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Adrian Theseira  
Assistant Director, Compliance and Enforcement  
Economic Regulation Authority  
PO Box 8469  
Perth WA 6849

Level 45  
152 St Georges Terrace  
Central Park  
Perth WA 6000

**Postal Address:**  
PO Box 7096  
Cloisters Square  
Perth WA 6850

T 08 9469 9800

Dear Adrian

### **Proposed revised 2020-21 LFAS Ancillary Service Requirement**

The purpose of this letter is to:

- notify the Economic Regulation Authority that the Australian Energy Market Operator has reassessed the level of the Load Following Service Ancillary Service Requirement for the 2020-21 Financial Year under clause 3.11.3 of the Wholesale Electricity Market Rules; and
- request that the ERA approves the proposed revised LFAS Ancillary Service Requirement (to apply during the remainder of the 2020-21 Financial Year) under clause 3.11.6 of the WEM Rules.

### **Background**

The ERA has approved the following LFAS Ancillary Service Requirement for the 2020-21 Financial Year:<sup>1</sup>

LFAS Upwards	85 MW between 5:30 am and 7:30 pm 50 MW between 7:30 pm and 5:30 am
LFAS Downwards	85 MW between 5:30 am and 7:30 pm 50 WM between 7:30 pm and 5:30 am

The ERA's decision stated (at page 5):

AEMO expected that approximately 520 MW of additional intermittent non-scheduled generation would connect to the SWIS in the initial part of 2020-21. This new generation is expected to increase the requirement for LFAS. AEMO was unable to determine the extent to which this additional capacity would affect the LFAS requirements. If circumstances arise where the approved LFAS requirement is insufficient, AEMO will reassess the requirement and submit an updated proposal in accordance with clause 3.11.3 of the [WEM] Rules.

<sup>1</sup> <https://www.erawa.com.au/cproot/21342/2/2020-ERA-Decision-on-AEMO-s-Ancillary-Service-Report-Clean-Version-.pdf>

AEMO has analysed data from some of the non-scheduled generation facilities that are currently undergoing commissioning and facilities that are in the nearby vicinity. The **Attachment** provides further details of AEMO’s analysis. The analysis confirms that there will be an increase in the requirement for LFAS to respond to the additional non-scheduled generation, which may result in AEMO not being able to meet the LFAS standard<sup>2</sup> with the current LFAS Ancillary Service Requirement. Consequently, AEMO has reassessed the level of the LFAS Ancillary Service Requirement for the remainder of the 2020-21 Financial Year under clause 3.11.3 of the WEM Rules.<sup>3</sup>

As this analysis is based partially on a limited data set, it may not accurately reflect the annual impact. Consequently, AEMO proposes to implement the additional LFAS Ancillary Service Requirement in a staged approach to increase the values to what is needed to manage power system security.

### **Proposed revised LFAS Ancillary Service Requirement**

AEMO requests that the ERA approves the proposed revised LFAS Ancillary Service Requirement (to apply during the remainder of the 2020-21 Financial Year) under clause 3.11.6 of the WEM Rules:

LFAS Upwards	Up to 105 MW between 5.30 AM and 7.30 PM Up to 80 MW between 7.30 PM and 5.30 AM
LFAS Downwards	Up to 105 MW between 5.30 AM and 7.30 PM Up to 80 MW between 7.30 PM and 5.30 AM

It is recommended that the proposed revised LFAS Ancillary Service Requirement apply from September 2020.

AEMO intends to review the LFAS Ancillary Service Requirement again in December 2020, or earlier if deemed necessary.

Please do not hesitate to contact me if you have any queries.

Yours sincerely



Dean Sharafi  
**Group Manager – System Management**

<sup>2</sup> Clause 3.10.1 of the WEM Rules.

<sup>3</sup> Clause 3.11.3 of the WEM Rules states: “If it considers that a considerable shortfall of any Ancillary Service relative to the applicable Ancillary Service Standard is occurring, or is likely to occur before the next update under clause 3.11.2, [AEMO] may reassess the level of the Ancillary Service Requirements for that Ancillary Service at that time”.

## **ATTACHMENT – 2020 LFAS Ancillary Service Requirement calculation methodology**

In the absence of a full data set to analyse the actual system outcomes, the initial approach to determining the additional requirements for the remainder of the 2020-21 financial year, was to estimate the additional requirements expected to be introduced through the addition of the new NSG facilities compared to the year 1 April 2019 to 1 April 2020. The two key considerations are 130 MW of additional grid-connected solar PV and 390 MW of wind.

