



NEM Event – Direction 23 to 30 December 2018

September 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 06 September 2019.

Unless otherwise indicated, terms in this report have the same meanings as those defined in the NER.

All references to time in this report are based on Australian Eastern Standard Time (AEST).

DISCLAIMER

AEMO has made every reasonable effort to ensure the quality of the information in this report but cannot guarantee its accuracy or completeness. Any views expressed in this report are those of AEMO unless otherwise stated, and may be based on information given to AEMO by other persons.

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ABBREVIATIONS

Abbreviation	Expanded name
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

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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 23 and 30 December 2018, AEMO issued five directions to South Australian Market Participants to maintain power system security across five events. These five directions events are summarised in Table 1.

Table 1 **Summary of the five South Australia directions between 23 and 30 December 2018**

Direction	Directed Participant	Event No.	Issue time	Cancellation time	Direction instruction
Pelican Point Gas Turbine (GT) 12	Pelican Point Power Pty Ltd (ENGIE)	1	1800 hrs, 23 December 2018	0600 hrs, 24 December 2018	Remain synchronised and follow dispatch targets from 2200 hrs on 23 December 2018.
Pelican Point GT 12	ENGIE	2	1630 hrs, 24 December 2018	1100 hrs, 25 December 2018	Remain synchronised and follow dispatch targets from 2300 hrs on 24 December 2018.
Pelican Point GT 12	ENGIE	3	1800 hrs, 25 December 2018	1130 hrs, 26 December 2018	Remain synchronised and follow dispatch targets from 2200 hrs on 25 December 2018.
Pelican Point GT 12	ENGIE	4	1600 hrs, 28 December 2018	1000 hrs, 29 December 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 29 December 2018.
Pelican Point GT 12	ENGIE	5	1600 hrs, 29 December 2018	1530 hrs, 30 December 2018	Remain synchronised and follow dispatch targets from 0100 hrs on 30 December 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 5 December 2018 for each of the direction events.

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

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

1. ENGIE submitted a rebid at 1356 hrs on 23 December 2018 for Pelican Point Power Station (PS) to de-commit at 2200 hrs on 23 December 2018².
2. ENGIE submitted a rebid at 1244 hrs on 24 December 2018 for Pelican Point PS to de-commit at 2300 hrs on 24 December 2018³.
3. ENGIE submitted a rebid at 0936 hrs on 25 December 2018 for Pelican Point PS to de-commit at 2000 hrs on 25 December 2018⁴.
4. ENGIE submitted a rebid at 1248 hrs on 28 December 2018 for Pelican Point PS to de-commit at 0100 hrs on 29 December 2018⁵.
5. ENGIE submitted a rebid at 1242 hrs on 28 December 2018 for Pelican Point PS to de-commit at 0100 hrs on 30 December 2018⁶.

As a result, AEMO determined that there would be insufficient online synchronous units available to meet system strength requirements following these de-commitments and assessed all available options before directing.

2.2 Assessment of market response and latest time to intervene

Under NER clause 4.8.5A(a) and (c), AEMO must notify the market of any anticipated power system security or reliability issue, and the latest time for market response before AEMO would need to intervene. For 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 five 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 the directions listed in Table 1. AEMO cancelled the directions when relevant synchronous generating units rebid into the market.

² Rebid reason: 1345~A~RESPOND TO PREDISPATCH: 22:00 TO D+1~

³ Rebid reason: 1240~A~RESPOND TO PREDISPATCH D+1~.

⁴ Rebid reason: 1710~F~REVISED TOLLING NOMINATION~.

⁵ Rebid reason: 1245~A~RESPOND TO PREDISPATCH D+1~.

⁶ Rebid reason: 1215~A~RESPOND TO PREDISPATCH D+1~.

3. Intervention process

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the directions between 23 to 30 December 2018⁷. Table 2 provides a high-level timeline of the intervention event.

Table 2 **Timeline of key events between 23 and 30 December 2018**

Time	Events / comments
23 December 2018	
1356 hrs	ENGIE submitted a rebid for Pelican Point PS to de-commit at 2200 hrs on 23 December 2018.
1415 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was 1800 hrs on 23 December 2018 (MN 66153).
1800 hrs	<ul style="list-style-type: none"> Direction issued to Pelican Point Power Pty Ltd (ENGIE) for Pelican Point Gas Turbine (GT) 12 to remain synchronised and follow dispatch targets from 2200 hrs on 23 December 2018 (PPCCGT direction 1). AEMO published MN 66159 declaring a direction was issued to a South Australian participant. AEMO published MN 66160 declaring that an AEMO intervention event had commenced from dispatch interval ending 1805 hrs on 23 December 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals. Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 2205 hrs on 23 December 2018.
24 December 2018	
0600 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT (PPCCGT direction 1) was cancelled and intervention constraints were revoked. AEMO published MN 66168 declaring the cancellation of the direction.
1244 hrs	ENGIE submitted a rebid for Pelican Point PS to de-commit at 2300 hrs on 24 December 2018.
1419 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was 1630 hrs on 24 December 2018 (MN 66170).
1630 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 2300 hrs on 24 December 2018 (PPCCGT direction 2). AEMO published MN 66173 declaring a direction was issued to a South Australian participant. AEMO published MN 66174 declaring that an AEMO intervention event had commenced from dispatch interval ending 1635 hrs on 24 December 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals. Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 2305 hrs on 24 December 2018.
25 December 2018	
1100 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT (PPCCGT direction 2) was cancelled and intervention constraints were revoked. AEMO published MN 66178 declaring the cancellation of the direction.
1119 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was 1800 hrs on 25 December 2018 (MN 66179).
0936 hrs	ENGIE submitted a rebid for Pelican Point PS to de-commit at 2000 hrs on 25 December 2018.
1800 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 2200 hrs on 25 December 2018 (PPCCGT direction 3). AEMO published MN 66182 declaring a direction was issued to a South Australian participant. AEMO published MN 66183 declaring that an AEMO intervention event had commenced from dispatch interval ending 1805 hrs on 25 December 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals. Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 2205 hrs on 25 December 2018.

