

NEM Lack of Reserve Framework Report

31 October 2018

Reporting period 1 July 2018 to 30 September 2018

A report for the National Electricity Market on the operation of the Lack of Reserve Framework

Important notice

PURPOSE

AEMO has prepared this document under clause 4.8.4B of the National Electricity Rules to report on the operation of the NEM Lack of Reserve Framework for the period 1 July 2018 to 30 September 2018.

DISCLAIMER

This document or the information in it may be subsequently updated or amended. This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law, the National Electricity Rules, or any other applicable laws, procedures or policies. AEMO has made every effort to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; 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.

VERSION CONTROL

Version	Release date	Changes
1	31 October 2018	Initial version

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

Executive summary

This report has been published in accordance with clause 4.8.4B of the National Electricity Rules.

During the reporting period 1 July 2018 to 30 September 2018, AEMO declared a total of 17 Lack of Reserve (LOR) conditions, either forecast or actual. This is compared to a total of 20 LOR conditions declared during the previous reporting period (1 April 2018 to 30 June 2018).

During the reporting period the predominant cause of LOR conditions were planned transmission network and generator outages, reducing available supply, with some instances occurring during periods of moderately high demand. Of the 17 forecast LOR conditions initially declared, four resulted in actual LORs. All four actual conditions were LOR1.

The next report on the NEM Lack of Reserve Framework, for the reporting period 1 October 2018 to 31 December 2018, will be published by 31 January 2019.

Contents

Executive summary	3
1. Introduction	5
2. Reserve Level Declaration Guidelines	7
2.1 Changes in the reporting period	7
2.2 Consultation on changes to the Guidelines	7
3. Lack of Reserve Conditions Declared	8
4. Review of Performance	15
4.1 Forecast Uncertainty Measure values	15
4.2 LOR declaration reserve requirements	17
4.3 Forecast and actual LOR declarations	18
4.4 Number and cause of LOR declarations	18
Glossary	20

Tables

Table 1 Summary of forecasted and actual LOR conditions, with causing factors.	5
Table 2 LOR notices declared during reporting period 1 July 2018 and 30 September 2018	9
Table 3 LORs declared during the reporting period, indicating where either FUM or LCR has set the reserve requirement. Yellow = LCR. Orange = FUM.	18

Figures

Figure 1 NSW region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.	15
Figure 2 QLD region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.	16
Figure 3 SA region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.	16
Figure 4 TAS region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.	17
Figure 5 VIC region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.	17

1. Introduction

This report has been published, in accordance with clause 4.8.4B of the National Electricity Rules (NER), to provide a high-level analysis of how the lack of reserve framework is operating. This report covers the period 1 July 2018 to 30 September 2018.

This report is divided into three sections:

- Reserve Level Declaration Guidelines – a summary of changes to the Guidelines over the past quarter, and an update on the progress of the consultation that is under way.
- Lack of Reserve (LOR) conditions declared – a list of all LOR conditions declared or revised during the past quarter (based on market notices), including an indication of the required reserve level and if the requirement was set by the Forecast Uncertainty Measure (FUM) or the largest credible risk/s in the region. The FUM value for the respective period is also provided. Table 1 below provides a high level summary of the LOR declarations and their causes.
- Review of Performance – a review of the performance of the lack of reserve framework and any observed trends, providing an assessment of FUM values compared to previous quarters, determinants of reserve level requirements, number of LOR declarations and causes of LOR declarations.

For further information, contact AEMO Operational Forecasting: op.forecasting@aemo.com.au.

The next report on the NEM Lack of Reserve Framework, for the reporting period 1 October 2018 to 31 December 2018, will be published by 31 January 2019.

Table 1 Summary of forecasted and actual LOR conditions, with causing factors.

Effective day	Region	LOR1		LOR2		Cause
		Actual	Forecast	Actual	Forecast	
09/07/2018	SA		1			This forecast LOR1 was due to planned transmission outages and later cancelled due to an increase in generation availability.
25/07/2018	SA				1	This forecast LOR2 was due to planned transmission outages and later cancelled due to an increase in generation availability.
06/08/2018	SA				2	One forecast LOR2 (0830-0900) was due to reduced availability due to planned transmission outages and later cancelled due to reduction in forecast demand. The other forecast LOR2 (1830-1930) was due to planned transmission outages and later cancelled following a reduction in the FUM value.
07/08/2018	SA				1	This forecast LOR2 was due to planned transmission outages and later cancelled due to an increase in generation availability.
08/08/2018	SA		1		1	The forecast LOR1 was due to planned transmission outages. This was progressed to a forecast LOR2 after the forecast

