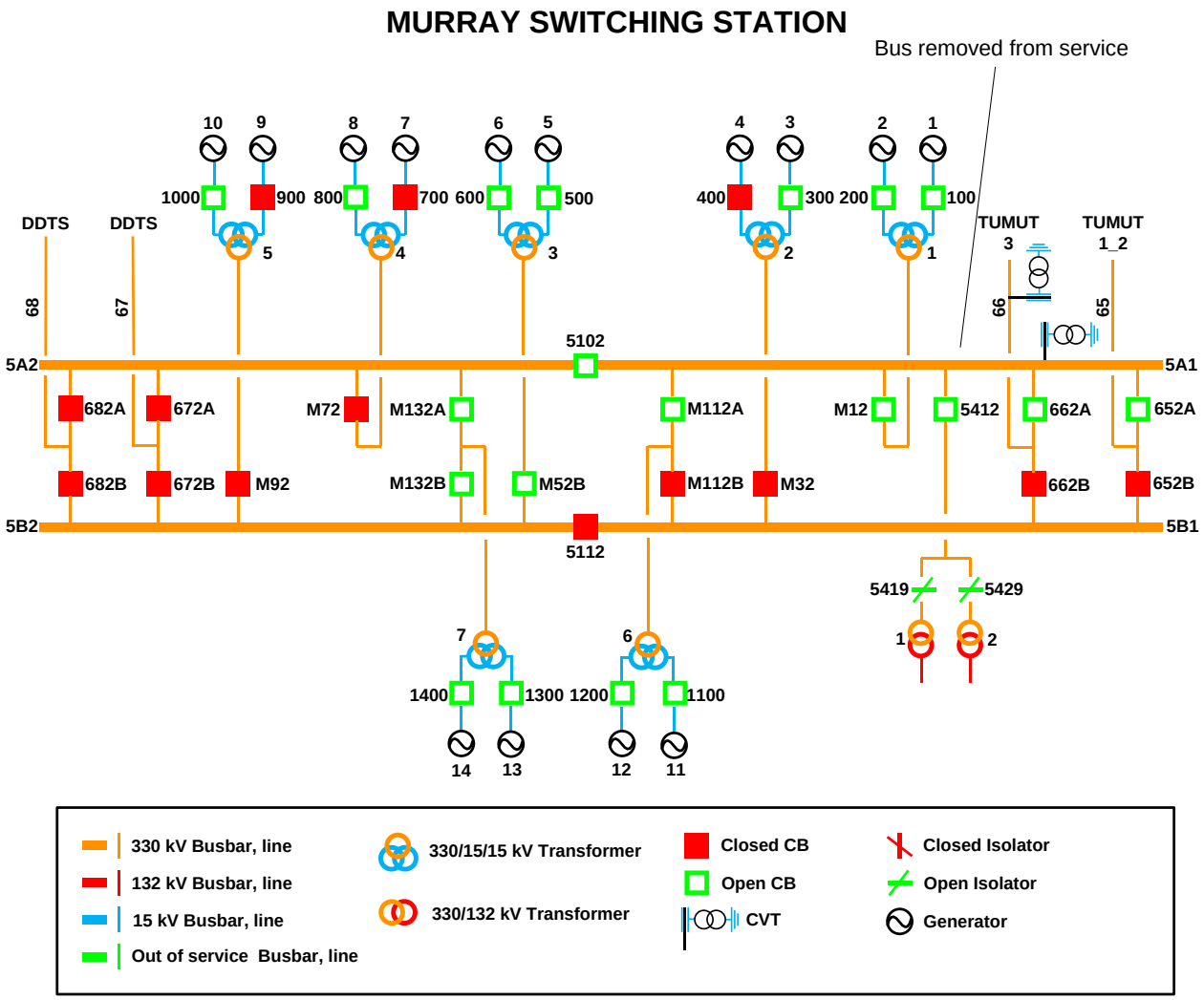
TransGrid immediately identified and rectified by the inadvertent CVT isolation.

# 4 Pre-Incident State

The status of the power system prior to the incident is shown in Figure 1. For clarity only equipment relevant to this incident has been included in the diagram. The diagram shows No. 5A1 330 kV busbar at MSS out of service for planned work.

[1] *NER* v59 Clause 4.8.15(a)(1)(i) and AEMC Reliability Panel Guidelines for Identifying Reviewable Operating Incidents.
[2] *NER* v59 Clause 4.8.15 (b)

**Figure 1 - Status of the power system prior to the incident**




## 5 Incident Event Log

The sequence of events comprising the incident are itemised in Table 1. The incident spanned approximately two minutes from the trip of the 330 kV CB 662B at MSS.

