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# **NEM Event – Direction 02 to 06 August 2018**

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**May 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 02 May 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).

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# 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
PS	Power Station
SA	South Australia

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# 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 02 and 06 August 2018, AEMO issued nine directions to South Australian Market Participants to maintain power system security. These directions are summarised in Table 1.

**Table 1 Summary of the nine South Australia directions between 02 and 06 August 2018**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 4	AGL SA Generation Pty Ltd	1	2300 hrs, 02 August 2018	1300 hrs, 05 August 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 03 August 2018.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	2300 hrs, 02 August 2018	1400 hrs, 03 August 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 03 August 2018.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	1330 hrs, 03 August 2018	1600 hrs, 04 August 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 04 August 2018.
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1600 hrs, 03 August 2018	1700 hrs, 04 August 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 04 August 2018.
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1350 hrs, 04 August 2018	1530 hrs, 05 August 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 05 August 2018.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	1700 hrs, 04 August 2018	1430 hrs, 05 August 2018	Remain synchronised and follow dispatch targets from 2100 hrs on 04 August 2018.
Torrens Island A unit 2	AGL SA Generation Pty Ltd	1	1900 hrs, 04 August 2018	0730 hrs, 06 August 2018	Synchronise and follow dispatch targets from 0900 hrs on 05 August 2018.
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1930 hrs, 05 August 2018	0500 hrs, 06 August 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 06 August 2018.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	1	1930 hrs, 05 August 2018	0730 hrs, 06 August 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 05 August 2018.

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

# 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. 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 from 02 August 2018 for each of the direction events.

Between 02 and 06 August 2018, AGL SA Generation Pty Ltd and ENGIE submitted several bids to de-commit its units. An initial bid was submitted at 0838 hrs on 31 July to de-commit Torrens Island A unit 4 from 0030 hrs on 03 August 2018<sup>2</sup>. Furthermore, an initial bid was submitted at 1213 hrs on 01 August 2018 for only one Pelican Point GT to be available on 02 August 2018<sup>3</sup>. These rebids raised the need for the first direction. As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements from 0030 hrs on 03 August 2018.

## 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 this market notice (MN 63710)<sup>4</sup> at 2023 hrs on 02 August 2018.

AEMO contacted all participants who operate suitable synchronous generating units in South Australia to confirm their availability and the latest time to intervene. Those 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, AEMO assessed the latest time to intervene for a possible market intervention as 2300 hrs on 02 August 2018.

## 2.3 Decision to intervene

With insufficient market response provided, AEMO evaluated the estimated costs, and issued directions as listed in Table 1. AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

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<sup>2</sup> Rebid reason: 0835~F~00 INITIAL BID~

<sup>3</sup> Rebid reason: 12010~P~INITIAL OFFER~

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

# 3. Intervention process

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the directions between 02 and 06 August 2018<sup>5</sup>. Table 2 provides a high-level timeline of the intervention event.

**Table 2 Timeline of key events between 02 and 06 August 2018**

Time	Events / comments
31 July 2018	
0838 hrs	AGL SA Generation Pty Ltd submitted an initial bid to de-commit Torrens Island A unit 4 from 0030 hrs on 03 August 2018.
01 August 2018	
1213 hrs	ENGIE submitted an initial bid for only one Pelican Point GT to be available on 02 August 2018.
02 August 2018	
2023 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 2300 hrs on 02 August 2018 (MN 63710).
2300 hrs	<ul style="list-style-type: none"> <li>AEMO published MN 63713 declaring a direction was issued to a SA participant.</li> <li>AEMO published MN 63714 declaring that an AEMO intervention event had commenced from dispatch interval (DI) ending 2305 hrs and that all dispatch intervals during the AEMO intervention event would be intervention price DIs.</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to remain synchronised and follow dispatch targets from 0030 hrs on 03 August 2018 (Event 1 direction 1).</li> <li>Intervention constraints applied to Torrens Island A unit 4 in central dispatch from dispatch interval (DI) ending 0035 hrs on 03 August 2018.</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 0100 hrs on 03 August 2018 (Event 1 direction 2).</li> <li>Intervention constraints applied to Torrens Island B unit 4 in central dispatch from dispatch interval (DI) ending 0105 hrs on 03 August 2018.</li> </ul>
03 August 2018	
1330 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 0030 hrs on 04 August 2018 (Event 1 direction 3).</li> <li>Intervention constraints applied to Torrens Island B unit 4 in central dispatch from dispatch interval (DI) ending 0035 hrs on 04 August 2018.</li> </ul>
1400 hrs	The direction to Torrens Island B unit 4 (Event 1 direction 2) was cancelled and intervention constraints were revoked.
1600 hrs	<ul style="list-style-type: none"> <li>Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0030 hrs on 04 August 2018 (Event 1 direction 4).</li> <li>Intervention constraints applied to Pelican Point GT 12 in central dispatch from dispatch interval (DI) ending 0035 hrs on 04 August 2018.</li> </ul>
04 August 2018	
1350 hrs	<ul style="list-style-type: none"> <li>Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0030 hrs on 05 August 2018 (Event 1 direction 5).</li> <li>Intervention constraints applied to Pelican Point GT 12 in central dispatch from dispatch interval (DI) ending 0035 hrs on 05 August 2018.</li> </ul>
1600 hrs	The direction to Torrens Island B unit 4 (Event 1 direction 3) was cancelled and intervention constraints were revoked.
1700 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 2100 hrs on 04 August 2018 (Event 1 direction 6).</li> <li>Intervention constraints applied to Torrens Island B unit 4 in central dispatch from dispatch interval (DI) ending 2105 hrs on 04 August 2018.</li> <li>The direction to Pelican Point GT 12 (Event 1 direction 4) was cancelled and intervention constraints were revoked.</li> </ul>
1900 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 2 to synchronise and follow dispatch targets from 0900 hrs on 05 August 2018 (Event 1 direction 7).</li> </ul>

