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# **NEM Event – Directions 13 to 14 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

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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 13 and 14 December 2018, AEMO issued four directions to South Australian Market Participants to maintain power system security. These four directions are classified under one direction event and are summarised in Table 1.

**Table 1 Summary of the four South Australia directions between 13 and 14 December**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
<b>Torrens Island A unit 2</b>	AGL SA Generation Pty Ltd	1	0700 hrs, 13 December 2018	1400 hrs, 14 December 2018	Synchronise Torrens Island A unit 2 at 2330 hrs on 13 December 2018 and follow dispatch targets
<b>Torrens Island A unit 3</b>	AGL SA Generation Pty Ltd	1	0700 hrs, 13 December 2018	1400 hrs, 14 December 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 13 December 2018
<b>Torrens Island B unit 1</b>	AGL SA Generation Pty Ltd	1	1830 hrs, 13 December 2018	1255 hrs, 14 December 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 14 December 2018 and follow dispatch targets.
<b>Quarantine Power Station (PS) unit 5</b>	Origin Energy Electricity Ltd	1	1223 hrs, 14 December 2018	1455 hrs, 14 December 2018	Synchronise Quarantine unit 5 at 1223 hrs on 14 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 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 13 December 2018 for the direction event.

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

For the direction event, the need for intervention arose due to:

1. AGL SA Generation Pty Ltd submitted an initial bid at 0737 hrs on 12 December 2018 to decommit Torrens Island A unit 2 from 2230 hrs on 13 December 2018<sup>2</sup>.
2. AGL SA Generation Pty Ltd submitted a bid at 1510 hrs on 12 December 2018 to decommit Torrens Island A unit 3 from 2230 hrs on 13 December 2018<sup>3</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 this direction event, AEMO issued this market notice (MN 65897)<sup>4</sup> at 1501 hrs on 12 December 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 0700 hrs on 13 December 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 2 and 3 and Torrens Island B unit 1) and Origin Energy Electricity Ltd (Quarantine PS unit 5) 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 13 and 14 December 2018<sup>5</sup>.

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

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<sup>2</sup> Initial bid: 0735~F~00 INITIAL BID~

<sup>3</sup> Rebid reason: 1230~F~001 PRIMARY RESPONSE TO D+1 PREDISPATCH~D+1/SL

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

<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).

**Table 2 Timeline of key events between 13 and 14 December**

Time	Events / comments
<b>12 December 2018</b>	
0737 hrs	<ul style="list-style-type: none"> <li>AGL SA Generation Pty Ltd submitted a bid to decommit Torrens Island A unit 2 from 2230 hrs on 13 December 2018.</li> </ul>
1501 hrs	<ul style="list-style-type: none"> <li>AEMO published MN 65897 indicating a possible need for intervention from 0000 hrs on 14 December 2018 and seeking a market response. The latest time to intervene was noted as 0700 hrs on 13 December 2018.</li> </ul>
1510 hrs	<ul style="list-style-type: none"> <li>AGL SA Generation Pty Ltd submitted a bid to decommit Torrens Island A unit 3 from 2230 hrs on 13 December 2018.</li> </ul>
<b>13 December 2018</b>	
0700 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to remain synchronised and follow dispatch targets from 2230 hrs on 13 December 2018.</li> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 2 to synchronise and follow dispatch targets from 2330 hrs on 13 December 2018.</li> <li>AEMO published MN 65905 declaring a direction was issued to a SA participant.</li> <li>AEMO published MN 65906 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 Torrens Island A unit 3 in central dispatch from DI ending 2235 hrs on 13 December 2018.</li> <li>Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 2335 hrs on 13 December 2018.</li> </ul>
1830 hrs	<ul style="list-style-type: none"> <li>Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 1 to remain synchronised and follow dispatch targets from 0030 hrs on 14 December 2018</li> <li>Intervention constraints applied to Torrens Island B unit 1 in central dispatch from DI ending 0035 on 14 December 2018.</li> </ul>
<b>14 December 2018</b>	
1223 hrs	<ul style="list-style-type: none"> <li>Direction issued to Origin Energy Electricity Ltd for Quarantine PS unit 5 to synchronise and follow dispatch targets from 1223 hrs on 14 December 2018.</li> <li>Intervention constraints applied to QPS5 in central dispatch from DI ending 1235 hrs on 14 December 2018.</li> </ul>
1255 hrs	<ul style="list-style-type: none"> <li>The direction to AGL SA Generation Pty Ltd for Torrens Island B unit 1 was cancelled and intervention constraints were revoked.</li> </ul>
1400 hrs	<ul style="list-style-type: none"> <li>The directions to AGL SA Generation Pty Ltd for Torrens Island A units 2 and 3 were cancelled and intervention constraints were revoked.</li> </ul>
1455 hrs	<ul style="list-style-type: none"> <li>The direction to Origin Energy Electricity Ltd for Quarantine PS unit 5 was cancelled and intervention constraints were revoked.</li> <li>AEMO published MN 65971 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 13 and 14 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 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 Torrens Island and Quarantine power stations resulted in approximately 1,701.46 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 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>	113,836	128,737	66,380	20,775	20,488
<b>Actual</b>	113,355	128,390	65,561	20,870 + 1,701 <sup>A</sup>	20,440
<b>Change</b>	<b>-481</b>	<b>-347</b>	<b>-820</b>	<b>1,797</b>	<b>-47</b>

A. 1,701 MWh is the directed energy.

<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.

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

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
<b>Without direction<sup>A</sup></b>	-1,111	-2,294	-704	-2,892	-284	4,039
<b>Actual<sup>A</sup></b>	-1,111	-1,815	45	-4,224	-682	3,993
<b>Change<sup>B</sup></b>	<b>No change</b>	<b>479 MWh less into NSW</b>	<b>749 MWh more into NSW</b>	<b>1,332 MWh more into VIC</b>	<b>398 MWh more into VIC</b>	<b>46 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|.

## 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 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 0705 hrs on 13 December 2018 until DI ending 1455 hrs on 14 December 2018.

# 5. Conclusions and further actions

Between 13 and 14 December 2018, AEMO issued four 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>7</sup> Intervention Pricing Methodology, available at <https://www.aemo.com.au/-/media/Files/PDF/Intervention-Pricing-Methodology-October-2014.pdf>.