



NEM Event – Directions 16 to 26 April 2019

October 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) clauses 4.8.9(f) and 3.13.6A(a). This report satisfies those NER obligations, and is based on information available to AEMO at 03 October 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.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this report:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it

ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
DI	Dispatch Interval
GT	Gas Turbine
MN	Market Notice
NEM	National Electricity Market
NER	National Electricity Rules

Contents

1.	Summary	4
2.	Intervention assessment	5
2.1	The need for intervention	5
2.2	Assessment of market response and latest time to intervene	5
2.3	Decision to intervene	6
3.	Intervention process	6
3.1	Adequacy of responses to AEMO inquiries	8
3.2	Participant ability to comply with the intervention	8
4.	Dispatch and pricing outcomes	8
4.1	Application of intervention pricing	9
5.	Conclusions and further actions	10

Tables

Table 1	Summary of the 11 South Australia directions between 16 and 26 April 2019	4
Table 2	Timeline of key events between 16 and 26 April 2019	6
Table 3	Estimated changes to local generation in each region (MWh)	9
Table 4	Estimated changes to interconnector flow between regions (MWh)	9

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 16 and 26 April 2019, AEMO issued 11 directions to South Australian Market Participants to maintain power system security across three events. The directions are summarised in Table 1.

Table 1 Summary of the 11 South Australia directions between 16 and 26 April 2019

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Torrens Island B unit 2	AGL SA Generation Pty Ltd	1	1800 hrs, 16 April 2019	1630 hrs, 17 April 2019	To remain synchronised and follow dispatch targets from 2130 hrs on 16 April 2019.
Torrens Island B unit 1	AGL SA Generation Pty Ltd	2	1500 hrs, 18 April 2019	1630 hrs, 19 April 2019	To remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	2	1500 hrs, 18 April 2019	1910 hrs, 18 April 2019	To synchronise and follow dispatch targets from 1000 hrs on 19 April 2019. Direction got cancelled before effective.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	2	1500 hrs, 18 April 2019	1910 hrs, 18 April 2019	To remain synchronised and follow dispatch targets from 2130 hrs on 18 April 2019. Direction got cancelled before effective.
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	2	1500 hrs, 18 April 2019	1500 hrs, 19 April 2019	To remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019.
Pelican Point GT 11	Pelican Point Power Pty Ltd	2	1800 hrs, 18 April 2019	1600 hrs, 20 April 2019	To remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019.
Pelican Point GT 12	Pelican Point Power Pty Ltd	2	1530 hrs, 19 April 2019	1500 hrs, 22 April 2019	To remain synchronised and follow dispatch targets from 2230 hrs on 19 April 2019.
Pelican Point GT 11	Pelican Point Power Pty Ltd	2	1530 hrs, 20 April 2019	1330 hrs, 21 April 2019	To remain synchronised and follow dispatch targets from 0000 hrs on 21 April 2019.
Pelican Point GT 11	Pelican Point Power Pty Ltd	2	1630 hrs, 21 April 2019	1600 hrs, 22 April 2019	To remain synchronised and follow dispatch targets from 0000 hrs on 22 April 2019.

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
Torrens Island B unit 1	AGL SA Generation Pty Ltd	2	2000 hrs, 19 April 2019	1630 hrs, 20 April 2019	To remain synchronised and follow dispatch targets from 0130 hrs on 20 April 2019.
Torrens Island B unit 2	AGL SA Generation Pty Ltd	3	0000 hrs, 25 April 2019	1230 hrs, 26 April 2019	To remain synchronised and follow dispatch targets from 0100 hrs on 25 April 2019.

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 times¹. 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 on 16 April 2019.

The need for intervention for each of the direction events arose due to the following respective rebids:

1. AGL SA Generation Pty Ltd submitted a rebid at 1324 hrs on 16 April 2019 for Torrens Island B unit 2 to de-commit at 2130 hrs on 16 April 2019².
2. AGL SA Generation Pty Ltd submitted a rebid at 1023 hrs on 18 April 2019 for Torrens Island B unit 1 to de-commit at 0030 hrs on 19 April 2019³. ENGIE also submitted a rebid at 1256 hrs on 18 April 2019 for Pelican Point Power Station to de-commit at 0030 hrs on 19 April 2019⁴.
3. AGL SA Generation Pty Ltd submitted an initial bid at 0950 hrs on 21 April 2019 for Torrens Island B unit 2 to de-commit at 0100 hrs on 25 April 2019⁵.

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 clauses 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 this market notification as listed in Table 2.

AEMO contacted all participants who operate suitable generating units in South Australia to confirm their availability and the latest time to intervene. Those participants indicated they did not intend to adjust their market offers, but identified units that would be available if directed.

