# Decision on the Australian Energy Market Operator's 2019/20 Ancillary Services Requirements

12 August 2019

Economic Regulation Authority
WESTERN AUSTRALIA

D204276

## Economic Regulation Authority

4th Floor Albert Facey House
469 Wellington Street, Perth

**Mail to:**
Perth BC, PO Box 8469
PERTH WA 6849

**T:** 08 6557 7900

**F:** 08 6557 7999

**E:** info@erawa.com.au

**W:** www.erawa.com.au

National Relay Service TTY: 13 36 77
(to assist people with hearing and voice impairment)


We can deliver this report in an alternative format for those with a vision impairment.

# Contents

# 1. Determination

1. The Economic Regulation Authority has conducted its audit of the 2019/20 Ancillary Services requirements and plan determined by the Australian Energy Market Operator (AEMO).

2. In accordance with clause 3.11.6 of the Wholesale Electricity Market Rules, the ERA approves AEMO's 2019/20 Ancillary Services requirements. AEMO's requirements are listed in Table 1 below.

**Table 1: 2019/20 Ancillary Services requirements**

| Ancillary Service | Requirement |
|---|---|
| Load Following Upwards | 85 MW between 5:30 am and 7:30 pm<br>50 MW between 7:30 pm and 5:30 am |
| Load Following Downwards | 85 MW between 5:30 am and 7:30 pm<br>50 WM between 7:30 pm and 5:30 am |
| Spinning Reserve Services | At least the maximum of:<br>a) 70% of the largest generator; and<br>b) 70% of the largest contingency event that would result in generation loss. |
| Load Rejection Reserve Services | Up to 120 MW that may be relaxed by 25% down when the risk of transmission faults is determined to be low[1] |
| Dispatch Support Service | There are no requirements for Dispatch Support Services. |
| System Restart Service | Three Facilities are required in diverse network areas |

[1] The Market Rules allow the Load Rejection Reserve requirement to be relaxed by up to 25% where AEMO considers that the probability of transmission faults is low.

# 2. Introduction

3. Ancillary Services are required to maintain power system security and reliability, enable orderly trading in electricity and ensure that electricity supplies are of acceptable quality. These services maintain key technical characteristics of the power system, including frequency and voltage.

4. The Market Rules require AEMO to prepare an Ancillary Services report. The report details the Ancillary Services costs and quantities provided in the previous year and AEMO's Ancillary Services requirements and plan for the coming year.

5. The Ancillary Services requirements must be determined in accordance with the SWIS Operating Standards and the Ancillary Service Standards. The requirements are the levels of services needed to meet the standards.

6. AEMO's Ancillary Services requirements and plan must be submitted to the ERA for audit and approval by 1 June each year. AEMO submitted its 2019/20 report to the ERA on 31 May 2019 and published this by 1 July 2019.

7. The Market Rules require the ERA to:

   - Audit and approve AEMO's determination of the Ancillary Services requirements. The ERA may require AEMO to re-determine the requirements (Market Rule 3.11.6).
   - Audit AEMO's determination of the Ancillary Services plan to meet the requirements. The ERA may require AEMO to re-determine the plan (Market Rule 3.11.12). There is no approval requirement for the plan.

8. The ERA has assessed AEMO's 2019/20 Ancillary Services requirements and plan against the following Market Rules:

   a) Market Rule 3.11.4 which requires AEMO to determine the Ancillary Services requirements for all classes of Ancillary Services.

   b) Market Rule 3.11.1 which requires AEMO to determine the requirements in accordance with the SWIS Operating Standards and the Ancillary Services Standards.

   c) Market Rule 3.11.2 which requires AEMO to determine the requirements based on the facilities and configuration expected for the SWIS in the coming year.

   d) Market Rule 3.11.4 when read in conjunction with Market Rule 3.11.5, which provides AEMO with discretion to determine the requirements according to location, take into account differing load levels, and vary by type of day and/or by time of day and/or vary across the year.

   e) Market Rule 3.1.11(c) which requires AEMO to determine the Ancillary Services plan for each class of service.

9. AEMO's 2019/20 report contains its requirements for all classes of Ancillary Services, complying with the requirement at a) above. The ERA's consideration of the remaining obligations is discussed in the following sections.

