AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

STATUS REPORT

1 January 2021 to 31 March 2021

Prepared under clause 7.12 of the WEM Rules

Contents

1. Introduction

The Australian Energy Market Operator (AEMO) has prepared this report under clause 7.12 of the Wholesale Electricity Market Rules (WEM Rules).

Clause 7.12 of the WEM Rules requires AEMO to provide a report to the Economic Regulation Authority (ERA) once every three months on the performance of the market with respect to the dispatch process. The report must include details of:

- the incidence and extent of issuance of Operating Instructions and Dispatch Instructions;
- the incidence and extent of non-compliance with Operating Instructions and Dispatch Instructions;
- the incidence and reasons for the issuance of Dispatch Instructions to Balancing Facilities Out of Merit, including for the purposes of clause 7.12.1 of the WEM Rules, issuing Dispatch Orders to the Balancing Portfolio in accordance with clause 7.6.2 of the WEM Rules;
- the incidence and extent of transmission constraints;
- the incidence and extent of shortfalls in Ancillary Services, involuntary curtailment of load, High Risk Operating States and Emergency Operating States; and
- the incidence and reasons for the selection and use of LFAS Facilities under clause 7B.3.8 of the WEM Rules.

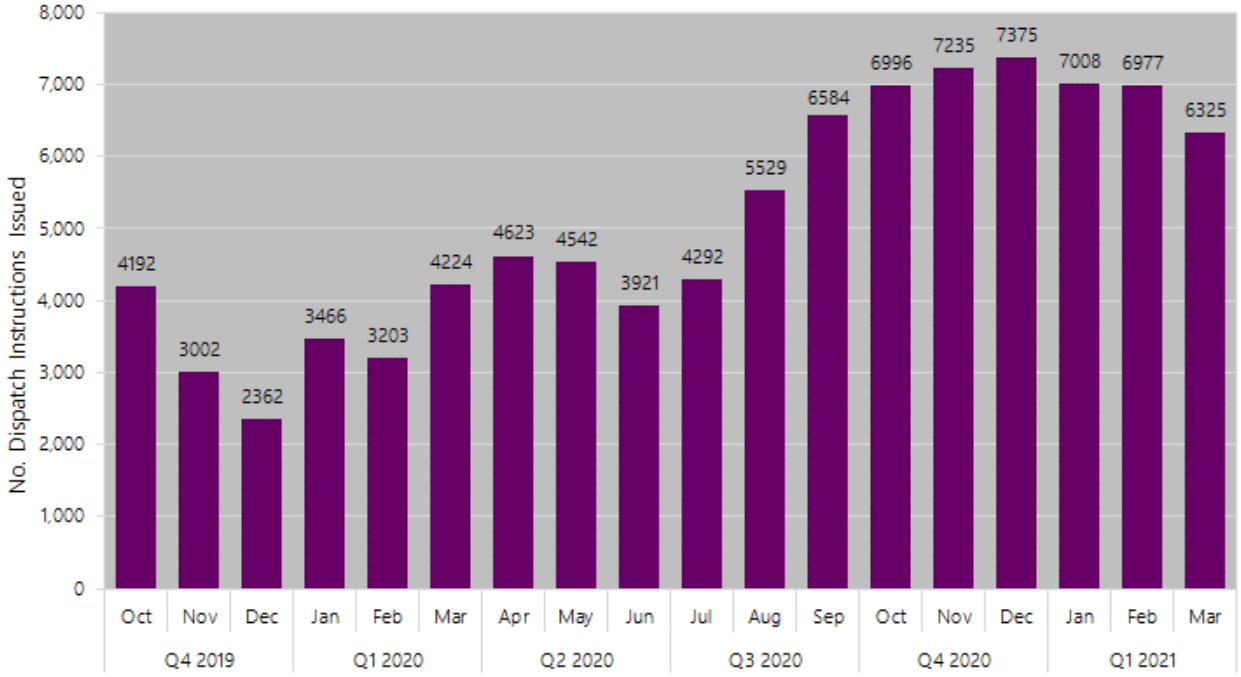
In this report:

- the reporting period is from 1 January 2021 to 31 March 2021;
- terms that are capitalised but not defined have the meaning given in the WEM Rules; and
- date references are to Trading Days, not calendar days, unless otherwise stated.

2. Issuance of Dispatch Instructions and Operating Instructions

AEMO issued 20,310 Dispatch Instructions to Market Participants during the reporting period.

