



NEM Event – Direction 23 April - 14 May 2018

August 2018

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 10 August 2018.

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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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 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 23 April and 14 May 2018, AEMO issued 27 directions to South Australian Market Participants to maintain power system security. The directions are summarised in Table 1.

Table 1 Summary of the 27 South Australia directions between 23 April and 14 May 2018

Direction	Directed Participant	No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 1	AGL SA Generation Pty Ltd	1	1825 hrs, 23 Apr 2018	1300 hrs, 1 May 2018	Synchronise at 0730 hrs on 24 April 2018 and follow dispatch targets.
		2	1300 hrs, 1 May 2018	1300 hrs, 4 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 2 May 2018.
		3	1525 hrs, 4 May 2018	2000 hrs, 5 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 5 May 2018.
		4	2105 hrs, 5 May 2018	1530 hrs, 6 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 6 May 2018.
		5	1430 hrs, 6 May 2018	1700 hrs, 8 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 7 May 2018.
		6	1420 hrs, 7 May 2018	1600 hrs, 11 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 9 May 2018.
		7	1430 hrs, 11 May 2018	1600 hrs, 12 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 12 May 2018.
		8	1700 hrs, 12 May 2018	1500 hrs, 13 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 13 May 2018.
		9	1500 hrs, 13 May 2018	1500 hrs, 14 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 14 May 2018.
Torrens Island A unit 2	AGL SA Generation Pty Ltd	1	1720 hrs, 8 May 2018	2200 hrs, 9 May 2018	Synchronise at 1400 hrs on 9 May 2018 and follow dispatch targets.
		2	2315 hrs, 9 May 2018	1700 hrs, 12 May 2018	Remain synchronised and follow dispatch targets from 2315 hrs on 9 May 2018.
		3	1400 hrs, 13 May 2018	0130 hrs, 14 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 14 May 2018.

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

Direction	Directed Participant	No.	Issue time	Cancellation time	Direction instruction
Torrens Island A unit 3	AGL SA Generation Pty Ltd	1	1710 hrs, 23 Apr 2018	1300 hrs, 27 Apr 2018	Synchronise at 0700 hrs on 24 April 2018 and follow dispatch targets.
		2	1200 hrs, 27 Apr 2018	2010 hrs, 27 Apr 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 28 April 2018. The direction was cancelled before effective.
		3	1715 hrs, 1 May 2018	1700 hrs, 5 May 2018	Synchronise at 1600 hrs on 2 May 2018 and follow dispatch targets.
		4	1300 hrs, 5 May 2018	1430 hrs, 8 May 2018	Remain synchronised and follow dispatch targets from 2000 hrs on 5 May 2018.
		5	1420 hrs, 7 May 2018	1720 hrs, 8 May 2018	Remain synchronised and follow dispatch targets from 1400 hrs on 9 May 2018. The direction was cancelled before effective.
Torrens Island A unit 4	AGL SA Generation Pty Ltd	1	2300 hrs, 24 Apr 2018	1600 hrs, 25 Apr 2018	Remain synchronised and follow dispatch targets from 0130 hrs on 25 April 2018.
		2	1400 hrs, 26 Apr 2018	2100 hrs, 27 Apr 2018	Remain synchronised and follow dispatch targets from 0000 hrs on 27 April 2018.
		3	2247 hrs, 27 Apr 2018	1530 hrs, 30 Apr 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 28 April 2018.
		4	1400 hrs, 30 Apr 2018	1600 hrs, 2 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 1 May 2018.
		5	1445 hrs, 10 May 2018	1330 hrs, 12 May 2018	Remain synchronised and follow dispatch targets from 0000 hrs on 12 May 2018.
		6	1700 hrs, 12 May 2018	1400 hrs, 13 May 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 13 May 2018.
Torrens Island B unit 1	AGL SA Generation Pty Ltd	1	1820 hrs, 23 Apr 2018	1000 hrs, 24 Apr 2018	Remain synchronised and follow dispatch targets from 0200 hrs on 24 April 2018.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	1	1325 hrs, 2 May 2018	0500 hrs, 4 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 3 May 2018.
Torrens Island B unit 3	AGL SA Generation Pty Ltd	1	1430 hrs, 6 May 2018	1530 hrs, 7 May 2018	Remain synchronised and follow dispatch targets from 0030 hrs on 7 May 2018.
Quarantine Power Station (PS) unit 5	Origin Energy Electricity Limited	1	2230 hrs, 9 May 2018	2330 hrs, 9 May 2018	Remain synchronised and follow dispatch targets from 2230 hrs on 9 May 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 on 23 April 2018.