Effective day	Region	LOR1		LOR2		Cause
		Actual	Forecast	Actual	Forecast	
						period entered the 3-day ahead horizon and the FUM set the LOR2 reserve requirement. The LOR1 and LOR2 forecasts were cancelled due to an increase in generator availability and a reduction in FUM value respectively.
20/08/2018	NSW				1	Multiple forecast LOR2s were issued due to moderately high demand and changes in generation availability and the FUM. The forecast LOR2 was later cancelled due to increased availability and a reduction in the FUM.
21/08/2018	NSW	1				The initially forecast LOR1 was later declared an actual LOR1 due to a combination of generation plant outages and moderate demand.
27/08/2018	NSW	1			1	The forecast LOR2 was due to a combination of generation plant outages and moderate demand. Changes in outage and demand conditions led this forecast LOR2 to be cancelled and reassessed as a forecast LOR1, and resulted in an actual LOR1.
28/08/2018	NSW	1			1	These reserve conditions were due to a combination of generation plant outages and high demand. The forecast conditions changed from LOR2 to LOR1 due to an increase in generation availability, and ended in an actual LOR1.
03/09/2018	NSW	1			1	Initially a forecast LOR1 due to generation availability and relatively high demand. Changes in the FUM value during the lead up to the effective LOR period led to a temporary LOR2 forecast which was later cancelled. The LOR1 forecast was reinstated and ended in an actual LOR1 condition.
04/09/2018	NSW		1		1	A combination of generation availability and relatively high demand caused an LOR2 forecast, which was later re-forecast as an LOR1 due to an increase in generation availability. Changes in the FUM value during the lead up to the effective LOR period led to a temporary re-forecast of an LOR2 which was later cancelled, and the LOR1 re-instated. The LOR1 was subsequently cancelled due to an increase in generation availability.
Total		4	3	0	10	17

The count of LOR conditions uses the methodology defined in section 3.

2. Reserve Level Declaration Guidelines

2.1 Changes in the reporting period

No changes were made to the initial version of the guidelines during the reporting period of 1 July 2018 to 30 September 2018.

2.2 Consultation on changes to the Guidelines

AEMO continues to review the performance of the reserve level declaration arrangements on an ongoing basis to analyse how the framework has been operating to date. AEMO has identified several changes and further development to improve the performance of the framework, and launched a consultation to update the Guidelines on 16 July 2018¹.

AEMO received two written responses to the Issues Paper published on 16 July 2018; both submissions requested further information and justification for the proposed changes. AEMO published an Update Paper² to provide stakeholders with further information, analysis and justification of the proposed changes to the Reserve Level Declaration Guidelines following the initial consultation period.

The Update Paper provides clarity around each of the proposed changes. Several of the proposed changes require no updates to the Guidelines, however additional information and justification was provided to increase the transparency of how the reserve level is determined. For the proposed changes which require updates to the Guidelines, additional information and justification was provided and a draft of the Guidelines with the required changes was published. Consultation on the draft closed on 24 October 2018.

For more information on the proposed changes or the status of the consultation, refer to AEMO's Consultations webpage.

¹ <https://www.aemo.com.au/Stakeholder-Consultation/Consultations/Changes-to-Reserve-Level-Declaration-Guidelines?Convenor=AEMO%20NSP>

² https://www.aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/Electricity_Consultations/2018/RLD/Update-Paper---Changes-to-Reserve-Level-Declaration-Guidelines.pdf

3. Lack of Reserve Conditions Declared

Table 2 lists all forecast and actual LORs declarations over the reporting period 1 July 2018 to 30 September 2018. Table 2 also identifies the market notices that communicated updates to, and cancellation of either forecast or actual LOR conditions.

The total count for LOR conditions is based on the following principles:

- All market notices making the initial declaration of a forecast or actual LOR condition during the reporting period were counted.
- Any market notices which were updates (to the reserve requirement, reserve capacity available or effective period) to previously issued forecast or actual LORs for a given effective date were not counted to prevent double counting of update notices.
- Updates to existing LOR conditions where the LOR level changed were counted as separate LOR conditions.
- Any forecast LORs which were subsequently declared as actual LORs of the same LOR level are counted once. In the summary table in section 2 these are shown as actual conditions only.

During the reporting period, there was one instance of a suspect LOR³. This suspect LOR was reviewed at the time and was not declared as a forecast or actual LOR, hence it has been excluded from the count of LOR declarations.

³ Market notice 63507 issued on 18/7/2018 at 13:32 declared the LOR as suspect. The LOR was cancelled with market notice 63508 issued on 18/7/2018 at 13:49.

Table 2 LOR notices declared during reporting period 1 July 2018 and 30 September 2018

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
SA Region										
09/07/2018	63314	02/07/2018 15:10	2030 to 2100	LOR1	Forecast	Planned transmission outages contributed to these forecast LOR1 conditions.	424	395	n/a as forecast period beyond 72 hrs ahead	LCR2
	63366	05/07/2018 14:54	n/a	LOR1	Cancel	LOR1 condition on this effective day was cancelled predominantly due to an increase in generation availability	445	740	n/a as forecast period beyond 72 hrs ahead	LCR2
25/07/2018	63564	23/07/2018 11:45	1830 to 1930	LOR2	Forecast	Some planned transmission outages contributed to these forecast LOR2 conditions	448	397	448	FUM
	63567	23/07/2018 22:33	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled predominantly due to an increase in generation availability	426	767	426	FUM
06/08/2018	63715	03/08/2018 10:58	0830 to 0900	LOR2	Forecast	Some planned transmission outages contributed to these forecast LOR2 conditions.	616	561	616	FUM
	63721	03/08/2018 15:37	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled predominantly due to a decrease in forecast demand	689	812	689	FUM

⁴ Reserve levels required and available are the values as stated in the market notice, and correspond to the interval with the lowest reserve available.

