



# NEM Event – Direction 14-19 July 2018

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**May 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 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
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 14 and 19 July 2018, AEMO issued five directions to South Australian Market Participants to maintain power system security. These five directions events are summarised in Table 1.

Table 1 **Summary of the five South Australia directions between 14 and 19 July 2018**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1630 hrs, 14 July 2018	1430 hrs, 15 July 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 15 July 2018.
Pelican Point GT 12	ENGIE	2	1630 hrs, 15 July 2018	0600 hrs, 16 July 2018	Remain synchronised and follow dispatch targets from 2200 hrs on 15 July 2018.
Pelican Point GT 12	ENGIE	3	1630 hrs, 16 July 2018	0630 hrs, 17 July 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 16 July 2018.
Pelican Point GT 12	ENGIE	4	1630 hrs, 17 July 2018	1500 hrs, 18 July 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 18 July 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	5	1630 hrs, 18 July 2018	0700 hrs, 19 July 2018	Remain synchronised and follow dispatch targets from 2330 hrs on 18 July 2018.

## 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 12 July 2018 for each of the direction events.

For each of the five directions, the need for intervention arose due to rebids submitted by ENGIE to de-commit Pelican Point GT 12:

1. Rebid at 1315 hrs on 14 July 2018 to de-commit from 0300 hrs on 15 July 2018<sup>2</sup>.

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

<sup>2</sup> Rebid reason: 1310~A~RESPOND TO PREDISPATCH D+1~

2. Rebid at 1247 hrs on 15 July 2018 to de-commit from 2200 hrs on 15 July 2018<sup>3</sup>.
3. Rebid at 1303 hrs on 16 July 2018 to de-commit from 2230 hrs on 16 July 2018<sup>4</sup>.
4. Rebid at 1357 hrs on 17 July 2018 to de-commit from 0100 hrs on 18 July 2018<sup>5</sup>.
5. Rebid at 1247 hrs on 18 July 2018 to de-commit from 2300 hrs on 18 July 2018<sup>6</sup>.

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

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.

For each of the five 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 directions as 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 14 and 19 July 2018<sup>7</sup>. Table 2 provides a high-level timeline of the intervention event.

Table 2 **Timeline of key events between 14 and 19 July 2018**

Time	Events / comments
14 July 2018	
1538 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 0030 hrs on 15 July 2018 (MN 63451).
1630 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 15 July 2018 (PPCCGT direction 1).</li> <li>• AEMO published MN 63453 declaring a direction was issued to a South Australian participant.</li> </ul>

<sup>3</sup> Rebid reason: 1245~A~RESPOND TO PREDISPATCH D+1~

<sup>4</sup> Rebid reason: 1300~A~RESPOND TO PREDISPATCH D+1~

<sup>5</sup> Rebid reason: 1355~A~RESPOND TO PREDISPATCH D+1~

<sup>6</sup> Rebid reason: 1245~A~RESPOND TO PREDISPATCH D+1~

<sup>7</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>AEMO published MN 63454 declaring that an AEMO intervention event had commenced from DI 1635 hrs and that all dispatch intervals during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to Pelican Point Power Station (PS) in central dispatch from dispatch interval (DI) ending 0035 hrs on 15 July 2018.</li> </ul>
15 July 2018	
1328 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 2200 hrs on 15 July 2018 (MN 63470).
1430 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point GT 12 (PPCCGT direction 1) was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 63473 declaring the cancellation of the direction.</li> </ul>
1630 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 2200 hrs on 15 July 2018 (PPCCGT direction 2).</li> <li>AEMO published MN 63475 declaring a direction was issued to a South Australian participant.</li> <li>AEMO published MN 63476 declaring that an AEMO intervention event had commenced from 1635 hrs and that all dispatch intervals during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 2205 hrs on 15 July 2018.</li> </ul>
16 July 2018	
0600 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point GT 12 (PPCCGT direction 2) was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 63479 declaring the cancellation of the direction.</li> </ul>
1358 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 2230 hrs on 16 July 2018 (MN 63482).
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 2230 hrs on 16 July 2018 (PPCCGT direction 3).</li> <li>AEMO published MN 63485 declaring a direction was issued to a South Australian participant.</li> <li>AEMO published MN 63486 declaring that an AEMO intervention event had commenced from DI 1635 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 2235 hrs on 16 July 2018.</li> </ul>
17 July 2018	
0630 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point GT 12 (PPCCGT direction 3) was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 63491 declaring the cancellation of the direction.</li> </ul>
1436 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 0100 hrs on 18 July 2018 (MN 63493).
1630 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 0100 hrs on 18 July 2018 (PPCCGT direction 4).</li> <li>AEMO published MN 63496 declaring a direction was issued to a South Australian participant.</li> <li>AEMO published MN 63497 declaring that an AEMO intervention event had commenced from DI 1635 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 0105 hrs on 18 July 2018.</li> </ul>
18 July 2018	
1407 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was at 2330 hrs on 18 July 2018 (MN 63506).
1500 hrs	<ul style="list-style-type: none"> <li>The direction to Pelican Point GT 12 (PPCCGT direction 4) was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 63510 declaring the cancellation of the direction.</li> </ul>
1630 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 2330 hrs on 18 July 2018.</li> <li>AEMO published MN 63512 declaring a direction was issued to a South Australian participant.</li> <li>AEMO published MN 63514 declaring that an AEMO intervention event had commenced from DI 1635 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.</li> <li>Intervention constraints applied to Pelican Point GT in central dispatch from DI ending 2335 hrs on 18 July 2018.</li> </ul>
0700 hrs	<ul style="list-style-type: none"> <li>The direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 63522 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 14 and 19 July 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 the relevant participants 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 GT 12 and Torrens Island A unit 1 resulted in approximately 8,063 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>8</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 five 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	310,271	366,359	268,040	63,444	73,768
Actual	309,099	362,682	266,559	62,993 + 8,063 <sup>A</sup>	73,208
Change	-1,172	-3,677	-1,480	+7,612	-560

<sup>8</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.

A. 8,063 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>	-2,148	-15,699	33,974	1,040	-1,662	13,002
Actual <sup>A</sup>	-2,038	-14,666	38,921	-3,871	-4,180	12,474
Change <sup>B</sup>	110 MWh less into NSW	1,034 MWh less into NSW	4,947 MWh more into NSW	4,911 MWh more into VIC	2,518 MWh more into VIC	528 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>9</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:

- DI ending 0035 hrs on 15 July 2018 until DI ending 1430 hrs on 15 July 2018.
- DI ending 2205 hrs on 15 July 2018 until DI ending 0600 hrs on 16 July 2018.
- DI ending 2235 hrs on 16 July 2018 until DI ending 0630 hrs on 17 July 2018.
- DI ending 0105 hrs on 18 July 2018 until DI ending 1500 hrs on 18 July 2018.
- DI ending 2335 hrs on 18 July 2018 until DI ending 0700 hrs on 19 July 2018.

# 5. Conclusions and further actions

Between 14 and 19 July 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

<sup>9</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).

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.