

# Audit and Approval of System Management's 2017/18 Ancillary Services Requirements and Plan

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**Economic Regulation Authority**

WESTERN AUSTRALIA

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## Introduction

1. The Wholesale Electricity Market (**WEM**) Rules require the Economic Regulation Authority (**Authority**) to audit and approve System Management's<sup>1</sup> determination of the Ancillary Services Requirements and to audit System Management's plan to meet those requirements.
2. Ancillary Services are defined in the WEM Rules to be services that are required to maintain Power System Security and Power System Reliability, facilitate 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.
3. System Management is required to publish a report by 1 July each year with details of the costs and quantities of Ancillary Services provided in the previous year and the requirements and plan for the coming year. System Management's determination of the requirements and plan must be submitted to the Authority for audit and approval by 1 June each year.
4. System Management provided its Ancillary Services Report 2017/18 to the Authority on 31 May 2017 containing its requirements and plan. System Management provided a further version on 7 June 2017. The Authority has considered both versions in its audit and determination process.

## Audit Scope

5. WEM Rule 3.11.6 requires System Management to submit the Ancillary Services Requirements to the Authority for approval. The Authority must:
  - audit and approve System Management's determination of the Ancillary Services Requirements, and the Authority may require System Management to re-determine the requirements (WEM Rule 3.11.6); and
  - audit System Management's determination of the Ancillary Services plan to meet the requirements, and the Authority may require System Management to re-determine the plan (WEM Rule 3.11.12). There is no approval requirement for the plan.
6. The scope of the Authority's audit has been to assess:
  - whether the requirements and plan for 2017/2018 comply with the relevant Market Rules and Market Procedures; and
  - the methodologies used to arrive at the requirements and plan.

## System Management's requirements and plan

7. System Management is required to determine the requirements for:

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<sup>1</sup> The WEM Rules define System Management as 'AEMO in its capacity as System Management'.

- a. Load Following Services (**LFAS**);
  - b. Spinning Reserve Services (**SRS**);
  - c. Load Rejection Reserve Services (**LRRS**);
  - d. Dispatch Support Services (**DSS**); and
  - e. System Restart Services.
8. System Management is also required to determine the plan to meet the requirements for each Ancillary Service type.
9. System Management's 2017/18 Ancillary Services Report<sup>2</sup> sets out its determination of the general requirements for each Ancillary Service type together with its plan for each requirement. The report states that:
- System Management interprets the term "Requirement" to mean the quantities needed to achieve the standards in the report; and
  - The "Ancillary Services Plan" for each service is the method of procurement whether by means of contract, through an established market or other mechanism provided for in the Market Rules.
10. The 2017/18 general requirements and plan determined by System Management are shown in table 1 below:

**Table 1: System Management's Ancillary Services requirements and plan for 2017/18<sup>3</sup>**

Ancillary Service	Requirement	Summary of plan for 2017/18
Load Following Services	± 72 MW	LFAS Market
Spinning Reserve Services	70% of largest generator or network contingency resulting in loss of generation	Existing 42 MW contract expires in September 2023. Extend contracts with existing providers for 26 MW. Synergy is the default provider of remaining amount.
Load Rejection Reserve Services	120 MW	Synergy will provide this service.
Dispatch Support Service	Case by case basis	Existing contracts continue until June 2018.
System Restart Service	Three required in diverse network areas	Currently three contracts in place. One expires June 2018. Contract negotiations underway for additional service in South Country.

<sup>2</sup> Refer to 'Annual ancillary services report' section of AEMO webpage at:  
<http://www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Data/System-Management-reports>

<sup>3</sup> Refer to Table 8 of section 5.6 of System Management's 2017/18 Ancillary Services Report.

## Compliance assessment

11. In carrying out its audit, the Authority has considered:
- (a) whether System Management has complied with WEM Rule 3.11.4, which requires System Management to determine the Ancillary Services Requirements for all classes of Ancillary Services;
  - (b) whether System Management has determined the requirements in accordance with the SWIS Operating Standards and the Ancillary Services Standards as required by WEM Rule 3.11.1;
  - (c) whether System Management has determined the requirements based on the facilities and configuration expected for the SWIS in the coming year as required by WEM Rule 3.11.2;
  - (d) whether System Management has determined the requirements in accordance with WEM Rule 3.11.4 read in conjunction with WEM Rule 3.11.5, which provides System Management 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; and
  - (e) whether System Management has determined the Ancillary Services plan for each class of service as required by WEM Rule 3.1.11(c).
12. The Authority confirms that System Management has complied with the non-discretionary requirements at (a), (b), (c) and (e) above.
13. For the discretionary requirement at (d), the Authority notes that the requirements for services such as SRS are variable (i.e. 70% of the largest contingency), but for services such as LFAS, a static requirement is set (+/- 72MW), with the report stating that real time usage may differ from this requirement. Notwithstanding challenges in measuring actual requirements and LFAS usage outlined later in this paper, there may be opportunity to sculpt forecasted requirements pursuant to the discretion provided under WEM Rule 3.11.5 to match expected real time requirements.

## Issues identified through audit

14. The Authority identified the following issues through its audit of the Ancillary Services Requirements and plan.

## Ancillary Services quantities

15. The Authority noted that the historical quantities reported for LFAS, SRS and LRR were significantly above the megawatt quantities of the requirements for each of these services, noting that there has been no change in System Management's requirements since the 2016/17 report (and in fact no material change since 2012/13).
16. The Authority was concerned that the amounts reported as being provided are not a true indicator of whether the requirements are adequate. The Authority sought further information from System Management.

