



NEM Event – Directions 24 to 31 March 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 13 August 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

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ABBREVIATIONS

Abbreviation	Expanded name
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
DI	Dispatch Interval
MN	Market Notice
NEM	National Electricity Market
NER	National Electricity Rules
PS	Power Station
SA	South Australia
GT	Gas Turbine
ST	Steam Turbine

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1. Summary

To ensure adequate system strength for secure operation of the South Australian power system, certain combinations of synchronous generating units must be in service at all 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 24 and 31 March 2019, AEMO issued six directions to South Australian market participants to maintain power system security across two events. These six directions are summarised in Table 1.

Table 1 Summary of the six South Australia directions between 24 and 31 March 2019

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Pelican Point unit Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1500 hrs, 24 March 2019	1400 hrs, 25 March 2019	Remain synchronised and follow dispatch targets from 2300 hrs on 24 March 2019
Torrens Island A unit 2	AGL SA Generation Pty Ltd	2	1330 hrs, 29 March 2019	0115 hrs, 30 March 2019	To synchronise and follow dispatch targets from 0030 hrs on 30 March 2019
Pelican Point unit GT 12	Pelican Point Power Pty Ltd (ENGIE)	2	2000 hrs, 29 March 2019	1630 hrs, 30 March 2019	Remain synchronised and follow dispatch targets from 0800 hrs on 30 March 2019
Quarantine Power Station (PS) unit 5	Origin Energy Electricity Ltd	2	0105 hrs, 30 March 2019	0330 hrs, 30 March 2019	To synchronise and follow dispatch targets from 0105 hrs on 30 March 2019
Torrens Island A unit 2	AGL SA Generation Pty Ltd	2	0135 hrs, 30 March 2019	1200 hrs, 31 March 2019	To synchronise and follow dispatch targets from 0200 hrs on 30 March 2019
Pelican Point unit GT 12 and Steam Turbine (ST) 18	Pelican Point Power Pty Ltd (ENGIE)	2	2000 hrs, 30 March 2019	1400 hrs, 31 March 2019	Remain synchronised and follow dispatch targets from 0200 hrs on 31 March 2019.

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

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 24 March 2019 for each of the direction events.

For each of the direction events, the need for intervention arose due to rebids submitted by AGL SA Generation Pty Ltd, Origin Energy Electricity Ltd, and ENGIE to de-commit their respective units:

1. First direction event: At 1448 hrs on 23 March 2019, ENGIE submitted a rebid to de-commit Pelican Point Gas Turbine (GT) from 2300 hrs on 24 March 2019². As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements from 2300 hrs on 24 March 2019.
2. Second direction event: At 1950 hrs on 28 March 2019, ENGIE submitted a rebid to decommit half of Pelican Point Power Station (PS) from 0030 hrs on 30 March 2019³. As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements from 0030 hrs on 30 March 2019.

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 market notices as listed in Table 2.

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

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

2.3 Decision to intervene

As all participants contacted had indicated that no market response would be provided, AEMO evaluated the estimated costs, and issued directions as listed in Table 1. AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

3. Intervention process

² Rebid reason: 1445~A~RESPOND TO PREDISPATCH D+1~

³ Rebid reason: 1945~F~REVISED TOLLING NOMINATION: #1189~

AEMO considers that it followed all applicable processes under NER clause 4.8 for the management of the directions between 24 to 31 March 2019⁴.

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

Table 2 Timeline of key events between 24 and 31 March 2019

Time	Events / comments
23 March 2019	
1448 hrs	<ul style="list-style-type: none"> ENGIE submitted a rebid to de-commit Pelican Point GT from 2300 hrs on 24 March 2019.
1752 hrs	<ul style="list-style-type: none"> AEMO published a market notice (MN) seeking a market response and noting that the latest time to intervene was determined to be 1500 hrs on 24 March 2019 (MN 67866).
24 March 2019	
1500 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 and ST 18 to remain synchronised and follow dispatch targets from 2300 hrs on 24 March 2019. AEMO published MN 67868 declaring a direction was issued to a SA participant. AEMO published MN 67869 declaring that an AEMO intervention event had commenced from dispatch interval (DI) ending 1505 hrs and that all DIs during the AEMO intervention event would be intervention price DIs. Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 2305 hrs on 24 March 2019.
25 March 2019	
1400 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT 12 and ST 18 was cancelled and intervention constraints were revoked. AEMO published MN 67903 declaring the cancellation of the direction.
28 March 2019	
1425 hrs	<ul style="list-style-type: none"> AEMO published a market notice seeking a market response; the latest time to intervene was not noted (MN 67922).
1950 hrs	<ul style="list-style-type: none"> ENGIE submitted a rebid to decommit half of Pelican Point PS from 0030 30 March 2019.
29 March 2019	
1127 hrs	<ul style="list-style-type: none"> AEMO published an updated market notice seeking a market response and noting that the latest time to intervene was determined to be 1330 hrs on 29 March 2019 (MN 67932).
1330 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 0030 hrs on 30 March 2019. AEMO published MN 67935 declaring a direction was issued to a SA participant. AEMO published MN 67936 declaring that an AEMO intervention event had commenced and that all DIs during the AEMO intervention event would be intervention price DIs. Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 0035 hrs on 30 March 2019.
2000 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0800 hrs on 30 March 2019. Intervention constraints applied to Pelican Point GT in central dispatch from DI ending 0805 hrs on 30 March 2019.
30 March 2019	
0046 hrs	<ul style="list-style-type: none"> Torrens Island A unit 2 tripped while under direction for system strength.

