



# **NEM Event – Direction 16 to 24 September 2018**

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**July 2019**

# 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 12 April 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
PS	Power Station
SA	South Australia

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# 1. Summary

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>.

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 16 and 24 September 2018, AEMO issued 12 directions to South Australian Market Participants to maintain power system security. These three directions events are summarised in Table 1.

**Table 1 Summary of the 12 South Australia directions between 16 and 24 September 2018**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1	1900 hrs, 16 September 2018	1945 hrs, 16 September 2018	Synchronise at 0900 hrs on 17 September 2018 and follow dispatch targets.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	1945 hrs, 16 September 2018	1700 hrs, 17 September 2018	Synchronise at 0900 hrs on 17 September 2018 and follow dispatch targets.
Osborne Power Station (PS)	Origin Energy Electricity Ltd	1	0930 hrs, 17 September 2018	1630 hrs, 17 September 2018	Remain synchronised and follow dispatch targets from 1030 hrs on 17 September 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1	1145 hrs, 17 September 2018	1430 hrs, 19 September 2018	Synchronise at 2230 hrs on 17 September 2018 and follow dispatch targets.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	1415 hrs, 17 September 2018	0500 hrs, 19 September 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 17 September 2018.
Pelican Point Gas Turbine (GT) 11	Pelican Point Power Pty Ltd (ENGIE)	1	1440 hrs, 17 September 2018	1155 hrs, 18 September 2018	Remain synchronised and follow dispatch targets from 2300 hrs on 17 September 2018
Torrens Island B unit 1	AGL SA Generation Pty Ltd	1	0950 hrs, 18 September 2018	1515 hrs, 18 September 2018	Synchronise at 0030 hrs on 19 September 2018 and follow dispatch targets.
Torrens Island A unit 4	AGL SA Generation Pty Ltd	1	0950 hrs, 18 September 2018	1515 hrs, 18 September 2018	Synchronise at 0030 hrs on 19 September 2018 and follow dispatch targets.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1	0950 hrs, 19 September 2018	1600 hrs, 19 September 2018	Remain synchronised and follow dispatch targets from 1100 hrs on 19 September 2018.

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

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 1	AGL SA Generation Pty Ltd	2	1530 hrs, 22 September 2018	1835 hrs, 22 September 2018	Synchronise at 0130 hrs on 23 September 2018 and follow dispatch targets.
Torrens Island A unit 4	AGL SA Generation Pty Ltd	2	1530 hrs, 22 September 2018	1835 hrs, 22 September 2018	Synchronise at 0200 hrs on 23 September 2018 and follow dispatch targets.
Torrens Island B unit 3	AGL SA Generation Pty Ltd	3	1100 hrs, 23 September 2018	0040 hrs, 24 September 2018	Synchronise at 2330 hrs on 23 September 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 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 13 September 2018 for each of the direction events.

For the first direction event:

- AGL submitted a rebid at 1252 hrs on 16 September 2018 to de-commit Torrens Island B unit 1 from 0100 hrs on 17 September 2018<sup>2</sup>.
- ENGIE submitted a rebid at 1325 hrs on 16 September 2018 to de-commit one Pelican Point GT from 0900 hrs on 17 September 2018<sup>3</sup>.

For the second direction event:

- ENGIE submitted a rebid at 1340 hrs on 22 September 2018 to de-commit Pelican Point PS from 0200 hrs on 23 September 2018<sup>4</sup>.

For the third direction event:

- AGL submitted a rebid at 1503 hrs on 22 September 2018 to de-commit Torrens Island B unit 2 from 0000 hrs on 24 September 2018<sup>5</sup>

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.

<sup>2</sup> Rebid reason: 1231~P~050 CHG IN UNIT OPERATION~501 CHANGED D+1 COMMITMENT

<sup>3</sup> Rebid reason: 1215~F~REVISED TOLLING NOMINATION: #747~SL

<sup>4</sup> Rebid reason: 1225~F~REVISED TOLLING NOMINATION: #768~

<sup>5</sup> Rebid reason: 1500~P~050 CHG IN UNIT OPERATION~NEEDS TO COME OFFLINE BIT EARL

## 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 each of the direction events, AEMO issued market notices as listed in Table 2.

AEMO contacted all participants who operate suitable 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.

