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Australian Energy Market Commission

## **DRAFT RULE DETERMINATION**

# **NATIONAL ELECTRICITY AMENDMENT (ENHANCING INFORMATION ON GENERATOR AVAILABILITY IN MT PASA) RULE 2022**

### **PROPONENT**

Australian Energy Market Operator (AEMO)

26 MAY 2022

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# **RULE**

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Reference: ERC0338

## CITATION

AEMC, Enhancing information on generator availability in MT PASA, Draft rule determination, 26 May 2022

## ABOUT THE AEMC

The AEMC reports to the Energy Ministers' Meeting (formerly the Council of Australian Governments Energy Council). We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the Energy Ministers' Meeting.

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## SUMMARY

- 1 The Commission has decided to make a more preferable draft rule on *Enhancing information on generator availability in MT PASA* in response to the rule change request received from AEMO on 15 December 2021. The draft rule increases the scope of information that is gathered from generators about their availability under the existing medium term projected assessment of system adequacy (MT PASA). This draft rule actions one of the Energy Security Board's (ESB) post-2025 recommendations to improve resource adequacy outcomes in the National Electricity Market (NEM).
- 2 The draft rule is consistent with the main purpose of the PASA, which is to ensure that "...participants are properly informed to enable them to make decisions about supply, demand and outages of transmission networks..."<sup>1</sup> The draft determination builds on existing MT PASA requirements, which require generators to indicate how many megawatts (MW) they could make available each day over the medium term horizon (this is between seven days and 36 months into the future). In addition to providing the MW availability, the draft rule would require scheduled generators to also provide a:
  - "unit state" that is, a scheduled generating unit's availability or unavailability and the reason for its availability or unavailability (referred to throughout this document as unit state, reason or reason code)
  - "unit recall time" to indicate the period in which the plant could be made available under normal conditions after a period of unavailability. AEMO would determine which unit states will require a unit recall time to be submitted.<sup>2</sup>

### Better information for the market and policy-makers will lead to more efficient decisions and better outcomes for consumers

- 3 The lack of detailed information on generator availability is becoming an issue, where it has not been in the past, due to the ongoing transition in the power system. As older generators approach the end of their technical life, their operators may shift to cyclical operating regimes, opting only to generate for certain periods of the year to maximise their profitability. This is due to large amounts of renewable energy generators entering the market and applying downward pressure on prices, especially at particular times of the day and year. As more generators move to cyclical operating regimes the challenge of operating the power system to deliver reliable, secure supply is expected to grow.
- 4 In its Post 2025 review of the NEM, the ESB considered the reliability issues associated with less-flexible generators changing their operating schedules for economic reasons and in particular the issue of mothballing generation units. This rule change request arose from this work and was one of several recommendations seeking to enhance reliability, which Energy Ministers agreed to progress.

1 NER cl. 3.7.1(b). This clause would be labelled the "PASA objective" under this draft rule.

2 Not all units would be required to enter a recall time. The requirement for a recall time will be triggered by a relevant reason code as outlined in the Reliability Standard Implementation Guidelines (RSIG).

- 5 This rule change seeks to improve understanding about why particular generators are unavailable and how long they would take to come back online. Improving access to more detailed availability information, including understanding whether generators are offline for economic reasons, would contribute to better operational, planning, policy and investment decisions as less flexible generators continue to change their operating schedules.
- 6 Systematically collecting and publishing more detailed information on generator availability is also important as the generation mix in the NEM becomes more complex. Without a standardised approach to the publication of reasons and recall times to accompany existing unit availability information, the market operator would continue to make ad-hoc requests to a growing number of diverse generators for the information it needs to operate the power system and market. This would become increasingly impractical and costly. It would also become increasingly challenging for market participants and policy makers to remain appropriately informed about generator availability given information collected through AEMO requests is not made public.
- 7 Without comprehensive, granular, standardised and public information to provide a more nuanced view of future unit availability, AEMO, participants and other stakeholders will likely face increasing time and resource costs to cobble together an incomplete picture of how changing plant operating regimes are influencing the supply outlook over the medium term. This would mean less informed decisions and a reduced ability for each stakeholder to play its role in an orderly transition.
- 8 While we acknowledge there will be some costs associated with providing more detailed information via the MT PASA, we have sought to minimise these through the draft rule's design and the proposed approach to implementation. More broadly, we consider that these costs would be offset by the benefits better information has for all stakeholders. Better information would contribute to more efficient decisions by market participants, policy makers, and other stakeholders. The flow on effect of this is the potential for lower energy prices and increased reliability outcomes for consumers. The information is important for supporting more efficient market outcomes, more targeted policy decisions, and ultimately a more coordinated approach to deliver a decarbonised, affordable, and reliable energy system for all consumers.

## The Commission has considered stakeholder feedback in making its decision

- 9 The draft rule aims to provide a comprehensive, standardised and public data set of unit availability and unavailability while minimising the compliance burden on participants. The Commission has considered the stakeholder feedback that was received in response to the consultation paper in making its draft determination, including implementation considerations. The key elements of the draft rule are as follows:
- Scheduled generators must submit **reason codes** and **recall times** to accompany the daily MW availability they already submit in MT PASA

- The process for, and the form of, reason and recall time information would be defined by AEMO in its Reliability standard implementation guideline (RSIG). AEMO would be required to consult with stakeholders on the detailed changes to the RSIG as per the consultation procedures in the Rules.
- We acknowledge that the way that reason codes are defined in the RSIG would have a bearing on the compliance burden. More reason codes would likely be more burdensome to comply with, and as such, while the draft rule has AEMO setting the number of reasons codes:
  - the draft rule provides direction for the definition of reason codes by specifying that they must distinguish between two main reasons, i.e whether unavailability is for economic or physical reasons; and
  - the Commission has expressed a preference that AEMO considers ways to keep the number of reason codes to a minimum.
- The draft determination also provides clarification in relation to the definition of unit recall time. This represents the time the participant expects to return the unit to service under “normal conditions after a period of unavailability”. We consider this to be the most appropriate way to define recall time as it is consistent with the current MT PASA approach, which is aimed at eliciting an efficient market response to resolve any potential supply shortfalls in normal conditions, as opposed to under direction from AEMO when it is intervening in the market.
- To avoid introducing additional complexity to the process and to ensure availability information is provided in a timeframe that would help to inform investment decisions, reason codes and recall times would be collected for the same 36-month timeframe that MW availability information is collected at present in MT PASA
- The Commission noted stakeholder feedback that the proposed requirement appears to be similar to existing obligations. Following an assessment to determine whether there was any overlap, we consider that requiring reason and recall information via the MT PASA is distinct from existing requirements. This is because, compared with existing obligations or requests for information from AEMO, the information required under this draft rule would consist of a process to collect and publish standardised information on a unit by unit basis over a 36-month period. This is a longer period than some seemingly similar requirements (e.g. outage recall portal) and more granular information than others (e.g. generator information survey). It is important to note that AEMO has advised that its implementation of the rule would involve streamlining information collection where practical. For example, the new information collected through this draft rule may replace the need for AEMO to collect the same information through the Electricity Statement of Opportunities (ESOO) and Energy Adequacy Assessment Projections (EAAP).<sup>3</sup> In addition, we expect that the regular collection of standardised, granular reason and recall information from all scheduled generating units through MT PASA would decrease the volume of ad-hoc requests AEMO makes to participants.