⁵ This column represents the FUM value of the intervals which correspond to the reserve requirement stated in the market notice.

⁶ LCR refers to Largest Credible Risk, this is the single largest credible risk in the region. LCR2 refers to the sum of the two largest credible risks in the region.

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
	63734	04/08/2018 22:57	1830 to 1930	LOR2	Forecast	LOR2 condition forecast due to planned transmission outages, and an increase in the LOR2 level due to the FUM	654	629	654	FUM
	63750	05/08/2018 10:57	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled as the FUM decreased	544	574	544	FUM
07/08/2018	63734	04/08/2018 22:57	1830 to 2000	LOR2	Forecast	Some planned transmission outages contributed to these forecast LOR2 conditions.	669	627	669	FUM
	63750	05/08/2018 10:57	1830 to 2030	LOR2	Update	Update to previous forecast with changes in reserve requirement and effective period.	696	596	696	FUM
	63756	05/08/2018 16:36	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled predominantly due to an increase in generation availability	654	754	654	FUM
08/08/2018	63720	03/08/2018 15:00	1800 to 1830	LOR1	Forecast	Some planned transmission outages contributed to these forecast LOR1 conditions.	471	411	n/a as forecast period beyond 72 hrs ahead	LCR2
	63754	05/08/2018 15:18	1930 to 2030	LOR1	Update	Update to previous forecast with changes in reserve values and effective period.	464	436	n/a as forecast period beyond 72 hrs ahead	LCR2
	63766	06/08/2018 11:13	1830 to 2000	LOR2	Forecast	LOR2 condition forecast due to the FUM being greater than the LCR2 at this time horizon	501	474	501	FUM
	63767	06/08/2018 12:36	1830 to 2030	LOR2	Update	Update to previous forecast with changes in reserve values and effective period.	530	395	530	FUM
	63776	07/08/2018 11:20	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled predominantly due to a reduction in the FUM value	391	419	391	FUM

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
	63777	07/08/2018 13:03	1830 to 2000	LOR1	Forecast	Some planned transmission outages contributed to these forecast LOR1 conditions.	447	399	374	LCR2
	63780	07/08/2018 13:48	n/a	LOR1	Cancel	LOR1 condition on this effective day was cancelled predominantly due to an increase in generation availability	447	596	369	LCR2
NSW Region										
20/08/2018	63951	19/08/2018 05:07	1800 to 1900	LOR2	Forecast	LOR2 condition forecast due a combination of generation plant outages and moderately high demand	1719	1611	1719	FUM
	63952	19/08/2018 08:44	n/a	LOR2	Cancel	LOR2 condition on this effective day was cancelled predominantly due to a reduction in the FUM value	1457	1572	1457	FUM
	63953	19/08/2018 10:31	1800 to 1930	LOR2	Forecast	LOR2 condition forecast due a reduction of generation plant availability	1508	1298	1508	FUM
	63956	19/08/2018 13:42	1800 to 1900	LOR2	Update	Update to previous forecast due to an increase in generation availability, and changes in effective period.	1508	1481	1508	FUM
	63957	19/08/2018 14:20	n/a	LOR2	Cancel	LOR2 condition forecasted in notice 63953 was cancelled predominantly due to a reduction in the FUM value	1464	1491	1464	FUM
21/08/2018	63963	21/08/2018 00:22	0800 to 0830	LOR1	Forecast	LOR1 condition forecast due a combination of generation plant outages and moderate demand	1400	1344	1123	LCR2
	63969	21/08/2018 08:10	0800 to 0830	LOR1	Actual	Actual LOR1 declared.	1400	1254	508	LCR2
	63970	21/08/2018 08:42	n/a	LOR1	Cancel	Cancellation of actual LOR1 condition	n/a	n/a	n/a	LCR2
27/08/2018	64008	26/08/2018 10:39	1730 to 2030	LOR2	Forecast	LOR2 condition forecast due a combination of generation plant outages and high demand	1274	1034	1274	FUM