AGL SA Generation Pty Ltd submitted a rebid at 1250 hrs on 23 April to de-commit Torrens Island B unit 1 from 0200 hrs on 24 April 2018². At 1559 hrs on 23 April 2018, ENGIE rebid Pelican Point Power Station (PS) to unavailable due to a trip at Pelican Point Gas Turbine (GT) 12. As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements from 0200 hrs on 24 April 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.

Following the trip of Pelican Point GT12 on 23 April 2018, ENGIE advised AEMO at 1700 hrs that Pelican Point GT12 would not be returning to service. AEMO contacted all eligible 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, AEMO did not publish a market notice under NER clause 4.8.5A(a) and (c) prior to issuing a direction. An immediate response was required and all eligible Participants had already been contacted regarding their availability following the trip of Pelican Point GT12.

2.3 Decision to intervene

As all eligible participants had indicated that no market response would be provided, AEMO evaluated the estimated costs, and issued directions to Origin Energy Electricity Limited and AGL SA Generation Pty Ltd for Torrens Island A unit 1, unit 2, unit 3, unit 4, Torrens Island B unit 1, unit 2, unit 3 and Quarantine PS unit 5 to synchronise/remain synchronised and follow dispatch targets, respectively. AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

² 1200~A~050 CHG IN AEMO PD~55 PD PRICE INCREASE SA \$114 AT 00:00

3. Intervention process

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the direction between 23 April and 14 May 2018³, other than the publication of market notices prior to the interventions under NER 4.8.5A(a) or (c). It was not reasonably practicable to publish those notices due to the timing and operational parameters associated with the first intervention, and it is noted that all Market Participants capable of providing a response had already been contacted. Table 2 provides a high-level timeline of the intervention event.

Table 2 Timeline of key events between 23 April and 14 May 2018

Time	Events / comments
23 April 2018	
1250 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 1 from 0200 hrs on 24 April 2018.
1559 hrs	ENGIE rebid Pelican Point Power Station (PS) to unavailable due to a trip at Pelican Point Gas Turbine (GT) 12.
1700 hrs	ENGIE contacted AEMO that Pelican Point Power Station (PS) would not be coming back into service. Based on the advised lead times, AEMO assessed that an immediate response was required.
1710 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to synchronise and follow dispatch targets from 0700 hrs on 24 April 2018 (1st Torrens Island A unit 3 direction). AEMO published MN62451 declaring a direction was issued to a SA participant from 1710 hrs on 23 April 2018. Intervention constraints applied to Torrens Island A unit 3 in central dispatch from DI ending 0705 hrs on 24 April 2018.
1724 hrs	AEMO published MN62452 declaring that an AEMO intervention event had commenced and that all dispatch intervals (DIs) during the AEMO intervention event would be intervention price DIs.
1820 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 1 to remain synchronised and follow dispatch targets from 0200 hrs on 24 April 2018. AEMO published MN62455 declaring a direction was issued to a SA participant from 1820 hrs on 23 April 2018. Intervention constraints applied to Torrens Island B unit 1 in central dispatch from DI ending 0205 hrs on 24 April 2018.
1825 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to synchronise and follow dispatch targets from 0730 hrs on 24 April 2018 (1st Torrens Island A unit 1 direction). AEMO published MN62456 declaring a direction was issued to a SA participant from 1825 hrs on 23 April 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0735 hrs on 24 April 2018.
24 April 2018	
1000 hrs	<ul style="list-style-type: none"> The direction to Torrens Island B unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62463 declaring the cancellation of the direction.
2300 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to remain synchronised and follow dispatch targets from 0130 hrs on 25 April 2018 (1st Torrens Island A unit 4 direction). AEMO published MN62479 declaring a direction was issued to a SA participant from 2300 hrs on 24 April 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0135 hrs on 25 April 2018.
25 April 2018	
1600 hrs	<ul style="list-style-type: none"> The 1st direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62484 declaring the cancellation of the direction.
26 April 2018	