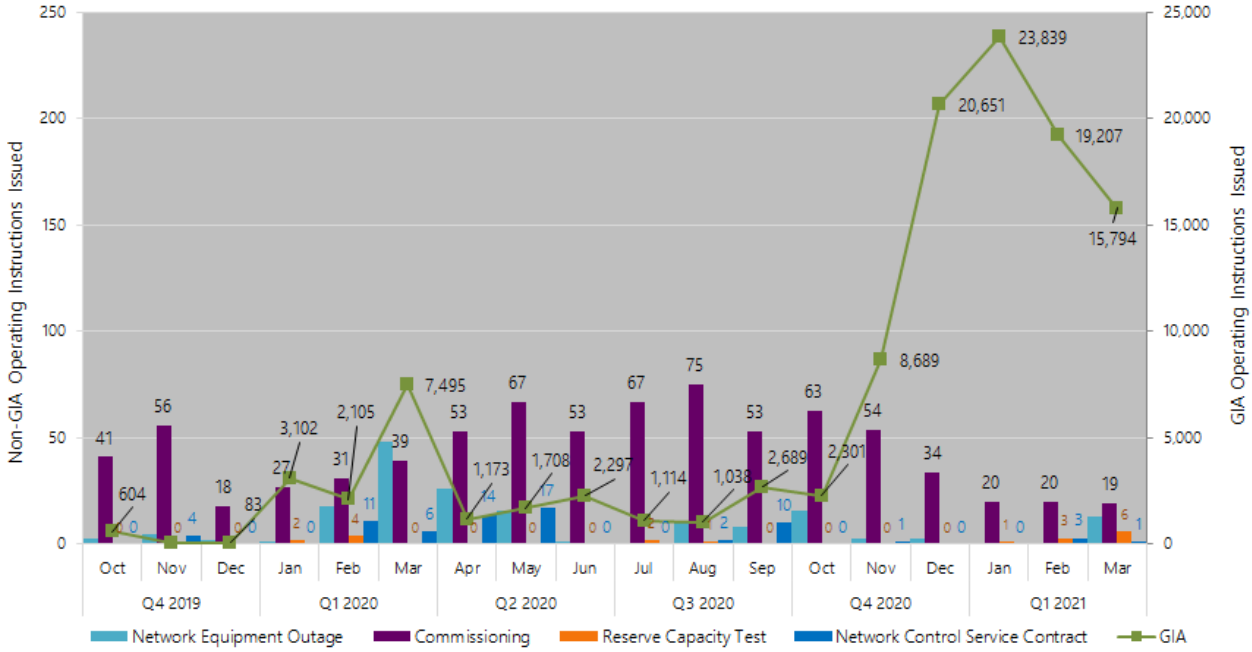
Figure 1: Dispatch Instructions issued during each Trading Month since 1 October 2019.



AEMO issued 58,926 Operating Instructions during the reporting period.

Situations where AEMO may issue Operating Instructions under the WEM Rules are for Commissioning Tests, Reserve Capacity Tests, Network Equipment Outages (pursuant to clause 7.7.11.) and provision of services under the Network Control Service Contracts and Generator Interim Access (GIA) Operating Instructions.

Figure 2: Operating Instructions issued during each Trading Month since 1 October 2019.



3. Non-Compliance with Dispatch Instructions and Operating Instructions[1]

During the reporting period, AEMO issued the following one-minute non-compliance notifications to Market Participants; taking into account the Tolerance Range, and any Facility Tolerance Ranges, where applicable:

- 4,811 Dispatch Instruction non-compliance notifications, and
- 1,061 Operating Instructions non-compliance notifications.

During the reporting period, the following were instances where a Market Participant did not confirm receipt when required to do so under the WEM Rules:

- 145 instances of non-acknowledgement of Dispatch Instructions, and
- 1,058 instances of non-acknowledgement of Operating Instructions.

Figure 3: Dispatch Instruction non-compliance notifications since 1 October 2019 (4,811 this reporting period).

