



Economic Regulation Authority

# Report to the Minister for Energy on the Australian Energy Market Operator's compliance 2021/22

Wholesale Electricity Market Rules

Gas Service Information Rules

26 June 2023

## **Economic Regulation Authority**

Level 4, Albert Facey House

469 Wellington Street, Perth WA 6000

**Telephone** 08 6557 7900

**Email** [info@erawa.com.au](mailto:info@erawa.com.au)

**Website** [www.erawa.com.au](http://www.erawa.com.au)

This document can also be made available in alternative formats on request.

National Relay Service TTY: 13 36 77

© 2023 Economic Regulation Authority. All rights reserved. This material may be reproduced in whole or in part provided the source is acknowledged.

# Contents

<b>Executive summary .....</b>	<b>2</b>
<b>1. Introduction .....</b>	<b>4</b>
<b>2. 2021/22 audit reports .....</b>	<b>5</b>
2.1 WEM Rules .....	5
2.2 WEM Rules audit report – Summary of findings .....	5
2.2.1 Load Following Ancillary Services .....	8
2.3 GSI Rules .....	8
2.4 GSI Rules audit report – Summary of findings .....	9
<b>3. AEMO’s response to the audits.....</b>	<b>11</b>
<b>4. WEM investigations .....</b>	<b>12</b>
4.1 Minor historic matters .....	12
4.2 Information Technology System Investigation .....	13
4.3 Reserve Capacity Requirement Investigation .....	14
<b>5. GSI investigations.....</b>	<b>15</b>

## List of appendices

<b>Appendix 1 Compliance Risk Ratings .....</b>	<b>16</b>
<b>Appendix 2 Independent Assurance Report on AEMO’s Compliance with the WEM Rules and WEM Procedures .....</b>	<b>17</b>
<b>Appendix 3 Independent Assurance Report on AEMO’s Compliance with the GSI Rules and GSI Procedures.....</b>	<b>44</b>
<b>Appendix 4 AEMO’s response to the audits .....</b>	<b>54</b>

## Executive summary

The Economic Regulation Authority (ERA) has prepared its annual report to the Minister for Energy on the Australian Energy Market Operator's (AEMO) compliance with the Wholesale Electricity Market (WEM) Rules and the Gas Services Information (GSI) Rules.

AEMO appointed PricewaterhouseCoopers (PwC) as Market Auditor (auditor) to conduct the 2021/22 financial year independent assurance engagement review for the Western Australia Energy Market.

This ERA report contains AEMO's 2021/22 financial year independent assurance report (report), together with the ERA's investigations into AEMO's non-compliances since the 2020/21 financial year report to the Minister for Energy.

One low-risk non-compliance matter was identified for the Gas Services Information (GSI) Rules.

The auditor reported 12 instances of non-compliance in relation to the WEM Rules. Additionally, AEMO self-reported ten matters to the auditor, of which nine were rectified by May 2023. AEMO has provided assurance that the remaining matter will be addressed by the WEM Reform after September 2023. The auditor did not rate any of the non-compliances as material.

In the 2020/21 FY report to the Minister, the ERA expressed two concerns over the adequacy of controls in AEMO's business unit responsible for operating the power system in the WEM. Firstly, there were 10 areas where AEMO's control environment could be improved, including inadequate management of control documentation. Secondly, the auditor found AEMO did not activate sufficient levels of Load Following Ancillary Services (LFAS) required by the WEM Rules in 14 instances. These non-compliances occurred in the last two consecutive audit years despite AEMO implementing improved controls after 2019/20. Given the findings, the ERA recommended AEMO consider enhancing its procedures for controls, including managing control documentation and audit trails, and monitoring the effective operation of controls.

During the current reporting period, the auditor noted that AEMO still had documentation gaps in various areas, such as its obligation registers and procedural records. Additionally, AEMO management reported 23 instances of LFAS non-compliances. To address these issues, AEMO made several improvements to its system, including enhancing visual displays and alarms to better monitor LFAS quantities and implementing monthly Control Room compliance reporting to monitor insufficient LFAS enablement. In June 2022, AEMO further improved the LFAS alarm and the Generator Overview Display to clearly state the shortfall. As a result of these actions, the number of reported breaches has decreased, with only two matters reported by AEMO after May 2022.

The ERA is also required to report on its own investigations into AEMO's compliance. In 2020/21 FY, the ERA investigated 21 matters concerning AEMO's compliance with dispatch requirements in the WEM Rules, mostly related to dispatch according to the latest balancing merit order. These were historical minor matters reported between January 2017 and December 2019, caused by human error or failure or outages of IT systems. AEMO has implemented initiatives to address these issues, such as completing the System Management Systems Transition project and providing ongoing training for System Management.

Since the last report to the Minister in 2020/21 FY, the ERA investigated 38 additional minor historical AEMO matters, mainly related to dispatch obligations. The ERA found many of the causes of these matters were like the ERA's previous investigations, with AEMO's duty controllers committing human errors or oversights. Additionally, AEMO experienced IT system failures resulting from different factors, such as office relocation, third-party IT system disruptions, and email system failures.

The ERA recently conducted two major investigations, one of which has been completed. The first investigation involved three instances of out-of-merit dispatch by AEMO due to failures and outages of AEMO's IT systems in February and May 2022. The second investigation pertained to three matters where AEMO did not comply with the WEM Rules requirements in calculating, approving, and allocating certified reserve capacity and capacity credits to facilities in the South West Interconnected System (SWIS). The

ERA has issued a warning letter to AEMO on this matter. Details of these investigations are discussed in sections 4.2 and 4.3.

The ERA remains concerned about the outcome of the first investigation into the recent IT failure, as it gives rise to overarching questions surrounding the reliability of the AEMO IT system. This system manages crucial functions, such as dispatching electricity generation, coordinating power system operations, and upholding the stability of the grid. Any disruptions or failures within the IT system have the potential to significantly impact the power system.

From October 2023, a new set of WEM Rules will come into effect, bringing significant changes to the electricity market in Western Australia. AEMO's IT systems are important to this transition and the ongoing functioning of the WEM in Western Australia. AEMO has been responsive to and fixed those IT issues that have been identified as contributing to WEM Rules non-compliances and is aware of the critical role its IT systems play in the functioning of the market. The ERA will continue to monitor AEMO's management of its IT systems.

The 2021/22 auditor's report states that AEMO's 'Information Confidentiality Status of WEM Related Information and Documents' procedure has not been reviewed and updated' (Item 22 WEM 1). In the discussion of this matter, it is reported that the lack of review and updating of this procedure has previously been raised as a non-compliance and discussed with the ERA. The ERA remains supportive of AEMO resolving this matter and will continue to work with AEMO on this, and all other, compliance matters.

# 1. Introduction

The ERA is responsible for the compliance and enforcement functions in the WEM Rules and the GSI Rules.

As part of these functions, the ERA must provide a report to the Minister for Energy on AEMO's compliance.<sup>1</sup> The report is prepared annually and includes AEMO's latest published audit reports and the results of any investigations into AEMO's compliance completed by the ERA.

This report covers the audit period from 1 July 2021 to 30 June 2022. The report also includes investigations of AEMO's compliance by the ERA up to the date of this report.

---

<sup>1</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 2.14.5B. Gas Services Information Rules (WA), 1 December 2022, Rule 174(5).

## 2. 2021/22 audit reports

### 2.1 WEM Rules

The WEM Rules require AEMO to have an annual compliance audit.<sup>2</sup> The audit must consider AEMO's compliance with the WEM Rules and WEM Procedures, including AEMO's internal procedures and business processes. The audit must also consider AEMO's market software systems and processes for software management.

The results of the 2021/22 audit are documented in the auditor's independent assurance report on AEMO's compliance with the WEM Rules and WEM Procedures (Appendix 2). The audit report was published on AEMO's website in January 2023.<sup>3</sup>

### 2.2 WEM Rules audit report – Summary of findings

A summary of the audit findings by compliance and risk rating is provided in Table 1.<sup>4</sup>

**Table 1: Summary of 2021/22 audit findings**

	Critical	High	Medium	Low	Total
<b>Level 1</b> (Non-compliance)	0	0	2	10	12
<b>Level 2</b> (Gaps in control design or operating effectiveness)	0	0	4	1	5
<b>Level 3</b> (Control improvement opportunities)	0	0	1	1	2
<b>Information technology related observations<sup>5</sup></b>	0	0	8	5	13
<b>Total</b>	0	0	15	17	32

In the current reporting period, there were a total of 12 non-compliance matters, comprising 11 separate non-compliances and 23 instances of Load Following Ancillary Services (LFAS) non-compliances combined into one matter (Issue No.22WEM12).<sup>6</sup> This represents a decrease from the previous year, where there was

<sup>2</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 2.14.2. Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 2.14.3.

<sup>3</sup> AEMO, 21 February 2023, 'Independent assurance report to the Board of Directors of the Australian Energy Market Operator Limited (AEMO) for the Wholesale Electricity Market', ([online](#)).[accessed 20 January 2023].

<sup>4</sup> Appendix 1 describes the risk ratings used by the auditor to assess AEMO's compliance.

<sup>5</sup> These findings related to logical access (4 Medium, 2 Low), physical access (2 Medium), and IT operations (2 Medium, 3 Low). No findings were identified regarding change management or program development. The IT findings did not result from any non-compliance with WEM rules and procedures directly; thus, they are exempted from the ERA's reporting requirements under clause 2.14.5B of the WEM rules.

<sup>6</sup> Refer to page 19 of the independent assurance report to the Board of Directors of the Australian Energy Market Operator Limited (AEMO) for the Wholesale Electricity Market.

a total of 48 non-compliances reported. Of the 12 non-compliance matters (compliance rating Level 1), the auditor identified two of these, while the rest were self-reported by AEMO. There were no critical or high-risk matters.

There were eight medium and five low rated Information Technology (IT) findings identified by AEMO and PwC in this reporting period. These findings currently have no direct impact on WEM Rules and Procedure non-compliance but have the potential to impact a range of markets and systems across AEMO, including the WEM and GSI.

Seven of the WEM related matters reported were not breaches but were identified as gaps in control design or operating effectiveness (compliance rating Level 2) or control improvement opportunities (compliance rating Level 3). For these matters the auditor found:

- A control gap which indicates the absence of a mechanism for periodically reviewing the changes made to the Standing Data, in order to ensure that the required Manager approval has been obtained.<sup>7</sup>
- Documentation gaps in areas such as AEMO's WEM Rules obligation registers, the Detective Trigger Process, analysis, and approvals of Margin Call Notices.<sup>8,9</sup>
- A lack of workshops for identifying, prioritising, and planning for Real Time Operations (RTO) training needs.<sup>10</sup>

The ERA understands from the auditor's findings that there are gaps and shortcomings in AEMO's processes and controls. AEMO implemented several initiatives to improve its operation and documentation requirements. These include developing new processes and work instruction documents, extending the remit of the Board Default Committee, conducting RTO training workshops, updating internal instructions on Margin Call Notices, and creating a new template to retain evidence of actions taken. AEMO is also addressing internal inconsistencies and updating practices to prepare for the new WEM.

There were two non-compliances rated as medium risk. One of these matters was identified by the auditor and one was identified by AEMO. Both have been resolved by AEMO's management and are shown as closed in the 2021/22 report.

Up until the June 2022 update of the WEM Rules, AEMO was required to:

- Produce operational plans to implement the aggregate under frequency load shedding requirements.<sup>11</sup>
- Make plans for manual load shedding and inform Network Operators of these plans.<sup>12</sup>

However, the auditor identified that while AEMO had captured the approach to both UFLS and manual load shedding in an operating protocol with the Network Operator, there was not a specific document which detailed these requirements. After the June 2022 WEM Rule changes, the requirements for these

<sup>7</sup> Standing Data maintained by AEMO under clause 2.34.1 of the WEM Rules. Appendix 1 of the WEM Rules describes the Standing Data to be maintained by AEMO. Standing data includes the technical specifications of power plants, transmission lines, and distribution systems, as well as the physical characteristics of the electricity network.