³ 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
1400 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to remain synchronised and follow dispatch targets from 0000 hrs on 27 April (2nd Torrens Island A unit 4 direction). AEMO published MN62537 declaring a direction was issued to a SA participant from 1400 hrs on 26 April 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0005 hrs on 27 April 2018.
27 April 2018	
1200 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to remain synchronised and follow dispatch targets from 0030 hrs on 28 April 2018 (2nd Torrens Island A unit 3 direction). AEMO published MN62591 declaring a direction was issued to a SA participant from 1200 hrs on 27 April 2018. Intervention constraints were not applied to Torrens Island A unit 3 in central dispatch as the direction was cancelled before effective.
1300 hrs	<ul style="list-style-type: none"> The 1st direction to Torrens Island A unit 3 was cancelled and intervention constraints were revoked. AEMO published MN62589 declaring the cancellation of the direction.
2010 hrs	<ul style="list-style-type: none"> The 2nd direction to Torrens Island A unit 3 was cancelled. AEMO published MN62611 declaring the cancellation of the direction.
2100 hrs	<ul style="list-style-type: none"> The 2nd direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62615 declaring the cancellation of the direction.
2247 hrs	<ul style="list-style-type: none"> 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 28 April (3rd Torrens Island A unit 4 direction). AEMO published MN62614 declaring a direction was issued to a SA participant from 2247 hrs on 27 April 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0035 hrs on 28 April 2018.
28 April 2018	
29 April 2018	
30 April 2018	
1400 hrs	<ul style="list-style-type: none"> 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 1 May (4th Torrens Island A unit 4 direction). AEMO published MN62628 declaring a direction was issued to a SA participant from 1400 hrs on 30 April 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0035 hrs on 1 May 2018.
1530 hrs	<ul style="list-style-type: none"> The 3rd direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62622 declaring the cancellation of the direction.
1 May 2018	
1300 hrs	<ul style="list-style-type: none"> The 1st direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62636 declaring the cancellation of the direction.
1300 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0030 hrs on 2 May 2018 (2nd Torrens Island A unit 1 direction). AEMO published MN62640 declaring a direction was issued to a SA participant from 1300 hrs on 1 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0035 hrs on 2 May 2018.
1715 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to remain synchronised and follow dispatch targets from 1600 hrs on 2 May 2018 (3rd Torrens Island A unit 3 direction). AEMO published MN62646 declaring a direction was issued to a SA participant from 1715 hrs on 1 May 2018. Intervention constraints applied to Torrens Island A unit 3 in central dispatch from DI ending 1605 hrs on 2 May 2018.
2 May 2018	
1325 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 0030 hrs on 3 May 2018. AEMO published MN62652 declaring a direction was issued to a SA participant from 1325 hrs on 2 May 2018. Intervention constraints applied to Torrens Island B unit 2 in central dispatch from DI ending 0035 hrs on 3 May 2018.