<sup>3</sup> Participants provide generator availability information under the generator information guidelines to inform the preparation of the ESOO and under the EAAP guidelines to provide a broad assessment of impacts on supply and reliability in the NEM.

- The new information collected under the draft rule would be published alongside the MT PASA reliability assessment, and not be an input to the modelling. AEMO would continue to analyse reliability over a 24 month period using the PASA availability that participants can make available given 24 hours notice.

10 There are three key milestones in relation to the Commission’s draft rule:

- Updates to the RSIG and MT PASA process description by **30 April 2023**
- Updates to other relevant AEMO guidelines and processes to streamline the collection of generator availability information where practical
- Expected commencement of the rule (if made) on **9 October 2023**. This date should allow AEMO and participants sufficient time to make changes to systems and processes including sequencing and/or bundling changes to systems and processes to reduce costs.

11 The Commission notes that much of the implementation detail falls to AEMO to develop. AEMO agrees that the approach set out by the Commission is a pragmatic way of balancing these costs and benefits and will work with participants when consulting on guidelines and procedures updates to achieve this balance so that the majority of the benefits are captured for the majority of stakeholders while minimising the costs to relevant participants.

### The Commission is interested in your feedback on the draft rule

12 The Commission invites **submissions** on this draft rule determination, including the more preferable draft rule, **by 7 July 2022**. Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any **request for a hearing** must be made in writing and must be received by the Commission **by 2 June 2022**.

13 Submissions and requests for a hearing should quote project number **ERC0338** and may be lodged online at [www.aemc.gov.au](http://www.aemc.gov.au). Interested stakeholders are encouraged to contact the project leader with questions or feedback at any stage. The project leader for this rule change is **Jessie Foran** who can be contacted on (02) 8296 7864 or at [jessie.foran@aemc.gov.au](mailto:jessie.foran@aemc.gov.au)

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# 1 DRAFT RULE DETERMINATION

This chapter summarises the Commission’s draft determination. The Commission has decided to make a draft rule requiring scheduled generators to provide, and AEMO to publish more information about when each generating unit is available over the next three years including the “unit state” with standardised reason codes to explain the status of each unit and a “unit recall time” that indicates the period in which the plant could be made available under normal conditions after a period of unavailability.

This new information, collected and published as part of the existing Medium-Term Projected Assessment of System Adequacy (MT PASA) process, would create a standardised, unit-by-unit, 36-month, public data set to underpin our collective understanding of the medium-term supply outlook.<sup>4</sup>

This chapter gives a brief overview of the draft rule and what it would mean in practice, including:

- The rule-making process to date, including consultation with stakeholders — see Section 1.1
- The key details of the draft rule — see Section 1.2
- How this rule fits into the broader NEM reform landscape — see Section 1.3

The Commission is seeking stakeholder feedback on this draft determination and draft rule. Submissions are due **7 July 2022**.

## 1.1 The Commission has considered stakeholder feedback on the rule change request from AEMO

On 15 December 2021, AEMO submitted a rule change request identifying that changes in generator operating regimes, driven by the rapid transition of the NEM’s generation fleet to a lower-emissions generation profile, may bring uncertainties and therefore challenges in maintaining system security and reliability.<sup>5</sup>

AEMO proposed that more detailed information be collected and published about scheduled generator availability as part of the MT PASA process to improve the transparency of information and allow for improved operational, market and investment decisions by market participants, jurisdictions, and market bodies.

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4 MT PASA is a key part of the reliability framework in the NEM. It is one component of the information that AEMO must publish to inform the market of prevailing and forecast conditions, and when reserves may be running low, to elicit a market response. Providing information to the market helps market participants make operational and investment decisions and also helps AEMO manage the power system.

5 The rule change request submitted by AEMO on 15 December 2021 can be found here: <https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa>

The request actions the ESB's *managing early exists* recommendation from the post 2025 reform package — a suite of reforms recommended by the ESB to meet the needs of the energy transition underway.<sup>6</sup>

On 3 February 2022, the Commission published a notice advising of its commencement of the rule-making process and a consultation paper seeking stakeholder feedback on the proposal.<sup>7</sup> Submissions closed on 3 March 2022 and we received eight submissions. The Commission considered all issues raised by stakeholders in submissions and these are discussed either in the body of this draft rule determination or in Appendix C.

## 1.2 The Commission has made a draft rule to collect and publish more information about generator availability as part of MT PASA

The Commission has decided to make a more preferable draft rule requiring scheduled generators to report, and AEMO to publish, a generating unit's:

- "unit state" in the form of standardised reason codes that explain why a scheduled generating unit is or is not available
- "unit recall time" to indicate the period in which the plant could be made available under normal conditions after a period of unavailability. AEMO will determine which unit states will require a unit recall time to be submitted.<sup>8</sup>

This information would form part of the MT PASA.<sup>9</sup> Through the MT PASA process, AEMO already collects and publishes information from scheduled generators about their daily availability from seven days to 36 months ahead of real-time.<sup>10</sup> The reason codes and recall times collected under this draft rule would cover the same period as part of the generator's regular submission of MT PASA data. This information would be published alongside existing PASA availability information in AEMO's MT PASA DUID Availability Report to help inform the decisions of participants, market bodies, policymakers and other interested stakeholders.<sup>11</sup>

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6 See ESB's recommendation 1(a)(ii) which is to: Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability. In agreeing to the recommendation National Cabinet noted that the rule change request should be prepared in consultation with senior officials and that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard. <https://www.energy.gov.au/sites/default/files/2021-10/Summary%20of%20the%20final%20reform%20package%20and%20corresponding%20Energy%20Security%20Board%20Recommendations0.pdf>

7 This notice was published under s.95 of the National Electricity Law (NEL).

8 Not all unit's will be required to enter a recall time. The requirement for a recall time will be triggered by a relevant reason code as outlined in the RSIG.

9 You can find more information about the MT PASA in Appendix F

10 Under NER cl. 3.7.2(d)(1)(i), scheduled Generators are already required to submit to AEMO a daily PASA availability for a 36 month period. This represents the generation capacity that could be made available with 24 hours taking into account ambient weather conditions at the time of 10%POE demand.

