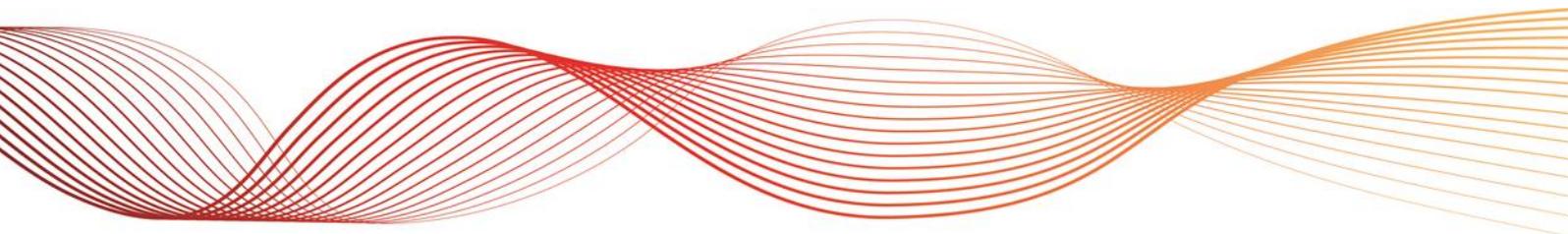




# NEM EVENT – DIRECTIONS 1-3 DECEMBER 2017

Published: **May 2018**





# IMPORTANT NOTICE

## Purpose

Where the Australian Energy Market Operator (AEMO) intervenes in the National Electricity Market (NEM) through the use of directions, AEMO must publish a report in accordance with National Electricity Rules (NER) clause 4.8.9(f) and 3.13.6A(a). This report satisfies those NER obligations, and is based on information available to AEMO at 22 May 2018.

Unless otherwise indicated, terms in this report have the same meanings as those defined in the NER.

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

## Disclaimer

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# CONTENTS

Purpose	2
Disclaimer	2
<b>1. SUMMARY</b>	<b>4</b>
<b>2. INTERVENTION ASSESSMENT</b>	<b>4</b>
2.1 The need for intervention	4
2.2 Assessment of market response and latest time to intervene	5
2.3 Decision to intervene	5
<b>3. INTERVENTION PROCESS</b>	<b>5</b>
3.1 Adequacy of responses to AEMO inquiries	6
3.2 Participant ability to comply with the intervention	6
<b>4. CHANGES TO DISPATCH OUTCOMES</b>	<b>6</b>
4.1 Application of Intervention Pricing	7
<b>5. CONCLUSIONS AND FURTHER ACTIONS</b>	<b>7</b>
<b>ABBREVIATIONS</b>	<b>8</b>

# TABLES

Table 1	Summary of the two South Australia directions between 1 December 2017 and 3 December 2017	4
Table 2	Timeline of key events between 1 December 2017 and 3 December 2017	5
Table 3	Estimated changes to local generation in each region (MWh)	7
Table 4	Estimated changes to interconnector flow between regions (MWh)	7



# 1. SUMMARY

To ensure adequate system strength for secure operation of the South Australia power system, certain combinations of synchronous generating units must be in service at all times<sup>1</sup>.

Clause 4.8.9 of the National Electricity Rules (NER) allows AEMO to intervene in the market by issuing directions or clause 4.8.9 instructions, if AEMO is satisfied that it is necessary to maintain or re-establish the power system to a secure, satisfactory, or reliable operating state. Section 116 of the National Electricity Law allows AEMO to issue directions to take certain action if AEMO considers that it is necessary to maintain power system security or for reasons of public safety.

Between 1 December 2017 and 3 December 2017, AEMO issued two directions to South Australian Market Participants to maintain power system security. The two directions are summarised in Table 1.

**Table 1 Summary of the two South Australia directions between 1 December 2017 and 3 December 2017**

Direction	Directed Participant	Issue time	Cancellation time	Direction instruction
<b>Osborne Power Station (PS)</b>	Origin Energy Electricity Ltd	2000 hrs, 1 December 2017	1800 hrs, 3 December 2017	Remain synchronised and follow dispatch targets effective from 2130 hrs on 1 December 2017.
<b>Torrens Island B unit 4</b>	AGL SA Generation Pty Ltd	0000 hrs, 2 December 2017	1500 hrs, 3 December 2017	Remain synchronised and follow dispatch targets effective from 0100 hrs on 2 December 2017.

# 2. INTERVENTION ASSESSMENT

## 2.1 The need for intervention

To ensure adequate system strength for secure operation of the South Australian power system, certain combinations of synchronous generating units must be in service at all times<sup>1</sup>. AEMO continues to investigate system strength requirements in South Australia, and updates the set of viable combinations on a regular basis. The need for intervention, and options considered, were assessed against the set of viable combinations available at 1 December 2017.