Time	Events / comments
1600 hrs	<ul style="list-style-type: none"> The 4th direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62653 declaring the cancellation of the direction.
3 May 2018	
4 May 2018	
0500 hrs	<ul style="list-style-type: none"> The direction to Torrens Island B unit 2 was cancelled and intervention constraints were revoked. AEMO published MN62700 declaring the cancellation of the direction.
1300 hrs	<ul style="list-style-type: none"> The 2nd direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62708 declaring the cancellation of the direction.
1525 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0100 hrs on 5 May 2018 (3rd Torrens Island A unit 1 direction). AEMO published MN62712 declaring a direction was issued to a SA participant from 1525 hrs on 4 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0105 hrs on 5 May 2018.
5 May 2018	
1300 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to remain synchronised and follow dispatch targets from 2000 hrs on 5 May 2018 (4th Torrens Island A unit 3 direction). AEMO published MN62716 declaring a direction was issued to a SA participant from 1300 hrs on 5 May 2018. Intervention constraints applied to Torrens Island A unit 3 in central dispatch from DI ending 2005 hrs on 5 May 2018.
1700 hrs	<ul style="list-style-type: none"> The 3rd direction to Torrens Island A unit 3 was cancelled and intervention constraints were revoked. AEMO published MN62718 declaring the cancellation of the direction.
2000 hrs	<ul style="list-style-type: none"> The 3rd direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62723 declaring the cancellation of the direction.
2105 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0100 hrs on 6 May 2018 (4th Torrens Island A unit 1 direction). AEMO published MN62727 declaring a direction was issued to a SA participant from 2105 hrs on 5 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0105 hrs on 6 May 2018.
6 May 2018	
1430 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 3 to remain synchronised and follow dispatch targets from 0030 hrs on 7 May 2018. AEMO published MN62737 declaring a direction was issued to a SA participant from 1430 hrs on 6 May 2018. Intervention constraints applied to Torrens Island B unit 3 in central dispatch from DI ending 0035 hrs on 7 May 2018.
1430 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0100 hrs on 7 May 2018 (5th Torrens Island A unit 1 direction). AEMO published MN62735 declaring a direction was issued to a SA participant from 1430 hrs on 6 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0105 hrs on 7 May 2018.
1530 hrs	<ul style="list-style-type: none"> The 4th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62733 declaring the cancellation of the direction.
7 May 2018	
1420 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0100 hrs on 9 May 2018 (6th Torrens Island A unit 1 direction). AEMO published MN62748 declaring a direction was issued to a SA participant from 1420 hrs on 7 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0105 hrs on 9 May 2018.
1420 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 3 to remain synchronised and follow dispatch targets from 1400 hrs on 9 May 2018 (5th Torrens Island A unit 3 direction). AEMO published MN62756 declaring a direction was issued to a SA participant from 1420 hrs on 7 May 2018. Intervention constraints were not applied to Torrens Island A unit 3 in central dispatch as the direction got cancelled before effective.

