

NEM Event – Direction 2-8 July 2018

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).

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
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

Contents

1.	Summary	4
2.	Intervention assessment	ţ
2.1	The need for intervention	Į.
2.2	Assessment of market response and latest time to intervene	Ĩ
2.3	Decision to intervene	(
3.	Intervention process	
3.1	Adequacy of responses to AEMO inquiries	}
3.2	Participant ability to comply with the intervention	3
4.	Dispatch and pricing outcomes	9
4.1	Changes to dispatch outcomes due to directions	Ç
4.2	Application of intervention pricing	10
5.	Conclusions and further actions	10
Tak	oles	
Table 1	Summary of the 14 South Australia directions 2-8 July 2018	2
Table 2	Timeline of key events 2-8 July 2018	6
Table 3	Estimated changes to local generation in each region (MWh)	Ç
Table 4	Estimated changes to interconnector flow between regions (MWh)	Ç

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 times¹.

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 2 July 2018 and 8 July 2018, AEMO issued 14 directions to South Australian Market Participants to maintain power system security. These 14 directions are classified under three direction events and are summarised in Table 1.

Table 1 Summary of the 14 South Australia directions 2-8 July 2018

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1	2120 hrs, 2 July 2018	0800 hrs, 3 July 2018	Remain synchronised and follow dispatch targets from 2300 hrs on 2 July 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	2	1700 hrs, 3 July 2018	0800 hrs, 4 July 2018	Remain synchronised and follow dispatch targets from 2300 hrs on 3 July 2018.
Torrens Island A unit 4	AGL SA Generation Pty Ltd	2	1700 hrs, 3 July 2018	0800 hrs, 4 July 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 3 July 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	3	1415 hrs, 4 July 2018	0855 hrs, 5 July 2018	Synchronise Torrens Island A unit 1 at 1900 hrs on 4 July 2018 and follow dispatch targets.
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	3	1450 hrs, 4 July 2018	2000 hrs, 4 July 2018	Remain synchronised and follow dispatch targets from 1600 hrs on 4 July 2018.
Quarantine Power Station (PS) unit 5	Origin Energy Electricity Ltd	3	1515 hrs, 4 July 2018	0700 hrs, 7 July 2018	Synchronise Quarantine PS unit 5 at 1930 hrs on 4 July 2018 and follow dispatch targets.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	3	1530 hrs, 4 July 2018	0855 hrs, 5 July 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 4 July 2018.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	3	0940 hrs, 5 July 2018	1200 hrs, 6 July 2018	Remain synchronised and follow dispatch targets from 1030 hrs on 5 July 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	3	1505 hrs, 5 July 2018	1730 hrs, 7 July 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 5 July 2018.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	3	1515 hrs, 6 July 2018	1730 hrs, 7 July 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 6 July 2018.
Osborne PS	Origin Energy Electricity Ltd	3	1018 hrs, 7 July 2018	1300 hrs, 8 July 2018	Synchronise Osborne PS at 1700 hrs on 7 July 2018 and follow dispatch targets.

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

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Quarantine PS unit 5	Origin Energy Electricity Ltd	3	1315 hrs, 7 July 2018	1830 hrs, 7 July 2018	Synchronise Quarantine PS unit 5 at 1330 hrs on 7 July 2018 and follow dispatch targets.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	3	1725 hrs, 7 July 2018	1600 hrs, 8 July 2018	Remain synchronised and follow dispatch targets from 2130 hrs on 7 July 2018.
Torrens Island A unit 1	AGL SA Generation Pty Ltd	3	1727 hrs, 7 July 2018	1630 hrs, 8 July 2018	Remain synchronised and follow dispatch targets from 2130 hrs on 7 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 28 June 2018 and 5 July 2018 for each of the respective direction events.

ENGIE submitted a rebid at 1630 hrs on 2 July 2018 to de-commit Pelican Point GT12 from 0000 hrs on 3 July 2018². This raised the need for the first direction event.