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
	64009	26/08/2018 13:07	1730 to 2000	LOR2	Update	Update to previously forecasted LOR2 with changes in reserve requirements and effective period.	1232	1131	1232	FUM
	64011	26/08/2018 17:23	1800 to 1830	LOR2	Update	Update to previously forecasted LOR2 with changes in reserve requirements and affective period.	1216	1197	1216	FUM
	64013	26/08/2018 18:09	n/a	LOR2	Cancel	LOR2 conditions referred to in notice 64011 were cancelled due to an increase in generation plant availability	1197	1200	1197	FUM
	64017	27/08/2018 16:53	1730 to 1800	LOR1	Forecast	LOR1 conditions forecast due to an increase in forecast demand and decrease in generation plant availability	1400	1257	510	LCR2
	64018	27/08/2018 17:36	1730 to 1800	LOR1	Actual	Actual LOR1 declared.	1400	1270	450	LCR2
	64019	27/08/2018 17:46	n/a	LOR1	Cancel	Cancellation of actual LOR1 condition	n/a	n/a	n/a	LCR2
28/08/2018	64008	26/08/2018 10:39	1800 to 2100	LOR2	Forecast	LOR2 condition forecast due to a combination of generation plant outages and high demand	1518	1042	1518	FUM
	64010	26/08/2018 14:58	1800 to 1930	LOR2	Update	Update to existing LOR2 with changes in reserve requirements and effective period.	1474	1311	1474	FUM
	64014	26/08/2018 18:13	n/a	LOR2	Cancel	LOR2 conditions referred in notice 64010 were cancelled due to an increase in generation availability and forecast NSW import capability	1521	1682	1521	FUM
	64020	27/08/2018 17:50	1800 to 1900	LOR1	Forecast	LOR1 conditions forecast due to a reduction in generation plant availability	1400	1359	1197	LCR2
	64021	27/08/2018 23:17	n/a	LOR1	Cancel	LOR1 condition forecasted in notice 64020 was cancelled due to an increase in generation availability	1400	1419	1171	LCR2

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
	64022	28/08/2018 10:16	1800 to 1900	LOR1	Forecast	LOR1 condition forecast due to an increase in demand forecast	1400	1347	1038	LCR2
	64025	28/08/2018 17:26	n/a	LOR1	Cancel	Cancellation of LOR1 condition forecasted in notice 64022 due to a decrease in demand forecast	1400	1542	663	LCR2
	64026	28/08/2018 18:43	1830 to 1900	LOR1	Actual	Actual LOR1 condition due to an increase in the demand forecast	1400	1326	600	LCR2
	64027	28/08/2018 19:39	n/a	LOR1	Cancel	Cancellation of actual LOR1 condition	n/a	n/a	n/a	LCR2
03/09/2018	64031	29/08/2018 15:00	1700 to 2100	LOR1	Forecast	LOR1 condition forecast due to generation availability	1400	1104	n/a as forecast period beyond 72 hrs ahead	LCR2
	64049	30/08/2018 16:23	n/a	LOR1	Cancel	The forecasted LOR1 condition was cancelled due to an increase in generation availability.	1400	1622	n/a as forecast period beyond 72 hrs ahead	LCR2
	64061	31/08/2018 19:14	1730 to 1800	LOR2	Forecast	Remaining generation availability and presence of FUM value resulted in a forecasted LOR2.	1596	1513	1596	FUM
	64062	31/08/2018 20:34	1730 to 2000	LOR2	Update	Update to existing LOR2 forecast with changes to reserve requirements and effective period.	1786	1172	1786	FUM
	64066	01/09/2018 21:11	1730 to 2000	LOR2	Update	Update to existing LOR2 forecast with changes to reserve requirement and effective period.	1624	1078	1624	FUM
	64070	02/09/2018 13:20	1800 to 1930	LOR2	Update	Update to existing LOR2 forecast with changes to reserve requirement and effective period.	1321	1055	1321	FUM
	64073	03/09/2018 05:30	1800 to 1900	LOR2	Update	Update to existing LOR2 forecast with changes to reserve requirement and effective period.	1184	1078	1184	FUM

Effective date	Market Notice ID	Issue date and time	Effective time	Level	Actual, forecast or cancel	Comments	Reserve requirement (MW) ⁴		FUM value (MW) ⁵	Reserve requirement set by ⁶
							Required	Available		
	64074	03/09/2018 05:31	1730 to 1930	LOR1	Forecast	LOR1 condition forecast due to generation availability	1400	1078	1184	LCR2
	64075	03/09/2018 08:21	n/a	LOR2	Cancel	The LOR2 was cancelled following a reduction in the FUM value	1098	1102	1098	FUM
	64076	03/09/2018 08:21	1800 to 1930	LOR1	Update	Update to previous LOR1 with changes to effective period.	1400	1102	1098	LCR2
	64083	03/09/2018 18:11	1800 to 1900	LOR1	Actual	Actual LOR1 declared.	1400	1329	414	LCR2
	64084	03/09/2018 19:27	n/a	LOR1	Cancel	Cancellation of actual LOR1 conditions due to an increase in generation availability.	n/a	n/a	n/a	LCR2
04/09/2018	64066	01/09/2018 21:11	1800 to 1900	LOR2	Forecast	LOR2 forecast due to a combination of relatively high demand and limited generation availability.	1786	1610	1786	FUM
	64078	03/09/2018 13:04	1800 to 1900	LOR2	Update	Update to existing LOR2 forecast with changes to reserve requirements.	1473	1355	1473	FUM
	64081	03/09/2018 15:09	n/a	LOR2	Cancel	Cancellation of forecasted LOR2 conditions due to an increase in generator availability and a decrease in FUM.	1320	1361	1320	FUM
	64082	03/09/2018 15:19	1830 to 1900	LOR1	Forecast	An LOR1 is forecast directly after the cancellation of LOR2; as remaining generation availability still warranted an LOR1.	1400	1361	1320	LCR2
	64085	03/09/2018 20:29	1800 to 1900	LOR2	Forecast	An increase in the FUM resulted in a forecast LOR2.	1405	1354	1405	FUM
	64086	03/09/2018 22:12	n/a	LOR2	Cancel	Cancellation of LOR2 condition forecasted in 64085 due to a reduction in the FUM value.	1309	1390	1309	FUM
	64091	04/09/2018 17:52	n/a	LOR1	Cancel	Cancellation of LOR1 condition forecasted in 64082 due to an increase in generation availability.	1400	1870	526	LCR2