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

² Rebid reason: 1230~F~001 PRIMARY RESPONSE TO D+1 PREDISPATCH~N

³ Rebid reason: 1020~P~050 CHG IN UNIT OPERATION~501 UNIT DECOMMITMENT FOR D+1 N

⁴ Rebid reason: 1250~A~RESPOND TO PREDISPATCH D+1~N

⁵ Bid reason: 0950~F~00 INITIAL BID~N

2.3 Decision to intervene

As all participants contacted had indicated that no market response would be provided, AEMO evaluated the estimated costs, and issued the directions listed in Table 1.

AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

3. Intervention process

AEMO considers that it followed all applicable processes under NER clause 4.8 for the management of the directions between 16 and 26 April 2019⁶. Table 2 provides a high-level timeline of the intervention event.

Table 2 Timeline of key events between 16 and 26 April 2019

Time	Events / comments
16 April 2019	
1324 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 2 from 2130 hrs on 16 April 2019.
1738 hrs	AEMO published a market notice (MN) seeking a market response and noting the latest time to intervene was 1800 hrs on 16 April 2019 (MN68123).
1800 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 (Event 1) to remain synchronised and follow dispatch targets from 2130 hrs on 16 April 2019. Intervention constraints applied in central dispatch from dispatch interval (DI) ending 2135 hrs on 16 April 2019. AEMO published MN 68125 declaring a direction was issued to a South Australian Participant. AEMO published MN 68126 declaring that an AEMO intervention event had commenced from DI ending 1805 hrs on 16 April 2019 and that all DIs during the AEMO intervention event would be intervention price DIs.
17 April 2019	
1630 hrs	<ul style="list-style-type: none"> The direction to Torrens Island B unit 2 (Event 1) was cancelled and intervention constraints were revoked. AEMO published MN 68134 declaring the cancellation of the AEMO intervention event and the associated direction.
1907 hrs	AEMO published MN 68135 seeking a market response and noting the latest time to intervene was 0500 hrs on 18 April 2019.
18 April 2019	
1023 hrs	AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 1 from 0030 hrs on 19 April 2019.
1210 hrs	AEMO published an update MN seeking a market response and noting the latest time to intervene was 1500 hrs on 18 April 2019 (MN 68140).
1256 hrs	ENGIE submitted a rebid to de-commit Pelican Point Power Station from 0030 hrs on 19 April 2019.
1500 hrs	<ul style="list-style-type: none"> Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 1 (Event 2 direction 1) to remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019. Intervention constraints applied in central dispatch from DI ending 0035 hrs on 19 April 2019.

⁶ 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
	<ul style="list-style-type: none"> • Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 (Event 2 direction 2) to synchronise and follow dispatch targets from 1000 hrs on 19 April 2019. No constraints required. • Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 (Event 2 direction 3) to remain synchronised and follow dispatch targets from 2130 hrs on 18 April 2019. No constraints required. • Direction issued to ENGIE for Pelican Point GT 12 (Event 2 direction 4) to remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019. Intervention constraints applied in central dispatch from DI ending 0035 hrs on 19 April 2019. • AEMO published MN 68141 declaring directions was issued to South Australian participants. • AEMO published MN68145 declaring that an AEMO intervention event had commenced from DI ending 1505 hrs on 18 April 2019 and that all DIs during the AEMO intervention event would be intervention price DIs.
1800 hrs	Direction issued to ENGIE for Pelican Point GT 11 (Event 2 direction 5) to remain synchronised and follow dispatch targets from 0030 hrs on 19 April 2019. Intervention constraints applied in central dispatch from DI ending 0035 hrs on 19 April 2019.
1910 hrs	The directions to Torrens Island B unit 2 and Torrens Island B unit 4 (Event 2 direction 2 and 3) were cancelled before taking effect.
19 April 2019	
1500 hrs	The direction to Pelican Point GT 12 (Event 2 direction 4) was cancelled and intervention constraints were revoked.
1530 hrs	Direction issued to ENGIE for Pelican Point GT 12 (Event 2 direction 6) to remain synchronised and follow dispatch targets from 2230 hrs on 19 April 2019. Intervention constraints applied in central dispatch from DI ending 2235 hrs on 19 April 2019.
1630 hrs	The direction to Torrens Island B unit 1 (Event 2 direction 1) was cancelled and intervention constraints were revoked.
2000 hrs	Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 (Event 2 direction 7) to remain synchronised and follow dispatch targets from 0130 hrs on 20 April 2019. Intervention constraints applied in central dispatch from DI ending 0135 hrs on 20 April 2019.
20 April 2019	
1530 hrs	Direction issued to ENGIE for Pelican Point GT 11 (Event 2 direction 8) to remain synchronised and follow dispatch targets from 0000 hrs on 21 April 2019. Intervention constraints applied in central dispatch from DI ending 0005 hrs on 21 April 2019.
1600 hrs	The direction to Pelican Point GT 11 (Event 2 direction 5) was cancelled and intervention constraints were revoked.
1630 hrs	The direction to Torrens Island B unit 2 (Event 2 direction 7) was cancelled and intervention constraints were revoked.
21 April 2019	
1330 hrs	The direction to Pelican Point GT 11 (Event 2 direction 8) was cancelled and intervention constraints were revoked.
1630 hrs	Direction issued to ENGIE for Pelican Point GT 11 (Event 2 direction 9) to remain synchronised and follow dispatch targets from 0000 hrs on 22 April 2019. Intervention constraints applied in central dispatch from DI ending 0005 hrs on 22 April 2019.
22 April 2019	
1500 hrs	The direction to Pelican Point GT 12 (Event 2 direction 6) was cancelled and intervention constraints were revoked.
1600 hrs	<ul style="list-style-type: none"> • The direction to Pelican Point GT 11 (Event 2 direction 9) was cancelled and intervention constraints were revoked. • AEMO published MN 68200 declaring the cancellation of the AEMO intervention event and the associated directions.