<sup>8</sup> Detective Trigger Process is a risk-based approach to determine the actions that should be undertaken by AEMO to ensure compliance in the event that the rule(s) becomes applicable in the upcoming Wholesale Electricity Market in October 2023.

<sup>9</sup> In accordance with clause 2.37.1 and 2.42.1 of the WEM Rules, AEMO must determine a Credit Limit for all Participants who trade in the WEM; and AEMO may issue a Margin Call Notice where a Market Participant's Trading Margin (a function of the Credit Limit) is less than zero.

<sup>10</sup> Real Time Operations (RTO) training, which supports RTO Operators having the necessary skills and capabilities to operate the energy systems in a secure and reliable manner, is delivered through a combination of face-to-face sessions, provision of written training guides, and eLearning modules.

<sup>11</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.6.2.

<sup>12</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.6.6



operational plans were replaced by the UFLS Requirements.<sup>13</sup> No manual load shedding or UFLS events were noted by the auditor during the audit period and the matter was closed in the audit report accordingly.

The other medium risk non-compliance matter concerned the inadvertent disclosure of confidential Market Participant bid information in a Daily Dispatch Plan sent to Synergy. AEMO identified the non-compliance and found it was caused by human error. To mitigate future non-compliances, AEMO has amended the template tool used to generate the Daily Dispatch Plan to introduce additional system and process steps.

There were also 23 instances of low-risk non-compliances related to AEMO not enabling sufficient LFAS as required under the WEM Rules.<sup>14</sup> LFAS is one of several essential services used to maintain the frequency of the power system. In 2020/21 FY the auditor rated LFAS non-compliances as medium risk matters. However, the LFAS matters in 2021/22 FY were all self-reported and risk rated by AEMO as low.

The ERA also noted in the 2020/21 FY audit report, the previous auditor Robinson Bowmaker Paul (RBP) reviewed LFAS activation data between July and March 2020 and noted 43 instances of under-activation of LFAS (over and above the instances self-reported by AEMO).<sup>15</sup> For the current reporting period, PwC considered AEMO's key processes and controls to support compliance with LFAS enablement, including consideration of both preventative and detective controls in place. Given the instances of non-compliances identified by AEMO management during the period, PwC have not performed further independent testing of 100 per cent of the population to identify instances of further non-compliance. Therefore, all 23 instances reported in the 2021/22 FY audit report were self-reported and risk rated by AEMO.

The ninth matter addresses the incorrect calculation of Spinning Reserve costs and will be addressed by WEM Reform after September 2023.<sup>16</sup>

Since September 2019, facilities not synchronised to the South West Interconnected System (SWIS) are not liable to pay Spinning Reserve costs. However, due to the absence of actual synchronisation data, AEMO settlement systems have been using assumed data, resulting in some incorrect settlement outcomes. The issue will be addressed as part of the WEM Reform Program, and settlement calculations will no longer use synchronisation data after September 2023. Although AEMO has assessed interim fixes, it has concluded that they are not cost-effective and would require the use of limited resources currently focused on higher priority issues. The impact of this issue was limited to only one participant, with an estimated cost of \$6,900. Therefore, this issue will remain open until the new market starts and it may be included in the upcoming market audit in 2022/23 FY.

The auditor reported that AEMO's 'Information Confidentiality Status of WEM Related Information and Documents' procedure has not been reviewed and updated (22WEM1). The auditor's report notes this matter has previously been raised as a non-compliance and AEMO has discussed resolution with the ERA. The ERA remains supportive of AEMO's efforts to resolve this non-compliance. The information rules are changing in the new market and the ERA supports AEMO prioritising the use of resources to prepare for the new regime.

Of the remaining nine low risk non-compliances, eight have been rectified. These non-compliances covered a range of different matters as follows:

- Inadequate review and update of 'Information Confidentiality Status of WEM Related Information and Documents' document.
- Failure to issue dispatch advisories.

<sup>13</sup> Under Frequency Load Shedding (UFLS) schemes are emergency mechanisms that are designed to mitigate the risk of power system collapse following multiple Non-Credible Contingency Events. The scheme only operates during rare events where a drop in frequency has not been arrested sufficiently by Frequency Control Essential System Services.

<sup>14</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 7B.3.6.

<sup>15</sup> Refer Audit finding 21WEM1.37 in the 'Independent Assurance Report on AEMO's compliance with the WEM Rules and WEM Procedures', ([online](#)).[accessed 21 April 2023].

<sup>16</sup> Spinning Reserve is the supply capacity held in reserve from synchronised Scheduled Generators or Interruptible Loads, so as to be available to support the system frequency in the event of an outage of a generating works or transmission equipment or to be dispatched to provide energy as allowed under these WEM Rules.

- Not meeting publishing deadlines.
- Incorrect inputs in calculations of MW values for ex-ante Outages.

### 2.2.1 Load Following Ancillary Services

The problem of inadequate LFAS activation is not a recent occurrence and AEMO considers the manual nature of processes to be a contributing factor to this persistent and systemic issue. AEMO forecasts the required amount of LFAS annually, which represents the quantities of LFAS that must be scheduled in advance for activation for each Trading Interval. There are two main contributing factors to these non-compliances:

- Activation of Synergy's LFAS generators is a manual process, which may result in discrepancies between the scheduled amount and the actual amount activated in real-time.
- The actual amount of LFAS required to maintain power system security may differ from the scheduled amounts.

AEMO has explored alternative approaches to mitigate these issues since the 2019/20 audit. Since the prior audit, AEMO has implemented changes to the System Operator Control Centre User Interface (SOCCUI) to improve visual displays to monitor the quantities of LFAS activated and Energy Management System (EMS) alarms to monitor LFAS quantities.

From March 2022 AEMO has also implemented monthly Control Room compliance reporting, monitoring intervals of insufficient LFAS enablement and any other focus areas identified. Monthly compliance reporting results are shared with the Power System Operations Controller team via email and are tabled for discussion as required in the monthly Controller meeting.

AEMO continues to monitor the effectiveness of LFAS enablement controls through trending and evaluation of the monthly compliance results. Opportunities to enhance current controls will be guided by:

- Feedback and discussion at the Controller meetings.
- Discussion with individual team members when enablement shortfalls are identified to understand contributing factors.

AEMO review of LFAS breaches since March 2022 has resulted in an alarm configuration review to identify and implement feasible improvements to reduce the likelihood of multi-interval LFAS under enablement occurring. In June 2022 AEMO implemented a new LFAS alarm and further visual improvements on the Generator Overview Display to explicitly state the shortfall. Alarms have been configured to trigger when an LFAS enablement shortfall is detected and remain active until there is no longer a shortfall.

While it is unlikely the remedial actions undertaken by AEMO will eliminate all LFAS non-compliances due to the manual nature of the processes, it is expected to reduce the occurrence of LFAS under enablement breaches in the future. The implementation of multiple actions as mentioned above may have led to a decrease in the number of reported breaches, with only two matters reported by AEMO after May 2022. In the new market LFAS will be replaced by Regulation, however the method of calculating Regulation quantities in the new WEM is not completely different from the existing way LFAS quantities are calculated. Given that the methodology for determining the Regulation quantity is not yet clear, it is likely the ERA will monitor this area.

## 2.3 GSI Rules

AEMO is required to have an annual compliance audit (clause 174(2) of the GSI Rules). The audit must consider AEMO's compliance with the GSI Rules and GSI Procedures, including AEMO's internal procedures and business processes. The audit must also consider AEMO's market software systems for the Gas Bulletin Board and calculation of GSI fees and processes for software management.

The results of the GSI audit are documented in the auditor's Independent Assurance Report on AEMO's Compliance with the GSI Rules and GSI Procedures (Appendix 3). The audit report was published on AEMO's website in January 2023.<sup>17</sup>

## 2.4 GSI Rules audit report – Summary of findings

The auditor reported the following main themes in the audit report:

- Extensive automation means that GSI obligations are well-controlled.
- AEMO has a strong compliance culture where self-reporting of matters is encouraged and the approach to compliance risk management is proactive.
- There were no non-compliance findings from the previous year.
- One market-related non-compliance with the GSI Rules was identified during the current reporting period.

A summary of the audit findings by compliance and risk rating is provided in Table 3 below.

---

<sup>17</sup> AEMO, 10 January 2023, 'Independent assurance report to the Board of Directors of the Australian Energy Market Operator Limited (AEMO) for the Gas Services Information', ([online](#)).[accessed 5 April 2023].

**Table 3: Summary of 2021/22 audit findings**

	Critical	High	Medium	Low	Total
<b>Level 1</b> (Non-Compliance)	0	0	0	1	1
<b>Level 2</b> (Gaps in control design or operating effectiveness)	0	0	0	0	0
<b>Level 3</b> (Control improvement opportunities)	0	0	0	0	0
<b>Information Technology related observations</b>	0	0	7	5	12
<b>Total</b>	0	0	7	6	13

The items above comprise one market-related non-compliance with the GSI Rules, and 12 IT related observations.

The compliance matter referred to in Table 3 was concerned with the adjustments for GSI Fees having not been recalculated within the required 10 business days of period end under the GSI Rule 117(1).<sup>18</sup> This issue represents a minor non-compliance with the GSI Rules and did not impact any Registered Shippers or have an operational impact on the Gas Bulletin Board (GBB).

<sup>18</sup> In accordance with GSI Rule 117(1), AEMO is required to issue a GSI invoice to each Registered Shipper within 30 business days of the end of each period. The GSI invoice comprises of Initial GSI Fees, which are to be recalculated within 30 Business Days of the end of that period and the adjustment GSI Fees, which are to be recalculated for a GSI Invoice period within 10 Business Days after the end of period.

### **3. AEMO's response to the audits**

AEMO stated it accepted the audit findings that were reported at the conclusion of both audits. AEMO published its response to the audits on its website.

## 4. WEM investigations

Clause 2.14.5B(b) of the WEM Rules requires the ERA to include the results of any investigations of AEMO's compliance with the WEM Rules and WEM Procedures in this report.

Since the previous report, the ERA has completed investigations into 44 AEMO non-compliance matters. Of these matters, 41 were self-reported by AEMO and three matters were identified by the ERA.

In the 2020/21 FY report to the Minister, it was noted there was a disagreement between AEMO and the previous Market Auditor regarding a non-compliance matter (21WEM1.38).<sup>19</sup> The auditor found AEMO was not complying with clause 3A.1.3 of the WEM Rules, which requires AEMO and a Network Operator to establish a documented process for exchanging information between the two parties.<sup>20</sup> AEMO disagreed that this matter was a non-compliance and considered it was meeting the intent of the clause by having documented a manual contingency process and a draft guideline. AEMO also stated it was actively seeking feedback from the Network Operator to finalise the guideline.

Since the 2020/21 FY report to the Minister, the ERA has confirmed AEMO is currently compliant with the requirements of clause 3A.1.3. A manual contingency process between Western Power and AEMO was in place from 1 February 2021 and the Consultation Guidelines for Western Power and AEMO Interactions was finalised on 13 June 2022.

At present, the ERA has more than a hundred active minor historic matters with AEMO, all of which were self-reported by AEMO. These matters involve breaches dating back to July 2012 and extending up to December 2022. However, none of these breaches posed a threat to the power system's security or reliability and are all categorised as minor matters.

With the launch of the new market in October 2023, a rule amendment will remove the ERA's obligation to investigate every alleged breach it becomes aware of. Instead, the ERA will be required to record all alleged breaches, assign a risk rating to each alleged breach, and investigate those alleged breaches in accordance with the assigned risk rating. The ERA will also have the discretion to investigate any breaches it deems appropriate, even where the matter(s) may not meet the threshold for investigation according to the assigned risk rating.

Most of the current active matters would not reach the threshold for investigation under the new WEM Rules. The ERA will prioritise the current list of minor historic matters accordingly in the current market.