# 3. Load Following Service

10. Load Following Ancillary Services (LFAS) ensure electricity supply and demand are balanced in real time to maintain the frequency of the power system within the SWIS Operating Standards.[2]

11. AEMO must determine the LFAS requirement in accordance with the SWIS Operating Standards and the Ancillary Service Standards (Market Rule 3.11.1).

12. The SWIS Operating Standards include the frequency standards for a Network defined in the Technical Rules (Table 2).[3]

**Table 2: Frequency operating standards in the Technical Rules**

| Condition | Frequency band |
|---|---|
| Normal Range | 49.8 Hz to 50.2 Hz for 99% of the time |
| Single Contingency Event | 48.75 Hz to 51 Hz |

13. The Ancillary Service Standard for LFAS is defined in Market Rule 3.10.1. This rule states:

> 3.10.1. The standard for Load Following Service is a level which is sufficient to:
>
> (a) provide Minimum Frequency Keeping Capacity, where the Minimum Frequency Keeping Capacity is the greater of:
>
> i. 30 MW; and
>
> ii. the capacity sufficient to cover 99.9% of the short-term fluctuations in load and output of Non-Scheduled Generators and uninstructed output fluctuations from Scheduled Generators, measured as the variance of one minute average readings around a thirty minute rolling average.

## 3.1 AEMO's proposed Load Following Service Requirement

14. AEMO's LFAS requirements are procured from the LFAS market. The LFAS market is settled on the quantity of LFAS that is determined by AEMO under clause 7B.1.4 and 7B.1.5.

15. AEMO's report states that two additional Facilities were certified to provide LFAS in 2018. AEMO anticipates that there will be an additional LFAS provider entering in 2019/20. This will increase the number of participants in the LFAS market to five.

16. Last year, AEMO's requirement for LFAS was +/- 72 MW. This was unchanged from prior years.

---

2 Market Rule 3.9.1 defines the Load Following Service.

3 Market Rule 3.1.1 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.

17. In its 2019/20 Ancillary Services report, to comply with the Market Rules, in developing its LFAS requirement AEMO has included an assessment of LFAS using the method specified in clause 3.10.1. This follows an audit finding from 2018 which found that when deriving its LFAS requirement, AEMO's 2018/19 report did not include an assessment against the requirement of Market Rule 3.10.1 and in particular measuring the service 'as the variance of 1 minute average readings around a thirty minute rolling average' as stated in the rule.

18. The result of the clause 3.10.1 assessment indicated that to cover 99.9% of the short-term fluctuations in load and output of non-scheduled generators and uninstructed output from scheduled generators using the measurement method in clause 3.10.1(a)ii identifies a requirement for+/-131 MW of Load Following Services. This value was derived by assessing the absolute difference between the 1 minute and 30 minute averages.

19. AEMO concluded that the results from applying the measurement method in clause 3.10.1 do not accurately represent its current operational practices, including the dispatch process which uses a 10-minute dispatch cycle. The approach AEMO used for the 2019/20 requirement was similar to the approach used for the 2018/19 LFAS requirements.

20. The approach used by AEMO is based on a method developed by its consultant during the 2018/19 Ancillary Services requirements process. The consultant's premise was that LFAS is a service balancing real-time electricity supply and demand. Imbalances result predominantly from differences between forecast and actual demand, including non-scheduled generation output. The consultant found that for 2017 data, the forecast error in a 10 minute time horizon was 78 MW for 99 per cent of the time, consistent with the 72 MW LFAS requirement proposed for the 2018/19 year. Modelling of prior years' forecasting error yielded similar results.

21. For 2019/20, AEMO used data from May 2018 to April 2019 to set its requirement. The more recent data showed varying levels of forecast uncertainty during different times of the day. AEMO revised its static +/-72 MW LFAS requirement so that in 2019/20 the LFAS requirement is proposed to be:

    - +/-85 MW between 5:30 AM and 7:30 PM
    - +/-50 MW between 7:30 PM and 5:30 AM.

