



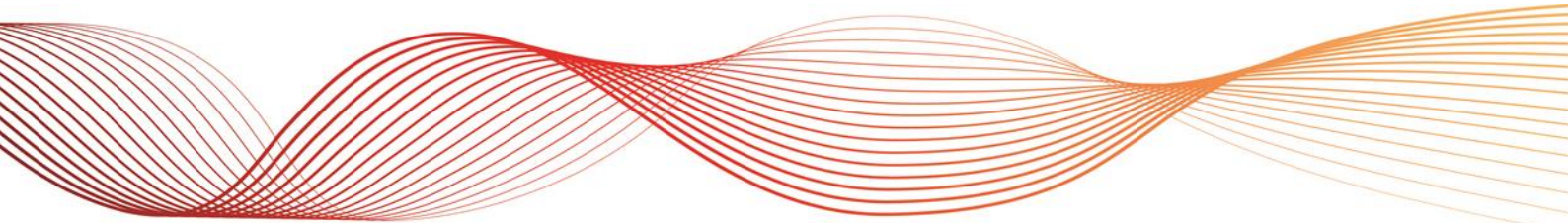
SCHEDULING ERROR REPORT

22 JANUARY 2018 –

INCORRECT SCADA INPUT AFFECTED DISPATCH INTERVAL

ENDING 1115 HRS

Published: **June 2018**





IMPORTANT NOTICE

Purpose

This report describes the circumstances surrounding a scheduling error identified by AEMO under NER 3.8.24(a)(2).

AEMO has prepared this report using information available as at 2 May 2018, unless otherwise specified.

All references to time in this report are based on Australian Eastern Standard Time (AEST).

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1. SUMMARY

On 22 January 2018, in accordance with clause 3.9.2B of the National Electricity Rules (NER), AEMO identified dispatch interval (DI) ending 1115 hrs as subject to review under its automated procedures¹ for identifying manifestly incorrect inputs (MII).

Under these procedures, the subsequent five DIs ending 1120 hrs to 1140 hrs were also automatically marked for review.

Due to higher priority actions required by the control room during this event, operators were not able to review and confirm the presence of MII within the 30-minute period allowed under the NER. After this 30-minute period had elapsed, the potential MII was automatically rejected in accordance with procedures, and spot prices were marked as firm for these intervals.

In addition to the above, DI ending 1115 hrs was also subject to an over-constrained dispatch (OCD)², and prices for this interval were subsequently revised to remove the impact of violating network constraint equations. However, this process does not remove the full impact of MII.

Following its investigation of the event, AEMO now considers that DI ending 1115 hrs should have been declared an MII, and that on this basis, a scheduling error occurred for this DI because dispatch outcomes were affected by incorrect SCADA inputs.

A total of 0.69 MWh of generation was constrained-off across all regions due to the scheduling error.

2. EVENT DETAILS

At 1104 hrs on 22 January 2018, incorrect Supervisory Control and Data Acquisition (SCADA) was injected at the Palmerston end of the Palmerston to Hadspen 1 and 2 220 kV lines. The Palmerston Substation is the assigned primary measurement end, where the measurement is used as an input to determine dispatch outcome.

The erroneous injection was triggered by an unexpected loss of the critical telemetered power flow data during an ongoing DC supply upgrade at the Palmerston Substation. While this data was incorrect, it was marked as being of good quality.

At 1111 hrs on 22 January 2018, the SCADA values at the Palmerston Substation were hand-dressed to the state estimated values.

DI ending 1115 was the only DI affected by the incorrect SCADA input of 776 MVA, which represented a step increase of 654 MVA compared to the previous DI. This resulted in a step change in the energy prices in Tasmania, in addition to a reversal of the Basslink interconnector target flows.

These changes exceeded the current automated monitoring thresholds, and DI ending 1115 hrs was automatically flagged as subject to review as a potential MII. A Market Notice (MN 60903) was issued to inform the market of the non-firm prices for DI ending 1115 hrs.

The NER require that MIIs are accepted or rejected within 30 minutes. During this period, automatic Market Notices (MN 60904-60908) were issued notifying that prices were not yet firm for DIs ending 1120 hrs to 1140 hrs.