11 DUID stands for dispatchable unit identifier. AEMO's MT PASA REGIONAVAILABILITY Report is a high frequency three-hourly information service (the 'three-hourly report') that gives a regional breakdown of the supply situation over a 36 month horizon, taking into account participant submissions on availability.

The information collected would *supplement* rather than be an input to the MT PASA modelling outputs, that is the Reliability run and the Loss of Load Probability (LOLP) run.<sup>12</sup> MT PASA modelling outputs would remain at 24 months given the cost to extend it to three years (in line with the information provided by scheduled generators) outweighs the benefits.

The form and approach for collecting and publishing both reason codes and recall times would be developed by AEMO and reflected in updates to the RSIG and the MT PASA process description.<sup>13</sup> AEMO would be required to consult with stakeholders through the *Rules consultation procedures* when updating the RSIG to reflect this draft rule.<sup>14</sup> Stakeholder input will be particularly valuable in developing the standard list of reason codes to explain unit state, and to help determine which reason codes would also require the entry of a unit recall time. For example where a unit has a reason code that indicates it is fully available, providing a recall time may not be relevant. AEMO would work with stakeholders to develop a form and approach to collecting reason codes and recall times that focuses on the purpose of that information, which is to inform more efficient decisions.<sup>15</sup>

Scheduled generators already have processes in place to ensure the PASA availability information represents the participant's "current intentions and best estimates" of the megawatts that they could make available for a given period.<sup>16</sup> Given the new reason and recall information is linked to the PASA availability information already provided, it must also meet this standard, and the Commission recommends that the new requirement be classified as a tier 1 civil penalty provision, consistent with the current penalty.<sup>17 18</sup>

The Commission acknowledges that information relating to generator availability is collected by AEMO or provided by participants under some existing rules requirements — and that

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- 12 The Reliability run is the annual operational "sent-out" demand profiles, consisting of half-hourly demand values, with energy consumption and maximum demand aligned with AEMO's latest sent-out forecasts. This identifies and quantifies any projected breach of the reliability standard. The Loss of Load Probability (LOLP) run is the abstract operational demand and VRE generation forecasts constructed, based on the evaluation of the years of historical observations. The traces represent conditions of high demand levels occurring coincidentally with low VRE generation output and are abstract since these conditions are assumed every day. This helps determine days most at risk of load shedding to help participants schedule outages outside of these periods, and indicate when AEMO may be required to direct or contract for reserves under the RERT. More information can be found in the MT PASA process description: [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/pasa/mt-pasa-process-description-v62.pdf?la=en](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/pasa/mt-pasa-process-description-v62.pdf?la=en)
  - 13 The Reliability standard implementation guidelines (RSIG) set out how AEMO implements the reliability standard and the approach and assumptions AEMO uses in relation to each of the inputs. The MT PASA process description fulfils AEMO's obligation under clause 3.7.2(h) of the Rules to document the procedure used in administering the MT PASA
  - 14 The Rules consultation procedure requirements are set out in NER Chapter 8. The requirement for AEMO to use the *Rules consultation procedures* to update the RSIG with regard to this draft rule is set out in NER cl 11.[xxx].2(b) of the amending rule.
  - 15 AEMO must have regard to NER cl.3.7.1(b) now labelled the "PASA objective" when defining reason codes and recall times in the RSIG. The PASA objective focuses on information that is required so the market is properly informed to enable it to make decisions about supply, demand and outages up to three years in advance.
  - 16 NER clause 3.7.2 (d)
  - 17 Under a tier 1 civil penalty, failure to submit the required information, or providing inaccurate information, would carry a maximum penalty for corporations of \$10 million, or if greater, three times the benefit obtained from the breach if this can be determined, or if not, 10% of annual turnover of the corporation. Tier 1 civil penalties are outlined in Regulation 6(2) and Schedule 1, Part 1 of the *National Electricity (South Australia) Regulations*.
  - 18 In addition to the MT PASA compliance and enforcement framework, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" so their generating units comply with relevant generator performance standards, regardless of their availability.

stakeholders provided this feedback in submissions to the consultation paper.<sup>19</sup> We have analysed this and in many cases this information is of a different nature and for a different purpose than the draft rule. However, where opportunities exist to streamline information collections, AEMO would update guidelines to reflect this. For example, the new information collected through this draft rule may replace the need to collect the same information through the ESOO process although similar information may still be required for differing time horizons. In addition, the Commission expects the regular collection of standardised, granular reason and recall information from all scheduled generating units through MT PASA could decrease the volume of ad-hoc requests AEMO makes to participants, further minimising the administrative burden associated with the draft rule.

The RSIG — which will set this information out — is expected to be updated by **30 April 2023** ahead of the substantive provisions of the draft rule commencing **9 October 2023**.

### 1.3 **The draft rule is part of a plan to support a smooth transition to a lower emissions electricity system that is reliable and affordable**

The electricity sector is decarbonising. This is demonstrated through changes in consumer and industry behaviour and investments both in the energy sector and more broadly, as well as through policy commitments.

Decarbonisation is relevant to the draft rule given the transition of the NNEM's generation fleet to a lower-emissions generation profile is driving changes in the sector. One such change is to plant operating regimes such as mothballing of units for prolonged periods of time, seasonal shut-downs, or cyclical running regimes.

This trend is particularly relevant in thermal generation because if the changes in operating regimes are not transparent and managed, it can bring challenges in maintaining system security and reliability.

The actions of ageing thermal generators have been in the spotlight since the closure of Northern and Hazelwood power station in 2016 and 2017 and more recently with the announcements of Origin and AGL to bring forward the closure dates to Eraring, Bayswater and Loy Yang.<sup>20</sup> During this period, the public dialogue around generator availability now and in the future has also been influenced by a number of regulatory actions - key market and regulatory events are summarised in Appendix B. While the impacts of these events on power system security and reliability have varied from minimal to material, unexpected changes in unit availability continues to be a concern. In this context the draft rule intends to

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<sup>19</sup> NER cl. 4.8.5 requires generators to submit outage recall information at AEMO's request if it is required in order to estimate the latest time that it would need to intervene. NER cl. 4.9.9 requires scheduled generators to notify AEMO of any events that change or are likely to change the operational availability of a generating unit. Participants also provide availability information under the generator information guidelines to inform the preparation of the Energy Statement of Opportunities (ESO) and under the Energy Adequacy Assessment Projections (EAAP) guidelines to provide a broad assessment of impacts on supply and reliability in the NEM.

<sup>20</sup> Eraring, a black coal power station owned by Origin will now close in 2025 - seven years earlier than planned. AGL owns both Bayswater and Loy Yang and has brought forward their closure dates to no later than 2033 (Bayswater, a 2640MW black coal power station in NSW previously closing in 2032) and 2045 (Loy Yang, a 3280MW brown coal power station in Victoria previously closing in 2048).

contribute towards reliability and efficiency through provision of better information to the market and to policy makers.