## 3.2 ERA assessment

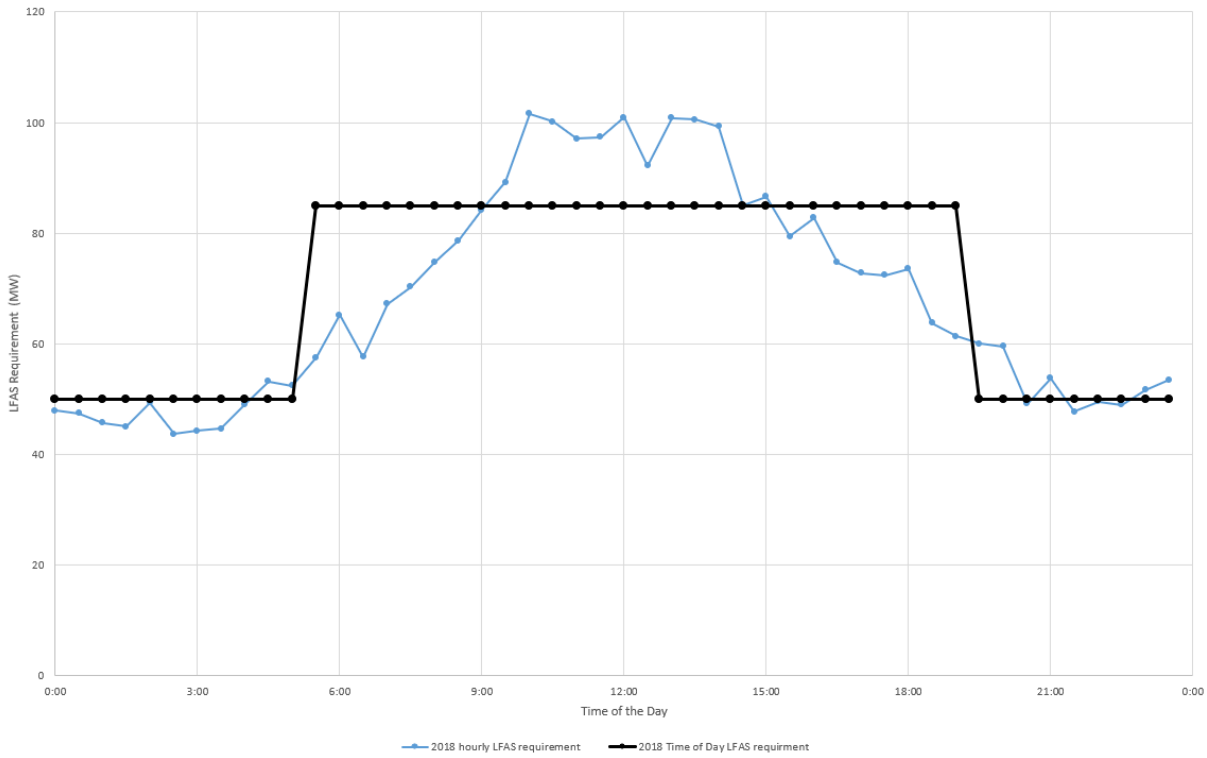
22. AEMO's method to derive the LFAS requirement for 2019/20 was similar to AEMO's 2018/19 method. The ERA examined whether the results of the method from 2018/19 were adequate to manage the frequency within the required standards. AEMO's 2019/20 Ancillary Services report states that for the 2018/19 year frequency was maintained within the normal range for greater than 99.9% of the time, exceeding the SWIS Operating Standard.

23. The ERA also considered AEMO's increased daytime LFAS requirement and materially lower overnight requirement. AEMO's updated requirements follow the ERA's 2018/19 recommendation for AEMO to consider future changes in demand from rooftop photovoltaic (PV) systems and increases in non-scheduled generation capacity.

24. AEMO stated that non-scheduled generation and rooftop PV systems had increased variability and the current LFAS requirement was inadequate under certain weather

conditions. AEMO stated that its analysis for the 2019/20 LFAS requirement had considered differences in forecast error (as the driver of the LFAS requirement) at different times of day.

25. Forecast error is the half-hourly combined differences between forecast and final non-scheduled generation output, as well as the difference between demand forecasts and actual demand.[4] This indicates the LFAS requirement for the applicable half-hour period. The information provided in AEMO's 2019/20 Ancillary Services Report shows greater error during the day and less overnight (Figure 1), supporting the change to a non-static LFAS requirement.[5]




26. Figure 1 indicates that there may be further opportunity for AEMO to vary the LFAS requirements. For example, there could be more than two tiers of LFAS levels or seasonal requirements. However, this is the first time that a variable requirement has been proposed. The ERA considers it reasonable that AEMO applies a conservative approach and monitors the adequacy of the 2019/20 LFAS requirements, prior to determining when further changes can be made.