4. Review of Performance

4.1 Forecast Uncertainty Measure values

The following section details the average, minimum and maximum FUM values for this reporting period, as compared with quarters one (January to March 2018) and two (April to June 2018). These values can be seen in Figure 1 to Figure 5 below for each region, and are summarised as follows:

- In general, average FUM values have decreased for QLD, and VIC. Average FUM values for NSW have remained relatively stable. The SA and TAS regions have seen minor increases in average FUM values.
- In general, minimum FUM values for all regions and time horizons have decreased or remained stable. Larger decreases are observed for minimum FUM values in the shorter time horizons.
- In general, maximum FUM values for most regions and time horizons have decreased. For TAS the maximum FUM values have remained relatively stable.

Figure 1 NSW region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.

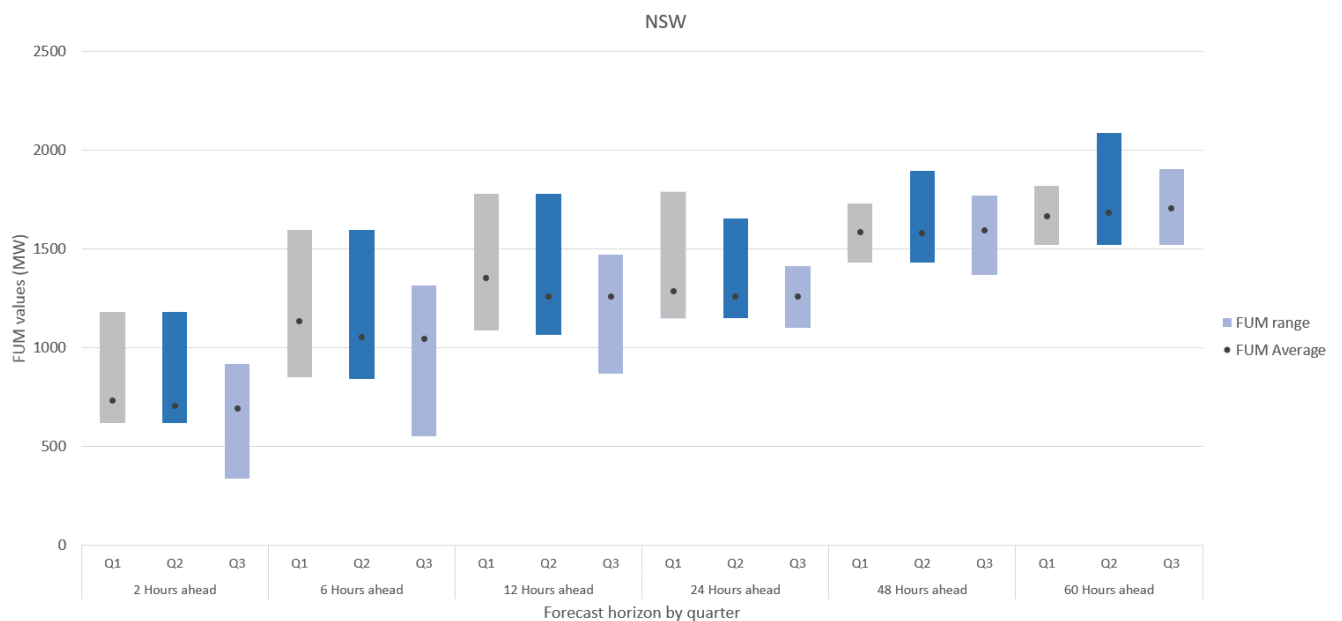


Figure 2 QLD region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.

