# POWER SYSTEM INCIDENT REPORT TRIP OF DEDERANG–WODONGA AND WODONGA–JINDERA 330 KV LINES ON 4 FEBRUARY 2011

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FINAL

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# Abbreviations and Symbols

| Abbreviation | Term |
|---|---|
| AEMO | Australian Energy Market Operator Ltd |
| EST | Eastern Standard Time |
| kV | kilovolt |
| MW | megawatt |
| MWh | megawatt hour (also MW·h) |
| NEM | National Electricity Market |
| EMS | Energy Management System |
| MMS | Market Management System |

# 1 Introduction

At 2030 hrs on 4 February 2011, the Dederang–Wodonga 330 kV line tripped. The line auto-reclosed at the Dederang end only. At the same time, the 060 Wodonga–Jindera 330 kV line opened at Jindera. As a result, 59 MW of customer load at Wodonga was interrupted until the Dederang–Wodonga line was manually closed at Wodonga at 2032 hrs. Lightning was reported in the area at the time of the incident. The 060 Wodonga–Jindera 330 kV line forms part of the interconnection between NSW and Victoria.

This report has been prepared 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 SP AusNet, TransGrid, and data from AEMO's Market Management System (MMS) and Energy Management System (EMS).

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

# 2 Summary of Events

At 2030 hrs on Friday 4 February 2011, the Dederang–Wodonga 330 kV line tripped and auto-reclosed at the Dederang end only. At the same time, the 060 Wodonga–Jindera 330 kV line opened at Jindera, interrupting supply to Wodonga 330 kV substation. Figures 1 and 2 show an overview of the 330 kV network between Dederang and Jindera before and after the incident. Lightning and thunderstorm activity were reported in the area at the time.

The auto-reclose of Dederang–Wodonga 330 kV line at Wodonga was unsuccessful as it requires a synchronising check, which was not possible because Wodonga lost supply when the Wodonga–Jindera line opened at Jindera at the same time.

This incident resulted in the interruption of 59 MW of customer load at Wodonga. This load was restored after the Dederang–Wodonga line was manually closed at Wodonga at 2032 hrs. The 060 Wodonga–Jindera line was also returned to service shortly after at 2035 hrs.

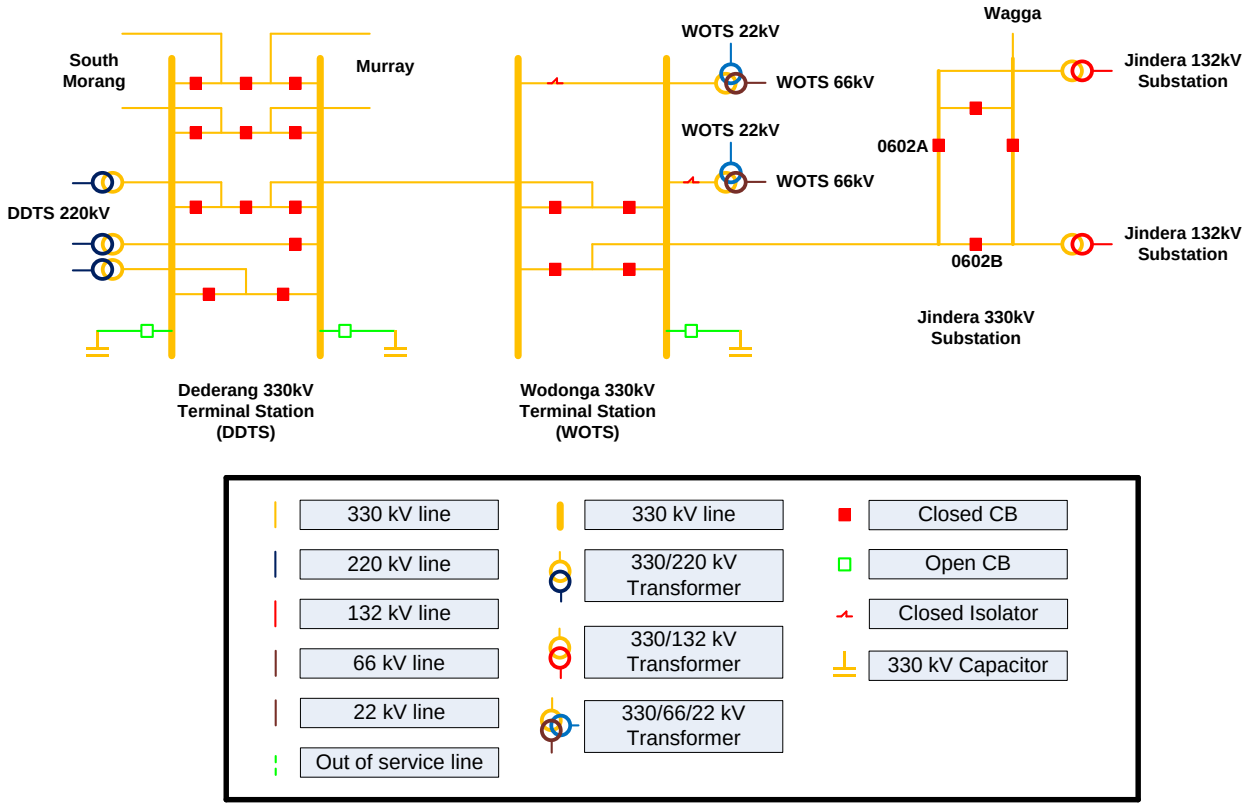


*Figure 1 – Overview of the 330 kV network between Dederang and Jindera (before the incident)*

