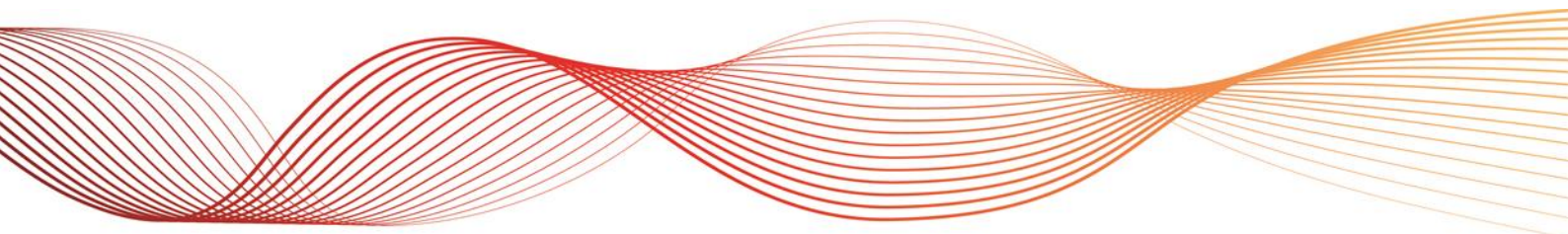




NEM EVENT – DIRECTIONS 22-24 SEPTEMBER 2017

Published: **May 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 6 April 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.

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 report; 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.

© 2018 Australian Energy Market Operator Limited. The material in this publication may be used in accordance with the [copyright permissions on AEMO's website](#).



CONTENTS

Purpose	2
Disclaimer	2
1. SUMMARY	4
2. INTERVENTION ASSESSMENT	4
2.1 The need for intervention	4
2.2 Assessment of market response and latest time to intervene	5
2.3 Decision to intervene	5
3. INTERVENTION PROCESS	5
3.1 Adequacy of responses to AEMO inquiries	6
3.2 Participant ability to comply with the intervention	6
4. CHANGES TO DISPATCH OUTCOMES	7
4.1 Application of Intervention Pricing	7
5. CONCLUSIONS AND FURTHER ACTIONS	8
ABBREVIATIONS	9

TABLES

Table 1	Summary of the three South Australia directions between 22 September 2017 and 24 September 2017	4
Table 2	Timeline of key events between 22 and 24 September 2017	6
Table 3	Estimated changes to local generation in each region (MWh)	7
Table 4	Estimated changes to interconnector flow between regions (MWh)	7

1. SUMMARY

To ensure adequate system strength for secure operation of the South Australia 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 22 September 2017 and 24 September 2017, AEMO issued three directions to South Australian Market Participants to maintain power system security. The three directions are summarised in Table 1.

Table 1 Summary of the three South Australia directions between 22 September 2017 and 24 September 2017

Direction	Directed Participant	Issue time	Cancellation time	Direction instruction
Torrens Island B unit 2	AGL SA Generation Pty Ltd	1805 hrs, 22 September 2017	1700 hrs, 24 September 2017	Remain synchronised and follow dispatch targets effective from 0100 hrs on 23 September 2017.
Osborne Power Station (PS)	Origin Energy Electricity Ltd	1135 hrs, 23 September 2017	1915 hrs, 24 September 2017	Remain synchronised and follow dispatch targets effective from 1200 hrs on 23 September 2017.
Torrens Island B unit 4	AGL SA Generation Pty Ltd	1400 hrs, 23 September 2017	1700 hrs, 23 September 2017	Remain synchronised and follow dispatch targets effective immediately.

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 times¹. 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 at 22 September 2017.

The 1430 hrs Pre-Dispatch (PD) run on 21 September 2017 (available at approximately 1400 hrs) indicated that there would be insufficient online synchronous generating units available to meet these requirements from 0400 hrs on 23 September 2017. AEMO determined that, should a market response not be provided, a direction would be required to maintain power system security.

During the initial direction event, at 1058 hrs on 23 September 2017, Origin Energy Electricity Ltd submitted a rebid to de-commit Osborne PS from 1200 hrs on 23 September 2017. As a result, AEMO determined that further intervention was required to ensure sufficient online synchronous generating units would be available to meet system strength requirements from 1200 hrs on 23 September 2017.

While both previous directions were in effect, at 1347 hrs on 23 September 2017, AGL SA Generation Pty Ltd submitted a rebid to de-commit Torrens Island B unit 4 from 1400 hrs on 23 September 2017. As a result, AEMO determined that further intervention was required to ensure sufficient online synchronous

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



generating units would be available to meet system strength requirements from 1400 hrs on 23 September 2017.

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 that may require intervention, and the latest time for market response before AEMO would need to intervene. AEMO issued this market notice (MN 59228) at 1702 hrs on 21 September 2017².

AEMO contacted the Registered Participants who operate eligible synchronous generating units in South Australia to seek their availability for the relevant periods. Those Registered Participants indicated they did not intend to adjust their market offers, but identified units that would be available if directed. Based on advised lead times, AEMO assessed that the latest time to intervene was 1800 hrs on 22 September 2017.

At 1800 hrs on 22 September 2017, the circumstances giving rise to the need for intervention were still in effect, and insufficient market response had been provided to address the system security issue.

There was insufficient time available to seek market response for the subsequent two concurrent interventions, and AEMO did not publish market notices under NER 4.8.5A(a) or (c) prior to issuing those directions. AEMO determined that the latest time to intervene was 1200 hrs on 23 September 2017 and 1400 hrs on 23 September 2017 respectively.