4 Measured in megawatts

5 Refer to Figure 5 in AEMO's Ancillary Services Report for the WEM 2019

# 4. Spinning Reserve Service

27. The Spinning Reserve Ancillary Service provides a rapid increase in generation following a sudden shortfall in electricity supply resulting from the loss of a large capacity generator or main transmission equipment.[6]

28. The SWIS Operating Standards require the frequency to remain within the 48.75 Hz to 51 Hz band for a single contingency event, such as an outage of one transmission line[7] (refer to Table 2).

29. The Ancillary Service Standard for Spinning Reserve Service is defined in Market Rule 3.10.2. This rule states:

> 3.10.2. The standard for Spinning Reserve Service is a level which satisfies the following principles:
>
> (a) the level must be sufficient to cover the greater of:
>
> i. 70% of the total output, including Parasitic Load, of the generation unit synchronised to the SWIS with the highest total output at that time; and
>
> ii. the maximum load ramp expected over a period of 15 minutes;
>
> (b) the level must include capacity utilised to meet the Load Following Service standard under clause 3.10.1, so that the capacity provided to meet the Load Following requirement is counted as providing part of the Spinning Reserve requirement;
>
> (c) the level may be relaxed by up to 12% by System Management where it expects that the shortfall will be for a period of less than 30 minutes; and
>
> (d) the level may be relaxed following activation of Spinning Reserve and may be relaxed by up to 100% if all reserves are exhausted and to maintain reserves would require involuntary load shedding. In such situations the levels must be fully restored as soon as practicable.

## 4.1 AEMO's proposed Spinning Reserve requirement

30. AEMO's proposed Spinning Reserve requirement for 2020/21 is at least the maximum of:

- 70% of the largest generating unit; and
- 70% of the largest contingency event that would result in the loss of generation.

## 4.2 ERA's assessment

31. The purpose of Spinning Reserve as defined in Market Rule 3.9.1 is to manage the frequency after the failure of equipment and prevent involuntary disconnections.

32. The standards for Spinning Reserve mean that the Spinning Reserve requirement is not a static megawatt level. Rather it is a dynamic requirement that AEMO sets in the planning horizon and adjusts closer to real-time according to system conditions. The

[6] The Spinning Reserve Service is defined in Market Rule 3.9.2.

[7] A single contingency is defined in the Technical Rules as '…a sequence of related events which result in the removal from service of one transmission line, transformer or other item of equipment…'.

requirement is not used for settlement purposes, rather the Market Rules require compensation for the provision of Spinning Reserve services to be determined through the margin values process or by contract.

33. As a result, the ERA's assessment of AEMO's Spinning Reserve requirement is limited to considering:

- Whether AEMO's proposed requirement is consistent with the standards.
- Whether there is any historical evidence that the real-time Spinning Reserve levels derived from AEMO's wording of the requirement were not adequate.

34. AEMO's obligation under the Market Rules for Spinning Reserve is that it must set the Spinning Reserve requirement in accordance with the SWIS Operating Standards and the Ancillary Service Standard referred to in section 4. The Market Rules require the application of standards under different frameworks (for example, the SWIS Operating Standards are found in the Technical Rules which apply to the network and the Ancillary Services Standards are in the Market Rules). This creates the opportunity for ambiguity when deriving the wording of a requirement to meet both standards. AEMO's requirement at paragraph 30 specifically refers to its obligations under both these standards. The ERA has not found any evidence to conclude that AEMO has failed to satisfy both standards.

35. The ERA also assessed the historical information provided in AEMO's 2019/20 Ancillary Services report. AEMO's report shows AEMO's performance in managing frequency in 2018/19 exceeded the SWIS Operating Standards. Frequency was maintained in the normal operating range for over 99.9% of the time and there were no frequency excursions below 48.75 Hz in 2018/19, which is the applicable level for Spinning Reserve. There were also no under-frequency load shedding events. Based on this performance, there is no evidence to suggest that AEMO's Spinning Reserve requirement has not been adequate.

