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22 August 2025

Ms Jenness Gardner  
Chief Executive Officer  
Economic Regulation Authority  
Email: [publicsubmissions@erawa.com.au](mailto:publicsubmissions@erawa.com.au)

Dear Ms Gardner,

### Limit Advice and Constraint Equations Review 2025

The Australian Energy Market Operator (AEMO) welcomes the opportunity to make a submission on the Economic Regulation Authority's (ERA) Draft Report, *Limit Advice and Constraint Equations Review 2025* (the Draft Report), prepared in accordance with clause 2.27C.1 of the Electricity System and Market Rules (ESM Rules).

AEMO recognises the considerable work that has gone into developing the Draft Report and appreciates the acknowledgement of the efforts made by AEMO and Western Power to improve the processes underpinning the development of Limit Advice and Constraint Equations.

In this submission, AEMO has provided its high-level comments on the Draft Report's recommendations below, with detailed comments on the recommendations and other findings provided in **Attachment 1**.

AEMO supports the Draft Report's recommendation to continue the roll out of dynamic thermal line ratings across the network, noting that AEMO's system studies indicate the potential for significant benefits with respect to network congestion.

AEMO partially supports the Draft Report's recommendation for further developing internal process documentation. AEMO considers that its work instructions on Limit Advice and Constraint Equations (e.g. wiki pages and flow charts) are effective in the management of this process as the tools provide benefits in improving accessibility, as well as increasing the speed and cost-efficiency of making process changes. Notwithstanding, in-line with the Draft Report's recommendations, AEMO will review the content of its internal process documentation to identify potential improvements in clarity and coverage.

The Draft Report's final two recommendations in relation to increasing public information above mandated requirements are supported in-principle. AEMO considers that in some instances the suggested inclusion of this content in WEM Procedures may not be appropriate and could potentially reduce flexibility in the provision of information, as more efficient and cost-effective approaches can be adopted more quickly. Where applicable, AEMO has provided further explanation in Attachment 1, including suggestions on how this can be achieved.

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Should you wish to discuss any of the matters raised in this submission, please contact Alireza Fereidouni, Manager – WA System Engineering, at [alireza.fereidouni@aemo.com.au](mailto:alireza.fereidouni@aemo.com.au).

Yours sincerely,

A black rectangular redaction box covering the signature of Nicola Falcon.

Nicola Falcon

**Interim Executive General Manager – Western Australia**

Attachments:

**Attachment 1: Detailed AEMO comments on the Draft Report**



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## Attachment 1: Detailed AEMO comments on the Draft Report

	<i>Draft Report comments and findings</i>	<i>AEMO Comments</i>
1.	<p><b>Comments on WEM Procedures and public information</b></p> <p><b>Section 7.2, item 1:</b></p> <p><i>“Procedures while complete and adequate are partially outdated and by adding more examples and background information will benefit market participants and potential new entrants. This will increase the transparency around the overall LACE framework and could provide more clarity around the interactions between the processes.”</i></p> <p><b>Section 7.2, item 7:</b></p> <p><i>“AEMO has developed the CIR website where information is available to the public. This in combination with the procedures provide a good basis. However, more information and potentially in less technical form would provide educational benefits to specifically new market entrants. Both Western Power and AEMO could consider publishing more ‘explanatory and educational’ information around its processes to increase transparency without the need of an external review. Any information published above</i></p>	<p>The requirements of AEMO’s WEM Procedures: Constraint Formulation, RCM Constraint Formulation, Limit Advice Requirements, and RCM Limit Advice Requirements, are outlined under clause 2.27A.10 of the ESM Rules.</p> <p>The Procedures are primarily designed to specify the processes for the exchange of information between AEMO and Western Power, and the processes that AEMO undertakes when formulating and updating Constraint Equations (including the Constraints Library). While AEMO endeavours to ensure that its WEM Procedures are as non-technical as possible, they need to be maintained in accordance with the heads of power, which often involves the use of technical language.</p> <p>To ensure that Market Participants can effectively engage with complex content associated with the Constraints framework, AEMO currently:</p> <ul style="list-style-type: none"> <li>• Publishes the <a href="#">WEM Design Summary</a>, which is aimed at providing new entrants with information on the functioning of the WEM. This publication includes content on Network Limits and Constraint Equations, as well as the RCM. The WEM Design Summary is currently being reviewed to include the many new reforms enacted since the New WEM Commencement Date, and AEMO will ensure these chapters are considered for amendment in line with the ERA’s recommendations.</li> <li>• Publishes and maintains the <a href="#">Congestion Information Resource</a> (CIR) (s. 2.27B of the ESM Rules), which includes an <a href="#">Additional Information</a> page, and a <a href="#">Frequently Asked Questions</a> page that are updated as needed to respond to</li> </ul>