⁷ 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
26 December 2018	
1 130 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT (PPCCGT direction 3) was cancelled and intervention constraints were revoked. AEMO published MN 66185 declaring the cancellation of the direction.
28 December 2018	
1 242 hrs	ENGIE submitted a rebid for Pelican Point PS to de-commit at 0100 hrs on 30 December 2018.
1 248 hrs	ENGIE submitted a rebid for Pelican Point PS to de-commit at 0100 hrs on 29 December 2018.
1 355 hrs	AEMO published a market notice seeking a market response and noting the latest time to intervene was 1600 hrs on 28 December 2018 (MN 66202).
1 600 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0100 hrs on 29 December 2018 (PPCCGT direction 4). AEMO published MN 66199 declaring a direction was issued to a South Australian participant. AEMO published MN 66200 declaring that an AEMO intervention event had commenced from dispatch interval ending 1605 hrs on 28 December 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals. Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 0105 hrs on 29 December 2018.
1 824 hrs	AEMO published a market notice seeking a market response and noting that the latest time to intervene would be updated after the 1230 hrs predispach run on 29 December 2018 (MN 66203). The latest time to intervene was later updated to 1545 hrs on 29 December 2018 (MN 66206).
29 December 2018	
1 000 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT (PPCCGT direction 4) was cancelled and intervention constraints were revoked. AEMO published MN 66205 declaring the cancellation of the direction.
1 600 hrs	<ul style="list-style-type: none"> Direction issued to ENGIE for Pelican Point GT 12 to remain synchronised and follow dispatch targets from 0100 hrs on 30 December 2018 (PPCCGT direction 5). AEMO published MN 66209 declaring a direction was issued to a South Australian participant. AEMO published MN 66210 declaring that an AEMO intervention event had commenced from dispatch interval ending 1605 hrs on 29 December 2018 and that all dispatch intervals during the AEMO intervention event would be intervention price dispatch intervals. Intervention constraints applied to Pelican Point PS in central dispatch from dispatch interval ending 0105 hrs on 30 December 2018.
30 December 2018	
1 530 hrs	<ul style="list-style-type: none"> The direction to Pelican Point GT (PPCCGT direction 5) was cancelled and intervention constraints were revoked. AEMO published MN 66218 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 from ENGIE for information prior to issuing the directions between 23 and 30 December 2018.

3.2 Participant ability to comply with the intervention

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

AEMO did not receive any indication that a Registered Participant would be unable to comply with the direction. AEMO is satisfied that 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 Pelican Point PS, resulted in approximately 9,512 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 minimised⁸. 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 five events. These are estimated by comparing against a simulated dispatch with the direction removed.

Directions in one region can cause dispatch changes to other regions. 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 from South Australia. The increased exports, 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	352,416	379,633	264,455	37,922	42,839
Actual	352,594	372,832	263,916	36,055 + 9,512 ^A	41,479
Change	178	-6,801	-539	7,646	-1,360

A. 9,512 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	-4,066	-39,078	-4,782	22,381	5,077	-14,111
Actual ^A	-4,042	-39,261	1,853	16,115	3,487	-15,468
Change ^B	24 MWh less into NSW	183 MWh more into NSW	6,634 MWh less into NSW	6,266 MWh less into SA	1,590 MWh less into SA	1,357 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 3.9.3(b) requires that AEMO set the dispatch price and ancillary service prices at the value which

⁸ 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 Methodology⁹.

Intervention pricing applies whenever the direction meets the region reference node test, that is a direction at the region 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 region reference node (Torrens Island) in the current system strength scenarios. Accordingly, system strength directions in South Australia pass the region 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 2205 hrs on 23 December 2018 until DI ending 0600 hrs on 24 December 2018.
- DI ending 2305 hrs on 24 December 2018 until DI ending 1100 hrs on 25 December 2018.
- DI ending 2205 hrs on 25 December 2018 until DI ending 1130 hrs on 26 December 2018.
- DI ending 0105 hrs on 29 December 2018 until DI ending 1000 hrs on 29 December 2018.
- DI ending 0105 hrs on 30 December 2018 until DI ending 1530 hrs on 30 December 2018.

5. Conclusions and further actions

Between 23 and 30 December 2018, AEMO issued five 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.

⁹ Intervention Pricing Methodology, available at http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/2019/Intervention-Pricing-Methodology.pdf.