Due to higher priority actions required by the control room during this time, operators were not able to review and confirm the presence of an MII. After 30 minutes had elapsed, the potential MII was automatically rejected and prices marked as firm for the period from DI ending 1120 hrs to DI ending 1140 hrs.

¹ Automated Procedures For Identifying Dispatch Intervals Subject To Review, available at https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/2017/Automated-Procedures-For-Identifying-Dispatch-Intervals-Subject-to-Review.docx.

² An OCD run occurs when the marginal price of one or more regions is greater than or equal to the market price cap (MPC), or less than or equal to the market floor price (MFP) due to the added cost of violated constraints. See https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Congestion-Information/2016/Over-Constrained-Dispatch-Rerun-Process.pdf.

Table 1 shows the Energy Regional Original Prices (ROP)³ for Tasmania and Victoria regions, and Basslink (T-V-MNSP1) interconnector target flows, for the previous DI (1110 hrs), and all DIs subject to review (DIs ending 1115 hrs to 1140 hrs).

Table 1 Regional ROP and interconnector target flows on 22 January 2018

		DI ending (hrs)						
		1110	1115	1120	1125	1130	1135	1140
Energy ROP (\$/MWh)	TAS	111.24	2,249,144	88.98	88.98	114.69	114.69	114.99
	VIC	116.64	278.62	120.89	115.77	120.89	120.89	120.89
Interconnector Target Flow	T-V-MNSP1	185	-35	125	230	217	217	199

For the dispatch outcome of DI ending 1115 hrs, AEMO published a Market Notice (MN 60909) to inform the market that the DI was not affected by MII, but that a manual rerun was required due to an unresolved OCD². AEMO manually resolved the OCD outcome on the next business day, 23 January 2018, and published firm prices (MN 60923).

Resolving the OCD only removes the impact of violating network constraint equations, and does not address the full impact of the erroneous SCADA data on dispatch outcomes. Following resolution of the OCD, while Tasmanian Frequency Control Ancillary Service (FCAS) prices reduced to \$33/MWh or below, the energy spot market price remained unchanged at \$14,200/MWh.

3. SCHEDULING ERROR

Under NER clause 3.8.24(a)(2), a scheduling error occurred for DI ending 1115 hrs on 22 January 2018 due to an undeclared MII when incorrect SCADA inputs affected dispatch outcomes.

To assess the market impact of this event, AEMO performed a simulation of dispatch outcomes assuming the incorrect SCADA data had been replaced with the last good value available from DI ending 1110 hrs.

Comparing the results of this simulation against actual market outcomes indicates that a total of 0.69 MWh of generation was constrained-off across all regions due to the scheduling error.

Under NER clause 3.16.2(a), Market Participants affected by a scheduling error may apply to a dispute resolution panel established under NER clause 8.2.6A for a determination on whether they are entitled to compensation.

4. CORRECTIVE ACTION

This incident was investigated by the Transmission Network Service Provider and identified an area of improvement in their work practices when working on secondary systems. Thorough investigation is ongoing to prevent reoccurrences.

5. CONCLUSION

Following its investigation of the event, AEMO now considers that DI ending 1115 hrs on 22 January 2018 should have been declared an MII, and that on this basis, a scheduling error occurred for that DI due to an undeclared MII when incorrect SCADA inputs affected dispatch outcomes.

A total of 0.69 MWh of generation was constrained-off across all regions due to the scheduling error.

³ The ROP is used in the price comparisons for the price revision process. The ROP includes the cost of any constraint violations, and can exceed the Market Price Cap (MPC), in which case it will be automatically revised before it is published as the Regional Reference Price (RRP) for the DI.



ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
DI	Dispatch Interval
FCAS	Frequency Control Ancillary Service
MII	Manifestly Incorrect Input
MN	Market Notice
MFP	Market Floor Price
MPC	Market Price Cap
MW	Megawatt
MWH	Megawatt Hour
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NER	National Electricity Rules
ROP	Regional Original Price
SCADA	Supervisory Control and Data Acquisition