### 4.1 Minor historic matters

In the ERA's report to the Minister last year, it was concluded that AEMO's assurance processes needed improvement, finding the underlying causes of many longstanding issues were similar to those encountered in the past. Specifically, many non-compliances were caused by system errors that had gone undetected in previous audits or software certification processes. As a result, the ERA identified a need for AEMO to enhance its processes to better identify and rectify these types of issues, thus reducing the risk of their recurrence in the future.

Since the last report, the ERA investigated 38 minor historic matters primarily related to Dispatch matters and involving AEMO's failure to provide necessary information to comply with the requirements of the WEM Rules:

- Provide information including forecasts, Ancillary Services Information, schedules of Dispatch and Operating Instructions and Outage schedules as required by the WEM Rules (15 matters).

<sup>19</sup> Refer Audit finding 21WEM1.38 in the 'Independent Assurance Report on AEMO's compliance with the WEM Rules and WEM Procedures', ([online](#)).[accessed 21 April 2023].

<sup>20</sup> At the time of this report Western Power is the only Network Operator.

- Issue or withdraw Dispatch Advisories (13 matters).
- Issue Dispatch Instructions (five matters).
- Approve Opportunistic Maintenance requests (three matters).
- Grant permission to synchronise, consistent with a Dispatch Instruction (one matter).
- Incorrect disclosure of confidential information (one matter).

For five of the matters, the ERA concluded no breach of the WEM Rules had occurred.

It is crucial for AEMO to address non-compliances to ensure compliance with the rules and improve the overall reliability of the power system. The causes of many minor historical matters were human error and oversights by AEMO's duty controllers. Furthermore, three information provision breaches were linked to AEMO's IT system failures, which were caused by separate factors, including AEMO's office relocation, third-party IT system disruptions, and email system failures.

In response to the investigation, AEMO has taken several actions to mitigate future non-compliances. One of the measures taken was to provide education and training to staff to ensure they are aware of the compliance requirements. AEMO has also implemented new procedures and automated reminders to improve compliance with information provision requirement of the rules. Additionally, AEMO has developed an internal guideline for generator synchronisation to clarify their requirements and ensure that synchronisation is approved. Additionally, AEMO has taken preventative measures by creating two separate files to prevent the possibility of confidential participant data being attached to the Dispatch Plan, thus mitigating the risk of non-compliance recurrence. These measures indicate AEMO's commitment to addressing and resolving non-compliance issues, and they aim to prevent future incidents by establishing better compliance protocols and educating their staff on compliance requirements.

## 4.2 Information Technology System Investigation

The ERA recently investigated three matters concerning AEMO's out of merit dispatch due to failures and outages of AEMO's IT systems in February and May 2022. The compliance risk was assessed based on a risk matrix.<sup>21</sup> Due to the cumulative constrained payments resulting from these breaches being material and due to these breaches associated with IT system occurring within a short period of time, these matters were classified as Major.

The two February 2022 non-compliance matters arose due to the IT failure of AEMO's energy management system (e-terra). AEMO stated a new alarm was developed and a software patch implemented to the e-terra system to prevent this IT error from reoccurring. The May 2022 matter was due to a weather data error in the Metrix forecasting information technology system. The weather data used for AEMO's load forecast provided by external weather data providers was incorrect. The load forecast error resulted in AEMO's dispatch system automatically dispatching renewable generation facilities down, which resulted in a High Risk Operating State for eleven minutes.<sup>22</sup> AEMO commenced dispatching facilities manually to return to a normal operating state. AEMO advised that an alarm has been installed in AEMO's dispatch system to alert AEMO's controllers of data errors and sudden load forecast deviations. AEMO confirmed these actions were completed by July 2022.

AEMO has taken steps to address the specific issues that caused the non-compliance, and is preparing for the upcoming large-scale system and process changes required as part of the WEM reform. The ERA will continue to monitor AEMO's progress in maintaining appropriate controls to ensure the stability and compliance of the energy market.

<sup>21</sup> The risk matrix used by the ERA's Secretariat for compliance and enforcement purposes was developed following the transfer of compliance functions to the ERA in July 2016.

<sup>22</sup> Wholesale Electricity Market Rules (WA), 29 April 2023, Rule 3.4



### 4.3 Reserve Capacity Requirement Investigation

A medium risk non-compliance issue was identified by the auditor in the 2019/20 Independent Assurance Report of AEMO's compliance with the WEM Rules (reference 21WEM1.73).<sup>23</sup> The error arose from using incorrect calculations in assigning certified reserve capacity to facilities, which concerned the relevant level calculation used to determine the capacity credits allocated to intermittent generators. Despite updating AEMO's relevant level calculation tool in 2017, the tool contained erroneous inputs that led to incorrect calculations for the 2017 to 2020 reserve capacity cycles.

The ERA investigated three matters where AEMO did not comply with the WEM Rules requirements when calculating, approving, and allocating certified reserve capacity and capacity credits to facilities in the SWIS. The compliance risk was assessed based on a risk matrix. Due to the cumulative constrained payments resulting in a material financial consequence, these matters were classified as Major.

The first matter pertains to AEMO miscalculating relevant level data, which led to the incorrect assignment of certified reserve capacity, allocation of capacity credits to market participants, and settlement calculations.<sup>24</sup> As a result, market participants received a net decrease of \$142,805 in capacity payments. AEMO corrected the relevant level calculation tool as soon as it became aware of the error.

Secondly, AEMO certified reserve capacity for one market participant during the 2018 reserve capacity cycle based on an incomplete application resulting in the market participant receiving capacity payments it was not entitled to.<sup>25</sup> AEMO has strengthened its processes for processing certified reserve capacity applications by publishing the procedures market participants must follow when applying for certified reserve capacity that provide for application completeness. The published procedures are also guides for AEMO to follow to ensure it has received all information necessary prior to assigning a quantity of certified reserve capacity.

Lastly, AEMO assigned capacity credits to a new generator based on an invalid application. This was a minor breach as AEMO allocated capacity credits to the facility on the date it was registered.

The ERA issued AEMO a formal warning on 16 March 2023 in relation to the breaches found in regard to the first and second matters outlined earlier (under clause 2.13.10(d) of the WEM Rules). The warning highlights the need for AEMO to take corrective action and implement measures to prevent similar breaches from occurring in the future.

<sup>23</sup> AEMO, 6 December 2021, 'Independent Assurance Report on AEMO's compliance with the WEM Rules and WEM Procedures', ([online](#)).[accessed 21 April 2023]

<sup>24</sup> Relevant level is a forecast of the contribution of renewables – such as wind and solar – to the reliability of the system and underpins capacity credits assigned to renewable generators.

<sup>25</sup> Reserve capacity



## **5. GSI investigations**

Although the GSI Rules do not require this report to include the results of any investigations carried out by the ERA on AEMO's compliance with the GSI Rules and GSI Procedures, this section has been included in this report for completeness.

The ERA did not investigate any alleged breaches of the GSI Rules or GSI Procedures by AEMO during the 2021/22 FY audit period.

## Appendix 1 Compliance Risk Ratings

Table 1 describes the ratings the auditor used to assess AEMO's compliance.

**Table 1: Compliance ratings used by the auditor<sup>26</sup>**

Compliance Rating	Definition
<b>Level 1</b> (Non-compliance)	Evidence of non-compliance with review criteria. These should be addressed as a matter of high priority.
<b>Level 2</b> (Gaps in control design or operating effectiveness)	Issues which could possibly result in non-compliance with review criteria but where no evidence of actual non-compliance was found. However, there is considered to be insufficient formal evidence of controls in place or being actioned in relation to these issues.
<b>Level 3</b> (Control improvement opportunities)	Housekeeping matters and opportunities for improving internal controls and procedures relating to gas market procedures.

The following risk ratings, set in consultation with AEMO, were used by the auditor to assess the findings:

**Critical:** Findings which may have a catastrophic impact on the market operations if they are not addressed immediately and require executive action with regular reporting at Board level.

**High:** Findings which may have a major impact on the market operations if they are not addressed as a matter of priority. These findings require senior management attention with regular monitoring and reporting at executive and Board meetings.

**Medium:** Findings which may have a moderate impact on the market operations if they are not addressed within a reasonable timeframe. These findings require management attention with regular ongoing monitoring.

**Low:** Findings which may have a minor impact on market operations if they are not addressed in the future. These findings are the responsibility of management with regular monitoring and reporting at staff meetings.

<sup>26</sup> Refer to page 5 of Independent Assurance Report on AEMO's compliance with the WEM Rules and Market Procedures.

## **Appendix 2 Independent Assurance Report on AEMO's Compliance with the WEM Rules and WEM Procedures**



To: The Board of Directors of AEMO

## **Independent assurance report to the Board of Directors of the Australian Energy Market Operator Limited (AEMO) for the Wholesale Electricity Market**

### ***Scope***

In accordance with our contract dated 14 January 2022, we were engaged by the Australian Energy Market Operator (AEMO) to perform an independent limited assurance engagement in respect of AEMO's internal control procedures in relation to compliance with the Wholesale Electricity Market Rules (WEM Rules) and WEM Procedures, for the year ended 30 June 2022, in the following areas:

- the compliance of AEMO's internal procedures and business processes with the WEM Rules;
- AEMO's compliance with the WEM Rules and WEM Procedures; and
- AEMO's market software systems and processes for software management.

### ***AEMO Management's responsibilities***

AEMO Management is responsible for maintaining an effective internal control structure, including control procedures, to ensure compliance with the WEM Rules and WEM Procedures. This responsibility includes establishing and maintaining internal controls relevant to compliance with the WEM Rules and WEM Procedures and the preparation and fair presentation of information that is free from material misstatement.

### ***Our Independence and Quality control***

We have complied with relevant ethical requirements related to assurance engagements, which include independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.

In accordance with Auditing Standard ASQC 1 Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, Other Assurance Engagements and Related Services Engagements the firm maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

### ***Our responsibilities***

Our responsibility is to express a limited assurance conclusion based on the procedures we have performed and the evidence we have obtained.

Our engagement has been conducted in accordance with the Australian Standard on Assurance Engagements (ASAE 3000) Assurance Engagements Other Than Audits or Reviews of Historical Financial Information. That standard requires that we plan and perform this engagement to obtain limited assurance about whether anything has come to our attention to indicate that the AEMO internal control procedures in relation to the areas listed under the Scope section above, have not been, in all material respects, effectively designed and operated, in order to comply with the relevant criteria outlined in:

PricewaterhouseCoopers, ABN 52 780 433 757  
Brookfield Place, 125 St Georges Terrace, PERTH WA 6000, GPO Box D198, PERTH WA 6840 T: +61 8  
9238 3000, F: +61 8 9238 3999, [www.pwc.com.au](http://www.pwc.com.au)

Liability limited by a scheme approved under Professional Standards Legislation.



- Wholesale Electricity Market Rules (1 July 2021) to Wholesale Electricity Market Rules (1 June 2022).

Where the effectiveness of key controls was used to determine compliance with the criteria above, the identification of key controls was performed with reference to applicable AEMO policy or procedure documentation.

The procedures we performed were based on our professional judgement and included:

- inquiry and observation of staff and management to understand the operation of controls
- review of relevant AEMO policies and procedures
- undertaking procedures to evaluate the design effectiveness of key controls
- performing limited sample testing to validate the operating effectiveness of key controls.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

### ***Scope Exclusions***

*Our review did not include any assessment of compliance or controls by market participants other than AEMO. For example, our procedures didn't consider application and IT controls over systems that are operated by external organisations, the compliance with Service Level Requirements, or the control procedures in place at those agencies not controlled by AEMO, such as:*

- Rule Participants other than AEMO
- Real time systems
- Retailers
- Distributors.

To support AEMO processes, AEMO relies on market participants operating in compliance with the WEM Rules or other relevant requirements (the 'market participants' compliance'). There are a number of AEMO's internal control procedures that rely on market participants' compliance, for example, among others:

- Market participants are responsible for the completeness and accuracy of Supervisory Control and Data Acquisition (SCADA) readings, which are used by AEMO to operate the WEM in compliance with the WEM Rules.
- Initial administrator user access is granted to key AEMO applications on request from market participants who are then responsible for ongoing access management for the applications. This would include controls for the approval, termination and periodic review of user access for appropriateness.