The draft rule is part of a broader work program across the market bodies and the ESB that seeks to meet the needs of the transitioning power system now and into the future. Other projects directly related to this draft rule include:

- AEMC and AEMO's **work to update the ST PASA process and methodology** including the AEMC's final rule to provide AEMO with flexibility to update ST PASA so that it remains fit for purpose as the market develops and AEMO's ST PASA Replacement Project that involves a comprehensive review of the Pre-dispatch (PD) and Short Term (ST) PASA methodology, exploring the development of a system that will serve the NEM now, and into the future.<sup>21,22</sup> ST and MT PASA are important parts of the reliability framework, working together to provide participants and other stakeholders with the information they need to identify and manage risks to power system security and reliability from one day to three years ahead. The granularity of information collected under the ST and MT PASA processes changes to reflect the time period covered by each tool. Improving the granularity and transparency of information collected over the medium-term (seven days to three years) will assist participants in transitioning their planning activities from the medium to short term. The Commission notes that the changes made under this draft rule are consistent with the final *Updating Short Term PASA* rule so that the two processes continue to work together.<sup>23</sup>
- the **ESB's resource adequacy work program** includes a number of reforms that seek to maintain alignment between both the physical needs of the electricity system and the financial interests of generating resources.<sup>24</sup> This draft rule is consistent with the *managing early exits* recommendation made by the ESB as part of its resource adequacy package and will support the objective of aligning physical and financial needs by providing a public source of granular information to inform decisions around generator availability.<sup>25</sup> The ESB's resource adequacy work also includes a capacity mechanism to explicitly value capacity to provide an 'investable' and enduring long-term signal for the right mix of capacity as the generation mix transitions, and tools that provide jurisdictions

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21 AEMC, *Updating Short Term PASA* final rule, 5 May 2022. More information can be found here: <https://www.aemc.gov.au/rule-changes/updates/short-term-pasa>

22 Information about AEMO's ST PASA replacement project can be found here: <https://aemo.com.au/en/initiatives/trials-and-initiatives/st-pasa-replacement-project>

23 The *Updating Short Term PASA* final rule commences on 31 July 2025, while the *Enhancing information on generator availability in MT PASA* draft rule is set to commence on 9 October 2023. There are two areas of cross over: 1) The "PASA objective" specified in the MT PASA draft rule to guide AEMO in developing reason codes and an approach to recall time information will also guide AEMO as it administers ST PASA when the *Updating Short Term PASA* rule commences in 2025. The "PASA availability" definition will remain the same in this MT PASA draft rule but change when the *Updating Short Term PASA* rule commenced in 2025 to allow AEMO to define a "given recall period" in the RSIG. This will allow the recall period to be different for ST PASA and MT PASA. AEMO will consult with stakeholders to define the appropriate recall period when it updates the RSIG to provide for the *Updating Short Term PASA* final rule. More information in Section 3.5.3.

24 ESB Post-2025 Market design final advice to Energy Ministers, Part B, 27 July 2021, p.15-46. <https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>

25 See recommendation 1(a)(ii) which is to "instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability". Made as part of the final reform package agreed by Energy Ministers in response to ESB post 2025 market re-design recommendations at: <https://www.energy.gov.au/sites/default/files/2021-10/Summary%20of%20the%20final%20reform%20package%20and%20corresponding%20Energy%20Security%20Board%20Recommendations0.pdf>

sufficient confidence that reliability will be maintained. Improving information transparency on availability would complement other resource adequacy workstreams. For example, providing better information on generator availability over the medium term to potential investors in firming generation or demand response capability will allow them to make more informed and efficient investment decisions.

- the AEMC's **Essential system services** work includes a range of projects that all seek to put in place mechanisms to procure, value and schedule the essential system services needed to support the changing mix of resources in the NEM. The AEMC's work in this space progresses the ESB's recommendations around essential system services, with current work focusing on primary frequency response and an operational security mechanism; following our recent final rules to put in place a new fast frequency response service and to evolve the system strength arrangements. The more nuanced understanding of the medium-term supply outlook made possible with the reason and recall information collected and published under this draft rule would assist AEMO and participants in undertaking planning activities to have better information about what particular units may be doing. For example AEMO has noted that its longer-term planning activities, including system strength and inertia projections, can require considering the likelihood and nature of changes in plant operational behaviour in response to changing market conditions.

In its role as rule-maker, the Commission takes a practical and transparent approach to decision-making that works to help deliver a decarbonising, affordable, and reliable energy system for all consumers.

This draft rule seeks to provide a comprehensive, standardised, more granular and public data set on generator availability allowing stakeholders to form a nuanced view of the supply outlook, and importantly, how it may change as market conditions change. With better and more transparent information, participants, market bodies, policymakers and other interested stakeholders will be able to make more informed decisions. This will ultimately lead to a more coordinated approach to delivering a decarbonising, affordable, and reliable energy system for all consumers.

## 2 THE COMMISSION CONSIDERS THAT THIS DRAFT RULE WILL PROMOTE THE LONG TERM INTERESTS OF CONSUMERS

This chapter explains why the Commission has made its draft determination and the accompanying more preferable draft rule. It outlines the:

- problem identified in the rule change request and how the draft rule will address it
- reasons the Commission considers the more preferable draft rule will promote the long-term interests of consumers, the benefits, costs and how these will be managed.
- how the draft rule meets the assessment criteria used to consider the proposed and alternative solutions

Under the NEL, the Commission may only make a rule if it is satisfied the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).<sup>26</sup> This is the decision-making framework that the Commission must apply.

The NEO is:<sup>27</sup>

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.

The question to be answered in assessing any rule change proposal is, therefore, would the proposed change promote more efficient decisions relating to investment, operation and use of electricity services in a way that would ultimately promote the long-term interests of consumers?

The Commission is satisfied that collecting and publishing real time information to explain the daily megawatt availability already provided as part of the MT PASA process will, or is likely to, contribute to the achievement of the NEO. The Commission has proposed a draft rule to achieve this which is published with this draft rule determination.

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO. In this instance, the Commission has made a more preferable rule as it will better meet the NEO by minimising the costs of implementation while capturing the majority of the benefits of improved information, compared to the solution proposed in the rule change request. The reasons are set out below.

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<sup>26</sup> Section 88 of the NEL.

<sup>27</sup> Section 7 of the NEL.

## 2.1 The draft rule addresses the reliability and security problems associated with a lack of consistent, standardised, public information about generator availability over the medium term

The market failure identified by the ESB as part of its post-2025 recommendations to Ministers and reflected in AEMO's rule change request is that there is imperfect information on generator availability over the medium-term horizon. Highly competitive markets have free or low-cost access to important information about the market to boost competition and help drive prices down. Lack of information increases the risks and costs for all stakeholders who rely on knowing what generation is available to make their decisions. Lack of information can provide (an inefficient) benefit from scale by introducing information asymmetry. Larger generators have access to information about a larger share of the generation fleet and their scale also allows them greater financial scope to obtain any information they lack than their smaller competitors.