ENGIE submitted a rebid at 1302 hrs on 3 July 2018 to de-commit Pelican Point GT12 from 0000 hrs on 4 July 2018³. AGL SA Generation Pty Ltd submitted rebids at 1342 hrs on 3 July 2018 to de-commit Torrens Island A units 1 and 4 from 2300 hrs on 3 July 2018 and 2230 hrs on 3 July 2018, respectively⁴. These rebids raised the need for the second direction event.

ENGIE submitted a rebid at 1134 hrs on 4 July 2018 to de-commit Pelican Point PS from 1600 hrs on 4 July 2018, following a trip earlier in the day⁵. AGL SA Generation Pty Ltd submitted a rebid at 1324 hrs on 4 July 2018 to de-commit Torrens Island B unit 2 from 2230 hrs on 4 July 2018⁶. These rebids raised the need for the third 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.

² Rebid reason: 1625~F~REVISED TOLLING NOMATION~

³ Rebid reason: 1250~A~RESPOND TO PREDISPATCH D+1~

⁴ Rebid reason: 1231~A~050 CHG IN AEMO PD~RESPONSE to D+1

 $^{^{5}}$ Rebid reason: 1130~P~GT11 BYPASS MAINTENANCE~

⁶ Rebid reason: 1231~P~050 CHG IN UNIT OPERATION~CHANGED D+1 UNIT COMMITMENT

For the first direction event, AEMO issued this market notice (MN 63320)⁷ at 2001 hrs on 2 July 2018. For the second direction event, AEMO issued the market notice (MN 63327) at 1353 hrs on 3 July 2018. For the third direction event, AEMO issued the market notice (MN 63349) at 1257 hrs on 4 July 2018.

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.

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 2100 hrs on 2 July 2018, 1700 hrs on 3 July 2018 and 1500 hrs on 4 July 2018 for the respective intervention events.

2.3 Decision to intervene

Following rebids by ENGIE and AGL SA Generation Pty Ltd to de-commit their Pelican Point and Torrens Island units, and with insufficient market response provided, AEMO evaluated the estimated costs and operational parameters, and issued the following directions to AGL SA Generation Pty Ltd at the start of each of the respective directions events:

- Torrens Island A unit 1 to remain synchronised at 2300 hrs on 2 July 2018 and follow dispatch targets
- Torrens Island A unit 1 to remain synchronised at 2300 hrs on 3 July 2018 and follow dispatch targets.
- Torrens Island A unit 1 to synchronise and follow dispatch targets from 1900 hrs on 4 July 2018.

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 2 July 2018 and 8 July 2018⁸. Table 2 provides a high-level timeline of the intervention event.

Table 2 Timeline of key events 2-8 July 2018

Time	Events / comments
2 July 2018	
1630 hrs	ENGIE submitted a rebid to de-commit Pelican Point GT12 from 0000 hrs on 3 July 2018.
2001 hrs	AEMO published MN 63320 indicating a possible need for intervention from 0000 hrs on 3 July 2018, and seeking a market response. The latest time to intervene was noted as 2100 hrs on 2 July 2018.
2120 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 2300 hrs on 2 July 2018 (TORRA1 direction 1). AEMO published MN 63322 declaring a direction was issued to a South Australian participant. AEMO published MN 63323 declaring that an AEMO intervention event had commenced and that all dispatch intervals (DIs) during the AEMO intervention event would be intervention price DIs. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 2305 hrs on 2 July 2018.
03 July 2018	

⁷ AEMO Market Notices are at http://www.aemo.com.au/Market-Notices.

⁸ 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.