- Metering data is received by AEMO from Western Power. AEMO assumes that the metering data is complete, accurate and valid. Our control procedures are limited to the procedures AEMO performs to validate the reasonableness of this data.

Our procedures did not extend to assessing the market participants' compliance.

It is assumed that automated pricing, dispatch and settlement calculations are consistent with the WEM Rules. Our scope did not include certification of electricity market systems such as the Real Time Dispatch Engine (RTDE), Wholesale Electricity Market System (WEMS), settlements systems, or other market systems.

We accept no responsibility for the adequacy or accuracy of work performed by AEMO or the Independent Certifier in relation to system certification. We accept no liability to AEMO or to any other person for any part of our review report that relies on, or assumes the adequacy of, system certification.

Our work is based primarily on information supplied by management and was carried out on the basis that such information is accurate and complete.

Whilst our engagement may involve the analysis of financial information and accounting records, it does not constitute an audit in accordance with Australian Auditing Standards or a review in accordance with Australian Auditing Standards applicable to review engagements and accordingly no such assurance will be provided in our report or deliverables.

### ***Use of report***

We prepared this report solely for AEMO's use and benefit in accordance with and for the purpose set out in our Master Supplies Agreement (MSA) between PricewaterhouseCoopers and AEMO dated 14 January 2022, and Description of Supplies for Market Audit Services dated 14 January 2022. In doing so, we acted exclusively for AEMO and considered no-one else's interests.

We accept no responsibility, duty or liability:

- to anyone other than AEMO in connection with this report
- to AEMO for the consequences of using or relying on it for a purpose other than that referred to above.

We make no representation concerning the appropriateness of this report for anyone other than AEMO. If anyone other than AEMO chooses to use or rely on it they do so at their own risk.

This disclaimer applies:

- to the maximum extent permitted by law and, without limitation, to liability arising in negligence or under statute; and
- even if we consent to anyone other than AEMO receiving or using this report.

### ***Inherent limitations***

Because of the inherent limitations of any internal control system, it is possible that fraud, error, or non-compliance may occur and not be detected. Further, the internal compliance and control culture has not been reviewed and no view is expressed as to its effectiveness.



A limited assurance engagement is not designed to detect all instances of non-compliance of the internal compliance and control system, as it is limited primarily to making enquiries, with management and staff, and applying analytical procedures. The limited assurance conclusion expressed in this report has been formed on the above basis.

### ***Materiality***

We have considered materiality when evaluating the effect of identified control weakness on our conclusion. Materiality is considered in the context of AEMO's objectives relevant to the area of activity being examined. When assessing materiality, we considered qualitative factors as well as quantitative factors, including:

- the purpose of the engagement and specific requirements of the engagement
- the economic, social, political, and environmental impact of control weaknesses
- the importance of an identified control weakness in relation to the area of activities and the entities overall objectives
- the impact of a centralised function on other parts of the entity
- public perception and/or interest in the area of activity
- the cost of alternative controls relative to their likely benefit
- the length of time an identified control weakness was in existence.



### *Summary of Findings*

The table below summarises new findings reported, and findings from prior periods which remained open as at 30 June 2022. This includes findings reported by AEMO management or through our review procedures.

	<b>Critical</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
Level 1	0	0	8	13
Level 2	0	0	6	3
Level 3	0	0	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>17</b>

The table below summarises findings from prior periods which have been closed during FY22.

	<b>Critical</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
Level 1	0	0	3	12
Level 2	0	0	3	4
Level 3	0	0	0	6
<b>Total</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>22</b>

All findings in the table above have been agreed with management and formally reported to AEMO's Finance Risk and Audit Committee.





We have categorised control observations noted according to agreed risk and compliance ratings. The risk ratings applied for each finding are consistent with the likelihood and consequence matrix adopted by AEMO's Risk and Audit Committee.

The ratings have been tailored to reflect the potential impact on the market as follows:

<b>Risk Rating</b>	<b>Definition</b>
Critical	Findings which may have a catastrophic impact on the market operations if they are not addressed immediately and require executive action with regular reporting at Board level.
High	Findings which may have a major impact on the market operations if they are not addressed as a matter of priority. These findings require senior management attention with regular monitoring and reporting at executive and Board meetings.
Medium	Findings which may have a moderate impact on the market operations if they are not addressed within a reasonable timeframe. These findings require management attention with regular ongoing monitoring.
Low	Findings which may have a minor impact on market operations if they are not addressed in the future. These findings are the responsibility of management with regular monitoring and reporting at staff meetings.

<b>Compliance Rating</b>	<b>Definition</b>
Level 1 (Non-compliance)	Evidence of non-compliance with review criteria. These should be addressed as a matter of high priority.
Level 2 (Gaps in control design or operating effectiveness)	Issues which could possibly result in non-compliance with review criteria but where no evidence of actual non-compliance was found. However, there is considered to be insufficient formal evidence of controls in place or being actioned in relation to these issues.
Level 3 (Control improvement opportunities)	Housekeeping matters and opportunities for improving internal controls and procedures relating to gas market procedures.

### ***Other information***

The information included in Appendix 1 is presented by AEMO management to provide risk rating details, root cause, recommendations, management responses and timelines for the observed exceptions. Such information has not been subject to the procedures applied by PwC in the assessment of AEMO's compliance with the criteria and accordingly, we express no opinion on it.



### ***Conclusion***

Based on our review, which is not an audit, nothing has come to our attention that causes us to believe that the Australian Energy Market Operator did not maintain, in all material respects, effective control procedures in relation to compliance with the WEM Rules and WEM Procedures for the year ended 30 June 2022, based on the scope referred to above.

A handwritten signature in cursive script that reads 'PricewaterhouseCoopers'.

PricewaterhouseCoopers

A handwritten signature in cursive script that reads 'Sian Ashdown'.

Sian Ashdown

Partner

Perth

19 December 2022

# Appendix 1 Summary of Observations & Management Comments

The following table provides a summary of issues against the criteria. It is presented by AEMO's management to the Economic Regulation Authority Western Australia (ERA) but is not included within the scope of this report and has not been subjected to the procedures applied by PwC in the assessment of AEMO's compliance with the criteria.

The detailed findings in relation to the Wholesale Electricity Market (WEM) are shown below, split between findings from the current review period (PwC reported and Management reported) and a status update of findings identified during the prior year review.

Findings reported have been discussed and agreed with Management and their comments are included. Target resolution dates for each issue have also been agreed and reported

## Appendix 1.1 – Wholesale Electricity Market – Findings reported by PwC – 1 July 2021 to 30 June 2022

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
22 WEM 1	<b>Issue Type</b> Non-compliance identified by PwC <b>Obligation</b> WEM Rule 10.2.1; 10.9.1	<p><b>AEMO's 'Information Confidentiality Status of WEM Related Information and Documents' procedure has not been reviewed and updated</b></p> <p>In accordance with clause 10.2.1 of the WEM Rules, AEMO must set and publish the confidentiality status for each type of market related information and document produced or exchanged in accordance with the WEM Rules or WEM Procedures.</p> <p>This includes the confidentiality status for all information provided by a Network Operator (i.e. Western Power) under clause 2.28.3B and clause 2.28.3C as 'System Operation Confidential', as required by clause 10.9.1 of the WEM Rules. Information shared by Western Power under clauses 2.28.3B and 2.28.3C includes data to model the performance of the SWIS (both current and futures state), which may include facility-specific data.</p> <p>To support these requirements, the 'Information Confidentiality Status of WEM Related Information and Documents' document (dated July 2012) published on the AEMO website, details the following:</p> <ul style="list-style-type: none"> <li>• Clause Reference (e.g. WEM Rule 1.6.1)</li> <li>• Information Contained (i.e. the market information or document produced or exchanged under the WEM Rules)</li> <li>• Confidentiality Status (e.g. Public, System Management Confidential).</li> </ul> <p>Review noted that the 'Information Confidentiality Status of WEM Related Information and Documents' publication was last updated in July 2012. Discussions with management confirmed that this has been discussed with the ERA and previously raised as a non-compliance, however attempts to update the document in 2019 were previously not supported by the ERA and Rule Change Panel.</p> <p>As a result, there are some areas which are not up to date, for example clause 2.28.3B and 2.28.3C that were not listed, and details for these clauses including 'Information Contained' and 'Confidentiality Status' were also absent.</p> <p><b>Implication:</b></p> <p>Where the confidentiality status is not appropriately reflected within the 'Information Confidentiality Status of WEM Related Information and Documents' document, this represents a non-compliance with WEM Rule 10.2.1.</p>	<b>Compliance Rating:</b> Level 1 <b>Risk Rating:</b> Low (Likelihood: Unlikely; Consequence: Immaterial)	<p>We note that this item has been previously risk accepted by management, as noted in the breach deferral form dated 6 October 2022.</p> <p>Management should continue to progress this item with the ERA, or alternatively seek a letter of 'no-action' from the ERA in relation to this non-compliance.</p>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations</p> <p><b>Implementation Date</b></p> <p>Closed</p>
22	<b>Issue Type</b> Control	<p><b>AEMO's Regulatory Delegations of Authority should be reviewed to support the timely action of Rule Participant suspension activities</b></p>	<b>Compliance Rating:</b>	Management should continue to evaluate the	<p><b>Management Response</b></p> <p>AEMO accepts finding and</p>

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
<b>WEM 2</b>	improvement opportunity identified by PwC  <b>Obligation</b>  WEM Rules 2.32.1 9.23.4 9.23.7	<p>WEM Rules 9.23.1 and 9.23.2 outline the circumstances a 'Suspension Event' may be triggered in relation to a Rule Participant, which may include scenarios such as a Rule Participant failing to make a payment before it is due, or Credit Support for a Rule Participant not being received by AEMO within 90 minutes of request.</p> <p>Once AEMO becomes aware that a Suspension Event has occurred in relation to a Rule Participant and the Suspension Event has not been remedied, a 'Cure Notice' must be issued which details the action(s) and deadline for remedying the Suspension Event. If a Rule Participant fails to remedy the Suspension Event before the deadline, AEMO may issue a Suspension Notice in line with WEM Rules 2.32.1 and 9.23.7.</p> <p>As per AEMO's Regulatory Delegations of Authority (DoA), AEMO's Board must approve the issue of both the Cure Notice and Suspension Notice prior to communication to the Rule Participant. In accordance with the DoA, all members of the Board are required to convene at short notice once a Suspension Event is identified.</p> <p>Whilst the current delegations may be appropriate, given the need for timely decision making for the issue of a Cure Notice (and potentially a Suspension Notice), there is opportunity to consider whether the delegations remain practical to meet the regulatory timeframes required by the WEM rules. Management has noted that a Suspension Event that was not remedied has not occurred in the Wholesale Electricity Market.</p> <p>It is also acknowledged that management is currently underway (in preparation for the new WEM) in reviewing AEMO's Regulatory Delegations of Authority to ensure delegations are reasonable and appropriate.</p> <p><b>Implication:</b></p> <p>Where there may be a delay in the issue of a Cure Notice or Suspension Notice, there is an increased risk of Rule Participants continuing to participate in the Wholesale Electricity Market during a period where they should either be remediating a Cure Notice, or are to be suspended from participating.</p>	<p>Level 3</p> <p><b>Risk Rating:</b></p> <p>Medium</p> <p>(Likelihood: Rare; Consequence: Moderate)</p>	delegations in place to support the timely issuance of Cure Notices and Suspension Notices respectively.	<p>recommendations.</p> <p><b>Implementation Date</b> 30 June 2023</p>
<b>22 WEM 3</b>	<p><b>Issue Type</b></p> <p>Control design issue identified by PwC</p> <p><b>Obligation</b></p> <p>WEM Rules 2.34.1</p>	<p><b>A periodic review of changes made to Rule Participant standing data should be performed to ensure only appropriate changes are made</b></p> <p>As per WEM Rule 2.34.1, AEMO must maintain a record of Standing Data for Rule Participants. This data varies based on the type of Rule Participant (e.g. scheduled generator, non-dispatchable load, etc). Standing data includes information such as (but not limited to):</p> <ul style="list-style-type: none"> <li>Metering Data Agent for the facility</li> <li>Facility-specific attributes (e.g. nameplate capacity, fuel type, AGC capability).</li> </ul>	<p><b>Compliance Rating:</b></p> <p>Level 2</p> <p><b>Risk Rating:</b></p> <p>Medium</p> <p>(Likelihood: Unlikely; Consequence:</p>	<p>Management should formalise a periodic review (e.g. monthly) of Standing Data changes made to ensure changes have been made accurately, completely and validly.</p> <p>This review should be evidenced and signed</p>	<p><b>Management Response</b></p> <p>AEMO accepts the finding and will implement the recommendation.</p> <p><b>Implementation Date</b></p> <p>31 March 2023</p>