Time	Events / comments
23 April 2019	
1209 hrs	AGL SA Generation Pty Ltd submitted an initial bid to de-commit Torrens Island B unit 2 at 0100 hrs on 25 April 2019.
24 April 2019	
1619 hrs	AEMO published MN 68206 seeking a market response and noting the latest time to intervene was 0000 hrs on 25 April 2019.
25 April 2019	
0000 hrs	<ul style="list-style-type: none"> • Direction issued to AGL SA Generation Pty Ltd for Torrens Island B unit 2 (Event 3) to remain synchronised and follow dispatch targets from 0100 hrs on 25 April 2019. Intervention constraints applied in central dispatch from DI ending 0105 hrs on 25 April 2019. • AEMO published MN 68208 declaring a direction was issued to a South Australian Participant. • AEMO published MN 68209 declaring that an AEMO intervention event had commenced from DI ending 0005 hrs on 25 April 2019 and that all DIs during the AEMO intervention event would be intervention price DIs.
26 April 2019	
1230 hrs	<ul style="list-style-type: none"> • The direction to Torrens Island B unit 2 (Event 3) was cancelled and intervention constraints were revoked. • AEMO published MN 68225 declaring the cancellation of the AEMO intervention event and the associated direction.

3.1 Adequacy of responses to AEMO inquiries

NER clause 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 SA Generation Pty Ltd and ENGIE for information prior to issuing the directions between 16 and 26 April 2019.

3.2 Participant ability to comply with the intervention

NER clause 4.8.9(d) requires that a Registered Participant must immediately notify AEMO of its inability to comply, or intention not to comply, with a direction or clause 4.8.9 instruction.

AEMO did not receive any indication that a Registered Participant would be unable to comply with the direction. AEMO is satisfied that AGL SA Generation Pty Ltd and ENGIE complied with the directions listed in Table 1.

4. Dispatch and pricing outcomes

4.1 Changes to dispatch outcomes due to the directions

The directions to AGL SA Generation Pty Ltd and ENGIE resulted in approximately 28,387 megawatt hours (MWh) of generation being added to the market.

Under NER clause 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 minimised⁷. 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 this direction. These have been 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 NEM regions.

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

	QLD	NSW	VIC	SA	TAS
Without direction	916,044	917,241	632,049	135,423	107,216
Actual	908,556	904,715	628,206	132,429 +28,387 ^A	104,977
Change	-7,488	-12,526	-3,843	25,394	-2,240

A. 28,387 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	-11,568	-79,080	-5,761	16,661	4,069	-32,589
Actual ^A	-10,441	-72,929	13,490	-4,822	180	-34,808
Change ^B	1,127 MWh less into NSW	6,151 MWh less into NSW	19,250 MWh more into NSW	21,482 MWh more into VIC	3,889 MWh less into SA	2,219 MWh more into TAS

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 clause 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

⁷ 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.

occurred. AEMO determines and publishes these prices in accordance with the Intervention Pricing Methodology⁸.

Intervention pricing applies whenever the direction meets the regional reference node test, that is a direction 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 can 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 clause 3.9.3(b), and for the full intervention period from:

- Dispatch Interval (DI) ending 1805 hrs on 16 April 2019 to DI ending 1630 hrs on 17 April 2019.
- DI ending 1505 hrs on 18 April 2019 to DI ending 1600 hrs on 22 April 2019.
- DI ending 0005 hrs on 25 April 2019 to DI ending 1230 hrs on 26 April 2019.

5. Conclusions and further actions

Between 16 and 26 April 2019, AEMO issued directions to South Australia Participants to maintain power system security.

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.

⁸ Intervention Pricing Methodology is available at http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/2018/Intervention-Pricing-Methodology.pdf.