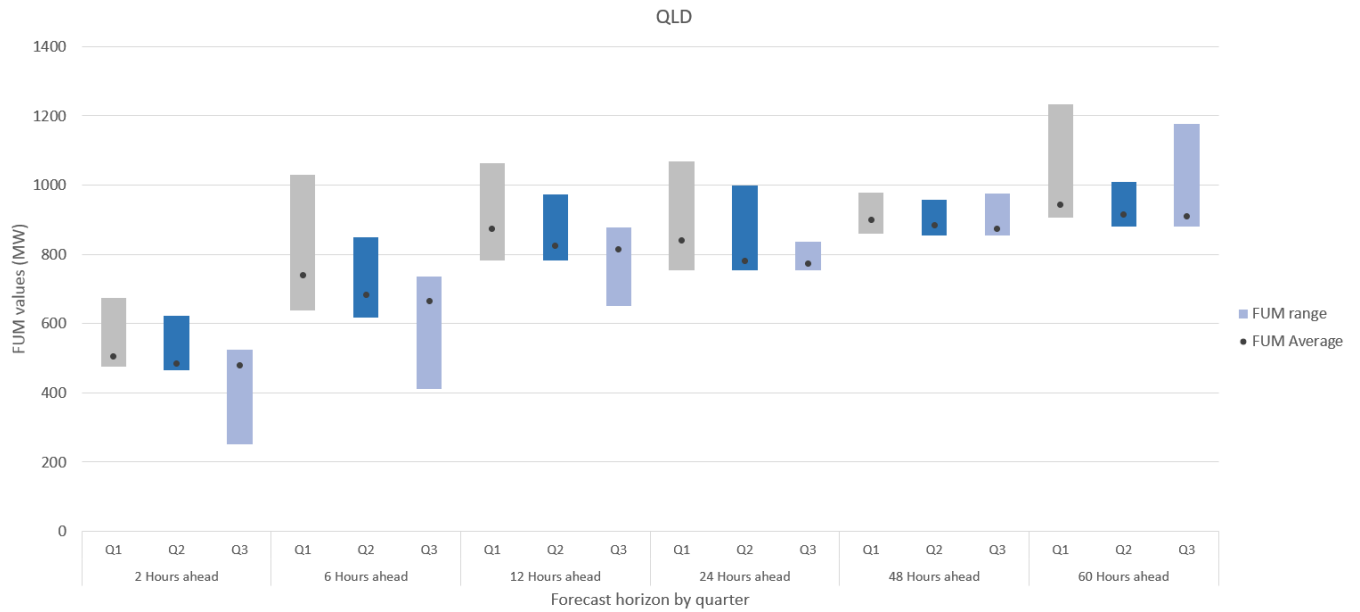


Figure 3 SA region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.

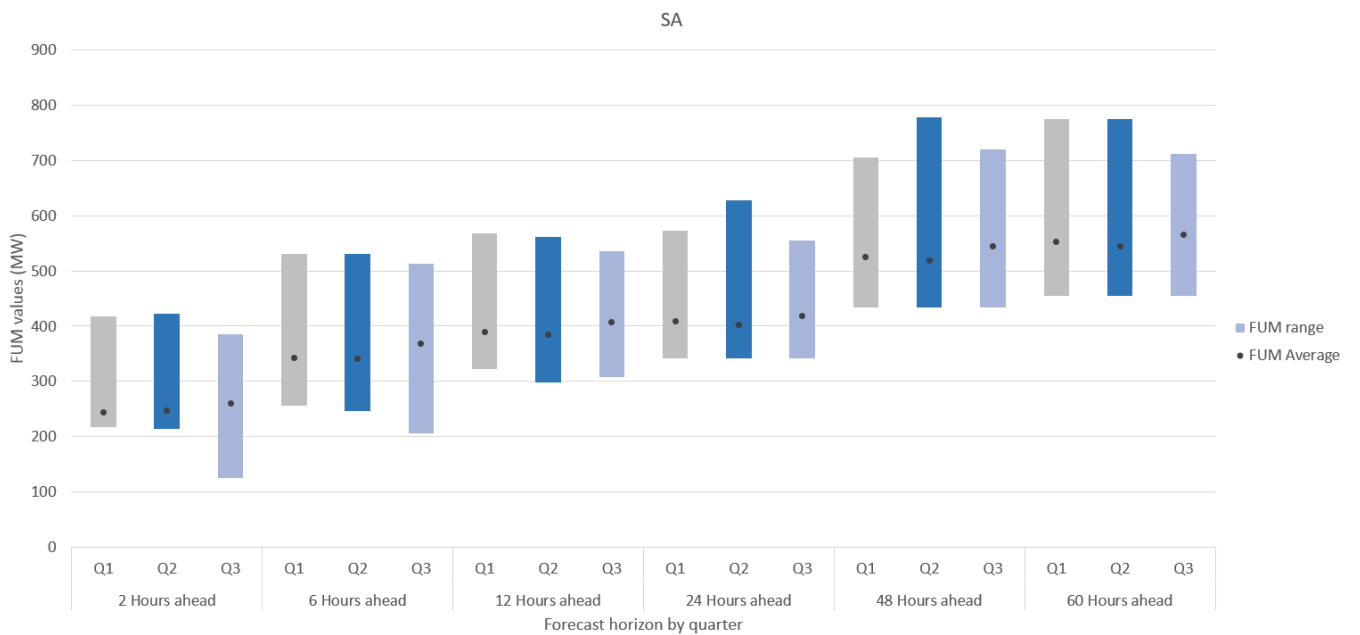


Figure 4 TAS region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.