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*and beyond ESM Rules requirements will increase market transparency and will have high educational value to stakeholders.”*

### **Section 5.1.2**

*“...the effect of special protection schemes, which also has a significant role in the relationship between RCM constraint equations and the NAQ, is not included in the procedure [RCM Constraint Formulation], but could provide useful additional information.”*

### **Section 5.1.1**

*“.. the review confirmed that AEMO engages in extensive quality assurance processes when formulating and maintaining operational constraint equations. While these are covered by the high-level principles in the procedure, explicit references to these practices are absent, and can benefit the overall goal of the procedure.”*

### **Section 5.1.2**

*“The procedure sets out the processes and high-level methodology used by AEMO to produce, update and maintain RCM constraint equations. It does not include specific operational information of what teams and steps ensure that the procedure’s methodology and principles are followed.”*

### **Section 4.1.1**

*“AEMO’s use of the PowerFactory model may require Western Power to make some adjustments to its model. While these requirements have been and are being communicated on an ongoing basis between*

common industry questions and feedback. AEMO is happy to include any additional Q&A’s that may be absent.

- Publishes useful additional information on the RCM on its website.

AEMO considers that these materials include less technical descriptions and explanations to support the more technical material provided in WEM Procedures. AEMO will continue to review and update these materials on an ongoing basis and is open to receiving specific suggestions on potential improvements to ensure completeness, adequacy, and relevance.

Similarly, when enacting the Procedure Change Process, AEMO will have regard to including further explanatory notes to support industry understanding. As suggested in section 5.1.2 of the Draft Report, AEMO will include the additional information in relation to the effect of special protection schemes within the Constraint Formulation and RCM Constraint Formulation WEM Procedures.

However, AEMO considers that content that is subject to ongoing refinement and may change regularly in response to continuous improvement initiatives and organisational changes is more appropriately included in internal work instructions and control documents than in WEM Procedures. This includes detailed quality assurance practices and specific information relating to teams within AEMO to enact procedure methodologies (as suggested in sections 5.1.1 and 5.1.2). To include such information in WEM Procedures may unnecessarily increase the volume of WEM Procedure changes (with subsequent timing and cost impacts) or may otherwise restrict or delay necessary process changes that improve efficiency.

Instead, AEMO includes principles for such activities in WEM Procedures, which provides Market Participants with high-level information governing the processes while supporting a more flexible approach to procedure updates. AEMO considers this approach ensures that resources are directed more toward continuous improvement than frequent procedure change processes.

Section 4.1.1 of the Draft Report suggests codifying changes (e.g. in WEM Procedures) in relation to AEMO’s use of the PowerFactory model. AEMO notes the



	<p><i>both entities, this is currently not codified in guidelines or procedures.”</i></p>	<p>that requirements in this regard have not materially changed, although AEMO is continuing to work with Western Power to improve the accuracy of the PowerFactory model, supported by the ESM Rules and WEM Procedures which enable this process. AEMO considers that codification of related changes should occur after these improvements are fully implemented and clear operational benefits have been demonstrated.</p> <p>Finally, AEMO notes that throughout the paper there are references to procedures benefiting from updated legislative references, specifically replacing ‘WEM Rules’ with the term ‘ESM Rules’. AEMO is reflecting the change in nomenclature as its WEM Procedures are amended, noting that s.141(1) of the <i>Electricity Industry Act 2004</i> facilitates this transition.</p>
2.	<p><b>Transparency on decision-making and process interactions</b></p> <p><b>Section 7.2, item 2:</b></p> <p><i>“Additional transparency around the RCM processes would benefit market participants and especially new entrants; in particular, what guides the decisions around potential network investment and special protection schemes, as well as information on the NAQ allocation process and where limit advice and constraint equations sit within the overall RCM framework.”</i></p>	<p>AEMO has, to date, supported Western Power with its queries on the impact of specific Limit Advice on possible Network Access Quantity (NAQ) results. However, AEMO notes that is an informal process that is not expected to continue indefinitely. This includes advising on possible impacts to NAQs, based on draft modelling.</p> <p>Notwithstanding, decisions and decision-making processes relating to network investment and special protection schemes are the responsibility of Western Power in its capacity as Network Operator. AEMO considers that the provision of this information is a matter for Western Power as they are its custodian.</p> <p>AEMO notes that provisions of the ESM Rules ensure that Market Participants receive appropriate information on the NAQ assignment process, by publishing RCM Limit Advice (see section 4.4B). Under AEMO’s RCM Limit Advice Requirements WEM Procedure, the information required to be provided by Western Power (and subsequently published by AEMO) must include all relevant protection schemes, such as special protection schemes and remedial action schemes (including triggers and actions for each scheme).</p> <p>Further information on publicly available materials on the RCM, Constraint Equations, Limit Advice (and the interactions between these) is outlined in AEMO’s response to item 1.</p>



