

COLLINSVILLE UNITS 1, 2 & 3 TRIP – 5 MAY 2010

VERSION: 1
DATE: 6 August 2010
Final

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1 Introduction

At 08:32 hrs on 5th May 2010, No.1, 2 and 3 generating units at Collinsville power station tripped. No. 4 and 5 generating units were not in service at the time. Approximately 39MW was being generated at Collinsville at the time of the incident.

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.

Information supplied by CS Energy has been used to prepare this report. Data from AEMO's Energy Management and Market Systems has also been used in analysing the event.

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

2 Summary of Events

Two Uninterruptible Power Supplies (UPS), No. 1 (configured as the master unit) and No. 2 (slave unit), are installed at the Collinsville Power Station to provide secure and continuous power supply to essential power station equipment in the event of loss of normal 415V supply. This is mainly to ensure safe shutdown of the turbine, generator and boiler plant. The two UPS units are able to function independently of each other except that the two UPSs share the same frequency reference signal (sent from UPS No. 1 to No. 2).

Following the failure of an inverter within the No. 1 UPS on 18th April 2010, the Collinsville power station was left with only No. 2 UPS in service. On 5th May 2010, a service technician from the supplier of the UPS arrived at Collinsville power station to investigate and rectify the inverter fault.

While the service technician was working on the No. 1 UPS, there was a momentary interruption of the 'Frequency Reference Signal' to the No. 2 UPS, resulting in the shutdown of the No. 2 UPS and total loss of reliable supply to the power station. With both UPS units out of service, DC power supply to protection circuits was interrupted. A 'Unit Protection Supply Fail' alarm was raised at 08:31:54.

At 08:31:55, a 'Boiler Master Fuel Trip' protection operated to trip generating units 1, 2 and 3 by initiating trip signals to Collinsville CB 4212, 4222 and 4232 respectively. The 'Boiler Master Fuel Trip' was initiated due to the loss of 'Flame Detection' caused by the loss of UPS supply.

The generating units 2, 3 and 1 were brought back to service at 09:52 hrs, 10:01 hrs and 10:17 hrs respectively.

At 12:09 hrs, AEMO issued the Market Notice 31694 to notify market of the non-credible contingency event.

3 Power System Security Assessment

Approximately 39 MW of generation was interrupted as a result of the tripping of three Collinsville generating units. No voltage or frequency violations occurred as a result of the tripping. There were no violations reported in AEMO power system security monitoring applications related to the incident.

The protection systems operated as expected for a loss of flame detection. The generating units were returned to service following the restoration of the No. 2 UPS.

4 Follow Up Actions

Any further work on the UPS units was suspended following the tripping. It was decided that the maintenance of UPS would take place only when none of the generating units are in service. Following the procurement of spare parts, the faulty inverter was fixed and the No. 1 UPS was returned to service on 23rd May 2010.

Even though the risk of tripping was identified, the reliance on the common frequency source used by both UPS units was unclear to the staff involved. Since the incident, the 'Permit to Work' isolation guide has been amended with a warning on the link between the two UPSs.

An engineering review on the design and configuration of the UPS units was carried out in consultation with the UPS supplier. A recommendation from the UPS supplier is expected by end September 2010.

5 Conclusion

On 5th May 2010 at 08:32 hrs, generating units 1, 2 and 3 at Collinsville power station tripped due to the total loss of Reliable Supply caused by the shutdown of the No. 2 UPS unit during maintenance work on No.1 UPS which had failed earlier. CS Energy has taken suitable actions to minimise similar events in the future.

6 Recommendation

CS Energy will forward a copy of its engineering review report and proposed actions to enhance the reliability of the UPS supply at Collinsville power station to AEMO by end October 2010.