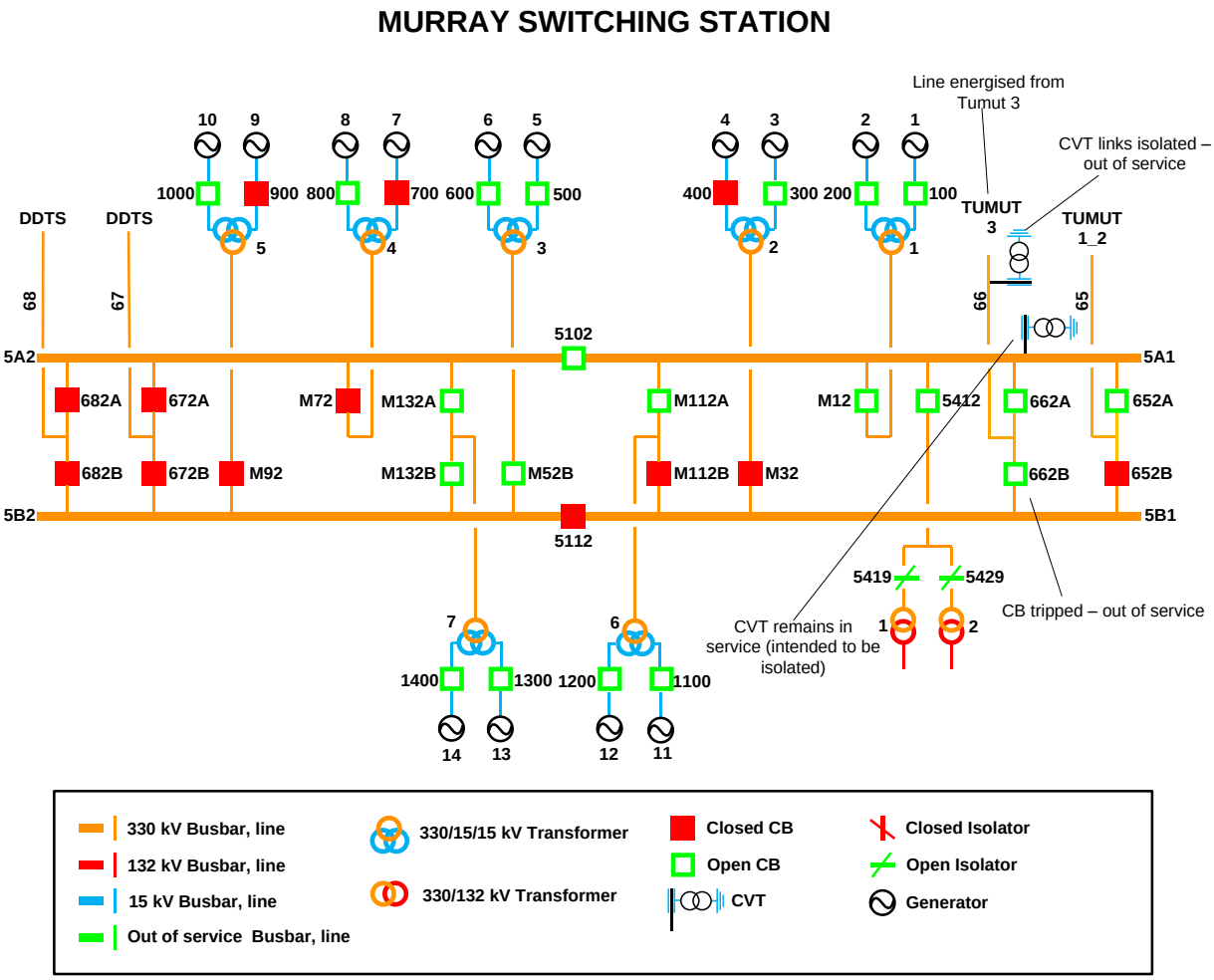
**Table 1 – Event Log**

| Date and Time | Event |
|---|---|
| 1729 hrs 18 November 2013 | Secondary links of the CVT on the Murray – Tumut 3 No.66 330 kV transmission line inadvertently isolated. |
| 1729 hrs 18 November 2013 | The 330 kV CB 662B at MSS trips out of service. |
| 1731 hrs 18 November 2013 | Remedial action taken by TransGrid.<br>330 kV CB 662B at MSS manually reclosed by TransGrid. |

# 6 Post-Incident State

The status of the power system immediately after the incident is shown in Figure 2. The diagram shows the 330 kV CB 662B at MSS open and the Murray – Tumut 3 No. 66 330 kV transmission line energised from the Tumut end.

**Figure 2 - Status of the power system immediately after the incident**




# 7 Immediate Actions

The cause of the trip was immediately identified by TransGrid, and the links to the CVT were restored. At 1731 hrs the 330 kV CB 662B at MSS was reclosed manually by TransGrid. This prompt response obviated the need for AEMO to invoke constraints to manage power system security. TransGrid then advised AEMO that the cause of the event had been identified, resolved and was unlikely to reoccur.

AEMO should then have issued a market notice to inform the market that a non-credible contingency had occurred[3]. AEMO has since clarified and reinforced with its staff that the trip of a transmission line at one end is a non-credible contingency event and thereby requires a market notice to be issued.

# 8 Follow-up Actions

No further actions were required by TransGrid or AEMO.

[3] Section 11.3, SO_OP3715 AEMO Power System Security Guidelines

## 9 Power System Security

Following a non-credible contingency event AEMO is required to assess whether or not to reclassify the event as a credible contingency[4] and to report how re-classification criteria were applied[5]. AEMO has to determine if the condition that caused the non-credible contingency event has been resolved.

For this event AEMO did not reclassify the event as a credible contingency because TransGrid had promptly advised AEMO that the cause of the event had been identified, resolved and was unlikely to reoccur.

## 10 Conclusions

The trip of the 330 kV CB 662B at MSS was initiated by the inadvertent removal of CVT links during planned work.

Over the course of the incident, the response of AEMO and TransGrid was appropriate to maintain power system security.

AEMO should have issued a Market Notice declaring the incident to be a non-credible contingency and that a reclassification of the incident was not required.

## 11 Recommendations

There are no recommendations arising from this incident.

[4] *NER* v59 Clause 4.2.3A (c)
[5] *NER* v59 Clause 4.8.15 (ca)