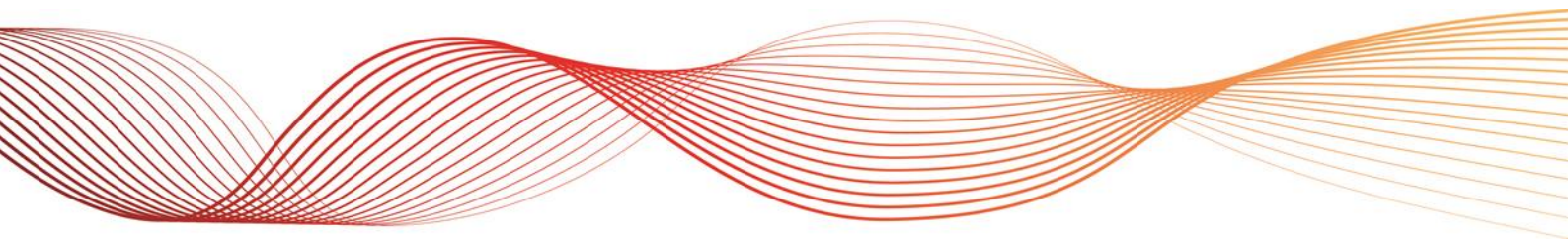




# NEM EVENT – DIRECTION 2-4 SEPTEMBER 2017

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 20 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        |
| <b>1. SUMMARY</b>  | <b>4</b> |
| <b>2. INTERVENTION ASSESSMENT</b>                              | <b>4</b> |
| 2.1 The need for intervention                                  | 4        |
| 2.2 Assessment of market response and latest time to intervene | 4        |
| 2.3 Decision to intervene                                      | 5        |
| <b>3. INTERVENTION PROCESS</b>                                 | <b>5</b> |
| 3.1 Adequacy of responses to AEMO inquiries                    | 5        |
| 3.2 Participant ability to comply with the intervention        | 6        |
| <b>4. CHANGES TO DISPATCH OUTCOMES</b>                         | <b>6</b> |
| 4.1 Application of intervention pricing                        | 7        |
| <b>5. CONCLUSIONS AND FURTHER ACTIONS</b>                      | <b>7</b> |
| <b>ABBREVIATIONS</b>   | <b>8</b> |

# TABLES

|         |  |   |
|---------|--|---|
| Table 1 | Summary of the South Australia direction between 2 September 2017 and 4 September 2017 | 4 |
| Table 2 | Timeline of key events between 2 and 4 September 2017                                  | 5 |
| Table 3 | Estimated changes to local generation in each region (MWh)                             | 6 |
| Table 4 | Estimated changes to interconnector flow between regions (MWh)                         | 7 |



# 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 times<sup>1</sup>.

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 2 September 2017 and 4 September 2017, AEMO issued one direction to a South Australian Market Participant to maintain power system security. The direction is summarised in Table 1.

**Table 1 Summary of the South Australia direction between 2 September 2017 and 4 September 2017**

| Direction                                     | Directed Participant                | Issue time                 | Cancellation time          | Direction instruction  |
|---|-------------------------------------|----------------------------|----------------------------|--|
| <b>Pelican Point unit gas turbine (GT) 12</b> | Pelican Point Power Pty Ltd (ENGIE) | 0430 hrs, 2 September 2017 | 0630 hrs, 4 September 2017 | For Pelican Point unit GT 12 to remain synchronised and follow dispatch targets at 0930 hrs on 2 September 2017. |

# 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<sup>1</sup>. 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 2 September 2017.

At 1353 hours (hrs) on 1 September 2017, ENGIE submitted a rebid de-committing Pelican Point Power Station (PS) Gas Turbine (GT) 12 from 0930 hrs on 2 September 2017. As a result, AEMO determined there would be insufficient online synchronous generating units available to meet system strength requirements from 0930 hrs on 2 September 2017.

As a result, AEMO sought a market response, assessed available options for intervention, and determined the latest time to intervene should a market response not be provided.

## 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 59110) at 2123 hrs on 1 September 2017<sup>2</sup>.

AEMO contacted the Registered Participants who operate eligible synchronous generating units in South Australia to seek their availability for the relevant period, and to determine the latest time to intervene. Those Registered Participants indicated they did not intend to adjust their market offers, but identified

<sup>1</sup> <http://www.aemo.com.au/Media-Centre/South-Australia-System-Strength-Assessment>.  
<sup>2</sup> AEMO Market Notices are at <http://www.aemo.com.au/Market-Notices>.



units that would be available if directed. Based on advised lead times, AEMO assessed that the latest time to intervene was 0430 hrs on 2 September 2017.

### 2.3 Decision to intervene

At 0430 hrs, insufficient market response had been provided, and the circumstances giving rise to the need for intervention were still in effect.

AEMO evaluated the estimated costs provided for eligible synchronous generating units, and issued a direction to ENGIE for Pelican Point unit GT 12 to remain synchronised and dispatch to its technical minimum load of 360 megawatts (MW)<sup>3</sup> from 0930 hrs on 2 September 2017.

## 3. INTERVENTION PROCESS

AEMO considers that it followed all applicable processes under NER Clause 4.8 for the management of the direction between 2 and 4 September 2017<sup>4</sup>. Table 2 provides a high level timeline of the intervention event.