Time	Events / comments						
0800 hrs	The direction to Torrens Island A unit 1 (TORRA1 direction 1) was cancelled and intervention constraints were revoked.						
	AEMO published MN 63324 declaring the cancellation of the direction.						
1302 hrs	ENGIE submitted a rebid to de-commit Pelican Point GT12 from 0000 hrs on 4 July 2018.						
1342 hrs	AGL SA Generation Pty Ltd submitted rebids to de-commit Torrens Island A units 1 and 4 from 2300 hrs on 3 July 2018 and 2230 hrs on 3 July 2018, respectively.						
1353 hrs	AEMO published MN 63327 indicating a possible need for intervention from 2300 hrs on 3 July 2018, and seeking a market response. The latest time to intervene was noted as 1700 hrs on 3 July 2018.						
1700 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island A units 1 and 4 to remain synchronised and follow dispatch targets from 2300 hrs on 3 July 2018 (TORRA1 direction 2) and 2230 hrs on 3 July 2018 (TORRA4 direction 1), respectively. AEMO published MN 63330 declaring a direction was issued to a South Australian participant. AEMO published MN 63331 declaring that an AEMO intervention event had commenced and that all dispatch intervals (DIs) during the AEMO intervention event would be intervention price DIs. Intervention constraints applied to Torrens Island A units 1 and 4 in central dispatch from DI ending 2305 hrs on 3 July 2018 and 2235 hrs on 3 July 2018, respectively. 						
4 July 2018							
0800 hrs	The directions to Torrens Island A unit 1 (TORRA1 direction 2) and 4 (TORRA4 direction 1) were cancelled and intervention constraints were revoked. ACM Published MAN 63247 declaring the appealship of the direction.						
	AEMO published MN 63347 declaring the cancellation of the direction. ENCIE or braithed a published as a security Delicary Delicary 1500 by any 4 but 2019 following a string.						
1134 hrs	ENGIE submitted a rebid to de-commit Pelican Point GT12 from 1600 hrs on 4 July 2018, following a trip earlier in the day.						
1257 hrs	AEMO published MN 63349 indicating a possible need for intervention from 1600 hrs on 4 July 2018, and seeking a market response. The latest time to intervene was noted as 1500 hrs on 4 July 2018.						
1324 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 2 from 2230 hrs on 4 July 2018.						
1415 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise at 1900 hrs on 4 July 2018 and follow dispatch targets (TORRA1 direction 3). Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 1905 hrs on 						
	4 July 2018.						
1450 hrs	 Direction issued to ENGIE for Pelican Point GT12 to remain synchronised and follow dispatch targets from 1600 hrs on 4 July 2018. AEMO published MN 63351 declaring a direction was issued to a South Australian participant. AEMO published MN 63355 declaring that an AEMO intervention event had commenced and that all dispatch intervals (DIs) during the AEMO intervention event would be intervention price DIs Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 1605 hrs on 4 July 						
	2018.						
1515 hrs	 Direction issued to Origin Energy Electricity Ltd for Quarantine PS unit 5 to synchronise at 1930 hrs on 4 July 2018 and follow dispatch targets (QPS5 direction 1). 						
10101113	 Intervention constraints applied to Quarantine PS unit 5 in central dispatch from DI ending 1935 hrs on 4 July 2018. 						
1530 hrs	 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 4 July 2018 (TORRB2 direction 1). Intervention constraints applied to Torrens Island B unit 2 in central dispatch from DI ending 2235 hrs on 4 July 2018. 						
2000 hrs	The direction to Pelican Point GT12 was cancelled and intervention constraints were revoked.						
5 July 2018							
0855 hrs	The directions to Torrens Island A unit 1 (TORRA1 direction 3) and Torrens Island B unit 2 (TORRB2 direction 1) were cancelled and intervention constraints were revoked.						
0940 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 1030 hrs on 5 July 2018 (TORRB2 direction 2). Intervention constraints applied to Torrens Island B unit 2 in central dispatch from DI ending 1035 hrs on 5 July 2018. 						