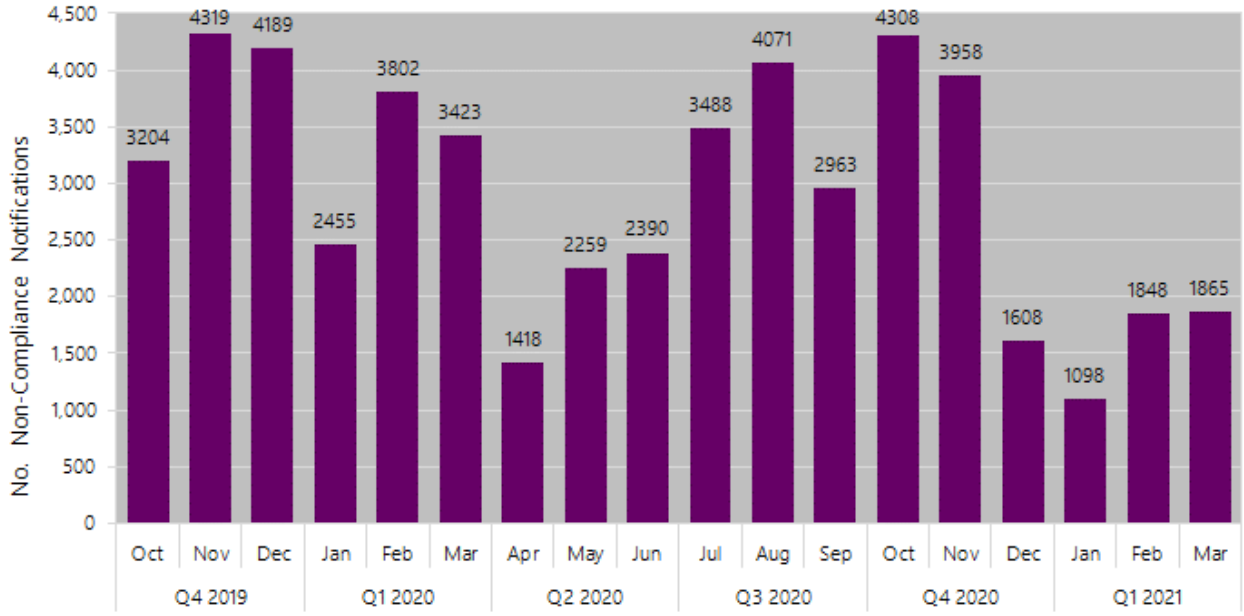
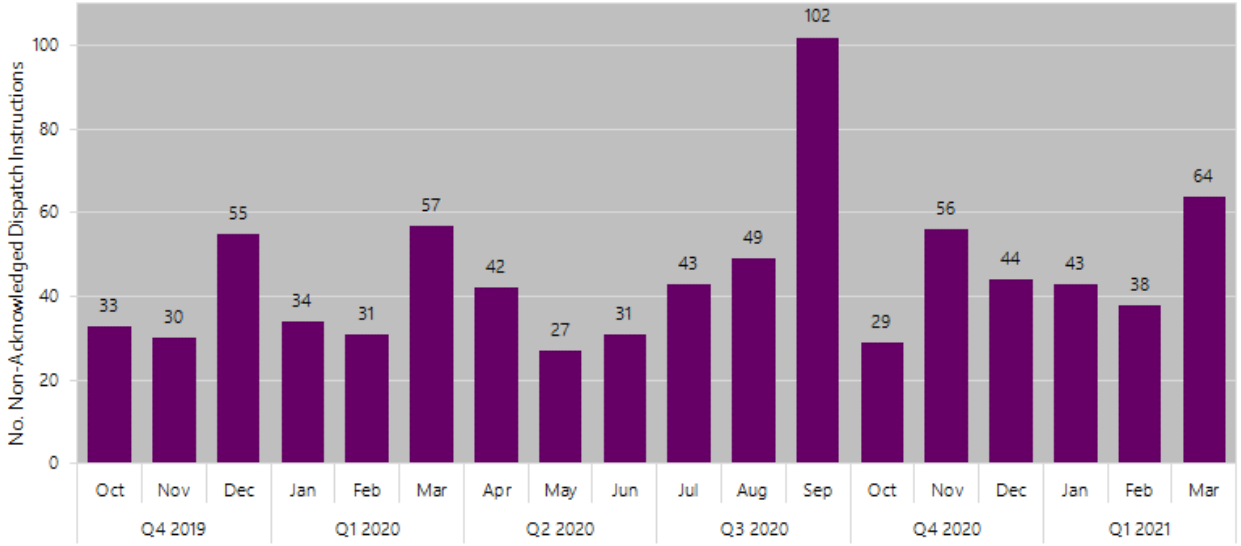


Figure 4: Non-acknowledgement of Dispatch Instructions since 1 October 2019 (145 this reporting period).



[1] Instances of non-compliance are calculated using information AEMO has at hand at the time of creation of the 7.12 report. Actual instances may differ once reviewed and determined by the ERA.