In practice, a lack of information around generator availability over the medium term makes it more challenging for:

- AEMO to effectively plan and operate the system
- participants to coordinate their maintenance schedules
- the AER to assess compliance, such as under the current notice of closure arrangements
- investors to assess opportunities for replacement plant or demand response capability
- policymakers to make informed policy decisions and take targeted action.

This can lead market bodies, participants and other market players to make less than efficient decisions, resulting in increased wholesale prices that increase consumer bills.

This lack of detailed information on generator availability is becoming more of an issue, where it has not been in the past, due to the ongoing transition in the power system. As older generators approach the end of their technical life, their operators may shift to cyclical operating regimes, opting only to generate for certain periods of the year to maximise their profitability. This is due to large amounts of renewable energy generators that are entering the market applying downward pressure on prices, especially at particular times of the day and year. As more generators approach the end of their technical life and move to cyclical operating regimes the challenge of operating the power system to deliver reliable, secure supply is expected to grow. There is a cost of not addressing it in a timely manner.

**Ergon Energy Queensland** agreed that there is a problem stating that *"the lack of detailed information around the availability of generators is complicating the ability for participants to accurately forecast future conditions and is leading to over-estimations in the levels of available generation and reliability within the three-year time period."*<sup>28</sup>. **Origin Energy** (Origin) and **Shell Energy** (Shell) each noted that more information about generator availability is important with Origin noting it *"could address any potential concerns over the*

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<sup>28</sup> Submission to the consultation paper: Ergon Energy Queensland (EEQ), p.1



*status and recallability of plant*<sup>29</sup> and Shell pointing out that "*Timely updating of information will be a key factor going forward...to facilitate appropriate market responses.*"<sup>30</sup>

Our analysis and consultation with stakeholders have revealed several existing processes through which AEMO collects information from generators on the reasons for and recall times from unavailability over the medium-term forecast horizon. However, these existing processes have a number of limitations, which justify the information provision requirements of this draft rule. In particular, information collected under these processes is not:

- centralised: instead it is collected through a number of different processes for different reasons.
- standardised: instead it is provided through different communications channels and in different units and formats
- comprehensive: it does not cover all time periods and units e.g. ESOO covers high level detail for 10 years, recall portal covers detailed outage recall information but only for the period covered by specific market notices
- sufficiently granular: the most complete data set on generator availability published in AEMO's generation information page only includes information to a seasonal resolution
- public: much of the existing generator availability information is not published, therefore not accessible by policymakers, market participants and other interested stakeholders.

These features of information provision are important in the context of the generation mix in the NEM becoming more complex with greater numbers of different types of generators. Without a standardised approach to the publication of generator availability through reasons and recall times, it will become increasingly challenging for the system operator, regulator, market participants and policy makers to remain appropriately informed about generator availability. It will also be impractical for the market operator to make ad hoc requests to a growing number of diverse generators for information it needs to operate the power system.

## 2.2 Reasons for making the draft rule

After providing due consideration to the issues raised in the rule change request and during consultation, the Commission is satisfied that collecting and publishing more information on generator availability as part of the MT PASA process would, or is likely to, contribute to the achievement of the NEO. This section outlines the benefits, the costs and how the Commission has decided to implement the more preferable draft rule because the benefits would outweigh the costs.

### 2.2.1 Better inputs lead to better outputs

In the case of this draft rule, the Commission considers that a **regular, comprehensive, granular, standardised, and public** data set that includes reasons and recall time to explain unit availability in more detail would lead to more informed and efficient decisions and, ultimately, reliability at a lower cost to consumers compared with the status quo.

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29 Submission to the consultation paper: Origin , p.1,

30 Submission to the consultation paper: Shell , p.2

Specifically, differentiating between generators that are offline for economic reasons or physical reasons would indicate how possible or likely it is that a unit's availability may change and under what conditions. Where AEMO has determined that a unit state would trigger the submission of unit recall time, this information would indicate how quickly a unit's availability could change. Both pieces of information add to stakeholder understanding of what the supply outlook may look like under different future scenarios.

While some information on future generator availability can be found or inferred from other sources of market information, establishing MT PASA as the central and public source of information about future generator activity over the medium term would provide a valuable resource for a broad range of stakeholders to inform their operational, investment and policy decisions. This information would support:

- more efficient planning and operational decisions by **participants** (e.g. adjusting maintenance schedules, informing AEMO intervention activities)
- more informed risk/opportunity assessments and therefore entry/exit decisions from **participants and investors** (e.g. timing of investment in new plant or demand response capability)
- more informed problem identification and policy action from **market bodies and other policymakers** (e.g. targeted problem identification and regulatory actions).
- more granular analysis to inform a variety of decisions by other interested stakeholders.

For example, **Ergon Energy Queensland** noted that "*more information about each generator's availability will enable better monitoring, forecasting availability, system reserve and hedging during this period of transition in the energy market and to ensure compliance with the Retailer Reliability Obligation (RRO).*"<sup>31</sup>

### 2.2.2

#### **The cost can be minimised through the implementation process**

The Commission acknowledges there are upfront and ongoing costs for AEMO and generators associated with meeting this new requirement.

AEMO has indicated that the cost of implementing changes to market systems and processes will be approximately \$1-2million.<sup>32</sup> This largely consists of upfront costs to change systems and processes and to consult on and update relevant guidelines and procedures.

Scheduled generators will also face upfront and ongoing costs to implement and comply with the new requirement. Stakeholders noted this in their submissions but did not provide any detail on the costs themselves.

For example, **Alinta** noted that "*this proposal would require amendments to participant's outage recording and market trading systems, experience shows that this can involve significant time and cost.*"<sup>33</sup>

31 Submission to the consultation paper: EEQ, p. 2

32 AEMO's estimate was provided as part of the ESBs post-2025 package of reforms, p.61 and confirmed this during the development of this draft determination.