For each of the three direction events, AEMO assessed the latest time to intervene taking account of the advised lead times. The latest times to intervene are listed in Table 2.

## 2.3 Decision to intervene

As all participants contacted had indicated that no market response would be provided, AEMO evaluated the estimated costs, and issued the directions listed in Table 1. 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 16 and 24 September 2018<sup>6</sup>. Table 2 provides a high-level timeline of the intervention event.

**Table 2** Timeline of key events between 16 and 24 September 2018

Time	Events / comments
<b>16 September 2018</b>	
1252 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 1 from 0100 hrs on 17 September 2018.
1325 hrs	ENGIE submitted a rebid to de-commit a Pelican Point GT from 0900 hrs on 17 September 2018.
1538 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was 1800 hrs on 16 September 2018 (MN 64258).
1900 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise at 0900 hrs on 17 September 2018 and follow dispatch targets (TORRA1 direction 1).</li> <li>AEMO published MN 64260 declaring a direction was issued to a South Australian participant.</li> <li>AEMO published MN 64261 declaring that an AEMO intervention event had commenced from dispatch interval ending 0905 hrs on 17 September 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals.</li> </ul>
1945 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island A unit 1 (TORRA1 direction 1) was cancelled.</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to synchronise at 0900 hrs on 17 September 2018 and follow dispatch targets (TORRB4 direction 1).</li> </ul>

<sup>6</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 B unit 4 in central dispatch from dispatch interval ending 0905 hrs on 17 September 2018.</li> </ul>
<b>17 September 2018</b>	
0930 hrs	<ul style="list-style-type: none"> <li>Direction issued to Origin Energy Electricity Ltd for Osborne PS to remain synchronise and follow dispatch targets from 1030 hrs on 17 September 2018.</li> <li>Intervention constraints applied to Osborne PS in central dispatch from dispatch interval ending 1035 hrs on 17 September 2018.</li> </ul>
1145 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise at 2230 hrs on 17 September 2018 and follow dispatch targets (TORRA1 direction 2).</li> <li>Intervention constraints applied to Torrens Island A unit 1 in central dispatch from dispatch interval ending 2235 hrs on 17 September 2018.</li> </ul>
1415 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronise and follow dispatch targets from 2230 hrs on 17 September 2018 (TORRB4 direction 2).</li> <li>Intervention constraints applied to Torrens Island B unit 4 in central dispatch from dispatch interval 2235 hrs on 17 September 2018.</li> </ul>
1440 hrs	<ul style="list-style-type: none"> <li>Direction issued to ENGIE for Pelican Point GT 11 to remain synchronised and follow dispatch targets from 2230 hrs on 17 September 2018 (PPCCGT direction 1).</li> <li>Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 2305 hrs on 17 September 2018.</li> </ul>
1630 hrs	<ul style="list-style-type: none"> <li>The direction to Osborne PS was cancelled and intervention constraints were revoked.</li> </ul>
1700 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island B unit 4 (TORRB4 direction 1) was cancelled and intervention constraints were revoked.</li> </ul>
<b>18 September 2018</b>	
0950 hrs	<ul style="list-style-type: none"> <li>Directions issued to AGL SA Generation Pty Ltd for Torrens Island B unit 1 and Torrens Island A unit 4 to both synchronise at 0030 hrs on 19 September 2018 and follow dispatch targets (TORRB1 direction 1 and TORRA4 direction 1).</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 1100 hrs on 19 September 2018 (TORRB4 direction 3).</li> <li>Intervention constraints applied to Torrens Island B unit 4 in central dispatch from dispatch interval ending 1105 hrs on 19 September 2018.</li> </ul>
1155 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point GT 11 (PPCCGT direction 1) was cancelled and intervention constraints were revoked.</li> </ul>
1515 hrs	<ul style="list-style-type: none"> <li>The directions to Torrens Island B unit 1 (TORRB1 direction 1) and Torrens Island A unit 4 (TORRA4 direction 1) were cancelled.</li> </ul>
<b>19 September 2018</b>	
0500 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island B unit 4 (TORRB4 direction 2) was cancelled and intervention constraints were revoked.</li> </ul>
1430 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island A unit 1 (TORRA1 direction 2) was cancelled and intervention constraints were revoked.</li> </ul>
1600 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island B unit 4 (TORRB4 direction 3) was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 64307 declaring the cancellation of the direction.</li> </ul>
<b>22 September 2018</b>	

