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# **NEM Event – Directions 30 November to 3 December 2018**

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**September 2019**

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# 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 06 September 2019.

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

AEMO has made every reasonable effort to ensure the quality of the information in this report but cannot guarantee its accuracy or completeness. Any views expressed in this report are those of AEMO unless otherwise stated, and may be based on information given to AEMO by other persons.

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## ABBREVIATIONS

Abbreviation	Expanded name
<b>AEMO</b>	Australian Energy Market Operator
<b>AEST</b>	Australian Eastern Standard Time
<b>DI</b>	Dispatch Interval
<b>MN</b>	Market Notice
<b>NEM</b>	National Electricity Market
<b>NER</b>	National Electricity Rules

# Contents

<b>1.</b>	<b>Summary</b>	<b>4</b>
<b>2.</b>	<b>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.</b>	<b>Intervention process</b>	<b>5</b>
3.1	Adequacy of responses to AEMO inquiries	6
3.2	Participant ability to comply with the intervention	7
<b>4.</b>	<b>Dispatch and pricing outcomes</b>	<b>7</b>
4.1	Changes to dispatch outcomes due to the direction	7
4.2	Application of intervention pricing	8
<b>5.</b>	<b>Conclusions and further actions</b>	<b>8</b>

# Tables

Table 1	Summary of the five South Australia directions between 30 November and 3 December	4
Table 2	Timeline of key events between 30 November and 3 December 2018	6
Table 3	Estimated changes to local generation in each region (MWh)	7
Table 4	Estimated changes to interconnector flow between regions (MWh)	8

# 1. Summary

To ensure adequate system strength for secure operation of the South Australian (SA) 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 30 November and 3 December 2018, AEMO issued five directions to South Australian Market Participants to maintain power system security. These five directions are classified under one direction event and are summarised in Table 1.

**Table 1 Summary of the five South Australia directions between 30 November and 3 December**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Pelican Point Gas Turbine (GT) 12 and ST 18	Pelican Point Power Pty Ltd (ENGIE)	1	1700 hrs, 30 November 2018	1500 hrs, 3 December 2018	Remain synchronised and follow dispatch targets from 0700 hrs on 1 December 2018
Torrens Island A unit 3	AGL SA Generation Pty Ltd	1	2030 hrs, 1 December 2018	0505 hrs, 2 December 2018	Synchronise Torrens Island A unit 3 at 1500 hrs on 2 December 2018 and follow dispatch targets.  This direction was cancelled before effective
Torrens Island A unit 4	AGL SA Generation Pty Ltd	1	2030 hrs, 1 December 2018	1830 hrs, 2 December 2018	Synchronise Torrens Island A unit 4 at 1500 hrs on 2 December 2018 and follow dispatch targets.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	2030 hrs, 1 December 2018	1630 hrs, 2 December 2018	Synchronise Torrens Island B unit 4 at 1500 hrs on 2 December 2018 and follow dispatch targets.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1	0505 hrs, 2 December 2018	1830 hrs, 2 December 2018	Synchronise Torrens Island A unit 1 at 1500 hrs on 2 December 2018 and follow dispatch targets.

## 2. Intervention assessment

### 2.1 The need for intervention

To ensure adequate system strength for secure operation of the South Australian power system, suitable combinations of synchronous generating units must be in service at all times. AEMO continues to investigate

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

system strength requirements in South Australia, and updates the set of viable combinations regularly. The need for intervention, and options considered, were assessed against the set of viable combinations available from 30 November 2018 for the direction event.

ENGIE submitted an initial bid at 1035 hrs on 30 November 2018 to decommit Pelican Point Combined Cycle Gas Turbine (PPCCGT) from 0700 hrs on 1 December 2018<sup>2</sup>. This raised the need for the direction event.

As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements following these de-commitments and assessed all available options before directing.

## 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. For this direction event, AEMO issued market notice (MN 65647)<sup>3</sup> at 1430 hrs on 30 November 2018.

AEMO contacted all Registered Participants who operate eligible synchronous generating units in South Australia to confirm their availability and 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 the advised lead times and ongoing commercial operation of key units in South Australia, AEMO assessed the latest time to intervene for a possible market intervention as 1700 hrs on 30 November 2018.

## 2.3 Decision to intervene

With insufficient market response provided, AEMO evaluated the estimated costs, and issued directions to AGL SA Generation Pty Ltd (Torrens Island A units 1, 3 and 4 and Torrens Island B unit 4) and Pelican Point Power Ltd Pty (Pelican Point PS) for their respective units to either synchronise or remain synchronised, and follow dispatch targets.

AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

# 3. Intervention process

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the directions between 30 November and 3 December 2018<sup>4</sup>.

Table 2 provides a high-level timeline of the intervention event.

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<sup>2</sup> Rebid reason: 1030~P~INITIAL OFFER~

<sup>3</sup> AEMO Market Notices are at <http://www.aemo.com.au/Market-Notices>.

<sup>4</sup> AEMO. Power system operating procedure SO\_OP 3707, "Intervention, direction and clause 4.8.9 instructions", 11 September 2014, available at [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).