33 Submission to the consultation paper: Alinta, p.2

**AGL** noted in relation to the requirement for recall times that *"The frequency and marginal adjustments of the recall information may have minimal benefit to the market but present significant costs to the generator"*.<sup>34</sup>

**Origin** inferred that the burden on participants should be reduced when it suggested limiting the new information to one-year ahead, saying *"This would help reduce the administrative burden of the new requirements on market participants while also provide the required level of supply-side visibility."*<sup>35</sup>

**Shell** acknowledged the cost and making this change and also said *"Further, we also acknowledge that there is a large degree of systems work currently underway across the industry that requires significant investment in terms of time and resources. Adding new systems changes can increase complexity and cost to system changes currently underway. That said, we still firmly consider that the costs of making this change will be relatively low compared to the benefits it is likely to provide the wider industry."*<sup>36</sup>

**Stanwell's** view was that *"the rule change if made, appears likely to incur implementation costs for functionality quickly superseded and for little benefit."*<sup>37</sup>

The Commission is mindful of the implementation and compliance costs that will be faced by AEMO, scheduled generators. Consequently, it has sought to balance the costs and benefits of the draft rule by:

- stating a preference for AEMO to implement the minimum number of reason codes as is practical to realise the benefits and the need for a reason code to distinguish between a physical and economic reason, while minimising cost and complexity for scheduled generators (see Section 3.1 for detail).
- allowing AEMO to determine which scheduled generators must also submit a recall time according to their unit state (see Section 3.1 for detail).
- stating a preference for AEMO to allow flexibility for participants when estimating recall times such that small changes to future outage plans do not always result in changes to the MT PASA entry (see Section 3.2 for detail).
- working with AEMO to identify opportunities to streamline existing rules requirements relating to information about generator availability so that, where practical, these new MT PASA inputs will supercede existing ones (see Section 3.5 for detail).
- requiring AEMO to have regard to the PASA objective when developing the details and approach for collecting and publishing reasons and recall times.<sup>38</sup> The purpose of the PASA objective is to limit the scope of information collected under this new requirement to that required to achieve the objective, that is, what information is required so that the market is properly informed to enable them to make decisions about supply, demand and outages up to three years in advance.

34 Submission to the consultation paper: AGL, p.1

35 Submission to the consultation paper: Origin, p.1

36 Submission to the consultation paper: Shell, p.2

37 Submission to the consultation paper: Stanwell, p.1

38 NER cl. 3.7.1(b) has been formally labelled the "PASA objective" under this draft rules.

- requiring AEMO to consult with stakeholders when updating guidelines and procedures to reflect this new requirement (see Section 3.5 for detail).
- allowing participants sufficient time to make changes to systems and processes by setting a draft commencement date of 9 October 2023. This date should allow participants to sequence and/or bundle changes to systems and processes to reduce costs (see Section 3.5 for detail).

Much of the implementation detail falls to AEMO to develop. AEMO agrees that the approach set out by the Commission and will work with participants when consulting on guidelines and procedures updates to achieve this balance so that the majority of the benefits are captured for the majority of stakeholders while minimising the costs to relevant participants (see Section 3.5 for more detail on the implementation process and timeframes).

### 2.2.3

#### There is a cost of doing nothing

In considering the cost associated with making the draft rule, the Commission notes there would also be a cost associated with not making a rule. The rapid transition of the NEM's generation fleet to a lower-emissions generation profile is already driving changes to plant operating regimes such as mothballing of units for prolonged periods of time, seasonal shut-downs, or cyclical running regimes.

AEMO anticipates generators will continue to make operational changes in their lead up to retirement. With this comes an increasing challenge for AEMO to assess the security and reliability implications of those operational changes.

AEMO anticipates an increased volume of ad-hoc requests for further information at higher cost due to receiving this information in a non-standardised way through mixed communication channels (e.g. email, phone call). This also continues to create a lost opportunity because ad-hoc information can not be used for broader analysis — e.g. as part of AEMO's operational readiness planning, determining the requirement for RERT, for longer-term planning activities, including system strength and inertia projections and other measures that support operating a reliable and secure power system.

Market participants and other stakeholders also require detailed information about the future supply outlook to inform their operational, investment and policy decisions and play their role in delivering reliable supply. Currently, participants rely on a range of sources to form an incomplete view of that future and have raised the need for more information.

For example, **Ergon Energy Queensland** noted in its submission: *"As the market progresses through the transition towards greater penetrations of renewable generation, the operating patterns of thermal generators will continue to evolve as they attempt to remain commercially viable. Consequently, Ergon Energy Retail and other market participants will spend more time analysing data to respond to these market dynamics. As such, more information about each generator's availability will enable better monitoring, forecasting availability, system reserve and hedging during this period of transition in the energy market and to ensure compliance with the Retailer Reliability Obligation."*<sup>39</sup>

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<sup>39</sup> Submission to the consultation paper: EEQ, p. 2

**Shell** noted that *"Timely updating of information will be a key factor going forward and the impact of changes to generator availability in the short to medium term should be provided on a regular and ongoing basis to the market in a timely manner to facilitate appropriate market responses. The MTPASA fulfills this role as it offers a regular weekly assessment of ongoing reliability in the NEM."*<sup>40</sup>

Without granular, standardised and public information to provide a more nuanced view of future unit availability, AEMO, participants and other stakeholders would likely face an increasing time and resource cost to cobble together an incomplete picture of how changing plant operating regimes are influencing the supply outlook over the medium term. This would mean less informed decisions and a reduced ability for each stakeholder to play its role in an orderly transition.

#### 2.2.4

#### The benefits of the more preferable draft rule outweigh its costs

Stakeholders tend to agree that improving information transparency supports more efficient outcomes with the following statements made in submissions:

- **AGL:** *"We broadly support improvements to generator transparency, particularly when this information can facilitate efficient market outcomes. Including this reporting requirement in the MT PASA framework will improve market transparency of generator availability"*<sup>41</sup>
- **Alinta:** *"While Alinta Energy supports the underlying intent of this rule change to capture sufficient information which assists AEMO in planning and operating the system..."*<sup>42</sup>
- **CS Energy:** *"CS Energy supports the need to develop flexible and adaptive market and regulatory frameworks to ensure processes such as MT PASA meet the requirements of the NEM from both an AEMO and Market Participant perspective."*<sup>43</sup>
- **Ergon and Energy Queensland:** *"more information about each generator's availability will enable better monitoring, forecasting availability, system reserve and hedging during this period of transition in the energy market and to ensure compliance with the Retailer Reliability Obligation."*<sup>44</sup>
- **EUAA:** *"believe[s] the new information] will enhance market transparency."*<sup>45</sup>
- **Origin:** *"requiring generators to report a reason and estimated recall time when submitting MT PASA inputs – and AEMO publishing this information – could address any potential concerns over the status and recallability of plant."*<sup>46</sup>
- **Shell:** *"[reasons and recall times would] improve transparency and quality of information to better inform the market; promote reliability and security of the power system; and minimise direct and indirect costs. A great level of detail around recall times and reasons*

40 Submission to the consultation paper: Shell, p. 2

41 Submission to the consultation paper: AGL p.1

42 Submission to the consultation paper: Alinta, p.1

43 Submission to the consultation paper: CS Energy, p.1

44 Submission to the consultation paper: EEQ, p.2

45 Submission to the consultation paper, Energy Users Association of Australia (EUAA), p.1

46 Submission to the consultation paper: Origin, p.1

*for outages will allow for the market to more effectively and efficiently allocate resources and schedule planned maintenance, forecast supply shortfalls, and make decisions that can reduce costs to consumers in the long term.*<sup>47</sup>

- **Stanwell:** *"Stanwell acknowledges the role of PASA in providing availability and capacity information to the market."*<sup>48</sup>

However, stakeholders have different views on whether the problem is material and the benefits sufficient to warrant the cost of making a change. Broadly, stakeholders who face the costs of implementing and complying with the draft rule (i.e. generators) are concerned the costs outweigh the benefit and those that do not face costs (retailers and consumers) consider the opposite.