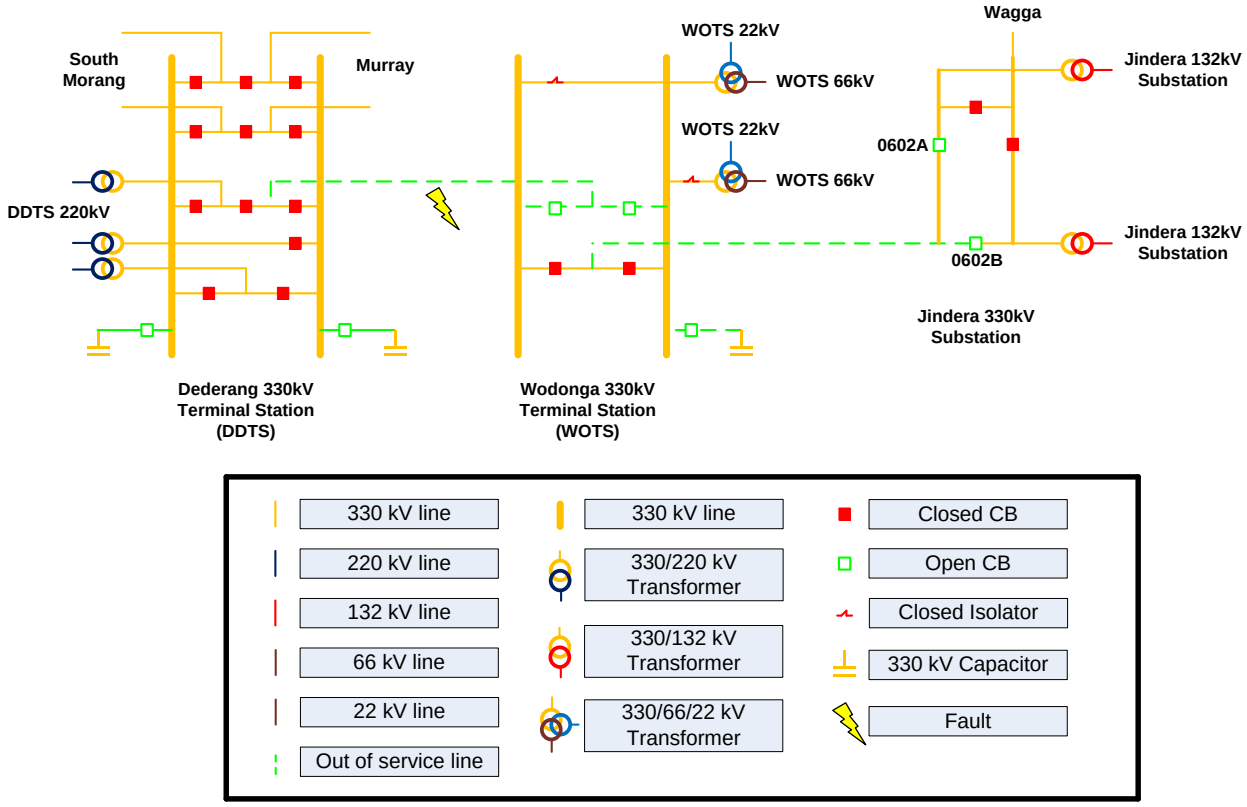


*Figure 2 – Overview of the 330 kV network between Dederang and Jindera (immediately after the incident)*

# 3 Immediate Actions

At 2126 hrs, AEMO issued a Market Notice 34390 declaring the simultaneous loss of both the Dederang–Wodonga and Wodonga–Jindera 330 kV lines as a single credible contingency.

Investigations by TransGrid revealed that the No. 1 protection system of the Jindera–Wodonga 330 kV line at Jindera operated at the same time (that is, at 2030 hrs) the Dederang–Wodonga 330 kV line tripped. Investigations further revealed that circuit breakers 0602A and 0602B of Jindera–Wodonga 330 kV line at Jindera opened due to the operation of the No. 1 protection system. This protection system uses distance protection in a blocking scheme, relying on a blocking signal from the remote end to ensure correct discrimination. The distance protection at Jindera operated in accelerated zone 2 time in the absence of a blocking signal from the Wodonga end.

SP AusNet advised that a wiring error was found in protection circuits of the Jindera–Wodonga 330 kV line at Wodonga, which prevented the blocking signals being sent to Jindera. This error was subsequently corrected and tested to confirm correct operation. SP AusNet believes this error may have been introduced when the protection signalling function was upgraded from the old power line carrier system to the new optical ground wire (OPGW) communications system.

On 25th February 2011 at 1033 hrs, AEMO issued a Market Notice 34646 cancelling the declaration of the simultaneous loss of both the Dederang–Wodonga and Wodonga–Jindera 330 kV lines as a single credible contingency.

# 4 Power System Security Assessment

There were no power system security violations flagged in AEMO's real-time power system security monitoring applications during the incident. The power system frequency remained within the frequency operating standards. All affected equipment was returned to service promptly after the incident.

# 5 Follow-up Actions

Nil.

# 6 Conclusions

At 2030 hrs on 04 February 2011, the Dederang–Wodonga 330 kV line tripped at both ends and then auto-reclosed at Dederang. This line trip is attributable to the lightning activity in the vicinity. The 060 Wodonga–Jindera 330 kV line opened at the Jindera end at the same time, interrupting 59 MW of customer load at Wodonga and blocking the auto-reclose of the Dederang–Wodonga 330 kV line. The customer load was restored when the Dederang–Wodonga 330 kV line was manually closed at Wodonga at 2032 hrs. The Wodonga–Jindera line tripped due to the absence of a protection blocking signal from Wodonga caused by a wiring error in protection at Wodonga. This error has since been corrected.

# 7 Recommendations

Nil.