**Table 2 Timeline of key events between 30 November and 3 December 2018**

Time	Events / comments
<b>30 November 2018</b>	
1035 hrs	<ul style="list-style-type: none"> <li>ENGIE submitted a bid to decommit PPCCGT from 0700 hrs on 1 December 2018.</li> </ul>
1430 hrs	<ul style="list-style-type: none"> <li>AEMO published MN 65647 indicating a possible need for intervention from 0700 hrs on 1 December 2018 and seeking a market response. The latest time to intervene was noted as 1700 hrs on 30 November 2018.</li> </ul>
1700 hrs	<ul style="list-style-type: none"> <li>Direction issued to ENGIE for PPCCGT GT 12 and ST 18 to remain synchronised and follow dispatch targets from 0700 hrs on 1 December 2018.</li> <li>AEMO published MN 65649 declaring a direction was issued to a SA participant.</li> <li>AEMO published MN 65650 declaring that an AEMO intervention event had commenced and that all dispatch intervals (DIs) during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to PPCCGT in central dispatch from DI ending 0705 hrs on 1 December 2018.</li> </ul>
<b>1 December 2018</b>	
2030 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A units 3 and 4 and Torrens Island B unit 4 to synchronise and follow dispatch targets from 1500 hrs on 2 December 2018.</li> <li>Intervention constraints applied to TORRA4 in central dispatch from DI ending 1640 hrs on 2 December 2018.</li> <li>AEMO published MN 65662 extending the forecast end of the direction event.</li> </ul>
<b>2 December 2018</b>	
0505 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise and follow dispatch targets from 1500 hrs 2 December 2018.</li> <li>Intervention constraints applied to TORRA1 in central dispatch from DI ending 1505 hrs on 2 December 2018.</li> <li>The direction to AGL SA Generation Pty Ltd for Torrens Island A unit 3 was cancelled before it became effective.</li> </ul>
1630 hrs	<ul style="list-style-type: none"> <li>The direction to AGL SA Generation Pty Ltd for Torrens Island B unit 4 was cancelled as the unit failed to synchronise.</li> </ul>
1830 hrs	<ul style="list-style-type: none"> <li>The directions to AGL SA Generation Pty Ltd for Torrens Island A units 1 and 4 were also cancelled and intervention constraints were revoked as they were not a viable system strength option with Torrens Island B unit 4 unavailable.</li> </ul>
1852 hrs	<ul style="list-style-type: none"> <li>AEMO published MN 65680 extending the forecast end of the direction event and extended Pelican Point direction.</li> </ul>
<b>3 December 2018</b>	
1500 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point Power Ltd Pty was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 65684 declaring the cancellation of the AEMO intervention event and all associated directions.</li> </ul>

### 3.1 Adequacy of responses to AEMO inquiries

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 from AGL and ENGIE prior to issuing the directions between 30 November and 3 December 2018.

## 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 is satisfied with ENGIE complying with the direction listed in Table 1.

However, AEMO received notification from AGL that it would not be able to comply with the direction to synchronise Torrens Island A unit 4 and Torrens Island B unit 4 at 1500 hrs on 2 December. Torrens Island A unit 4 synchronised late at 1626 hrs on 2 December. Torrens Island B unit 4 had a turbine trip and could not come into service for the direction. As a result, AEMO cancelled the direction to all AGL units, as they were no longer a viable system strength option.

# 4. Dispatch and pricing outcomes

## 4.1 Changes to dispatch outcomes due to the direction

The directions to Torrens Island and Pelican Point resulted in approximately 9,646.89 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>5</sup>. AEMO considered the application of counter-action constraints to achieve this objective, but concluded this was not practical during this intervention.

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

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 market-based generation in South Australia, they also increased exports into Victoria. 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>	402,925	383,625	256,259	59,784	56,817
<b>Actual</b>	401,534	376,548	258,367	59,062 + 9,647 <sup>A</sup>	55,440
<b>Change</b>	<b>-1,391</b>	<b>-7,078</b>	<b>-2,108</b>	<b>8,925</b>	<b>-1,378</b>

A. 9,646.89 MWh is the directed energy.

<sup>5</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.

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

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
<b>Without direction<sup>A</sup></b>	-2,621	2,149	29,836	-3,094	-287	-559
<b>Actual<sup>A</sup></b>	-2,579	3,511	38,755	-8,686	-3,426	-1,915
<b>Change<sup>B</sup></b>	<b>42 MWh less into NSW</b>	<b>1,362 MWh more into QLD</b>	<b>8,919 MWh more into NSW</b>	<b>5,592 MWh more into VIC</b>	<b>3,140 MWh more into VIC</b>	<b>1,356 MWh less into TAS</b>

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

B. Change = |Actual - Without direction|.

## 4.2 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>6</sup>.

Intervention pricing applies whenever the direction meets the regional reference node test, that is, a direction hypothetically given to a plant at the regional reference node would have avoided the need for the direction.

AEMO's transfer limit advice on South Australia System Strength provides a number of feasible combinations of generating units that provide the needed level of system strength. All combinations of plant in the limit advice could be fully substituted by directing at the regional reference node (Torrens Island) in the current system strength scenarios. Accordingly, system strength directions in South Australia pass the regional reference node test and intervention pricing is appropriate.

Intervention pricing was applied for this event in accordance with NER 3.9.3(b), and for the full intervention period from dispatch interval (DI) ending 1705 hrs on 30 November 2018 until DI ending 1500 hrs on 3 December 2018.

# 5. Conclusions and further actions

Between 30 November and 3 December 2018, AEMO issued five directions to South Australian Market Participants to maintain power system security, in response to a forecast lack of system strength in the region.

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 seeking market response from all generators capable of meeting the system strength requirements. The market was informed after each direction was issued.

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

<sup>6</sup> Intervention Pricing Methodology, available at <https://www.aemo.com.au/-/media/Files/PDF/Intervention-Pricing-Methodology-October-2014.pdf>.