Time	Events / comments
1505 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 2230 hrs on 5 July 2018 (TORRA1 direction 4). Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 2235 hrs on 5 July 2018.
6 July 2018	
1200 hrs	The direction to Torrens Island B unit 2 (TORRB2 direction 2) was cancelled and intervention constraints were revoked.
1515 hrs	 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 6 July 2018 (TORRB2 direction 3). Intervention constraints applied to Torrens Island B unit 2 in central dispatch from DI ending 2235 hrs on 6 July 2018.
7 July 2018	
0700 hrs	The direction to Quarantine PS unit 5 (QPS5 direction 1) was cancelled and intervention constraints were revoked.
1018 hrs	 Direction issued to Origin Energy Electricity Ltd for Osborne PS to synchronise at 1700 hrs on 7 July 2018 and follow dispatch targets. Intervention constraints applied to Osborne PS in central dispatch from DI ending 1705 hrs on 7 July 2018.
1315 hrs	 Direction issued to Origin Energy Electricity Ltd for Quarantine PS unit 5 to synchronise at 1330 hrs on 7 July 2018 and follow dispatch targets (QPS5 direction 2). Intervention constraints applied to Quarantine PS unit 5 in central dispatch from DI ending 1335 hrs on 7 July 2018.
1725 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 2130 hrs on 7 July 2018 (TORRB2 direction 4). Intervention constraints applied to Torrens Island B unit 2 in central dispatch from DI ending 2135 hrs on 7 July 2018.
1727 hrs	 Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 2130 hrs on 7 July 2018 (TORRA1 direction 5). Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 2135 hrs on 7 July 2018.
1730 hrs	The directions to Torrens Island A unit 1 (TORRA1 direction 4) and Torrens Island B unit 2 (TORRB2 direction 3) were cancelled and intervention constraints were revoked.
1830 hrs	 The direction to Quarantine PS unit 5 (QPS5 direction 2) was cancelled and intervention constraints were revoked.
8 July 2018	
1300 hrs	The direction to Osborne PS was cancelled and intervention constraints were revoked.
1600 hrs	The direction to Torrens Island B unit 2 (TORRB2 direction 4) was cancelled and intervention constraints were revoked.
1630 hrs	 The direction to Torrens Island A unit 1 (TORRA1 direction 5) was cancelled and intervention constraints were revoked. AEMO published MN 63418 declaring the cancellation of the direction.

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, Origin and ENGIE prior to issuing the directions between 2 and 8 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 AGL, ENGIE and Origin complying with the directions listed in Table 1.

4. Dispatch and pricing outcomes

4.1 Changes to dispatch outcomes due to directions

The directions to Torrens Island A units 1 and 4, Torrens Island B unit 2, Pelican Point GT12, Quarantine PS unit 5, and Osborne PS resulted in approximately 13,954 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 minimised⁹. 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 decreased imports into South Australia. The decreased imports, 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
Without direction	702,058	847,038	638,930	143,093	162,037
Actual	697,046	840,305	637,102	143,333 + 13,954 ^A	161,933
Change	-4,651	-6,733	-1,828	14,195	-104

A. 13,954 MWh is the directed energy.

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

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
Without direction ^A	-3,116	-22,113	75,116	9,782	-411	26,518
Actual ^A	-2,676	-17,927	86,823	1,835	-6,412	26,470
Change®	441 MWh less into NSW	4,187 MWh less into NSW	11,707 MWh more into NSW	7,947 MWh less into SA	6,001 MWh more into VIC	49 MWh less into VIC

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

⁹ 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 Methodology¹⁰.

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 2125 hrs on 2 July 2018 until DI ending 0800 hrs on 3 July 2018.
- DI ending 1705 hrs on 3 July 2018 until DI ending 0800 hrs on 4 July 2018.
- DI ending 1420 hrs on 4 July 2018 until DI ending 1630 hrs on 8 July 2018.

Conclusions and further actions

Between 2 and 8 July 2018, AEMO issued 14 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.

¹⁰ Intervention Pricing Methodology, available at https://www.aemo.com.au/-/media/Files/PDF/Intervention-Pricing-Methodology-October-2014.pdf.