The solar generation is split into two geographically and electrically diverse areas, as well as being distant from Perth where most of the rooftop PV is located. Without sufficient data to provide an alternative perspective, it is assumed for this year that the new solar facilities will not materially impact the requirement during sunlight hours, as any fluctuations in cloud cover are unlikely to impact all sites at the same time. When compared to the 1.5 GW of rooftop PV installed, which is the largest driver of the daytime LFAS requirements, the impact of the new solar farm is expected to be minimal.

To estimate the additional LFAS requirements introduced by the connection of the new wind facilities, a comparison was done from a base case (excluding the new facilities) with the requirements considering possible output of the facilities. The base variability in generation requiring LFAS response was determined for the period 1 April 2019 to 1 April 2020. This was used as an estimate for the amount of LFAS that would have been used if there were no other frequency controlling mechanisms in the system. The data was segmented into day and night time periods as per the current LFAS requirements i.e. from 5:30 AM to 7:30 PM and from 7:30 PM to 5:30 AM. Analysis was done to determine what an adequate LFAS Upwards and LFAS Downwards requirement would be to counter the downward and upward fluctuations for 99% of the time respectively<sup>4</sup>.

### **1.1. Comparison with requirements scaled from existing facilities over an annual period**

As a first pass estimation of the output of the new windfarms, the possible (unconstrained) output of existing windfarms in the vicinity of these new windfarms was scaled up to estimate what the new windfarms would have generated if they were in operation. As a persistent forecast is utilised in the real time dispatch engine (RTDE) to forecast each 5 minute instant in time, for each 5 minute datapoint a 10 minute look ahead forecast error in the modelled wind output was calculated as a proxy for the additional fluctuation that would require LFAS to respond. This was combined with the base case scenario and the analysis was repeated to determine what an increased LFAS Upwards and Downwards requirement would be to respond to the downward and upward fluctuations for 99% of the time respectively.

When the difference between these results and the base case results was considered, an estimate of the additional LFAS required was 21MW for both peak and off-peak periods.

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<sup>4</sup> Clause 3.1.1 of the WEM Rules states that the frequency and time error standards for a Network in the SWIS are as defined in the Technical Rules that apply to that Network. The frequency standards in the Technical Rules require that frequency should be within the normal operating band for 99% of the time.

## 1.2. Comparison with possible output from new facilities

An analysis has also been undertaken to validate the extrapolation approach (scaling of existing facilities) using operational measurements available to date (wind speeds recorded at the two new facility sites for up to 29 days).

Similar to the previous approach, a base case was considered, which did not include the impact from commissioning facilities, which was then compared to a case where the estimated output of the facilities was calculated based on the actual wind speeds and assuming they had been fully commissioned. Results from this limited data set indicated an additional requirement of 23 MW and 41 MW for peak and off-peak periods respectively.

As the two approaches both support an increased requirement of approximately 20 MW for the peak requirement, it is proposed that the peak LFAS Upwards and Downwards requirements be increased from 85 MW to 105 MW.

With the limited data available for the analysis of data from the new windfarms, it is not possible to confirm the reason for the larger increase of 41 MW in off-peak periods. While it may be correct, there is also a possibility that there is insufficient data to produce a valid outcome or that it may indicate some seasonal behaviour. As the two approaches suggest that an increase of between 21 MW and 41 MW is required for the off-peak period, it is considered that an increase of 30 MW will allow AEMO to manage power system security given the limited data and the ability to procure Backup LFAS. Thus, the recommendation is to increase the off-peak period LFAS Upwards and Downwards requirements from 50 MW to 80 MW.

As this analysis is based partially on a limited data set, it may not accurately reflect the annual impact. Consequently, AEMO proposes to implement these requirements in a staged approach to increase the values to what is needed to manage power system security. AEMO intends to review the LFAS Ancillary Service Requirement again in December 2020, or earlier if deemed necessary.

The proposed LFAS requirements for the remainder of the 2020-21 Financial Year are as follows;

### 1. LFAS Upwards:

- Up to 105 MW between 5.30 AM and 7.30 PM;
- Up to 80 MW between 7.30 PM and 5.30 AM.

### 2. LFAS Downwards:

- Up to 105 MW between 5.30 AM and 7.30 PM;
- Up to 80 MW between 7.30 PM and 5.30 AM.