4. Issuance of Dispatch Instruction to Balancing Facilities Out of Merit

4.1 Instances of Out of Merit dispatch identified by AEMO

During the reporting period, no instances were identified where Dispatch Instructions were issued to Balancing Facilities Out of Merit, other than for the reasons outlined in Section 4.2.

4.2 Other instances of Out of Merit dispatch[2]

Section 5 of this report includes information regarding instances of Out of Merit dispatch due to transmission network constraints. AEMO Issues Dispatch Advisories when these situations occur.

Section 6 of this report describes occasions of High Risk and Emergency Operating States that occurred during the reporting period. During elevated Operating States, there may be a need to dispatch Facilities Out of Merit to enable the SWIS to be returned to a Normal Operating State.

5. Transmission Constraints

A "transmission constraint" refers to the configuration of the transmission network that has an effect or potential effect of constraining or otherwise varying the output of a generation Facility. As a result of the transmission constraint, the generation Facility is required to increase or decrease output, depending on the relevant circumstances.

AEMO has identified the following transmission constraints during the reporting period:

- From Trading Interval 16:2 on 3 Jan 2021 to Trading Interval 11:1 on 4 Jan 2021, a bushfire caused a trip of the KW-MSR81 and KW-MSR82 transmission lines and resulted in the need to constrain the PERTHENERGY_KWINANA_GT1 Facility (Dispatch Advisory 207688).
- From Trading Interval 14:1 on 4 Mar 2021 to Trading Interval 15:2 on 4 Mar 2021,due to major storm activity in the Eastern Goldfields region the MU-NGS-KDNX1 and MRT-CGT-YLN-WKTX1 transmission lines tripped and resulted in the need to constrain the INVESTEC_COLLGAR_WF1 Facility (Dispatch Advisory 207861).
- From Trading Interval 14:1 on 4 Mar 2021 to Trading Interval 15:2 on 4 Mar 2021, due to major storm activity in the Eastern Goldfields region the MU-NGS-KDNX1 and MRT-CGT-YLN-WKTX1 transmission lines tripped and resulted in the need to constrain the PRK_AG Facility (Dispatch Advisory 207861).
- From Trading Interval 14:1 on 4 Mar 2021 to Trading Interval 15:2 on 4 Mar 2021, due to major storm activity in the Eastern Goldfields region the MU-NGS-KDNX1 and MRT-CGT-YLN-WKTX1 transmission lines tripped and resulted in the need to constrain the STHRNCRS_EG Facility (Dispatch Advisory 207861).
- From Trading Interval 5:2 on 11 Mar 2021 to Trading Interval 7:2 on 11 Mar 2021, a Network outage at ALB T3 resulted in the need to constrain the ALBANY_WF1 Facility (Dispatch Advisory 207885).
- From Trading Interval 5:2 on 11 Mar 2021 to Trading Interval 7:2 on 11 Mar 2021, a Network outage at ALB T3 resulted in the need to constrain the GRASMERE_WF1 Facility (Dispatch Advisory 207885).
- From Trading Interval 17:2 on 11 Mar 2021 to Trading Interval 18:1 on 11 Mar 2021, a Network outage at ALB T3 resulted in the need to constrain the ALBANY_WF1 Facility (Dispatch Advisory 207886).
- From Trading Interval 17:2 on 11 Mar 2021 to Trading Interval 18:1 on 11 Mar 2021, a Network outage at ALB T3 resulted in the need to constrain the GRASMERE_WF1 Facility (Dispatch Advisory 207886).

[2] 7.6.1D of the WEM Rules provides for Out of Merit dispatch to avoid a High Risk Operating State or an Emergency Operating State or, if the SWIS is in a High Risk Operating State or an Emergency Operating State, to enable the SWIS to be returned to a Normal Operating State.