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
		<p>All Standing Data is maintained in the WEMS application by AEMO.</p> <p>The 'Standing Data' work instruction details the process to be performed by the Analyst following a Standing Data change request from a Rule Participant and specifies for each type of Standing Data change, who the Analyst must consult with.</p> <p>Standing Data change requests are submitted by the Rule Participant via WEMS. When a Standing Data request has been submitted, an Analyst will review the request to ensure all information provided is accurate and complete. This review may include consultation with other stakeholders (e.g. Reserve Capacity, Operational Planning &amp; Forecasting, Western Power, etc), dependent on the type of Standing Data being updated.</p> <p>Following review and determination that the change is appropriate, a request for approval is sent via email to the Manager, WA Market Operations &amp; Support. As required by the work instruction, the Analyst will attach evidence to the request for approval that the consultation as required by the work instruction has been followed; the Manager will then review the evidence provided to verify that the work instruction process has been followed. Once approved, the Analyst will process the change within WEMS.</p> <p>There is reliance placed upon the Analyst ensuring appropriate email approval has been obtained, as the Analyst still has the ability to process the Standing Data request within WEMS regardless of an approval not being obtained.</p> <p>Discussion with management noted that although there are alternative controls to review Standing Data change requests for appropriateness prior to acceptance (e.g. Manager approval as a matter of policy), there is no mechanism in place to conduct periodic review of Standing Data changes made in a given period to ensure Manager approval was obtained.</p> <p>It is acknowledged that upon joining the WA Market Operations team, analysts will undertake a six-week onboarding plan, which includes the process for Standing Data change requests (under Registrations).</p> <p><b>Implication:</b></p> <p>Where a change in Standing Data is made without appropriate Manager approval obtained, there may be an increased risk of Standing Data being accepted without appropriate review, leading to incorrect standing data in WEMS that has not been prevented by another standing data control.</p>	Moderate)	off by the Manager, WA Market Operations & Support.	
22 WEM 4	Issue Type Non-compliance	<b>While the Operating Protocol between AEMO and Western Power notes the requirements for UFLS and manual load shedding, and the basis upon which</b>	Compliance Rating:	As noted, no management actions required as the	<b>Management Response</b> AEMO accepts finding and

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
	<p>identified by PwC</p> <p><b>Obligation</b></p> <p>WEM Rules 3.6.2, 3.6.4, 3.6.6</p>	<p><b>these were to be operated, AEMO did not have a separate operational plan for manual load shedding and UFLS</b></p> <p>Prior to the WEM Rules being updated on 1 June 2022, AEMO were required to produce operational plans for:</p> <ul style="list-style-type: none"> <li>Implementing aggregate under frequency load shedding requirement (WEM Rule 3.6.2); and</li> <li>Manual load shedding (WEM Rule 3.6.6)</li> </ul> <p>Further, AEMO were required to communicate the plans noted above to the Network Operator (i.e. Western Power) in line with WEM Rules 3.6.4 and 3.6.6.</p> <p>Through discussions with management (held prior to 1 June 2022), it was noted that operational plans were not in place for either under frequency load shedding or manual load shedding respectively.</p> <p>Management highlighted that frequent communication with Western Power was (and still is) undertaken on an ongoing basis, which includes discussion regarding maintaining power system security in high risk operating states.</p> <p>It is acknowledged that sections 12.1 and 12.2 of the <i>Operating Protocol for AEMO and Western Power version 4</i> noted the requirement for plans for under frequency load shedding and manual load shedding, and at a high level described the basis upon which these were to be operated.</p> <p>It is further acknowledged that following updates to the WEM Rules on 1 June 2022, obligations relating to Demand Control within section 3.6 of the WEM Rules were replaced with Under Frequency Load Shedding (UFLS) obligations. The Demand Control obligations were not applicable following this update.</p> <p>Further, it was noted no manual load shedding or UFLS has been required during the testing period, with the most recent event in January 2020 where UFLS was triggered.</p> <p><b>Implication:</b></p> <p>No implication has been noted. As documented above, these obligations are not applicable following 1 June 2022, and subsequently there are no further requirements upon AEMO to ensure compliance with these obligations.</p>	<p>Level 1</p> <p><b>Risk Rating:</b></p> <p>Medium</p> <p>(Likelihood: Rare; Consequence: Major)</p>	<p>obligations are not applicable following 1 June 2022.</p>	<p>recommendations</p> <p><b>Implementation</b></p> <p><b>Date</b> Closed</p>
<p>22</p> <p>WEM</p> <p>5</p>	<p><b>Issue Type</b></p> <p>Control design issue identified by PwC</p>	<p><b>Documentation to support the Detective Trigger Process could be enhanced to demonstrate that all applicable obligations have been appropriately assessed</b></p>	<p><b>Compliance Rating:</b></p> <p>Level 2</p>	<p>Management should update the Trigger Register and Obligations Register such that they can be reconciled by an</p>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations.</p>

No.	<p><b>Obligation</b></p> <p>WEM Rules (Multiple)</p>	<p>The new WEM will come into effect 1 October 2023, with a number of rule changes being staged and introduced prior to go-live. This is to ensure AEMO and other Rule Participants are adequately prepared to de-risk delivery of the wider WEM Reform.</p> <p>Due to the significant volume of regulatory change, and as a number of obligations are yet to be triggered (i.e. are contingent upon a date or specific condition or event occurring), management have developed a “Detective Trigger Process”. This is a risk-based approach to determine the actions that should be undertaken by AEMO to ensure compliance in the event that the rule(s) becomes applicable.</p> <p>Where an obligation is assessed as applicable for the Detective Trigger Process, management may postpone the identification of the key controls designed to support compliance until a date, or until an event occurs that requires AEMO to comply with the obligation. In the interim, the Detective Trigger Process requires active monitoring from management on whether the defined trigger has occurred, so that a response plan may be prepared. The process includes five key criteria to assess applicability for an obligation:</p> <ol style="list-style-type: none"> <li>1. Assessing if the obligation is conditional</li> <li>2. Identifying if sufficient time exists to respond once the compliance requirement is triggered.</li> <li>3. Determining if any preparation is required to support compliance</li> <li>4. Defining and monitoring the trigger for the obligation</li> <li>5. Determining actions following the activation of trigger</li> </ol> <p>Management is required to enter the details of the applicable obligations within the “Trigger Register”. This register outlines the general regulatory requirement, the trigger, how it is monitored, who is responsible to monitor and when to monitor. Additionally, actions to be undertaken prior and post the trigger are documented.</p> <p>Inspection of the Trigger Register noted that, while the register clearly defines triggers, monitoring plans and actions, the level of completeness of the supporting workpapers and detailed obligations register means that it is unable to be reconciled by an independent party (e.g. auditor or regulator) with the obligations register.</p> <p><b>Implication:</b></p> <p>While a risk-based methodology has been established to manage the volume of rule changes through the Detective Trigger Process, there is insufficient traceability to support the assessment undertaken by management, making it difficult for an independent party to confirm that key criteria has been considered in a complete and accurate manner. This may increase the risk of non-compliance in the event the Detective Trigger Process cannot be effectively applied, resulting in a potential legal, reputational and financial impact to AEMO in the event of non-compliance.</p>	<p><b>Risk Rating:</b></p> <p>Medium</p> <p>(Likelihood: Unlikely; Consequence: Moderate)</p>	<p>independent party.</p>	<p><b>Implementation Date</b></p> <p>31 March 2023</p>
-----	--	---	---	---------------------------	--



<p>22 WEM 6</p>	<p><b>Issue Type</b></p> <p>Control design issue identified by PwC</p> <p><b>Obligation</b></p> <p>All WEM Rules upon AEMO</p>	<p><b>AEMO's key control procedures to support compliance with market obligations have not been formally defined and documented in the compliance obligation register</b></p> <p>The WEM Rules details the obligations and function of AEMO (amongst other bodies) for the operation of the market. There are approximately 950 obligations upon AEMO within the Rules. To manage compliance, each respective business unit is responsible for maintaining an obligations and controls register which includes risk assessment of the obligations, responsible owners, and key control procedures to support compliance. There are four registers including:</p> <ul style="list-style-type: none"> <li>• Systems Management (308 obligations)</li> <li>• Market Operations (428 obligations)</li> <li>• Reserve Capacity (207 obligations)</li> <li>• Audit and Compliance register - an overall register which records obligations and their respective attributes at a section level rather than at an individual (specific) obligation level.</li> </ul> <p>Review of the obligation registers as at the time of fieldwork (July 2022) noted:</p> <ul style="list-style-type: none"> <li>• All in-scope sections of the Rules were mapped to a responsible obligation owner within the Audit and Compliance register. However, at an individual obligation level, there were 515 (54%) obligations that were not assigned to an obligation owner (within Systems Management and Reserve Capacity). This included 18 'major' and 205 'moderate' obligations.</li> <li>• All in-scope sections are assigned a control owner and risk rating in the Audit and Compliance register. However, there are 207 (22%) individual obligations that were not assigned a control owner or risk rating, all of which are related to Reserve Capacity.</li> <li>• 110 (11%) obligations were not mapped to a corresponding procedure or control to demonstrate how the obligation is managed. This included 17 'moderate' rated obligations.</li> <li>• 593 (62%) obligations were mapped to a procedure document, however the specific control activity was not clearly documented. This was across all three registers, and included 17 'major' and 321 'moderate' rated obligations. Additionally, key control attributes (e.g. control type, IT dependencies, and control frequency) were not documented.</li> </ul> <p>It is acknowledged that the Reserve Capacity team subsequently provided an updated obligations and controls matrix that addressed a number of the gaps outlined above.</p>	<p><b>Compliance Rating</b></p> <p>Level 2</p> <p><b>Risk Rating</b></p> <p>Medium</p> <p>(Likelihood: Possible; Consequence: Minor)</p>	<p>The Operations, System Design and Transformation, and Market Development teams, in conjunction with Audit &amp; Compliance, should undertake an exercise to agree and update the obligations and controls mapping document to accurately reflect management's control activities. This should prioritise higher-risk obligations.</p>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations</p> <p><b>Implementation Date</b></p> <p>Pre WEM-Reform: October 2023</p> <p>Post WEM-Reform: April 2024</p>
---------------------	--	--	--	--	--