**Table 2 Timeline of key events between 2 and 4 September 2017**

| Time                     | Events / Comments   |
|--------------------------|---|
| <b>1 September 2017</b>  |   |
| 2123 hrs                 | AEMO published market notice seeking a market response and noting the latest time to intervene was at 0430 hrs on 2 September 2017 (MN 59110).  |
| <b>2 September 2017</b>  |   |
| 0430 hrs                 | Direction issued to ENGIE for Pelican Point unit GT12 to remain synchronised and follow dispatch targets from 0930 hrs on 2 September 2017.   |
| 0434 hrs                 | AEMO published MN 59112 declaring a direction was issued to a South Australian participant at 0430 hrs.   |
| 0439 hrs                 | AEMO published MN 59113 declaring that an AEMO intervention event had commenced and that all DIs during the AEMO intervention event would be intervention price DIs.  |
| 0930 hrs                 | Intervention constraints applied to Pelican Point PS in central dispatch from DI ending 0935 hrs.   |
| 1953 hrs                 | AEMO published MN 59119 declaring that AEMO has identified an issue with the intervention pricing implemented from DI ending 0935 hrs on 2 September and is endeavouring to resolve the issue as soon as possible. Refer to Section 4.1 for more information. |
| <b>3 September 2017</b>  |   |
| 1044 hrs                 | AEMO published MN 59120 declaring AEMO had resolved the issue with intervention pricing from DI ending 1915 hrs on 2 September 2017.  |
| <b>04 September 2017</b> |   |
| 0557 hrs                 | AEMO published MN 59133 declaring that the direction to ENGIE (Pelican Point GT12) was cancelled from 0630 hrs on 4 September 2017.   |

### 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 the direction on 2 September 2017.

<sup>3</sup> Pelican Point PS is an aggregate unit, and 360 MW is the technical minimum load for combined station (GT11, GT12 and ST18).

<sup>4</sup> [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](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).





### 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 direction for Pelican Point GT12 to remain synchronised and dispatch to technical minimum load resulted in approximately 7,430 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 minimised<sup>5</sup>. AEMO considered the application of counter-action constraints to achieve this objective, but concluded this was not practical during this intervention, because all eligible units were either offline or operating at technical minimum load.

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.

From dispatch interval (DI) ending 0935 hrs to DI ending 1910 hrs on 2 September 2017, interaction between Frequency Control Ancillary Service (FCAS) bids and constraints restricted Pelican Point PS dispatch targets to the minimum enablement limit of its FCAS trapezium in the intervention pricing run. For the purposes of Participant compensation (and comparison in this section), AEMO has performed manual reruns of the intervention period to estimate what the dispatch outcomes that would have applied had the direction event not occurred.

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, resulted in displacement of generation in all regions.

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

|                          | QLD         | NSW           | VIC           | SA                             | TAS         |
|--------------------------|-------------|---------------|---------------|--------------------------------|-------------|
| <b>Without direction</b> | 280,816     | 263,805       | 228,207       | 48,452                         | 49,119      |
| <b>Actual</b>            | 280,059     | 261,058       | 227,039       | 47,360<br>+ 7,430 <sup>A</sup> | 48,415      |
| <b>Change</b>            | <b>-757</b> | <b>-2,747</b> | <b>-1,168</b> | <b>+6,338</b>                  | <b>-704</b> |

A. 7,430 MWh is the directed energy

<sup>5</sup> 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.



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

|                                      | Terranora                   | QNI                          | VIC-NSW                       | Heywood                       | Murraylink                    | Basslink                     |
|--------------------------------------|-----------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|
| <b>Without direction<sup>A</sup></b> | -3,255                      | -31,048                      | 33,889                        | -8,208                        | -2,633                        | -2,675                       |
| <b>Actual<sup>B</sup></b>            | -3,237                      | -30,336                      | 37,678                        | -12,609                       | -4,299                        | -3,364                       |
| <b>Change<sup>C</sup></b>            | <b>18 MWh less into NSW</b> | <b>713 MWh less into NSW</b> | <b>3788 MWh more into NSW</b> | <b>4400 MWh more into VIC</b> | <b>1666 MWh more into VIC</b> | <b>689 MWh more into TAS</b> |

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 AEMO to 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 Methodology<sup>6</sup>.

Intervention pricing was applied for this event in accordance with NER 3.9.3(b) for the full intervention period from DI ending 0430 hrs on 2 September 2017 until DI ending 0630 hrs on 4 September 2017.

For the intervention pricing run, Pelican Point PS dispatch targets was restricted to the minimum enablement limit of its FCAS trapezium between dispatch interval (DI) ending 0935 hrs to DI ending 1910 hrs on 2 September 2017. While this is consistent with the Intervention Pricing Methodology, it can result in pricing outcome that do not reflect how the market would have operated absent of the direction. AEMO manually resolved this issue to improve the quality of the intervention pricing run from DI ending 1915 hrs on 2 September 2017.

AEMO has addressed this issue by setting a process to increase Constraint Violation Penalty (CVP) on the intervention constraint if this situation eventuates again. With a higher CVP, units can ramp down to below their minimum enablement limit in the intervention pricing run.

## 5. CONCLUSIONS AND FURTHER ACTIONS

Between 2 September and 4 September 2017, AEMO issued one direction to a South Australian Market Participant 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 informing the market.

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

<sup>6</sup> 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                    |
| FCAS         | Frequency Control Ancillary Services |
| MN           | Market Notice                        |
| NEM          | National Electricity Market          |
| NER          | National Electricity Rules           |
| PD           | Pre-Dispatch                         |