36. AEMO's report identifies another emerging challenge. During 2019/20, several non-scheduled generators are expected to be connected to a single transmission line. There is a risk that a single transmission line could be the largest contingency, exceeding the Spinning Reserve requirement. AEMO stated that this means it may need to increase its Spinning Reserve requirements or reduce the size of the largest contingency (for example, by constraining generation). Further modelling is required to estimate the size and frequency of this contingency. Advice from AEMO is that it does not expect this to be a significant matter in 2019/20 due to the timing of the connections.

37. The ERA also considered AEMO's plan to procure the services to meet the Spinning Reserve requirements in 2019/20. AEMO's plan is summarised in Table 3.

**Table 3: AEMO's 2019/20 plan for Spinning Reserve**

| Ancillary Service | Summary of procurement plan for 2018/19 |
|---|---|
| Spinning Reserve Services | 42 MW supplied by long term interruptible load contract.<br>21 MW are currently being contracted from short term non-Synergy contracts.[8]<br>Reserves above contracted amounts will be provided by the Balancing Portfolio. (Synergy is the default provider of Spinning Reserve Services). |

8 AEMO's report states that these contracts are currently being finalised.

38. The Market Rules allow AEMO to procure a contract for Spinning Reserve service with a participant other than Synergy, where this provides a less expensive alternative for provision of the service (Market Rule 3.11.8(b)).

39. AEMO's 2019/20 Ancillary Services plan includes short term contracts with non-Synergy providers for 21 MW of Spinning Reserve.

40. AEMO's report states that the challenges with the current process for Spinning Reserve procurement, and particularly enabling new contractual providers, are a concern for industry. AEMO's cites the timing of the determination of margin values[9] and consequently what a non-Synergy service provider could expect to be paid as an example of these challenges. As an example, stakeholders have advised that the timing of the margin values determination requires a non-Synergy service provider to tender without sufficient information to satisfy an economic business case.

41. The ERA noted other challenges in its 2017/18 Report to the Minister for Energy, which stated that the Spinning Reserve procurement terms are likely to have limited third-party participation and reduction in spinning reserve costs.[10]

42. AEMO expects that the introduction of a new Ancillary Services framework as part of market reforms will assist to alleviate the procurement challenges.[11] AEMO should consider whether there is opportunity prior to reforms to address some of these challenges, such as contracting for longer terms and procuring more flexible quantities.

## 4.3 Other matters concerning Spinning Reserve

43. In the 2019/20 determination of the Margin Values, the ERA raised concerns about AEMO's interpretation of the Market Rules on the interaction between LFAS raise and Spinning Reserve services. [12] The ERA was concerned with AEMO's interpretation of Market Rule 3.10.2(b).

44. Market Rule 3.10.2(b) states:

> (b) the level must include capacity utilised to meet the Load Following Service standard under clause 3.10.1, so that the capacity provided to meet the Load Following requirement is counted as providing part of the Spinning Reserve requirement.

45. AEMO's 2019/20 Ancillary Services report explained why AEMO considers that Spinning Reserve can be provided only by a Balancing Portfolio Facility or contracted generator. AEMO has also provided further information explaining why some LFAS capacity is excluded when determining the Spinning Reserve requirement.[13] AEMO's explanation is that facilities that provide capacity to meet the LFAS requirement are only considered as providing part of the Spinning Reserve requirement where those facilities have the technical capability and control systems to provide that service. AEMO

9 Margin Values are parameters used to determine payments to Synergy for the recovery of their expected costs to provide Spinning Reserve services. Refer to the ERA's 2019/20 margin values report, page 16

10 Refer to the ERA's 2018 Report to the Minster for Energy, pp 44-45

11 Refer to the New Essential System Services Framework information on the to the Energy Transformation Taskforce web page.

12 The margin values process determines the parameters used in the Ancillary Service settlement calculations to compensate Synergy for the costs it incurs in providing Spinning Reserve. ERA (2019) Margin Values determination, p15-16 online.

13 Refer to letter from AEMO dated 10 July 2019.

provided a practical example to demonstrate this. The ERA supports excluding LFAS capacity that demonstrably cannot meet the Spinning Reserve standard.

# 5. Load Rejection Reserve service

46. Load Rejection Reserve services are provided by generators that are instructed to decrease their output quickly where load is lost, such as when a transmission line trips. This service is required to maintain system frequency within acceptable limits.

47. The SWIS Operating Standards require the frequency to remain below 51 Hz for a single contingency event, such as an outage of one transmission line[14] (refer to Table 2).