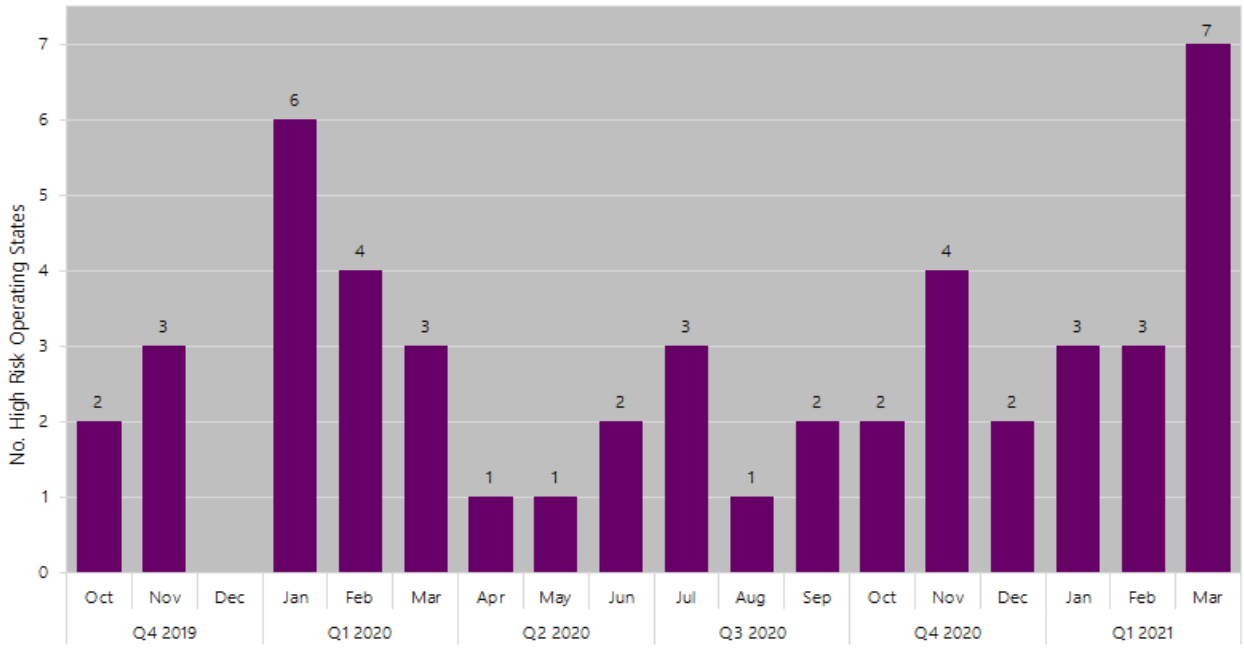
- From Trading Interval 7:1 on 30 Mar 2021 to Trading Interval 17:1 on 30 Mar 2021, a Network outage on the on the TS-MBA81 line resulted in the need to constrain the ALINTA_WWF Facility (Dispatch Advisory 207943).
- From Trading Interval 7:1 on 30 Mar 2021 to Trading Interval 17:1 on 30 Mar 2021, a Network outage on the on the TS-MBA81 line resulted in the need to constrain the MWF_MUMBIDA_WF1 Facility (Dispatch Advisory 207943).
- From Trading Interval 6:1 on 31 Mar 2021 to Trading Interval 7:1 on 31 Mar 2021, a Network outage on the on the TS-MBA81 line resulted in the need to constrain the ALINTA_WWF Facility (Dispatch Advisory 207943).
- From Trading Interval 7:1 on 31 Mar 2021 to Trading Interval 15:2 on 31 Mar 2021, a Network outage on the on the TS-MBA81 line resulted in the need to constrain the MWF_MUMBIDA_WF1 Facility (Dispatch Advisory 207943).
- From Trading Interval 7:2 on 11 Mar 2021 to Trading Interval 17:2 on 11 Mar 2021, a Network outage at ALB T3 resulted in the need to constrain the ALBANY_WF1 Facility (Dispatch Advisory 207886).
- From Trading Interval 7:2 on 31 Mar 2021 to Trading Interval 15:2 on 31 Mar 2021, a Network outage on the on the TS-MBA81 line resulted in the need to constrain the ALINTA_WWF Facility (Dispatch Advisory 207943).

6. Operating States, Shortfalls in Ancillary Services and Involuntary Curtailment of Load

6.1 High Risk Operating State

There were thirteen instances of a High Risk Operating State during the reporting period. AEMOs System Management System Transition project was commissioned in late 2020 transferring a lot of Western Power IT systems into AEMO and unsurprising there has been some teething issues needing resolution. Of the seven IT incidents reported that resulted in High Risk operating states, one was an AEMO wide issue, and 4 related to two separate issues. These issues have been investigated and resolved.

Figure 5: High Risk Operating States that have occurred since 1 October 2019.