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
		<p>In addition, there is no process in place for self-assessment or independent review to understand the effectiveness of key controls on a periodic basis.</p> <p><b>Implication</b></p> <p>Where key control activities and their respective attributes to support obligations are not fully documented, there is reduced traceability to understand whether controls are adequately designed or performed in line with management objectives. This may impact AEMO's ability to monitor, assess and report on the compliance status of obligations and result in instances of non-compliance not being identified and reported in a timely manner. This may have a legal, reputational and financial impact to AEMO in the event of non-compliance.</p>			
22 WEM 7	<p><b>Issue Type</b></p> <p>Control design issue identified by PwC</p> <p><b>Obligation</b></p> <p>WEM Rules (Multiple)</p>	<p><b>Processes for training identification and planning should be formalised to ensure Power Systems Operations training is relevant and aligned to management's objectives</b></p> <p>Real Time Operations (RTO) training, which supports RTO Operators having the necessary skills and capabilities to operate the energy systems in a secure and reliable manner, is delivered through a combination of face-to-face sessions, provision of written training guides, and eLearning modules. This training is undertaken on both the East (NEM, STTM &amp; DWGM) and West (WEM) Coasts.</p> <p>To ensure RTO training needs are identified, prioritised and planned for, Planning Workshops are held three times a year, which are attended by the RTO Training team and RTO Operator. Training needs, prioritisation, and delivery methods are determined via collaboration and consideration of factors, such as emerging changes in the market, risks identified by Operators including past breaches, areas of focus identified by RTO Operations, and feedback from previous sessions.</p> <p>Whilst these Workshops are held on the East Coast for NEM, STTM and DWGM respectively, none are currently held for the WEM.</p> <p>Discussions with RTO Training highlighted that plans are in place to introduce Planning Workshops for WEM PSO, however this has not yet been delivered as part of the wider training uplift program that has been undertaken, which has included:</p> <ul style="list-style-type: none"> <li>• Introduction Skills Maintenance and Simulation (SMS) Training sessions in June/July 2022, utilising newly developed Dispatch Training Simulator. Delivering simulation training on WA System restart, in addition to a multiple contingency condition event.</li> <li>• Follow up SMS through October – December, will cover other priority training areas including SCADA failure and Summer readiness topics.</li> </ul>	<p><b>Compliance Rating:</b></p> <p>Level 2</p> <p><b>Risk Rating:</b></p> <p>Medium</p> <p>(Likelihood: Unlikely; Consequence: Moderate)</p>	<p>Management should introduce Planning Workshops (or alternative mechanism) for WEM PSO staff to ensure training is relevant and meaningful. The Training team should leverage practices undertaken by the East Coast to support alignment, including consideration of:</p> <ul style="list-style-type: none"> <li>• Frequency of Workshops held</li> <li>• Attendees</li> <li>• Inputs and priority training areas for consideration</li> </ul>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations.</p> <p><b>Implementation Date</b></p> <p>31 March 2023</p>

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
		<p>Furthermore, aligning East and West Coast training practices will support the sharing of knowledge, lessons learnt, and facilitate continuous improvement between both coasts.</p> <p><b>Implication</b></p> <p>Where the specific objectives and the target audience of training programs are unclear, or prioritisation of training is not in line with operational requirements or management objectives, there is an increased risk of deterioration in RTO Operators' skills and competency to operate the markets safely and reliably.</p> <p>In addition, AEMO may not be able to demonstrate that PSO staff were appropriately trained in the event of an incident.</p>			
22 WEM 8	<p><b>Issue Type</b></p> <p>Control improvement opportunity identified by PwC</p> <p><b>Obligation</b></p> <p>WEM Rule 4.24.1</p>	<p><b>AEMO should define and document the minimum factors and thresholds considered by management for determining if Supplementary Reserve Capacity is required</b></p> <p>As per WEM rule 4.24.1, if at any time after the day which is six months before the Capacity Year AEMO considers that, in its opinion, inadequate Reserve Capacity will be available in the SWIS to maintain Power System Security and Power System Reliability, using the most recent Long Term PASA study, AEMO must determine the timeline and expected amount of the shortfall.</p> <p>AEMO's Reserve Capacity team has established a Market Procedure, <i>Supplementary Reserve Capacity</i> which outlines key processes to be undertaken throughout the Supplementary Reserve Capacity lifecycle, including steps to determine the amount of SRC required and associated timeframe.</p> <p>Through discussion with management, it was noted that the following factors (amongst others) will be considered on an ongoing basis to determine if there is inadequate Reserve Capacity:</p> <ul style="list-style-type: none"> <li>• Outputs from Medium Term Projected Assessment of System Adequacy Reporting and the Electricity Statement of Opportunities</li> <li>• Bid stack behaviour</li> <li>• Performance indicators from Equivalent Planned Outage Hours (EPOH) monitoring</li> <li>• Expected forced outages</li> </ul> <p>Whilst it is noted that these factors (amongst others) are considered in real-time by management, this criteria is not formally defined by AEMO in a policy or procedure.</p> <p><b>Implication</b></p>	<p><b>Compliance Rating:</b></p> <p>Level 3</p> <p><b>Risk Rating:</b></p> <p>Low</p> <p>(Likelihood: Unlikely; Consequence: Major)</p>	<p>Management should define and document the criteria, including key factors and thresholds (where applicable) that would trigger an assessment for determining if Supplementary Reserve Capacity is required.</p>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations.</p> <p><b>Implementation Date</b></p> <p>31 March 2023</p>

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
		<p>Where AEMO determines informally that nothing has come to its attention that Supplementary Reserve Capacity is required for the respective period, there is increased difficulty for AEMO to evidence the factors they have considered in coming to their final determination.</p> <p>Should there be a requirement for Supplementary Reserve Capacity in a period where AEMO has determined that they did not require Supplementary Reserve Capacity, there is an increased risk that evidence to support decisions (and in rare cases, dispute resolution) will be difficult to source.</p>			
22 WEM 9	<p><b>Issue Type</b></p> <p>Control design issue identified by PwC</p> <p><b>Obligation</b></p> <p>WEM Rules 2.37.1 (Credit Limits)</p> <p>2.42.1 (Margin Calls)</p>	<p><b>AEMO should clearly define and retain evidence of steps to be taken following a Market Participant exceeding their Trading Limit</b></p> <p>In accordance with clause 2.37.1 and 2.42.1 of the Rules, AEMO must determine a Credit Limit for all Participants who trade in the WEM; and AEMO may issue a Margin Call Notice where a Market Participant's Trading Margin (a function of the Credit Limit) is less than zero.</p> <p>To support compliance with these requirements, AEMO has developed an internal procedural document, <i>Internal Procedures and Working Instructions</i>. The procedure requires that where a participant reaches 90% of their Trading Limit, AEMO must notify the participant and monitor trading activity, and where a participant exceeds their Trading Limit, AEMO may issue a Margin Call Notice.</p> <p>Throughout FY22, there were 78 instances across 12 Market Participants where participants reached 90% of their Trading Limit, and 16 instances across 5 Market Participants where Trading Limits were exceeded. No Margin Call Notices were issued for the period.</p> <p><b>Evidence should be retained to demonstrate key decisions taken by AEMO after a Market Participant exceeds their Trading Limit</b></p> <p>When a Market Participant exceeds their Trading Limit, the Prudentials team are to make a determination on how to proceed, whether it be through the issuance of a Margin Call Notice or an Informal Request for additional Credit Support to mitigate the negative Trading Margin.</p> <p>Sample testing of one (1) out of four (4) instances during FY22 where a participant exceeded their Trading Limit on 10 August 2021 noted:</p> <ul style="list-style-type: none"> <li>Evidence was not retained to support the analysis of the actual Market Exposure of the participant, as required by Section 4, Step 1 of the Internal Procedures and Working Instructions, and</li> <li>Evidence was not retained of approval from the Group Manager, WA Markets to issue an Informal Request for additional Credit support in lieu of</li> </ul>	<p><b>Compliance Rating:</b></p> <p>Level 2</p> <p><b>Risk Rating:</b></p> <p>Low</p> <p>(Likelihood: Unlikely; Consequence: Minor)</p>	<p>Management should:</p> <ol style="list-style-type: none"> <li>Communicate to relevant staff the requirement to retain evidence of analysis and approval of decisions made where a participant exceeds their trading limit.</li> <li>Update the <i>Internal Procedures and Working Instructions</i> to capture key considerations for determining under what circumstances a Margin Call Notice should be issued (noting that the considerations are not exhaustive and a decision is ultimately made at the discretion of AEMO).</li> <li>Update <i>Internal Procedures and Working Instructions</i> to address any internal</li> </ol>	<p><b>Management Response</b></p> <p>AEMO accepts finding and recommendations.</p> <p><b>Implementation Date</b></p> <p>31 December 2022</p>

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status
		<p>a Margin Call Notice (as required by Section 4.2 of Internal Procedures and Working Instructions).</p> <p>In addition, discussion with management noted that a broad range of factors are considered in determining whether a Margin Call Notice, and that the decision is at the discretion of the Prudential Analyst with approval from the Manager and Group Manager, WA Markets. While management was able to articulate some of the key factors considered in reaching a determination, these were not formally defined or documented in the <i>Internal Procedures and Working Instructions</i>.</p> <p><b>Internal Procedures and Working Instructions requires updating to address internal inconsistencies and reflect actual practices</b></p> <p>Per the <i>Internal Procedures and Working Instructions</i>, where a Participant has exceeded its Trading Limit on a business day as at 11am (during the Prudential calculation), "the Participant is generally given until 2pm of the same day ... to provide additional Prepayments/Credit Support to mitigate the negative Trading Margin prior to further action potentially being taken by AEMO before 4pm".</p> <p>Discussion with management indicated that "generally" is typically interpreted as within 1-2 business days.</p> <p>In contrast, Section 4 of the <i>Internal Procedures and Working Instructions</i> requires that all steps must be taken before 4pm on the day of the Trading Margin breach. However, the 4pm deadline is unachievable if the 2pm deadline is completed in subsequent business days, creating an internal inconsistency within the procedure.</p> <p><b>Implication</b></p> <p>Where evidence is not retained to support analysis and approvals made by AEMO regarding Margin Call Notices there is an increased risk that, in the event of a participant defaulting, AEMO may not be able to provide justification for key determinations made.</p> <p>In addition, where there are internal inconsistencies or inaccuracies within the <i>Internal Procedures and Working Instructions</i>, there may be differences in AEMO's response to a participant exceeding their Trading Limit.</p>		inconsistencies and reflect current practices.	

## Appendix 1.2 – Wholesale Electricity Market – Findings reported by Management – 1 July 2021 to 30 June 2022

AEMO's Audit & Compliance team is responsible for verifying the status of non-compliances reported by Management to ensure that remediation actions have been implemented and closed. All Management identified non-compliances are reported by Audit & Compliance to the FRAC on a quarterly basis.

For Management reported findings, PwC have relied on the information provided in the compliance breach forms and the status per Management representation.

The following table is a summary of Management identified non-compliances reported to the FRAC:

No.	Obligation	Finding	Compliance Rating	Rating as reported by Management	Breach form completed	Breach form reference	Status as reported by Management
22 WEM 10	7.11.5(h)	System Management did not issue a Dispatch Advisory to advise Market Participants that AEMO would call upon additional LFAS Facilities other than in accordance with the LFAS Enablement Schedules.	Level 1	Low	Yes	700	Closed
22 WEM 11	3.21.6	System Management zeroed MW values for ex-ante Outages for a Facility that was under a Commissioning Flag.	Level 1	Low	Yes	705	Closed
22 WEM 12	7B.3.6	LFAS Shortfall occurring on dates: 1/03/21, 4/03/21, 30/06/21, 18/08/21, 14/09/21, 10/10/21, 15/10/21, 22/10/21, 1/11/21, 7/11/21, 9/12/21, 22/12/21, 24/12/21, 23/01/22, 24/01/22, 4/03/22, 30/03/22, 1/04/22, 2/04/22, 7/04/22, 18/04/22, 24/04/22, 3/05/22	Level 1	Low	Yes	709, 710, 715, 716, 731, 733, 734, 735, 739, 740, 741, 742, 743, 744, 745, 758, 759, 760, 761, 762, 763, 764, 770	Closed
22 WEM 13	3.21.6(b)	Ex-Ante Outage quantities for a Facility were incorrectly calculated to be 0 MW (for the entire Trading Day 31/07/2021). These quantities should have been 10 MW.	Level 1	Low	Yes	711	Closed
22 WEM 14	4.1.23B	AEMO must determine and publish the 4 Peak SWIS Trading Intervals by a specific date in accordance with clause 4.1.23B of the WEM Rules. The timeline specified in clause 4.1.23B of the WEM Rules changed effective 1 October 2021. The WEM Rules are now inoperable given the Interval Meter Deadline, as defined in clause 9.16.2(a) is related to a Trading Month, not a Trading Week. This means AEMO were non-compliant with its obligations under 4.1.23B since 1 October 2021.	Level 1	Low	Yes	719	Closed