17. System Management's report stated for LFAS, SRS and LRRS that the actual provision of these services is normally higher due to the way in which these services are made available and also to ensure that minimum requirements are met consistently.
18. In the case of LFAS, System Management advised that the requirement (+/- 72 MW) is determined with reference to the technical capability of the generators that are usually on line to provide the service. System Management's report states that the LFAS requirement is equivalent to the operating range of two high efficiency gas turbine facilities (Synergy facilities).
19. Through historical observation, System Management considers that this level (+/-72 MW) is sufficient to maintain the combined frequency standard of 99.9%<sup>4</sup>. Data supplied by System Management confirms this frequency performance.
20. System Management's report shows that the average LFAS enabled over the period is greater than the requirement<sup>5</sup>. System Management clarified that it is not technically possible to only provide the exact requirements due to the manner in which the service is provided.
21. System Management explained that when a facility is enabled for LFAS, it is enabled for its full response range (raise and lower) and not just the direction that may be required at the time. Similarly, the enablement is in a 'block', commonly between 30 MW and 40 MW and not the smaller increments required to exactly match the requirement. However, the quantities reported exceed the sum of two or three blocks for substantial periods as indicated in Figures 2, 3 and 4 of System Management's report.
22. In addition, in determining the actual provision of LFAS, System Management advises that it is not possible to distinguish between energy and ancillary services provided by the Synergy portfolio because of the way the portfolio is dispatched<sup>6</sup>.
23. These measurement issues mean that it is difficult to determine how much LFAS is actually being provided by the Synergy portfolio. System Management has not proposed investigations to overcome this measurement shortcoming in its Ancillary Services plan for 2017/18.
24. Similar measurement concerns exist for SRS requirements. For example, Figure 4 in the report indicates a maximum spinning reserve requirement at around 550MW. After deducting the LFAS requirement, this is equivalent to a single contingency of around 680MW<sup>7</sup>. This is substantially higher than the maximum single contingency identified in the report of 301MW relating to a network contingency.
25. Although the SRS measurement reported does not appear to correspond with the requirement, the Authority notes that the WEM Rules use the quantities identified through the Margin Values process for settlement<sup>8</sup> of non-contracted services.

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<sup>4</sup> Page 7 Section 2.1.3 of System Management's Ancillary Services Report 2017/18 defines the LFAS standard as '...the SWIS frequency is to be maintained between 49.8 Hz and 50.2 Hz for at least 99.9% of the time each month, excluding events that result in the frequency deviating from the Normal Operating State of  $50 \pm 0.32\text{Hz}$ '.

<sup>5</sup> Page 12 Figure 2 of System Management's Ancillary Services Report 2017/18.

<sup>6</sup> The Synergy Portfolio does not receive Dispatch Instructions so there is no record from which to determine whether its movements were for balancing energy or ancillary services.

<sup>7</sup> The SRS requirement being 70% of the contingency or  $(550-72)/0.7$

<sup>8</sup> WEM Rule 3.22.1

## Frequency performance

26. The Authority noted that historical frequency performance statistics for the combined effects of LFAS, SRS and LRRS in section 3.6 and also those just for LFAS in section 3.1.2 of System Management's report indicate performance in excess of the standards. Performance above the standards may indicate excessive Ancillary Service levels.
27. The Authority sought to understand the drivers of this performance.
28. System Management advised that the frequency performance was not just the result of the megawatt requirements, but also correlated to the performance characteristics of the facilities providing the services. For example, faster and more flexible machines such as high efficiency gas turbines are very efficient in correcting frequency excursions. However, System Management's report does not contain supporting evidence.
29. The Authority considers that the frequency performance above the standards requires further investigation to determine the extent to which this performance is being driven by the level of the requirements, the actual level of LFAS usage, or the technical capability of the facilities providing the service.

## Costs

30. The issues above raise the question of whether the true costs of these services are transparent to the market.
31. This is predominantly the case for LFAS, because the LFAS market is settled on System Management's +/-72 MW requirement. It is apparent that greater (and less) than this amount is provided at different times. System Management's report confirms this and states that payments are only made according to the approved requirements resulting in no additional costs being incurred by Market Participants. The Authority considers that the underlying issue is that these costs are not transparent to the market.
32. Individual Ancillary Service Requirements influence the costs associated with other Ancillary Services. For example, the LFAS requirement and the LRRS requirements are inputs into the Margin Values<sup>9</sup> determinations process for SRS.

## Authority's decision

33. The Authority approves System Management's determination of the 2017/18 Ancillary Service Requirements set out in Table 1. In making its determination the Authority notes:
  - (a) System Management's historical performance appears adequate to maintain power system security and reliability;
  - (b) System Management's requirements for 2017/18 are consistent with previously approved levels;
  - (c) System Management has not forecasted any material changes taking place to the power system or the market in 2017/18 requiring a change to the Ancillary Services requirements; and

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<sup>9</sup> [https://www.erawa.com.au/electricity/wholesale-electricity-market/determinations/ancillary-services-parameters/spinning-reserve-margin\\_peak-and-margin\\_off-peak](https://www.erawa.com.au/electricity/wholesale-electricity-market/determinations/ancillary-services-parameters/spinning-reserve-margin_peak-and-margin_off-peak)



- (d) should there be a shortfall of any services then System Management may reassess its requirements and will need to seek the Authority's approval in compliance with Market Rule 3.11.6.
34. The Authority notes that the issues raised in this paper may have been addressed by the Electricity Market Review (e.g. co-optimised energy and ancillary services market, shorter dispatch cycles and individual facility bidding). Future reforms are currently uncertain.
35. The Authority considers that Ancillary Services costs should be transparent to the market and recommends that System Management clarify its plan to consider issues raised in its report. Specifically, if certainty on the reforms mentioned above is not received in the near future, the Authority recommends System Management investigate improving LFAS measurement.
36. The Authority also recommends System Management investigate the drivers of the frequency performance in excess of the standards.