At 1312 hrs on 1 December 2017, AGL SA Generation Pty Ltd submitted a rebid de-committing Torrens Island B unit 4 capacity with effect from 0100 hrs on 2 December 2017<sup>2</sup>. As a result, AEMO determined there would be insufficient online synchronous generating units available to meet system strength requirements from 0100 hrs on 2 December 2017. AEMO assessed available options, and determined that directing Torrens Island B unit 4 to remain online was the only viable option.

Prior to the start of the initial direction, at 1558 hrs on 1 December 2017, Origin Energy Electricity Ltd submitted a rebid de-committing Osborne PS capacity with effect from 2130 hrs on 1 December 2017<sup>3</sup>. As a result, AEMO determined there would be insufficient online synchronous generating units available to meet system strength requirements from 2130 hrs on 1 December 2017. AEMO again assessed available options, and determined that a direction to Osborne PS to remain online was the only viable option.

<sup>1</sup> <http://www.aemo.com.au/Media-Centre/South-Australia-System-Strength-Assessment>.

<sup>2</sup> Rebid reason: 1231-F-91 PD PRICE F/CAST LOWER THAN AGL EST-

<sup>3</sup> Rebid reason: 1555A CONSTRAINT MANAGEMENT – V::N\_DDSM\_V2 SL.



## 2.2 Assessment of market response and latest time to intervene

Under NER clause 4.8.5A(a) and (c), AEMO must notify the market of any anticipated power system security or reliability issue and the latest time for market response before AEMO would need to intervene. AEMO issued two of these market notices (MN 60167 and 60170) at 1433 hrs and 1647 hrs respectively on 1 December 2017<sup>4</sup>.

AEMO contacted the Registered Participants who operate eligible synchronous generating units in South Australia to seek their availability for the relevant period, and to determine the latest time to intervene. Those Registered Participants indicated they did not intend to adjust their market offers, but identified units that would be available if directed.

Based on advised lead times, AEMO assessed that the latest time to intervene was at 2130 hrs on 1 December 2017 and again at 0100 hrs on 2 December 2017.

## 2.3 Decision to intervene

As insufficient market response had been provided by the latest time to intervene, AEMO evaluated the estimated costs provided for eligible synchronous generating units, and issued an initial direction to Origin Energy Electricity Ltd for Osborne PS to remain synchronised and follow dispatch targets from 2130 hrs on 1 December 2017.

Following the rebid de-committing Torrens Island B unit 4, a direction was also issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 0100 hrs on 2 December 2017.

# 3. INTERVENTION PROCESS

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the directions between 1 December 2017 and 3 December 2017<sup>5</sup>. Table 2 provides a high-level timeline of the intervention event.

**Table 2 Timeline of key events between 1 December 2017 and 3 December 2017**

Time	Events / comments
<b>1 December 2017</b>	
1433 hrs	AEMO published market notice seeking a market response and noting the latest time to intervene was at 0100 hrs on 2 December 2017 (MN 60167).
1647 hrs	AEMO published market notice seeking a market response and noting the latest time to intervene was at 2130 hrs on 1 December 2017 (MN 60170).
2000 hrs	Direction issued to Origin Energy Electricity Ltd for Osborne PS to remain synchronised and follow dispatch targets from 2130 hrs on 1 December 2017.
2011 hrs	AEMO published MN 60173 declaring a direction was issued to a South Australian participant at 2000 hrs.
2011 hrs	AEMO published MN 60174 declaring an AEMO intervention event commenced from dispatch interval (DI) ending 2005 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.
2130 hrs	Intervention constraints applied to Osborne PS in central dispatch from DI ending 2135 hrs.

<sup>4</sup> AEMO Market Notices are at <http://www.aemo.com.au/Market-Notices>.

<sup>5</sup> [http://aemo.com.au/-/media/Files/Electricity/NEM/Security\\_and\\_Reliability/Power\\_System\\_Ops/Procedures/SO\\_OP\\_3707---Intervention-Direction-and-Clause-4-8-9-Instructions.pdf](http://aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Power_System_Ops/Procedures/SO_OP_3707---Intervention-Direction-and-Clause-4-8-9-Instructions.pdf).



Time	Events / comments
<b>2 December 2017</b>	
0000 hrs	Direction issued to AGL SA Generation Pty Limited for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 0100 hrs on 2 December 2017.
0002 hrs	AEMO published MN 60176 declaring a direction was issued to a South Australian participant at 0000 hrs.
0003 hrs	AEMO published MN 60177 declaring an AEMO intervention event commenced from DI ending 0005 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.
0100 hrs	Intervention constraints applied to Torrens Island B unit 4 in central dispatch from DI ending 0105 hrs.
<b>3 December 2017</b>	
1508 hrs	AEMO published MN 60199 declaring that the direction to AGL SA Generation Pty Limited (Torrens Island B unit 4) was cancelled at 1500 hrs on 3 December 2017. Intervention constraints revoked for Torrens Island B unit 4.
1756 hrs	AEMO published MN 60205 declaring that the direction to Origin Energy Electricity Limited (Osborne PS) was cancelled at 1800 hrs on 3 December 2017. Intervention constraints were revoked for Osborne PS.