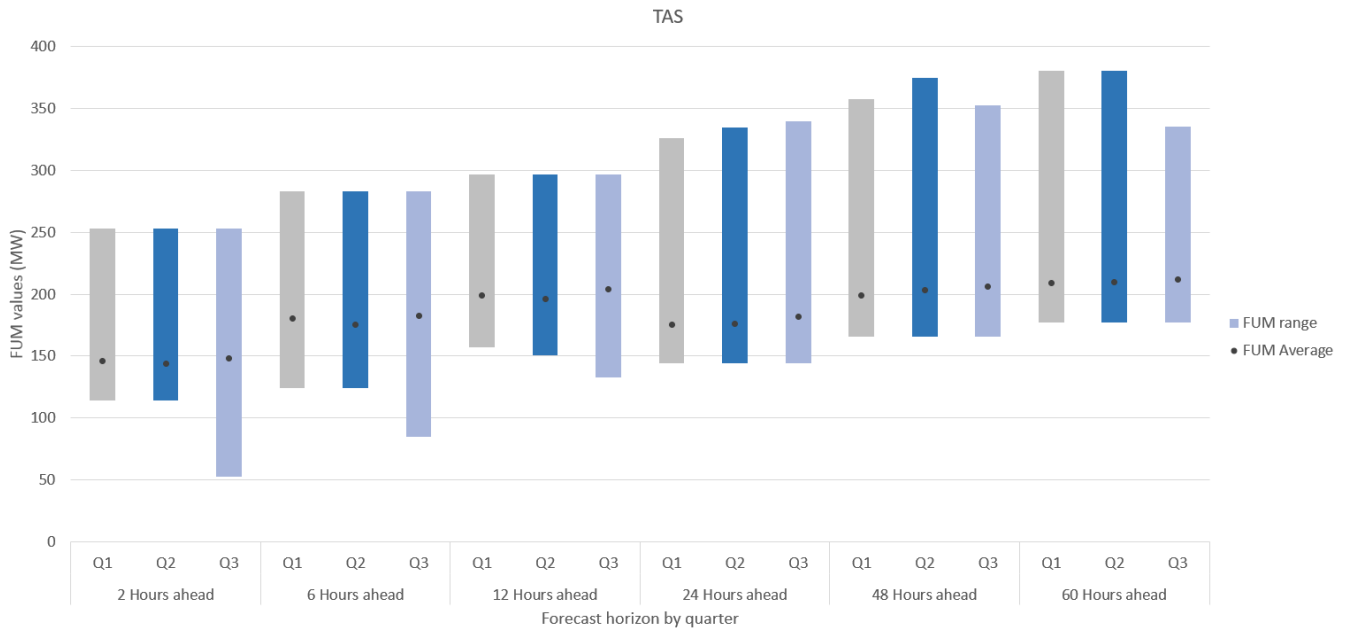
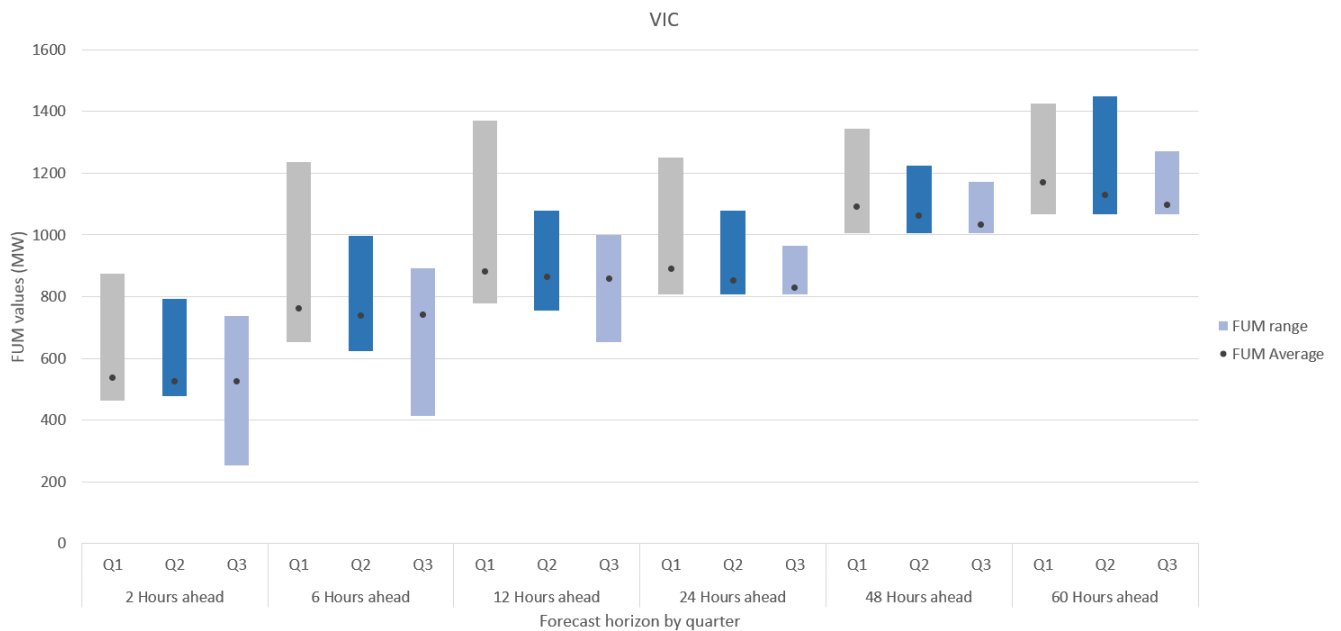


Figure 5 VIC region: maximum, minimum and average FUM values for the reporting period compared with quarter 1 and 2.