<sup>5</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).

Time	Events / comments
	<ul style="list-style-type: none"> <li>Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 0905 hrs on 05 August 2018.</li> </ul>
05 August 2018	
1300 hrs	The direction to Torrens Island A unit 4 (Event 1 direction 1) was cancelled and intervention constraints were revoked.
1430 hrs	The direction to Torrens Island B unit 4 (Event 1 direction 6) was cancelled and intervention constraints were revoked.
1530 hrs	The direction to Pelican Point GT 12 (Event 1 direction 5) was cancelled and intervention constraints were revoked.
1930 hrs	<ul style="list-style-type: none"> <li>Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0030 hrs on 06 August 2018 (Event 1 direction 8).</li> <li>Intervention constraints applied to Pelican Point GT 12 in central dispatch from dispatch interval (DI) ending 0035 hrs on 06 August 2018.</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 2230 hrs on 05 August 2018 (Event 1 direction 9).</li> <li>Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 2235 hrs on 05 August 2018.</li> </ul>
06 August 2018	
0500 hrs	The direction to Pelican Point GT 12 (Event 1 direction 8) was cancelled and intervention constraints were revoked.
0730 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island A unit 2 (Event 1 direction 7) was cancelled and intervention constraints were revoked.</li> <li>The direction to Torrens Island B unit 2 (Event 1 direction 9) was cancelled and intervention constraints were revoked.</li> </ul>
0750 hrs	AEMO published MN 63764 declaring the cancellation of the AEMO Intervention Event and all associated directions.

### 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 from AGL and ENGIE for information prior to issuing the directions between 02 and 06 August 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 did not receive any indication that a Registered Participant would be unable to comply with the direction. AEMO is satisfied with AGL and ENGIE complying with the directions listed in Table 1.

## 4. Dispatch and pricing outcomes

### 4.1 Changes to dispatch outcomes due to the direction

The directions to Pelican Point PS, Torrens Island A and Torrens Island B resulted in approximately 11,445 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>. 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 all nine 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 other NEM regions.

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

	QLD	NSW	VIC	SA	TAS
Without direction	471,601	540,579	424,182	100,467	124,556
Actual	469,496	541,270	415,213	100,676 + 11,445 <sup>A</sup>	123,641
Change	-2,105	691	-8,969	11,654	-915

A. 11,445 MWh is the directed energy.

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

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
Without direction <sup>A</sup>	-2,010	-13,572	66,991	6,170	-3,657	28,188
Actual <sup>A</sup>	-1,250	-12,237	68,350	-2,807	-6,149	27,327
Change <sup>B</sup>	760 MWh less into NSW	1335 MWh less into NSW	1359 MWh more into NSW	8977 MWh more into VIC	2492 MWh more into VIC	862 MWh less into VIC

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>7</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

<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.

<sup>7</sup> Intervention Pricing Methodology, available at

[http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security\\_and\\_Reliability/Dispatch/Policy\\_and\\_Process/2018/Intervention-Pricing-Methodology.pdf](http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/2018/Intervention-Pricing-Methodology.pdf)



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 DI ending 2305 hrs on 02 August 2018 until DI ending 0730 hrs on 06 August 2018.

## **5. Conclusions and further actions**

Between 02 and 06 August 2018, AEMO issued nine 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.