Time	Events / comments
1340 hrs	ENGIE submitted a rebid to de-commit Pelican Point PS from 0200 hrs on 23 September 2018.
1456 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 1500 hrs on 22 September 2018 (MN 64318).
1503 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 2 from 0000 hrs on 24 September 2018.
1530 hrs	<ul style="list-style-type: none"> <li>• Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise at 0130 hrs on 23 September 2018 and follow dispatch targets (TORRA1 direction 3).</li> <li>• Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to synchronise at 0200 hrs on 23 September 2018 and follow dispatch targets (TORRA4 direction 2).</li> <li>• AEMO published MN 64322 declaring a direction was issued to a South Australian participant.</li> <li>• AEMO published MN 64323 declaring that an AEMO intervention event had commenced from dispatch interval ending 0135 hrs on 23 September 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals.</li> </ul>
1628 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene would be estimated after the 1230 hrs pre-dispatch run on 23 September 2018 (MN 64324).
1835 hrs	<ul style="list-style-type: none"> <li>• The directions to Torrens Island A unit 1 (TORRA1 direction 3) and Torrens Island A unit 4 (TORRA4 direction 2) were cancelled.</li> <li>• AEMO published MN 64327 declaring the cancellation of the direction.</li> </ul>
<b>23 September 2018</b>	
1100 hrs	<ul style="list-style-type: none"> <li>• Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 3 to synchronise at 2330 hrs on 23 September 2018 and follow dispatch targets.</li> <li>• AEMO published MN 64329 declaring a direction was issued to a South Australian participant.</li> <li>• AEMO published MN 64330 declaring that an AEMO intervention event had commenced from dispatch interval ending 2335 hrs on 23 September 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals.</li> <li>• Intervention constraints applied to Torrens Island B unit 3 in central dispatch from dispatch interval ending 2335 hrs on 23 September 2018.</li> </ul>
<b>24 September 2018</b>	
0400 hrs	<ul style="list-style-type: none"> <li>• The direction to Torrens Island B unit 3 was cancelled and intervention constraints were revoked.</li> <li>• AEMO published MN 64375 declaring the cancellation of the direction.</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 from AGL, Origin, and ENGIE for information prior to issuing the directions between 16 and 24 September 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 that AGL, ENGIE and Origin complied with the directions listed in Table 1.



# 4. Dispatch and pricing outcomes

## 4.1 Changes to dispatch outcomes due to the directions

The directions to Torrens Island A, Torrens Island B, Osborne PS, and Pelican Point PS resulted in approximately 6,120 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>7</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 12 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 from South Australia. 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	344,780	371,668	251,782	63,321	81,285
Actual	343,288	370,349	249,557	62,813 + 6,120 <sup>A</sup>	80,858
Change	<b>-1,492</b>	<b>-1,319</b>	<b>-2,225</b>	<b>5,611</b>	<b>-427</b>

A. 6,120 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>	-3,336	-30,817	9,743	-198	-514	19,093
Actual <sup>A</sup>	-3,204	-29,463	12,433	-4,940	-1,187	18,695
Change <sup>B</sup>	<b>132 MWh less into NSW</b>	<b>1,355 MWh less into NSW</b>	<b>2,690 MWh more into NSW</b>	<b>4,742 MWh more into VIC</b>	<b>674 MWh more into VIC</b>	<b>398 MWh less into VIC</b>

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

B. Change = |Actual - Without direction|.

<sup>7</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.

## 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>8</sup>.

Intervention pricing applies whenever the direction meets the region reference node test, that is a direction at the region 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 can be fully substituted by directing at the region reference node (Torrens Island) in the current system strength scenarios. Accordingly, system strength directions in South Australia pass the region 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 0905 hrs on 17 September 2018 until DI ending 1700 hrs on 17 September 2018.
- DI ending 2235 hrs on 17 September 2018 until DI ending 1600 hrs on 19 September 2018.
- DI ending 2335 hrs on 23 September 2018 until DI ending 0400 hrs on 24 September 2018.

# 5. Conclusions and further actions

Between 16 and 24 September 2018, AEMO issued 12 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.

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<sup>8</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).