No.	Obligation	Finding	Compliance Rating	Rating as reported by Management	Breach form completed	Breach form reference	Status as reported by Management
22 WEM 15	3.23.1	Report for Summer 2020 not published until 08/12/2020. As 01/12/2020 was a Tuesday the LoadWatch Report should have been published by 12:00 on 01/12/2020.	Level 1	Low	Yes	721	Closed
22 WEM 16	7.11.5(h), 7.6.1	Incorrect upwards constraint dispatched, no Dispatch Advisory issued about the resulting Out of Merit Dispatch.	Level 1	Low	Yes	746	Closed
22 WEM 17	10.2.4	AEMO sent to Synergy Daily Dispatch Plan containing cleared bid information of other Market Participants in error.	Level 1	Medium	Yes	754	Closed
22 WEM 18	7.6A.2(c)	Market Rule requirements 7.6A.2.(c) – AEMO must submit a day ahead Synergy Dispatch Plan before 4pm daily. Synergy Dispatch Plan for Trading Day 27/5/22 was due before 4:00pm on Scheduling Day 26/5/22. It was sent at 6:21pm (2:21 hrs late) on 26/5/22.	Level 1	Low	Yes	768	Closed
22 WEM 19	Appendix 2, Step 1.1	Incorrect calculation of spinning reserve costs due to using assumed rather than actual synchronisation data. One participant was affected by an estimated \$6,900.	Level 1	Low	Yes	794	Open - Not yet due

## Appendix 1.3 – Wholesale Electricity Market – Summary of prior year findings reported by RBP

For the FY22 Market Audit, AEMO's Audit & Compliance team is responsible for verifying the status of non-compliances reported by RBP in prior years to ensure that remediation actions have been implemented and closed. All PwC-identified non-compliances and their respective management actions reported from FY22 onwards will be validated by PwC. All Management identified non-compliances are reported by Audit & Compliance to the FRAC on a quarterly basis.

For Management reported findings, PwC have relied on the information provided in the compliance breach forms and the status per Management representation.

The following table is a summary of RBP identified non-compliances that were open as of the time of reporting in FY21:

No.	Obligation	Finding	Compliance Rating	Rating as reported by Management	Status as reported by Management
21WEM1.42	2.13.9(j) and (k)	No formal processes to investigate dispatch non-compliance	Level 2	Low	Closed
19WEM1.61	Chapter 3	Improvement in logbook consistency and review process from Control Rooms	Level 3	Low	Closed
20WEM1.43	3.19	Process for ensuring sufficient Ancillary Services capacity has high risk of human error during the assessment of outage applications	Level 2	Medium	Closed
21WEM1.40	3.7.1	Audit trails to be improved for System Restart Testing processes	Level 3	Low	Closed
21WEM1.47	3.21A	No formalised process for reviewing impacts of Commissioning Test Plans on system security	Level 3	Low	Closed
21WEM1.53	3.10	No formalised control to mitigate the risk against incorrect Spinning Reserve activation due to fragmented Control Room kit	Level 2	Medium	Closed
21WEM1.54	3.6.2	No formalised operational plans for AUFLS Implementation in place	Level 3	Low	Closed
21WEM1.59	3.11.4	Continued trend of Spinning Reserves shortfalls	Level 3	Low	Closed
21WEM1.38	3A.1.3	GPS Communication Protocol between AEMO and Western Power not finalised	Level 1	Low	Closed
21WEM1.52	4.26.2CA, Appendix 10	Failure to recalculate Relevant Demand resulting in incorrect NSTEM Settlement calculations	Level 1	Low	Closed
21WEM1.49	6.20.2 6.20.11	Errors in calculation of Alternative Maximum STEM Price occurring since September 2020	Level 1	Low	Closed



No.	Obligation	Finding	Compliance Rating	Rating as reported by Management	Status as reported by Management
21WEM1.46	7.6.1C	No formalised approach to dispatching marginal intermittent generators	Level 2	Low	Closed
21WEM1.48	Chapter 3 Chapter 7	No simulator training or access to simulator for controllers, pending new EMS system implementation	Level 2	Medium	Closed
21WEM1.57	Chapter 3 Chapter 7	Control Room quality reviews not being conducted	Level 2	Low	Closed
21WEM1.69	7.13.1A(b)	Incorrect Outage Data published on WEM Market Data webpage	Level 3	Low	Closed
20WEM1.04	7A.3.15 7A.3.1(d)	Published Relevant Dispatch Quantity (RDQ) forecasts do not accurately reflect best estimate of forecast load	Level 1	Low	Closed
20WEM1.28	7A.3.2 and Section 4 of MP: Balancing Market Forecast	Non-compliant Tie Breaking methodology used due to removal of the correct methodology from the WEM Rules and Balance Forecast Market Procedure	Level 1	Low	Closed
20WEM1.57	7A.3.2(a)	AEMO System non-compliant with Manifest Error Rule relating to loss adjustment	Level 1	Low	Closed
21WEM1.37	7B.3.6	Failure to activate sufficient LFAS	Level 1	Medium	Closed
20WEM1.06	Appendix 2 (step 1)	Intermittent loads without registered facilities not allocated Spinning Reserve share	Level 1	Low	Closed

## Appendix 1.4 – Wholesale Electricity Market - Summary of prior period findings reported by Management

No.	Obligation	Finding	Compliance Rating	Rating as reported by Management	Breach form completed	Breach form reference	Status as reported by Management
21WEM1.22	1.45.22	New rule clause consciously not implemented by commencement date as specified by the Energy Transformation Implementation Unit (ETIU) (Clause 1.45.10)	Level 1	Low	Yes	661	Closed
21WEM1.35	Appendix 5	Incorrect loss factors applied to Notional Wholesale Meter for Individual Reserve Capacity Requirement (IRCR) calculation	Level 1	Medium	Yes	692	Closed
21WEM1.72	Appendix 9	Failure to publish Existing Facility Load for Scheduled Generation (EFLSG) by required date	Level 1	Low	Yes	695	Closed
21WEM1.73	Appendix 9	Relevant Levels (RL) incorrectly calculated for the Reserve Capacity Cycle for period 2017-2020	Level 1	Medium	Yes	698	Closed
21WEM1.14	7.6.1C(a)	Incorrect out of merit dispatch	Level 1	Low	Yes	649	Closed
21WEM1.01	7B.3.6	Failure to activate sufficient LFAS	Level 1	Medium	Yes	622	Closed
21WEM1.15	7B.3.6	Incorrect Facility activated for LFAS	Level 1	Low	Yes	650	Closed
21WEM1.30	4.26.6(e).i.2 4.12.7 4.12.4	Settlement implementation issues	Level 1	Medium	Yes	677	Closed

## Appendix 2 Information Technology

There were 8 Medium and 5 Low rated Information Technology findings identified by Management and PwC in FY22. These findings have the potential to impact a range of markets and systems across AEMO, including the WEM and GSI.

These findings related to logical access (4 Medium, 2 Low), physical access (2 Medium), and IT operations (2 Medium, 3 Low). No findings were identified regarding change management or program development.

## **Appendix 3 Independent Assurance Report on AEMO's Compliance with the GSI Rules and GSI Procedures**



**To: The Board of Directors of AEMO**

**Independent assurance report to the Board of Directors of the Australian Energy Market Operator Limited (AEMO) for the Gas Services Information**

***Scope***

In accordance with our contract dated 14 January 2022, we were engaged by the Australian Energy Market Operator (AEMO) to perform an independent limited assurance engagement in respect of AEMO's internal control procedures in relation to compliance with the Gas Services Information (GSI) Rules, for the year ended 30 June 2022, in the following areas:

- the compliance of AEMO's internal procedures and business processes with the GSI Rules;
- AEMO's compliance with the Rules and Procedures; and
- AEMO's software systems for the WA Gas Bulletin Board and the calculation of GSI Fees and processes for software management.

***AEMO Management's responsibilities***

AEMO Management is responsible for maintaining an effective internal control structure, including control procedures, to ensure compliance with the Gas Services Information Rules (GSI Rules). This responsibility includes establishing and maintaining internal controls relevant to compliance with the GSI Rules and the preparation and fair presentation of information that is free from material misstatement.

***Our Independence and Quality control***

*We have complied with relevant ethical requirements related to assurance engagements, which include independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.*

In accordance with Auditing Standard ASQC 1 Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, Other Assurance Engagements and Related Services Engagements the firm maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

***Our responsibilities***

*Our responsibility is to express a limited assurance conclusion based on the procedures we have performed and the evidence we have obtained.*

Our engagement has been conducted in accordance with the Australian Standard on Assurance Engagements (ASAE 3000) Assurance Engagements Other Than Audits or Reviews of Historical Financial Information. That standard requires that we plan and perform this engagement to obtain limited assurance about whether anything has come to our attention to indicate that the AEMO internal control procedures in relation to the areas listed under the Scope section above, have not been, in all material respects, effectively designed and operated, in order to comply with the relevant criteria outlined in:

- Gas Services Information Rules –Version 1 July 2021 to Version 30 October 2021.

*PricewaterhouseCoopers, ABN 52 780 433 757*

*Brookfield Place, 125 St Georges Terrace, PERTH WA 6000, GPO Box D198, PERTH WA 6840 T: +61 8 9238 3000, F: +61 8 9238 3999, [www.pwc.com.au](http://www.pwc.com.au)*

Liability limited by a scheme approved under Professional Standards Legislation.



Where the effectiveness of key controls was used to determine compliance with the criteria above, the identification of key controls was performed with reference to applicable AEMO policy or procedure documentation.

The procedures we performed were based on our professional judgement and included:

- inquiry and observation of staff and management to understand the operation of controls
- review of relevant AEMO policies and procedures
- undertaking procedures to evaluate the design effectiveness of key controls
- performing limited sample testing to validate the operating effectiveness of key controls.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

### ***Scope Exclusions***

Our review did not include any assessment of compliance or controls by market participants other than AEMO. For example, our procedures didn't consider application and IT controls over systems that are operated by external organisations, the compliance with Service Level Requirements, or the control procedures in place at those agencies not controlled by AEMO, such as Facility Operators and Gas Shippers.

To support AEMO processes, AEMO relies on market participants operating in compliance with the GSI Rules or other relevant requirements (the 'market participants' compliance'). It is assumed that the data received by AEMO from external organisations is complete, accurate and valid. Our scope was limited to the procedures that AEMO performed over validating the reasonableness of this data. Our procedures did not extend to assessing the market participants' compliance.

It is assumed that fee calculations are consistent with the GSI Rules. Our scope did not include certification of systems such as the WA Gas Bulletin Board, the GSI Fee Calculation Tool, or other market systems.

We accept no responsibility for the adequacy or accuracy of work performed by AEMO or the Independent Certifier in relation to system certification. We accept no liability to AEMO or to any other person for any part of our review report that relies on, or assumes the adequacy of, system certification.

Our work is based primarily on information supplied by management and was carried out on the basis that such information is accurate and complete.

Whilst our engagement may involve the analysis of financial information and accounting records, it does not constitute an audit in accordance with Australian Auditing Standards or a review in accordance with Australian Auditing Standards applicable to review engagements and accordingly no such assurance will be provided in our report or deliverables.



### ***Use of report***

We prepared this report solely for AEMO's use and benefit in accordance with and for the purpose set out in our Master Supplies Agreement (MSA) between PricewaterhouseCoopers and AEMO dated 14 January 2022, and Description of Supplies for Market Audit Services dated 14 January 2022. In doing so, we acted exclusively for AEMO and considered no-one else's interests.

We accept no responsibility, duty or liability:

- to anyone other than AEMO in connection with this report
- to AEMO for the consequences of using or relying on it for a purpose other than that referred to above.

We make no representation concerning the appropriateness of this report for anyone other than AEMO. If anyone other than AEMO chooses to use or rely on it they do so at their own risk.

This disclaimer applies:

- to the maximum extent permitted by law and, without limitation, to liability arising in negligence or under statute; and
- even if we consent to anyone other than AEMO receiving or using this report.