The Commission acknowledges the concerns raised by participants who would face the cost of implementing and complying with the draft rule, and is seeking to to minimise these costs through implementation.

However, the Commission considers that the benefits to *all* stakeholders of publishing unit states explaining reasons and recall times to indicate how quickly a unit could be back in service is likely to outweigh the costs to generators and AEMO of providing it. The information is important for supporting more efficient market outcomes, more targeted policy decisions, and ultimately a more coordinated approach to deliver a decarbonising affordable, and reliable energy system for all consumers.

The Commission has made a number of design choices to make a draft rule that is more preferable than the rule change proposed by AEMO.<sup>49</sup> The Commission has included the following features that were not included in the rule change request:

- It makes a specific distinction between a physical and economic reason for an unavailable unit state. This distinction, which was not proposed in the rule change request, is a key component of the more preferable draft rule as it will allow stakeholders to form expectations around whether unit availability may change and under what conditions.
- It would allow AEMO to determine which unit states must also be accompanied by a unit recall time in consultation with stakeholders and with regard to the PASA objective. The form and approach for collecting recall times will be defined by AEMO in the RSIG. This approach, which is different to that proposed in the rule change request, means that stakeholder views can be taken into account so that the approach determined in the RSIG pragmatically accommodates situations where the value of marginal improvements to accuracy when it comes to estimating recall times, are not offset by the costs of calculating it.

The requirements in this draft rule are proposed to apply to scheduled generators from the commencement date of 9 October 2023, however they are also intended to apply to

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47 Submission to the consultation paper: Shell, p.2

48 Submission to the consultation paper: Stanwell, p.5

49 AEMO rule change request, submitted on 15 December 2021, can be found here: <https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa>

scheduled bidirectional units on commencement of the *Integrating energy storage systems into the NEM* rule in June 2024.<sup>5051</sup>

These elements allow for the draft rule to better meet the NEO because they minimise the costs associated with providing this more detailed information about generator availability to the market.

## 2.3 Considering the more preferable draft rule against assessment criteria

In assessing this rule change request, the Commission has focused on **market efficiency criteria**, on the basis that improving the inputs, for example, the quality of information, can improve the outputs, for example, reliability, security and affordability.

The Commission considers the following criteria relevant for understanding how the draft rule promotes the NEO:

- **Improving information transparency:** The draft rule would improve the quality and transparency and, therefore, reduce the cost of important market information. Including the unit state as well as the reason for unavailability (whether physical or economic) and recall times, along with existing PASA availability information, should level the playing field and provide value to a broader range of stakeholders that struggle to access and/or interpret current information in an efficient and useful way.<sup>52</sup>
- The information collected under this draft rule would be:
  - directly **relevant** to the investment and operational decisions of participants, market bodies, policymakers and a range of other interested stakeholders
  - a **comprehensive data set**, covering all scheduled generating for every 24 hour period over 36 months<sup>53</sup>
  - **granular** over the medium-term, allowing participants to form a more accurate assessment of the availability intentions of their competitors<sup>54</sup>
  - **standardised** making it easier to interpret on a like for like basis and use in scenario planning<sup>55</sup>

50 Section 3.5.4 explains how the draft rule aligns with the *Integrating energy storage systems into the NEM* final rule

51 On 2 December 2021, the Commission made a final rule in response to a rule change request from the AEMO to better integrate storage and hybrid systems, and allow greater participation in the market. More information on the final rule can be found here: <https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem>

52 In its submission Shell Energy specifically noted that access to this information could provide improved signals to wholesale demand response (WDR) providers to ensure this resource is integrated in the most efficient manner and allow more efficient integration of WDR and also distributed energy resources.

53 AEMO may request any data it needs to operate the power system or market but this is done in an ad-hoc, as needs manner and cannot be used, even within AEMO for any kind of formalised planning or assessment

54 Information published in AEMO's generation information page covers a 10-year period but only includes information at a seasonal resolution. ST PASA and the generator recall portal captures granular information only over operational timeframes. EAAP/GELP provides a detailed understanding of resource constraints but does not provide insight into commercial motivations;

55 A standard list of reason codes and a standard approach to recall times will be defined in the RSIG

- **public** so it can be accessed by all interested stakeholders including policymakers, market bodies, market participants and other interested stakeholders.<sup>56</sup>
- **Increasing competition:** the draft rule would promote competition by informing activity between buyers and sellers, levelling the playing field, reducing transaction costs and reducing barriers to efficient entry and exit of participants. This may include opportunities for newer participants such as aggregated distributed energy resources or those with demand response capability.
- **Increasing productive efficiency:** the draft rule would promote productive efficiency by more accurately informing the market of generation availability so that participants can make better-informed decisions regarding scheduling planned maintenance and establishing expected reliability and security conditions. This should lead to the optimal (least-cost) combination of resources available to meet demand at a price that closely reflects the cost of providing that resource. Where participants fail to deliver secure and reliable supply, this information would assist AEMO and governments to intervene in the market in more targeted and efficient ways.
- **Supporting reliability and security outcomes:** the draft rule promotes lower-cost security and reliability. Higher quality and more transparent information about generator availability supports productively efficient operational decisions (as described above) but it would also support more efficient investment decisions by market participants to promote reliability and security outcomes. It would also improve the ability of AEMO to assess reliability and security conditions in the NEM and provide more accurate information to the market, further promoting reliability and security outcomes over time.

The Commission is mindful that the way a change is implemented may be the difference between a solution that contributes to the achievement of the NEO and one that does not. The Commission had three implementation criteria in mind when assessing the draft rule.