⁴ AEMO. Power system operating procedure SO_OP 3707, "Intervention, direction and clause 4.8.9 instructions", 11 September 2014, 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
0105 hrs	<ul style="list-style-type: none"> Direction issued to Origin Energy Electricity Ltd for Quarantine PS unit 5 to synchronise and follow dispatch targets from 0105 hrs on 30 March 2019. Intervention constraints applied to Quarantine PS unit 5 in central dispatch from DI ending 0110 hrs on 30 March 2019.
0115 hrs	<ul style="list-style-type: none"> The direction to AGL SA Generation Pty Ltd for Torrens Island A unit 2 was cancelled and intervention constraints were revoked.
0135 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 0200 hrs on 30 March 2019. Intervention constraints applied to Torrens Island A unit 2 in central dispatch from DI ending 0205 hrs on 30 March 2019.
0330 hrs	<ul style="list-style-type: none"> The direction to Origin Energy Electricity Ltd for Quarantine PS unit 5 was cancelled and intervention constraints were revoked.
1630 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT 12 was cancelled and intervention constraints were revoked.
2000 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0200 hrs on 31 March 2019. Intervention constraints applied to Pelican Point GT in central dispatch from DI ending 0205 hrs on 31 March 2019.
31 March 2019	
1200 hrs	<ul style="list-style-type: none"> The direction to AGL SA Generation Pty Ltd for Torrens Island A unit 2 was cancelled and intervention constraints were revoked.
1400 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT 12 was cancelled and intervention constraints were revoked. AEMO published MN 67996 declaring the cancellation of the AEMO intervention event and all associated directions.

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, Origin Energy Electricity Ltd, and ENGIE for information prior to issuing the directions between 24 and 31 March 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 is satisfied with Origin Energy Electricity Ltd and ENGIE complying with the directions listed in Table 1.

AGL SA Generation Pty Ltd Torrens Island A unit 2 was unable to comply and tripped while under direction for system strength at 0046 hrs on 30 March 2019. AEMO then cancelled the direction and revoked intervention constraints at 0115 hrs on 30 March 2019. AEMO issued a direction to AGL SA Generation Pty Ltd at 0135 hrs on 30 March 2019 to synchronise Torrens Island A unit 2 and follow dispatch targets from 0200 hrs on 30 March 2019.

4. Dispatch and pricing outcomes

4.1 Changes to dispatch outcomes due to the direction

The directions to Pelican Point GT 12, Torrens Island A unit 2, and Quarantine PS unit 5 resulted in approximately 7,373 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 minimised⁵. AEMO considered the application of counter-action constraints to achieve this objective, but concluded this was not practical during this intervention.

Tables 3 and 4 summarise the estimated change to dispatch outcomes resulting from all six 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 other NEM regions.

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

	QLD	NSW	VIC	SA	TAS
Without direction	344,574	353,923	242,681	59,087	35,911
Actual	344,110	350,156	241,063	58,174 7,373 ^A	35,552
Change	-464	-3,767	-1,617	6,460	-358

A. 7,373 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	-1,891	-13,300	7,750	-1,937	-839	-15,950
Actual ^A	-1,820	-12,907	12,034	-7,567	-1,632	-16,308
Change ^B	71 MWh less into NSW	394 MWh less into NSW	4285 MWh more into NSW	5630 MWh more into VIC	793 MWh more into VIC	358 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].

⁵ 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 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 occurred. AEMO determines and publishes these prices in accordance with the Intervention Pricing Methodology⁶.

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 1505 hrs on 24 March 2019 until DI ending 1400 hrs on 25 March 2019.
- DI ending 1335 hrs on 29 March 2019 until DI ending 1400 hrs on 31 March 2019.

5. Conclusions and further actions

Between 24 and 31 March 2019, AEMO issued six directions to three 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.

⁶ Intervention Pricing Methodology, at http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/2019/Intervention-Pricing-Methodology.pdf.