48. The Ancillary Service Standard for Load Rejection Reserve is defined in Market Rule 3.10.4. This rule states:

> 3.10.4. The standard for Load Rejection Reserve Service is a level which satisfies the following principles:
>
> (a) the level sufficient to keep over-frequency below 51 Hz for all credible load rejection events;
>
> (b) may be relaxed by up to 25% by System Management where it considers that the probability of transmission faults is low.

## 5.1 AEMO's proposed Load Rejection Reserve requirement

49. For 2019/20 AEMO has specified a requirement of up to 120 MW for Load Rejection Reserve. AEMO is currently undertaking a trial of a dynamic Load Rejection Reserve requirement. The reference to 'up to' in AEMO's requirement is to take into account that a level lower than 120 MW may be adequate during the trial. The Market Rules also allow AEMO to relax the Load Rejection Reserve requirement by up to 25 per cent where it considers that the probability of transmission faults is low (clause 3.10.4(b)).

50. The Market Rules state that AEMO may enter into an Ancillary Service Contract with a participant for Load Rejection Reserve, (Market Rule 3.11.8A). AEMO undertook a request for expression of interest process for these services (as well as Spinning Reserve) which closed on 15 March 2019. AEMO's report states that no contracts were procured and that its Load Rejection Reserve requirements will be met by Synergy's Balancing Portfolio in 2019/20. Synergy is the default provider of these services.

## 5.2 ERA's assessment

51. When assessing AEMO's Load Rejection Reserve requirement, the ERA considered the findings of AEMO's 2018 market audit concerning shortfalls in Ancillary Services, where the level of service enabled was less than the approved requirement. AEMO's 2019/20 Ancillary Services report shows that the shortfalls in services are occurring less often, mostly less than 1 per cent of the time, other than for Load Rejection Reserve services.

[14] A single contingency is defined in the Technical Rules as '…a sequence of related events which result in the removal from service of one transmission line, transformer or other item of equipment…'.

52. Shortfalls in services for sustained periods of time without any threat to power system security could mean that there is room to relax the set requirements during these times, where the standards allow this.

53. Load Rejection Reserve services were under-provisioned for approximately 4.5 per cent of the time during 2018/19 but AEMO still met the frequency standard for this service.[15] In one instance the quantity of Load Rejection Reserve available fell as low as 20.8 MW. AEMO's report states "even when the quantity of LRR available was lower than the requirement, the standard for LRR was still met, as the frequency would not have exceeded 51 Hz for credible load rejection events".

54. This suggests that there could be scope for AEMO to revise its Load Rejection Reserve requirements. Before proposing changes, it is reasonable for AEMO to test these. In this context, AEMO's report states that since April 2019 it has been testing the application of a dynamic requirement for Load Rejection Reserve services to better reflect real-time requirements. If the trial is successful, AEMO will use this to determine its requirements for 2020/21. The ERA recommends AEMO keep it informed of the trial's progress ahead of next year's Ancillary Services requirements process.

55. Compensation for Load Rejection Reserve services is determined through the Cost_LR process.[16] The outcomes from the dynamic trial should also apply to assumptions used by AEMO and its consultants for future Cost_LR processes.

[15] The Load Rejection Reserve standard in the Market Rules requires the frequency to maintained below 51Hz. There were no frequency excursion events above 51 Hz in 2018/19.

[16] The Cost_LR parameters covers the costs of providing Load Rejection Reserve services, as well as System Restart services. The ERA must approve these parameters after receiving a proposal from AEMO.

# 6. Contracted services

56. The Market Rules state that AEMO may enter into an Ancillary Service Contract with a participant for Load Rejection Reserve, System Restart or Dispatch Support services (Market Rule 3.11.8A). Load Rejection Reserve services were discussed in section 5. The remaining two services that are defined under the Market Rules, System Restart and Dispatch Support services, are discussed below.

## 6.1 System Restart

57. System Restart services are provided by generators capable of starting up in total blackout system conditions, and able to energise the power system to enable other generators to be started up.

58. The Ancillary Service Standard for System Restart is defined in Market Rule 3.10.6. This rule states:

> 3.10.6 The standard for System Restart Service is a level which is sufficient to meet System Management's operational plans as developed in accordance with clause 3.7.1.