Time	Events / comments
1530 hrs	<ul style="list-style-type: none"> The direction to Torrens Island B unit 3 was cancelled and intervention constraints were revoked. AEMO published MN62744 declaring the cancellation of the direction.
8 May 2018	
1430 hrs	<ul style="list-style-type: none"> The 4th direction to Torrens Island A unit 3 was cancelled and intervention constraints were revoked. AEMO published MN62750 declaring the cancellation of the direction.
1700 hrs	<ul style="list-style-type: none"> The 5th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62746 declaring the cancellation of the direction.
1720 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 2 to synchronise and follow dispatch targets from 1400 hrs on 9 May 2018 (1st Torrens Island A unit 2 direction). AEMO published MN62761 declaring a direction was issued to a SA participant from 1720 hrs on 8 May 2018. Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 1405 hrs on 9 May 2018.
1720 hrs	<ul style="list-style-type: none"> The 5th direction to Torrens Island A unit 3 was cancelled. AEMO published MN62762 declaring the cancellation of the direction.
9 May 2018	
2200 hrs	<ul style="list-style-type: none"> The 1st direction to Torrens Island A unit 2 was cancelled and intervention constraints were revoked. AEMO published MN62773 declaring the cancellation of the direction.
2230 hrs	<ul style="list-style-type: none"> Direction issued to Origin Energy Electricity Limited for Quarantine PS unit 5 to remain synchronised and follow dispatch targets from 2230 hrs on 9 May 2018. AEMO published MN62775 declaring a direction was issued to a SA participant from 2230 hrs on 9 May 2018. Intervention constraints applied to Quarantine PS unit 5 in central dispatch from DI ending 2235 hrs on 9 May 2018.
2315 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 2 to remain synchronised and follow dispatch targets from 2315 hrs on 9 May 2018 (2nd Torrens Island A unit 2 direction). AEMO published MN62777 declaring a direction was issued to a SA participant from 2315 hrs on 9 May 2018. Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 2320 hrs on 9 May 2018.
2330 hrs	<ul style="list-style-type: none"> The direction to Quarantine PS unit 5 was cancelled and intervention constraints were revoked. AEMO published MN62779 declaring the cancellation of the direction.
10 May 2018	
1445 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to remain synchronised and follow dispatch targets from 0000 hrs on 12 May (5th Torrens Island A unit 4 direction). AEMO published MN62791 declaring a direction was issued to a SA participant from 1445 hrs on 10 May 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0005 hrs on 12 May 2018.
11 May 2018	
1430 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0100 hrs on 12 May 2018 (7th Torrens Island A unit 1 direction). AEMO published MN62808 declaring a direction was issued to a SA participant from 1430 hrs on 11 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0105 hrs on 12 May 2018.
1600 hrs	<ul style="list-style-type: none"> The 6th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62806 declaring the cancellation of the direction.
12 May 2018	
1330 hrs	<ul style="list-style-type: none"> The 5th direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62814 declaring the cancellation of the direction.
1600 hrs	<ul style="list-style-type: none"> The 7th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62816 declaring the cancellation of the direction.
1700 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0030 hrs on 13 May 2018 (8th Torrens Island A unit 1 direction). AEMO published MN62820 declaring a direction was issued to a SA participant from 1700 hrs on 12 May 2018.

Time	Events / comments
	<ul style="list-style-type: none"> Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0035 hrs on 13 May 2018.
1700 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 4 to remain synchronised and follow dispatch targets from 0100 hrs on 13 May (6th Torrens Island A unit 4 direction). AEMO published MN62822 declaring a direction was issued to a SA participant from 1700 hrs on 12 May 2018. Intervention constraints applied to Torrens Island A unit 4 in central dispatch from DI 0105 hrs on 13 May 2018.
1700 hrs	<ul style="list-style-type: none"> The 2nd direction to Torrens Island A unit 2 was cancelled and intervention constraints were revoked. AEMO published MN62818 declaring the cancellation of the direction.
13 May 2018	
1400 hrs	<ul style="list-style-type: none"> The 6th direction to Torrens Island A unit 4 was cancelled and intervention constraints were revoked. AEMO published MN62828 declaring the cancellation of the direction.
1400 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 2 to remain synchronised and follow dispatch targets from 0100 hrs on 14 May 2018 (3rd Torrens Island A unit 2 direction). AEMO published MN62826 declaring a direction was issued to a SA participant from 1400 hrs on 13 May 2018. Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 0105 hrs on 14 May 2018.
1500 hrs	<ul style="list-style-type: none"> The 8th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62830 declaring the cancellation of the direction.
1500 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island A unit 1 to remain synchronised and follow dispatch targets from 0030 hrs on 14 May 2018 (9th Torrens Island A unit 1 direction). AEMO published MN62832 declaring a direction was issued to a SA participant from 1500 hrs on 13 May 2018. Intervention constraints applied to Torrens Island A unit 1 in central dispatch from DI ending 0035 hrs on 14 May 2018.
14 May 2018	
0130 hrs	<ul style="list-style-type: none"> The 3rd direction to Torrens Island A unit 2 was cancelled and intervention constraints were revoked. AEMO published MN62833 declaring the cancellation of the direction.
1500 hrs	<ul style="list-style-type: none"> The 9th direction to Torrens Island A unit 1 was cancelled and intervention constraints were revoked. AEMO published MN62841 declaring the cancellation of the direction.
1518 hrs	<ul style="list-style-type: none"> Cancellation of intervention pricing at 1500 hrs on 14 May 2018. AEMO publishes MN62843 declaring the cancellation of intervention pricing.