Date/Interval(s)	1 Jan 2021 / Trading Interval 9:1 to Trading Interval 12:2
Dispatch Advisory#	207684
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	5 Jan 2021 / Trading Interval 17:1 to Trading Interval 21:1
Dispatch Advisory#	207690
Details	A shortfall in Ancillary Service Requirements occurred.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	16 Jan 2021 / Trading Interval 17:1 to Trading Interval 10:1
Dispatch Advisory#	207722
Details	A bushfire in proximity to the 330kV transmission corridor resulted in a trip of a transmission line.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	1 Feb 2021 / Trading Interval 17:2 to Trading Interval 18:2
Dispatch Advisory#	207781
Details	A shortfall in Ancillary Service Requirements occurred.
AEMO Action	AEMO was required to dispatch Out of Merit to maintain Power System Security and Power System Reliability.

Date/Interval(s)	24 Feb 2021 / Trading Interval 18:2 to Trading Interval 21:2
Dispatch Advisory#	207821
Details	AEMO experienced degradation of its IT systems
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	28 Feb 2021 / Trading Interval 1:1 to Trading Interval 1:2
Dispatch Advisory#	207841
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, and will dispatch Out of Merit if required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	2 Mar 2021 / Trading Interval 13:1 to Trading Interval 14:1
Dispatch Advisory#	207842
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	4 Mar 2021 / Trading Interval 14:1 to Trading Interval 15:2
Dispatch Advisory#	207861
Details	At 14:06, the MU-NGS-KDNX1 and MRT-CGT-YLN-WKTX1 lines tripped resulting in aloss of approximately 140MW.
AEMO Action	AEMO constrained INVESTEC_COLLGAR_WF1, STHRNCRS_EG and PRK_AG until the lines returned to service.

Date/Interval(s)	9 Mar 2021 / Trading Interval 0:1 to Trading Interval 3:1
Dispatch Advisory#	207883
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	9 Mar 2021 / Trading Interval 0:2
Dispatch Advisory#	207882
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	16 Mar 2021 / Trading Interval 12:2 to Trading Interval 13:1
Dispatch Advisory#	207921
Details	At 12:59, cloud cover reduced residential PV generation resulting in a rapid increase of approximately 300MW in generation and a frequency deviation to 49.50Hz. Frequency returned to a normal operating level within 282 seconds of the reduction in PV.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

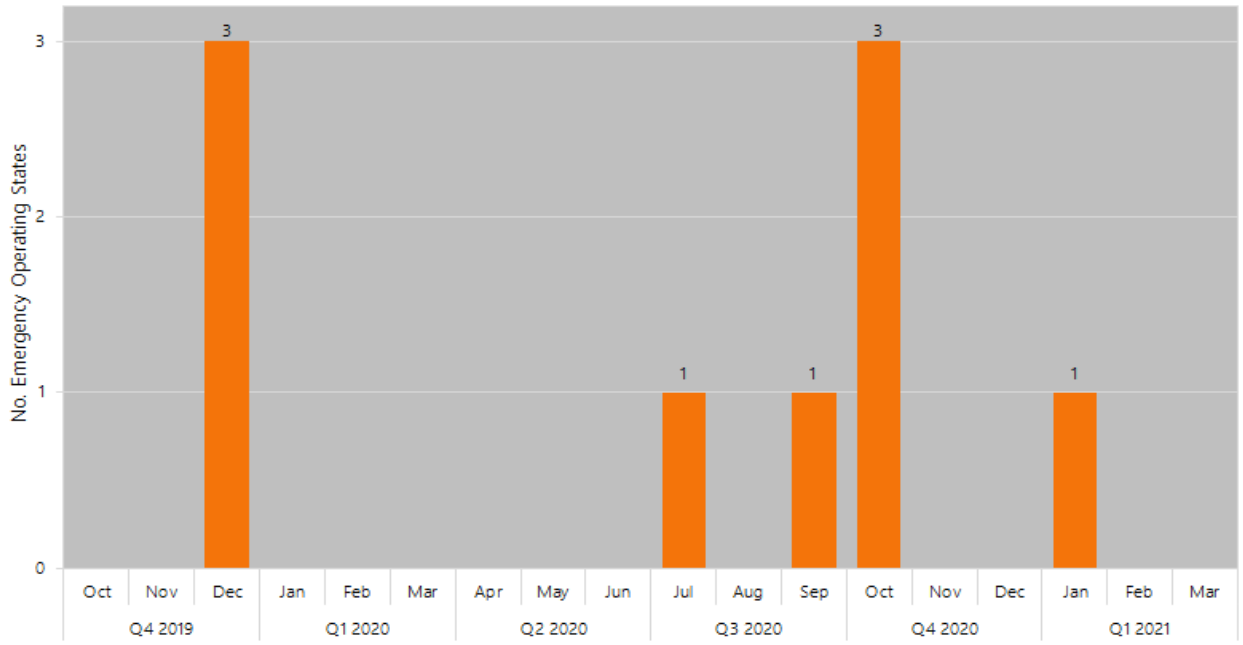
Date/Interval(s)	16 Mar 2021 / Trading Interval 21:2 to Trading Interval 23:2
Dispatch Advisory#	207923
Details	AEMO experienced IT issues affecting the operation of the Real Time Dispatch Engine.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