<p>3.</p>	<p><b>Internal documentation</b></p> <p><b>Section 7.2, item 4:</b></p> <p><i>“AEMO has less internal documentation, mostly limited to process flow charts and internal wiki pages with work instructions. While these are helpful, they do not provide sufficient and comprehensive documentation coverage of internal processes, which would benefit new starters. While time-consuming, the benefit of documenting internal processes is that possible gaps and areas of improvement are identified, which could lead to improved processes and effectiveness.”</i></p>	<p>The format of work instructions relating to Limit Advice and Constraint Equations are specifically designed to support AEMO’s internal processes. AEMO applies a variety of processes to ensure these instructions provide appropriate change control, accessibility for staff, and the ability to evolve rapidly. This approach maximises operational efficiency, minimises costs, and helps ensure that instructions remain current.</p> <p>AEMO currently provides comprehensive training to new starters by means of coaching delivered by experienced and senior peers and instructional videos, both of which are complementary to internal documentation and AEMO’s mandatory induction processes for all new starters. AEMO’s new starter training also includes a specific requirement to identify and address potential gaps in internal documentation.</p> <p>AEMO considers that updating internal documentation is part of its general ongoing process improvement initiatives. Furthermore, the current form and content is beneficial to both new starters and the rest of the team in an engineering context, particularly given the technical nature of the subject matter.</p> <p>Notwithstanding, AEMO accepts the Draft Report findings and will review its existing internal documentation with the view of improving clarity and coverage.</p>
<p>4.</p>	<p><b>Engagement between AEMO and Western Power</b></p> <p><b>Section 7.2, item 5:</b></p> <p><i>“Both organisations have been on a steep learning curve over the last few years, including the preparation time prior new market start. As discussed, some processes are more mature than others, but there appears to be an ongoing effort between Western Power and AEMO to continue improving communication between the organisations, increasing mutual understanding of each other’s requirements and overarching work that would impact market</i></p>	<p>AEMO agrees that while some processes are more mature than others, there is an ongoing initiative to improve communication and learning between the organisations, and AEMO looks forward to continuing its collaboration with Western Power in this regard.</p>



	<p><i>outcomes. It is expected that these learning processes will continue into the future.”</i></p>	
5.	<p><b>Dynamic Line Ratings</b></p> <p><b>Section 7.2, item 6:</b></p> <p><i>“Dynamic line ratings are used across transmission network providers around the world and there is strong evidence of the benefits they provide. There is also a well-established base of knowledge and understanding, that would allow Western Power to benefit from a wide range of existing information in its implementation process. This work will be of interest to the market and the ERA may seek to assess progress in future reviews.”</i></p>	<p>AEMO agrees with this assessment, noting that it has previously performed power system studies to assess the potential impact of dynamic line ratings (DLR) and recently updated its systems to enable their implementation.</p> <p>AEMO considers that the outcomes of its studies indicated significant benefits that should be realised with respect to network congestion.</p> <p>AEMO will continue to actively engage with Western Power to ensure a smooth implementation of DLR.</p>
6.	<p><b>Systems for developing Constraint Equations</b></p> <p><b>Section 4.1.1.2</b></p> <p><i>“The systems were established before new market start. However, because of the lack of testing prior to the start of the new market they have needed to evolve and have matured over time. Where errors were gradually found through the real-time operation, they were rectified. The actual constraint formulation scripts, however, are based on the principles as published in various WEM Procedures and have not been amended over time, as this would result in a change in the core systems functionality. This degree of rigidity means that AEMO adheres to the standard formulation methodology.”</i></p>	<p>AEMO is committed to continuous improvement and addresses any issues identified through real-time operation in a timely manner.</p> <p>AEMO confirms that it has adhered to the standard formulation methodology as published in various WEM Procedures and has not amended this methodology over time as this would result in a change in the core systems functionality.</p> <p>AEMO considers that the principles in the various WEM Procedures document best practice and therefore is yet to find sufficient justification to deviate from these principles. Notwithstanding, where such issues arise in real-time operation that require the amendment of WEM Procedures, these will be updated as soon as possible, in accordance with the Procedure Change Process.</p>