### ***Inherent limitations***

Because of the inherent limitations of any internal control system, it is possible that fraud, error, or non-compliance may occur and not be detected. Further, the internal compliance and control culture has not been reviewed and no view is expressed as to its effectiveness.

A limited assurance engagement is not designed to detect all instances of non-compliance of the internal compliance and control system, as it is limited primarily to making enquiries, with management and staff, and applying analytical procedures. The limited assurance conclusion expressed in this report has been formed on the above basis.

### ***Materiality***

We have considered materiality when evaluating the effect of identified control weakness on our conclusion. Materiality is considered in the context of AEMO's objectives relevant to the area of activity being examined. When assessing materiality, we considered qualitative factors as well as quantitative factors, including:

- the purpose of the engagement and specific requirements of the engagement
- the economic, social, political, and environmental impact of control weaknesses
- the importance of an identified control weakness in relation to the area of activities and the entities overall objectives
- the impact of a centralised function on other parts of the entity
- public perception and/or interest in the area of activity
- the cost of alternative controls relative to their likely benefit
- the length of time an identified control weakness was in existence.



### Summary of Findings

The table below summarises new findings reported, and findings from prior periods which remained open as at 30 June 2022. This includes findings reported through our review procedures.

	Critical	High	Medium	Low
Level 1	0	0	5	4
Level 2	0	0	2	2
Level 3	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>6</b>

The items above comprise one market-related non-compliance with the GSI Rules, and 12 IT related observations.

The table below summarises findings from prior periods which have been closed during FY22.

	Critical	High	Medium	Low
Level 1	0	0	0	0
Level 2	0	0	0	0
Level 3	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

All findings in the table above have been agreed with management and formally reported to AEMO's Finance Risk and Audit Committee.

We have categorised control observations noted according to agreed risk and compliance ratings. The risk ratings applied for each finding are consistent with the likelihood and consequence matrix adopted by AEMO's Risk and Audit Committee.

The ratings have been tailored to reflect the potential impact on the market as follows:

Risk Rating	Definition
Critical	Findings which may have a catastrophic impact on the market operations if they are not addressed immediately and require executive action with regular reporting at Board level.
High	Findings which may have a major impact on the market operations if they are not addressed as a matter of priority. These findings require senior management attention with regular monitoring and reporting at executive and Board meetings.
Medium	Findings which may have a moderate impact on the market operations if they are not addressed within a reasonable timeframe. These findings require management attention with regular ongoing monitoring.
Low	Findings which may have a minor impact on market operations if they are not addressed in the future. These findings are the responsibility of management with regular monitoring and reporting at staff meetings.





Compliance Rating	Definition
Level 1 (Non-compliance)	Evidence of non-compliance with review criteria. These should be addressed as a matter of high priority.
Level 2 (Gaps in control design or operating effectiveness)	Issues which could possibly result in non-compliance with review criteria but where no evidence of actual non-compliance was found. However, there is considered to be insufficient formal evidence of controls in place or being actioned in relation to these issues.
Level 3 (Control improvement opportunities)	Housekeeping matters and opportunities for improving internal controls and procedures relating to gas market procedures.

### ***Other information***

The information included in Appendix A is presented by AEMO management to provide risk rating details, root cause, recommendations, management responses and timelines for the observed exceptions. Such information has not been subject to the procedures applied by PwC in the assessment of AEMO's compliance with the criteria and accordingly, we express no opinion on it.

### ***Conclusion***

Based on our review, which is not an audit, nothing has come to our attention that causes us to believe that the Australian Energy Market Operator did not maintain, in all material respects, effective control procedures in relation to compliance with Gas Services Information (GSI Rules) for the year ended 30 June 2022, based on the scope referred to above.

PricewaterhouseCoopers

Sian Ashdown  
Partner

Perth  
19 December 2022

# Appendix 1 Summary of Observations & Management Comments

The following table provides a summary of issues against the criteria. It is presented by AEMO's management to the Economic Regulation Authority Western Australia (ERA) but is not included within the scope of this report and has not been subjected to the procedures applied by PwC in the assessment of AEMO's compliance with the criteria.

The detailed findings in relation to the Gas Services Information (GSI) are shown below, split between findings from the current review period (PwC reported and Management reported) and a status update of findings identified during the prior year review.

Findings reported have been discussed and agreed with Management and their comments are included. Target resolution dates for each issue have also been agreed and reported.

## Appendix 1.1 – Gas Services Information – Findings reported by PwC – 1 July 2021 to 30 June 2022

No.	Issue type & Obligation	Finding and implication	Compliance & risk rating	Recommendation	Management Comments/ Implementation Status												
22 GSI 1	<b>Issue Type</b> Non-compliance identified by PwC  <b>Obligation</b> GSI Rule 119(1)(a)	<b>Adjustments for GSI Fees have not been recalculated within the required ten business days of period end</b>  <i>In accordance with GSI Rule 117(1), AEMO is required to issue a GSI invoice to each Registered Shipper within 30 business days of the end of each period. The GSI Invoice Period is defined as the three month period starting on 1 January, 1 April, 1 July, and 1 October each year. The GSI invoice comprises of:</i>  <i>Initial GSI Fees, which are to be recalculated within 30 Business Days of the end of that period (GSI Rule 117(1)(a))</i>  <i>Adjustment GSI Fees, which are to be recalculated for a GSI Invoice period within 10 Business Days after the end of period p+4 (i.e 1 year later) (GSI Rule 119(1)(a)).</i>  <i>Sample testing for the GSI invoice period starting 1 January 2022 (Q1 2022) identified that the Adjustment Fees for (Q1 2021) were calculated 16 business days late in line with GSI Rule 119(1)(a):</i>  <table><tr><th>GSI Fee recalculation required</th><th>End period date</th><th>Due Date</th><th>Date calculation was performed</th></tr><tr><td>Initial GSI Fees</td><td>31 March 2022</td><td>17 May 2022</td><td>11 May 2022 (no exception noted)</td></tr><tr><td>Adjustment GSI Fees</td><td>31 March 2021</td><td>14 April 2022</td><td>11 May 2022 (exception noted)</td></tr></table> <i>Management noted that the GSI Fee Calculation Model, which calculates both the Initial and Adjustment GSI Fees, was run only once for the Q1 2022 Invoices, and that management's process operates such that GSI Fee Calculation Model calculates the Initial and Adjustment GSI Fees simultaneously for each GSI Invoice Period. Further, invoices outlining both initial and adjustment GSI fees were subsequently issued in line with the GSI Rules. Notwithstanding, the delayed calculation of the Adjustment GSI Fees that are included in the invoice represents a technical non-compliance with the GSI Rule 119(1)(a).</i>  <b>Implication</b>  Management confirmed that no complaint or feedback has been received by any Register Shippers in relation to this matter. This issue represents a minor non-compliance with the GSI Rules and did not impact any Registered Shippers or have an operational impact on the Gas Bulletin Board (GBB).	GSI Fee recalculation required	End period date	Due Date	Date calculation was performed	Initial GSI Fees	31 March 2022	17 May 2022	11 May 2022 (no exception noted)	Adjustment GSI Fees	31 March 2021	14 April 2022	11 May 2022 (exception noted)	<b>Compliance Rating:</b>  Level 1  <b>Risk Rating:</b>  Low (Likelihood: Unlikely Consequence: Immaterial)	Management should raise a 'management-identified non-compliance', noting the reasoning for the intentional non-compliance.	<b>Management Response</b>  AEMO accepts finding and recommendations.  <b>Implementation Date</b>  31 December 2022
GSI Fee recalculation required	End period date	Due Date	Date calculation was performed														
Initial GSI Fees	31 March 2022	17 May 2022	11 May 2022 (no exception noted)														
Adjustment GSI Fees	31 March 2021	14 April 2022	11 May 2022 (exception noted)														

## Appendix 1.2 – Gas Services Information – Findings reported by Management – 1 July 2021 to 30 June 2022

AEMO's Audit & Compliance team is responsible for verifying the status of non-compliances reported by Management to ensure that remediation actions have been implemented and closed.

All Management identified non-compliances are reported by Audit & Compliance to the FRAC on a quarterly basis.

There were no non-compliances identified by Management for Gas Services Information.

## Appendix 1.3 – Gas Services Information – Summary of prior year findings reported by RBP

There were no open prior period findings reported by RBP for Gas Services Information.

## Appendix 1.4 – Gas Services Information – Summary of prior period findings reported by Management

There were no open prior period findings reported by Management for Gas Services Information.

## Appendix 2 Information Technology

There were 7 Medium and 5 Low rated Information Technology findings identified by Management and PwC in FY22. These findings have the potential to impact a range of markets and systems across AEMO, including the WEM and GSI.

These findings related to logical access (4 Medium, 2 Low), physical access (1 Medium), and IT operations (2 Medium, 3 Low). No findings were identified regarding change management or program development.

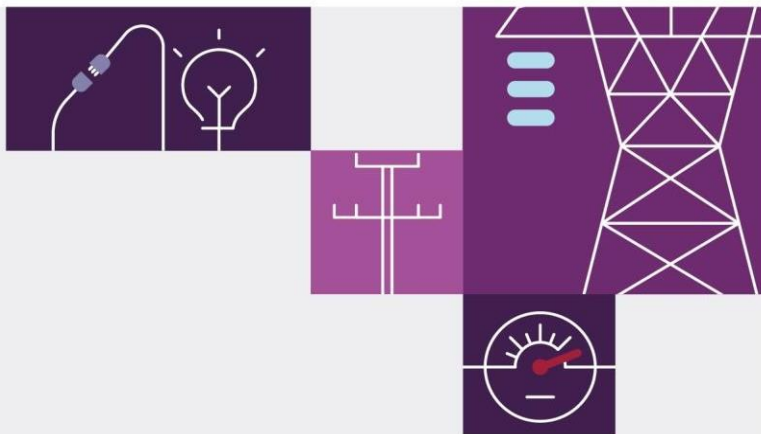
## **Appendix 4 AEMO's response to the audits**

# AEMO Response to WEM & GSI Market Audit Reports

**December 2022**

For audit Period 1 July 2021 to  
30 June 2022





# Important notice

## Purpose

AEMO has prepared this document in response to the Market Audit reports for the annual Wholesale Electricity Market (WEM) and Gas Services Information (GSI) audits conducted for the period 1 July 2021 to 30 June 2022, as at the date of publication.

## 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 Wholesale Electricity Market, the Wholesale Electricity Market Rules, the Gas Services Information 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.

## Copyright

© 2022 Australian Energy Market Operator Limited. The material in this publication may be used in accordance with the [copyright permissions on AEMO's website](#).

AEMO acknowledges the Traditional Owners of country throughout Australia and recognises their continuing connection to land, waters and culture. We pay respect to Elders past and present.



# 1 Background

The Wholesale Electricity Market (WEM) Rules and the Gas Services Information (GSI) Rules require AEMO to appoint a market auditor to conduct the WA electricity and gas market audits. The audits are compliance based reviews of AEMO's obligations under the WEM Rules and the GSI Rules and associated procedures.

The WEM Rules and the GSI Rules require two annual audits to be undertaken:

1. WEM Electricity Compliance Audit; and
2. GSI Gas Compliance Audit.

AEMO appointed Pricewaterhouse Coopers (PwC) to conduct the market audits for the period 1 July 2021 to 30 June 2022.

The final audit reports prepared by PwC can be found on AEMO's website at <https://aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/wem-events-and-reports/market-audit-reports> and <https://aemo.com.au/en/energy-systems/gas/wa-gas-bulletin-board-wa-gbb/market-audit-reports> and should be read in conjunction with this report.

This report sets out the matters that AEMO accepts and does not accept (and reasons for those views) with respect to the final audit reports as required under clause 2.14.4(b) of the WEM Rules and rule 174(3) of the GSI Rules.

## 2 AEMO Response

AEMO accepts PwC's findings and recommendations with respect to the audit reports for:

1. WEM Electricity Compliance Audit; and
2. GSI Gas Compliance Audit.