Date/Interval(s)	29 Mar 2021 / Trading Interval 10:1
Dispatch Advisory#	207944
Details	At 10:06 the BW2_BLUEWATERS_G1 Facility tripped resulting in a loss of approximately 210MW and a frequency deviation to 49.18Hz. Frequency returned to within the normal Operating Range within 80 seconds.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

6.2 Emergency Operating State

There was one instance of an Emergency Operating State during the reporting period.

Figure 6: Emergency Operating States that have occurred since 1 October 2019.



Date/Interval/s	1 Jan 2021 / Trading Interval 11:1 to Trading Interval 12:2
Dispatch Advisory #	207686
Details	Due to a forced outage of the NBT-YDT-TST-ENT91 line, at 11:26:51 WARRADARGE_WF1 and YANDIN_WF1 Facilities tripped, resulting in a loss of approximately 308MW of generation and a frequency deviation to 48.93Hz. Frequency returned to a normal operating level within 196 seconds of the Facility tripping.
AEMO Action	AEMO dispatched according to the latest BMO received, unless Out of Merit dispatch was required to maintain Power System Security and Power System Reliability.

6.3 Shortfalls in Ancillary Services

During the reporting period there were 115 instances of a shortfall in Ancillary Services. A shortfall occurs when the Ancillary Service Requirements are not met within a Trading Interval.

Load Rejection Reserve Service (LRRS)

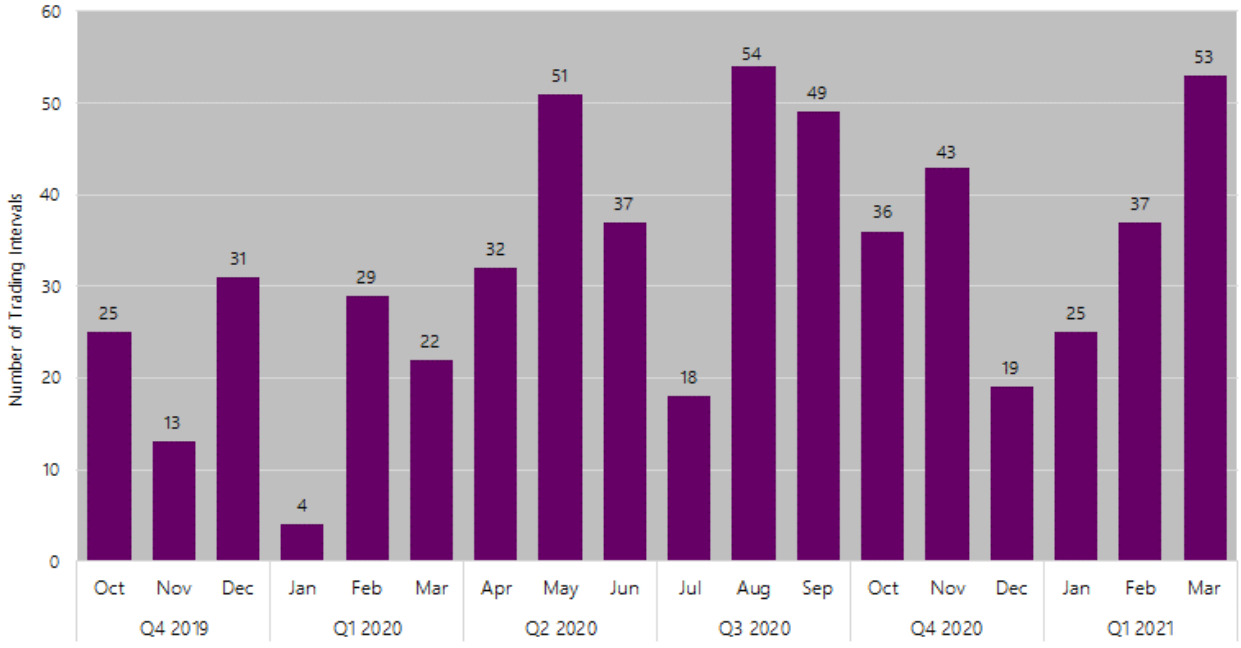
AEMO's primary function as the system operator in the SWIS is to ensure the SWIS operates in a secure and reliable manner (clause 2.2.1 of the WEM Rules). The LRRS is the service of holding capacity associated with a Scheduled Generator in reserve so that the Scheduled Generator can reduce output rapidly in response to a sudden decrease in SWIS load.