2.3 Decision to intervene

As insufficient market response had been provided, AEMO evaluated the estimated costs provided for eligible synchronous generating units, and issued an initial direction to AGL SA Generation Pty Ltd for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 0100 hrs on 23 September 2017.

Following the subsequently advised de-commitment of Osborne PS, AEMO again evaluated the estimate costs provided for eligible synchronous generating units and a direction was issued to Origin Energy Electricity Ltd for Osborne PS to remain synchronised and follow dispatch targets from 1200 hrs on 23 September 2017.

Following the subsequently advised de-commitment of Torrens Island B unit 4, AEMO again evaluated the estimated costs provided for eligible synchronous generating units and a direction was issued to AGL SA Generation Pty Ltd for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 1400 hrs on 23 September 2017.

3. INTERVENTION PROCESS

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the directions between 22 and 24 September 2017³. Table 2 provides a high level timeline of the intervention event.

² AEMO Market Notices are at <http://www.aemo.com.au/Market-Notices>.

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.

Table 2 Timeline of key events between 22 and 24 September 2017

Time	Events / comments
21 September 2017	
1702 hrs	AEMO published market notice seeking a market response and noting the latest time to intervene was at 1800 hrs on 22 September 2017 (MN 59228).
22 September 2017	
1805 hrs	Direction issued to AGL SA Generation Pty Limited for Torrens Island B unit 2 to remain synchronised and follow dispatch targets from 0100 hrs on 23 September 2017.
1820 hrs	AEMO published MN 59233 declaring a direction was issued to a South Australian participant at 1805 hrs.
1823 hrs	AEMO published MN 59235 declaring an AEMO intervention event commenced from dispatch interval (DI) ending 1810 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.
23 September 2017	
1135 hrs	Direction issued to Origin Energy Electricity Ltd for Osborne PS to remain synchronised and follow dispatch targets from 1200 hrs on 23 September 2017.
1218 hrs	AEMO published MN 59251 declaring a direction was issued to a South Australian participant at 1135 hrs.
1219 hrs	AEMO published MN 59253 declaring an AEMO intervention event commenced from DI ending 1135 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.
1400 hrs	Direction issued to AGL SA Generation Pty Limited for Torrens Island B unit 4 to remain synchronised and follow dispatch targets from 1400 hrs on 23 September 2017.
1434 hrs	AEMO published MN 59254 declaring a direction was issued to a South Australian participant at 1400 hrs.
1434 hrs	AEMO published MN 59256 declaring an AEMO intervention event commenced from DI ending 1400 hrs and that all DIs during the AEMO intervention event would be intervention price DIs.
1717 hrs	AEMO published MN 59267 declaring that the direction to AGL SA Generation Pty Limited (Torrens Island B unit 4) was cancelled at 1700 hrs on 23 September 2017. Intervention constraints revoked for Torrens Island B unit 4.
24 September 2017	
1700 hrs	AEMO published MN 59284 declaring that the direction to AGL SA Generation Pty Limited (Torrens Island B unit 2) was cancelled at 1700 hrs on 24 September 2017. Intervention constraints were revoked for Torrens Island B unit 2.
1904 hrs	AEMO published MN 59287 declaring that the direction to Origin Energy Electricity Limited (Osborne PS) was cancelled at 1915 hrs on 24 September 2017. Intervention constraints revoked for Osborne PS.

3.1 Adequacy of responses to AEMO inquires

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 directions between 22 September 2017 and 24 September 2017.

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 directions.

4. CHANGES TO DISPATCH OUTCOMES

The directions for Torrens Island B and Osborne PS units to remain synchronised and follow dispatch targets resulted in a total of approximately 6,631 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 direction because all South Australian scheduled units were running at technical minimum load or not generating.

Table 3 and 4 summarise the change to dispatch outcomes resulting from these directions. These are estimated by comparing against a simulated dispatch with the directions 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 from the region. The increased exports, coupled with an impact on network constraints, displaced local generation in Victoria, and lesser amounts in the other NEM regions.

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

	QLD	NSW	VIC	SA	TAS
Without direction	261,036	222,137	188,698	51,332	62,099
Actual	260,460	222,393	183,357	51,278 +6,631 ^A	61,758
Change	-576	+256	-5,341	+6,577	-341

A. 6,631 MWh direction-based generation

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

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
Without direction^A	-2,529	-25,929	46,129	-9,440	-2,719	14,384
Actual^B	-2,345	-25,567	46,333	-13,500	-4,891	14,073
Change^C	184 MWh less to NSW	362 MWh less to NSW	204 MWh more to NSW	4,060 MWh more to VIC	2,172 MWh more to VIC	311 MWh less to TAS

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

B. Change = [Actual - Without direction].

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

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 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.

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.

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



Intervention pricing was applied for this event in accordance with NER 3.9.3(b) for the full intervention period from DI ending 1810 hrs on 22 September 2017 until DI ending 1915 hrs on 24 September 2017.

5. CONCLUSIONS AND FURTHER ACTIONS

Between 22 and 24 September 2017, AEMO issued three energy directions to South Australian Market Participants to maintain power system security, in response to a forecast lack of system strength.

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 informing the market to the extent reasonably practical within time constraints.

AEMO is also satisfied with the timeliness and adequacy of participant responses and communication throughout.



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
PD	Pre-Dispatch