### 3.1 Adequacy of responses to AEMO inquires

NER 4.8.5A (d) permits AEMO to request information from Scheduled Network Service Providers, Scheduled Generators, Semi-Scheduled Generators, and Market Customers.

AEMO is satisfied with the timeliness, adequacy, and effectiveness of all responses to its requests for information prior to issuing directions between 1 December 2017 and 3 December 2017.

### 3.2 Participant ability to comply with the intervention

NER 4.8.9(d) requires that a Registered Participant must immediately notify AEMO of its inability to comply, or intention not to comply, with a direction or clause 4.8.9 instruction.

AEMO did not receive any indication that a Registered Participant would be unable to comply with the directions.

## 4. CHANGES TO DISPATCH OUTCOMES

The two directions to remain synchronised and follow dispatch targets resulted in approximately 7,379 megawatt hours (MWh) of generation being added to the market.

Under NER 3.8.1(b)(11), AEMO must ensure that, as far as reasonably practicable, the number of participants affected by the intervention, and the resulting changes to interconnector flows are minimised<sup>6</sup>. To achieve this objective, AEMO can apply counter-action constraints, however this was not practical during this direction because all South Australian scheduled units were not generating, or were running at or near technical minimum loading.

Table 3 and 4 summarise the change to dispatch outcomes resulting from this direction. These are estimated by comparing against a simulated dispatch with the direction removed.

<sup>6</sup> AEMO's power system operating procedure SO\_OP 3707 "Intervention, Direction and Clause 4.8.9 Instructions" describes this objective. In practice, AEMO meets the objective by selecting generating units located in the same region as the directed generation (and, if possible, belonging to the same participant) and then constraining the dispatch of the selected generating units by an equal and opposite amount to that of the directed generating units.

Directions in one region can cause dispatch changes to other regions. In particular, these changes are driven by economic co-optimisation within the market, and by the interplay between network constraint equations across multiple regions.

Of note is that while these directions displaced generation in South Australia, they also increased exports from the region. The increased exports, coupled with an impact on network constraints, resulted in displacement of generation in all regions.

**Table 3 Estimated changes to local generation in each region (MWh)**

	QLD	NSW	VIC	SA	TAS
<b>Without direction</b>	297,531	301,377	201,741	44,810	29,600
<b>Actual</b>	295,203	297,740	202,049	44,160 +7,379 <sup>A</sup>	29,095
<b>Change</b>	-2,328	-3,636	+309	+6,728	-505

A. 7,379 MWh direction-based generation

**Table 4 Estimated changes to interconnector flow between regions (MWh)**

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
<b>Without direction<sup>A</sup></b>	-3,151	-19,488	14,314	-4,692	-683	-15,319
<b>Actual<sup>A</sup></b>	-2,987	-17,303	20,520	-10,316	-1,685	-15,826
<b>Change<sup>B</sup></b>	164 MWh less to NSW	2,186 MWh less to NSW	6,206 MWh more to NSW	5,624 MWh more to VIC	1,002 MWh more to VIC	507 MWh more to TAS

A. Positive numbers are for flows flowing north or west, negative for flows flowing south or east.

B. Change = |Actual - Without direction|.

## 4.1 Application of Intervention Pricing

AEMO declares intervention pricing for periods subject to an AEMO intervention event. Under intervention pricing, NER 3.9.3 (b) requires that AEMO set the dispatch price and ancillary service prices at the value which AEMO, in its reasonable opinion, considers would have applied had the intervention event not occurred. AEMO determines and publishes these prices in accordance with the Intervention Pricing Methodology<sup>7</sup>.

Intervention pricing was applied for this event in accordance with NER 3.9.3(b), and for the full intervention period from DI ending 2005 hrs on 1 December 2017 until DI ending 1800 hrs on 3 December 2017.

## 5. CONCLUSIONS AND FURTHER ACTIONS

Between 1 December 2017 and 3 December 2017, AEMO issued two energy directions to South Australian Market Participants to maintain power system security, in response to a forecast lack of system strength.

AEMO is satisfied that all applicable procedures and processes were followed in assessing the need for intervention, determining the latest time to intervene, enacting and managing the intervention, applying appropriate intervention pricing, and ensuring the market remained informed at all stages.

AEMO is also satisfied with the timeliness and adequacy of participant responses and communication throughout.

<sup>7</sup> Intervention Pricing Methodology at <https://www.aemo.com.au/-/media/Files/PDF/Intervention-Pricing-Methodology-October-2014.pdf>.



## ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
DI	Dispatch Interval
MN	Market Notice
NEM	National Electricity Market
NER	National Electricity Rules
PD	Pre-Dispatch