During the reporting period 104 instances related to shortfalls of LRRS [3]. The majority of shortfalls occurred during periods of high volatility of wind and rooftop PV systems. In these situations, maintaining the required level of Load Rejection Reserve is difficult, and maintaining Power System Security and Power System Reliability while minimising costs to the WEM often means no action is the best response.

Load Following Ancillary Services (LFAS)

For every Trading Interval, System Management must activate each LFAS Facility for its full upward and downward LFAS Enablement to satisfy the LFAS Enablement Schedule. During the reporting period 11 Trading Intervals of LFAS Enablement shortfalls, with an average of 2MW of under-enablment, were reported. Manual identification and processes contributed to the LFAS under-enablments.

Figure 7: Shortfalls in Ancillary Services that have occurred since 1 October 2019.



Note. Six additional LFAS Enablement shortfalls were reported for June and two for August 2020 after the quarter's end. An additional adjustment was made to August 2020 as six shortfalls were in September.

None of the LRRS or LFAS shortfalls placed the SWIS in a High Risk Operating State or an Emergency Operating State as defined under WEM Rule 3.4.1.

6.4 Involuntary curtailment of load

There were no instances of involuntary curtailment of load during the reporting period.

[3] As outlined in AEMO's Ancillary Services Report for the WEM 2020, AEMO has been conducting a Load Rejection Reserve (LRR) trial using a dynamic requirement in real time. The dynamic formulation incorporates physical aspects of the power system, including setting the upper limit of the LRR requirement based on the largest credible contingency in real time. Data is based on the number of Trading Intervals where Load Rejection Reserve was less than the dynamic requirement, calculated using five-minute averages within a Trading Interval.

7. Selection and use of LFAS Facilities other than in accordance with LFAS Merit Order

During the reporting period, there were six instances where AEMO was required to use Load Following Ancillary Services (LFAS) Facilities outside of the LFAS Enablement Schedule to operate the SWIS in a reliable and safe manner under clause 7B.3.8 of the WEM Rules.

Date/Intervals	26 Jan 2021 / Trading Interval 9:2
Dispatch Advisory #	207761
Details	AEMO required backup l LFAS due to the NEWGEN_KWINANA_CCG1 Facility being unable to provide LFAS as per the LFAS Merit Order.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.

Date/Intervals	20 Feb 2021 Trading Interval 17:2 to 21 Feb 2021 Trading Interval 4:1
Dispatch Advisory #	207801
Details	AEMO required backup LFAS due to the ALINTA_PNJ_U2 Facility being unable to provide LFAS as per the LFAS Merit Order.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.

Date/Intervals	21 Feb 2021 / Trading Interval 12:1 to Trading Interval 13:2
Dispatch Advisory #	207802
Details	AEMO required backup LFAS due to the ALINTA_PNJ_U2 Facility being unable to provide LFAS as per the LFAS Merit Order.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.

Date/Intervals	3 Mar 2021 / Trading Interval 8:1 to Trading Interval 9:1
Dispatch Advisory #	207843
Details	AEMO required backup LFAS due to the ALINTA_PNJ_U1 Facility being unable to provide LFAS as per the LFAS Merit Order.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.

Date/Interval/s	13 Mar 2021 / Trading Interval 13:2 to Trading Interval 14:2
Dispatch Advisory #	207901
Details	AEMO required backup LFAS due to Newgen_Kwinana_CCG1 Facility being unable to provide LFAS as per the LFAS Merit Order.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.

Date/Intervals	16 Mar 2021 / Trading Interval 13:2 to Trading Interval 17:1
Dispatch Advisory #	207922
Details	AEMO required additional LFAS due to fluctuations in frequency due to PV volatility.
AEMO Action	AEMO was required to activate LFAS from the Backup LFAS Provider to maintain Power System Security and Power System Reliability.