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 prior to issuing the directions between 23 April and 14 May 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.

4. Changes to dispatch outcomes

The directions to Torrens Island A unit 1, unit 2, unit 3, and unit 4, Torrens Island B unit 1, unit 2, and unit 3, and Quarantine PS unit 5 resulted in approximately 35,676 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 minimised⁴. AEMO considered the application of counter-action constraints to achieve this objective, but concluded this was not practical during this intervention.

Table 3 and 4 summarise the estimated change to dispatch outcomes resulting from this direction. 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 most regions other than Tasmania. The Basslink interconnector was unavailable during the direction period.

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

	QLD	NSW	VIC	SA	TAS
Without direction	3,071,543	3,203,339	2,429,807	456,251	532,878
Actual	3,063,728	3,178,609	2,424,971	454,717 + 35,676 ^A	532,878
Change	-7,815	-24,730	-4,836	34,142	0

A. 35,676 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	-36,582	-244,781	45,044	105,180	4,427	0
Actual ^A	-35,748	-238,008	76,941	73,246	792	0
Change ^B	834 MWh less into NSW	6,774 MWh less into NSW	31,897 MWh more into NSW	31,933 MWh less into SA	3634 MWh less into SA	0 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|.

4.1 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

⁴ 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.

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 Methodology⁵.

Intervention pricing was applied for this event in accordance with NER 3.9.3(b), and for the full intervention period from DI ending 1710 hrs on 23 April 2018 until DI ending 1500 hrs on 14 May 2018.

For the intervention pricing run, Torrens Island B unit 2 dispatch targets were restricted to the minimum enablement limit of its FCAS trapezium between DI ending 0035 hrs and DI ending 0235 hrs on 3 May 2018. While this is consistent with the Intervention Pricing Methodology, it can result in pricing outcomes that do not reflect how the market would have operated had the direction not occurred. AEMO manually resolved this issue to improve the quality of the intervention pricing run once it was identified.

There is a known issue that directed units can become restricted to the minimum enablement of their FCAS trapeziums in the intervention pricing run. AEMO has addressed this issue by following a process to increase Constraint Violation Penalty (CVP) on the intervention constraint. With a higher CVP, units can ramp down to below their minimum enablement limit in the intervention pricing run.

Post-event analysis, AEMO identified that the timing of intervention constraints used for Torrens Island A unit 1, 2 and 3 were incorrect. This can result in pricing outcomes that do not reflect how the market would have operated had the directions not occurred.

5. Conclusions and further actions

Between 23 April and 14 May 2018, AEMO issued 27 directions to South Australian Market Participants to maintain power system security, in response to a forecast lack of system strength in the region.

With the exception of publishing market notices prior to intervention, 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.

AEMO is required to publish market notices under NER 4.8.5A(a) and (c) even when aware that there will be no market response. The need for intervention to meet system strength requirements in South Australia generally arises at short notice, and is currently a frequent occurrence. Market notices are sometimes not published in advance because significant control room resources are dedicated to seeking and processing the information necessary to quantify the requirement and timing, then determine the most appropriate option for intervention.

AEMO is investigating changes in its processes to comply with these requirements while minimising the number of market notices issued. One measure AEMO has already implemented is to notify the market when AEMO has intervened and considers that further interventions are possible in the short term if synchronous generator availability changes.

⁵ Intervention Pricing Methodology <https://www.aemo.com.au/-/media/Files/PDF/Intervention-Pricing-Methodology-October-2014.pdf>.

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