59. Clause 3.7.1 requires AEMO in its capacity as System Management to make operational plans and preparations to restart the SWIS in the event of a blackout. There is no external oversight of these operational plans under the Market Rules. The clause states:

> 3.7.1 System Management must make operational plans and preparations to restart the SWIS in the event of a system shutdown.

60. AEMO's 2019/20 Ancillary Services Report states that AEMO requires three system restart facilities. These facilities should not be in the same location, to mitigate the risk of total service failure due to a common reason. AEMO reasoned that three facilities are required in case one or more of the facilities cannot provide the service due to planned or unplanned outages.

61. AEMO has contracted three services in three different geographical locations (North Metropolitan, South Metropolitan and South Country).

62. AEMO's obligation under the Market Rules for System Restart is that it must determine a requirement that is consistent with its own operational plans. This effectively means that AEMO is the decision maker for the System Restart service requirement, where the requirement is consistent with its operational plans. The ERA is not aware of any evidence to indicate any inconsistencies.

## 6.2 Dispatch Support Services

63. Market Rule 3.9.9 defines Dispatch Support Services. This rule states:

> 3.9.9. Dispatch Support Service is any other ancillary service that is needed to maintain Power System Security and Power System Reliability that are not covered by the other Ancillary Service categories. Dispatch Support Service is to include the service of controlling voltage levels in the SWIS, where that service is not already provided under any Arrangement for Access or Network Control Service Contract.

64. There is no Ancillary Service standard for Dispatch Support Services. Instead the need for the service is determined by AEMO. This service is to be procured under contract (Market Rule 3.11.8A).

65. AEMO's 2019/20 Ancillary Services report states that there are no current requirements for Dispatch Support Services but did identify an emerging challenge that may require these services.

66. AEMO also stated that in addition to the volatility in non-scheduled generation, it has observed a decline in the daytime minimum load. AEMO stated that the reduction in system inertia as synchronous generators are replaced by non-synchronous generation during these low-load conditions could trigger involuntary disconnections through Under Frequency Load Shedding should a contingency occur when there is sufficient response capability.

67. AEMO explained that work is under way to address these challenges, but in the interim AEMO may require Dispatch Support Services to manage these emerging events. AEMO's report does not indicate when these services will be needed but AEMO will need to seek the ERA's approval under Market Rule 3.11.8B prior to entering into any Dispatch Support Service contracts.

# 7. Ancillary Services Costs 2018/19

68. The total cost of Ancillary Services for 2018/19 is approximately $3 million more than 2017/18 (and $24 million more than 2016/17). This increase is primarily due to a $8 million increase in the total LFAS upwards costs. This is largely offset by a $5 million reduction in the cost of Spinning Reserve.

69. For LFAS, quantities have remained the same across the two years and the increase in costs is therefore driven by the prices offered by participants in the LFAS market. The ERA has considered what consequences AEMO's adjusted LFAS requirements for 2019/20 will have for LFAS costs. The ERA's analysis of LFAS offers between January and April 2019 using AEMO's 2019/20 requirements indicates there could be a small reduction in LFAS costs for 2019/20.

70. The reduction in Spinning Reserve costs is predominantly driven by a reduction in the margin values from 36 per cent and 64 per cent in 2017/18 to 25 per cent and 50 per cent in 2018/19.[17]

[17] Refer to the ERA's Determination of the spinning reserve ancillary service margin peak and margin off-peak parameters for 2018/19

# 8. Conclusion and Recommendations

71. The ERA approves AEMO's 2019/20 Ancillary Service requirements as set out in Table 1. In making its determination the ERA considered:

- AEMO's historical performance in maintaining power system security and reliability.
- AEMO's requirements for 2019/20, which take into account changes that have emerged from the increase in rooftop PV systems and non-scheduled generation.
- The requirement under the Market Rules for AEMO to monitor if changes are required to the service levels during 2019/20. Should there be any changes, AEMO will need to reassess these and seek the ERA's approval under Market Rule 3.11.6.
- That AEMO is assessing whether further changes can be made to the requirements for LFAS and Load Rejection Reserve in future years.

72. The ERA recommends that AEMO actively monitor the performance of the dynamic Load Rejection Reserve requirement trial and the adequacy of the new LFAS requirement during 2019/20. AEMO should keep the ERA informed of the progress of these changes throughout the year, and provide advance notice of any amendments, refinements or other proposed changes to the requirements prior to submission of the 2020/21 requirements.