4.2 LOR declaration reserve requirements

This section summarises how the reserve requirements were set during any LOR periods. Of the total 17 LOR declarations, in 10 instances the reserve requirements were set by the FUM and in the other 7 instances the reserve requirements were set by the LCR or LCR2.

In 5 out of the 10 cases where the FUM set the reserve requirement, the FUM value acted to raise the reserve requirement of an existing LOR1 condition (where the reserve requirement was set by the LCR2) and resulted in a forecast LOR2. Of these 5 cases, in 3 instances an actual LOR1 was subsequently declared (with the reserve requirement being set by the LCR2) indicating genuine lack of reserve conditions.

All of the LOR2 conditions were declared with the FUM setting the reserve requirement, and all LOR1 conditions were declared with the LCR setting the reserve requirement.

Table 3 shows the forecast and actual LORs and what has set the reserve requirement, with Yellow indicating the requirement was set by the LCR, and Orange indicating the requirement was set by the FUM.

Table 3 LORs declared during the reporting period, indicating where either FUM or LCR has set the reserve requirement. Yellow = LCR. Orange = FUM.

Effective period	LOR1	LOR2
South Australia		
09/07/2018	Forecast	
25/07/2018		Forecast
06/08/2018		Forecast
		Forecast
07/08/2018		Forecast
08/08/2018	Forecast	Forecast
New South Wales		
20/08/2018		Forecast
21/08/2018	Forecast then Actual	
27/08/2018	Forecast then Actual	Forecast
28/08/2018	Forecast then Actual	Forecast
03/09/2018	Forecast then Actual	Forecast
04/09/2018	Forecast	Forecast

4.3 Forecast and actual LOR declarations

During the reporting period there were 10 forecast LOR2s; none of these forecast LOR2s were subsequently declared as actual LOR2 conditions. However, 5 of the 10 forecast LOR2s were subsequently declared as forecast LOR1s with 3 of these 5 becoming actual LOR1s. To summarise, during the reporting period there were 12 separate effective periods forecast as LOR conditions, and of these 12, 4 progressed from a forecast condition to an actual condition. This is best reflected in Table 3 above, which shows the days affected by various LOR conditions, either forecast or actual.

During the reporting period there were 7 forecast LOR1s with 4 of the 7 subsequently being declared as actual LOR1s. Of the 4 actual LOR1s, 3 of them were flagged earlier (with additional lead time) as forecast LOR2 conditions. Where the forecast LOR did not result in an actual LOR, the predominant cause of the cancellations was market response resulting in increased available generation, and in some cases a reduction in the FUM value.

4.4 Number and cause of LOR declarations

A total of 17 LOR conditions (forecast or actual) were declared during the reporting period, slightly fewer than for the previous reporting period (of similar length), which saw 20 LOR declarations.

During this period LOR conditions were predominantly caused by reduced generator availability and planned transmission network outages. In some cases, these conditions were combined with periods of moderately high demand. The trends in the causes for LORs for this reporting period have not changed significantly since the previous reporting period.

Of the 17 forecast LOR conditions initially declared, four resulted in actual LORs. In cases where forecast conditions did not eventuate in actual LORs, this was predominantly the result of increases in generation availability after the publication of the LOR forecast.

Glossary

This document uses many terms that have meanings defined in the National Electricity Rules (NER). The NER meanings are adopted unless otherwise specified.

For each of the terms below, refer to the Guidelines for further information.

Term	Definition
FUM	Forecast Uncertainty Measure. The number of MWs representing the level of forecasting uncertainty.
Guidelines	The Reserve Level Declaration Guidelines published by AEMO under clause 4.8.4A of the NER
LCR	Largest Credible Risk. This is the single largest credible risk in the region.
LCR2	Largest Credible Risk 2. This is the sum of the two largest credible risks in the region.
LOR1	Lack of Reserve 1. The threshold for an LOR1 is determined by the larger value of either the Forecast Uncertainty Measure or single the largest credible risk in the region.
LOR2	Lack of Reserve 2. The threshold for an LOR2 is determined by the larger value of either the Forecast Uncertainty Measure or the sum of the two largest credible risks in the region (i.e. LCR2).
LOR3	Lack of Reserve 3. The threshold for an LOR3 condition is when the forecasted reserve for a region is at or below zero.