**Costs and complexity, impact across and within stakeholder groups, and consistency with related reforms.** In deciding to make this draft rule the Commission considers that:

- the **costs** to AEMO and scheduled generators in making changes to implement the new requirement are offset by the benefits to a broad range of stakeholders. The Commission also considers that draft rule can be implemented in a way that minimises **cost and complexity** (see Section 2.2.2 above).
- there are a variety of **stakeholder impacts** but none that are reasons to treat some stakeholders differently in order to better serve the long-term interests of consumers. Applying the new requirement to all scheduled generators is appropriate given this is consistent with how the current MT PASA requirement for generator availability information applies and this new information is just an extension of that idea.
- in terms of **consistency with related reforms**, MT PASA is a core part of the reliability framework in the NEM. The information collected through this draft rule will support efficient operation of the market and may also be useful in informing the design or

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<sup>56</sup> AEMO collects a range of information to perform its functions that is not made public e.g. through its *Procedure for Submitting Recall Information of Scheduled Generator Outages*



operation of a number of other work programs, including the ESB resource adequacy reform package, the AEMC essential system services work and the AEMC and AEMO's work to update short-term PASA (see Section 1.3).

## 3 DETAILS OF THE RULE CHANGE AND ITS IMPLEMENTATION

This chapter provides more detail on each of the key elements of the draft rule. It explains the Commission's decisions and responds to stakeholder issues. The elements covered in this chapter include:

- Unit state (reason code)
- Unit recall times
- How reason codes and recall times may work in practice
- Compliance, enforcement and penalties
- Timeline and process to implement the draft rule
- Link between this draft rule and the MT PASA reliability assessment
- Interactions between this draft rule and the ESB work program
- Notifying jurisdictions of changes in reliability conditions of that jurisdiction

### 3.1 Unit state (reason codes)

Stakeholders expressed mixed views on the proposed collection of reason codes from generators in MT PASA. Some generators were against the proposal, noting that they considered it would interfere with commercial decisions, and that it was unnecessary to publish them to the market as they were most useful to AEMO.<sup>57</sup> Other stakeholders were more supportive, considering that better information transparency would allow market participants and other stakeholders to make better, more efficient decisions.<sup>58</sup> Ergon Energy considered a relatively higher amount of reason codes could provide useful information to stakeholders, for example on seasonal unit capability changes while Stanwell noted their support for minimising the number of reason codes.<sup>59</sup>

The Commission's draft rule requires scheduled generators to submit a "unit state" in the form of standardised **reason codes** that explain why a scheduled generating unit is or is not available. This information must be provided in accordance with the MT PASA schedule and when their current intentions and best estimates change. AEMO will define a standard list of reason codes in the RSIG in a way such that it is easy for market participants and other stakeholders to differentiate whether the unit is unavailable for:

- economic reasons — for example, where the participant has put the unit into reserve such that the time to recall would exceed 24 hours resulting from an expectation that wholesale prices would not be sufficient to justify keeping the unit on standby.
- physical reasons — for example, where the participant has planned a physical outage that is expected to take more than 24 hours to return to market.

57 Submissions to the consultation paper: Alinta Energy, p. 1; CS Energy, p. 3; Stanwell p. 4.

58 Submissions to the consultation paper: Ergon Energy, pp. 1-2; Origin Energy, p. 1; Shell Energy pp. 2-3.

59 Submission to the consultation paper: Ergon Energy, p. 2; Stanwell, p.4.

Stanwell noted that reason codes may not add any additional value beyond what a recall time would provide.<sup>60</sup> The Commission considers that reason codes do provide value, specifically that the distinction between economic and physical outages, which was not proposed in the rule change request, and is a key component of the more preferable draft rule would allow stakeholders to form expectations around whether unit availability may change and under what conditions. For example:

- a unit that is unavailable in a future period for **physical reasons** (e.g. planned maintenance) is unable or less likely to respond to changes market conditions - and the likelihood of it changing will decrease as the time of planned maintenance approaches and resources are committed to the maintenance task.
- a unit that is unavailable in a future period for **economic reasons** (e.g. due to sustained low prices making operation uncommercial) is more likely to respond to changes in market conditions, assuming appropriate resources can be mobilised to bring it back online.

This approach was selected because it provides additional information to market participants and other stakeholders with minimal administrative burden on participants. The reason for unavailability would already be known to participants, and thus the only additional ongoing burden would only involve logging it and submitting it alongside their usual availability bids. Publishing this additional information to the market will allow participants and stakeholders to make better, more efficient decisions that should result in lower and less volatile wholesale prices and thus lower prices for consumers.

In line with minimising the administrative burden on participants in gathering this information, the Commission has a preference for AEMO to develop the minimum number of individual recall codes that are practical. There is a trade-off between granularity of reason codes and burden on participants, with more codes increasing the burden in both administration and compliance. The Commission's view is that there is a small number of useful codes beyond which, would not materially enhance the information provided to the market.

Stakeholders also noted that similar information on reasons for unavailability is collected through the generation information survey process as part of AEMO's preparation of the ES00. However, the information is materially different in that AEMO expects participants only to submit unavailability if the period of unavailability is long enough to materially impact overall seasonal availability. Additionally, AEMO has indicated that the additional information collected under this rule change could replace some of the information occasionally provided through the generation information survey. This is detailed further in Section 3.5.2.

## 3.2 Unit recall times

The Commission's more preferable draft rule requires scheduled generators to submit a **unit recall time** to accompany their unit availability and reason code in accordance with the MT

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<sup>60</sup> Submission to the consultation paper: Stanwell, p.4 notes "Similarly, it does not appear relevant whether a unit is "active – reserve shutdown, inactive – planned shutdown, or deactivated – mothballed", but rather whether the unit can be brought into service and what lead time is required.

PASA schedule and when their current intentions and best estimates change. Only those scheduled generating units which have submitted a particular unit state will be required to enter a unit recall time under the draft rule. The unit states that must be accompanied by a unit recall time and the form and approach for collecting recall times would be defined by AEMO in the RSIG and must be developed in consultation with stakeholders.

The unit recall time will represent the period in which the plant could be made available under normal conditions after a period of unavailability, and not under direction from AEMO. This is consistent with the purpose of PASA which is to collect and publish information that can help participants make informed decisions and to allow the market to operate effectively with minimum amount of intervention by AEMO.<sup>61</sup>

Recall time information would add to stakeholder understanding of what could happen to the supply outlook if market conditions changed. For example if a unit had entered a recall time of 48 hours, it could be expected to come online to fill a gap left by a forced outage, or a short-term price increase. Whereas if a unit had entered a recall time of six months, it would perhaps only return if there was a more permanent change in market conditions such as the exit of another plant. Not all reason codes will necessitate the entry of a recall time. AEMO would have the flexibility to determine which reason codes require the entry of a unit recall time. For example where a unit has a reason code that indicates it is fully available, providing a recall time will not be relevant. Or for certain types of outages (or at certain stages during major outages), the unit may not be recallable, making any recall time estimate costly to calculate and of little value. AEMO would work with stakeholders to understand where providing recall times will help inform stakeholder understanding and support efficient decisions.

Stakeholders raised three main concerns relating to the provision of recall time information including that:

**1. Stakeholder view: Calculation of recall times may be inconsistent between generators given they may take into account a range of factors including commercial considerations.**

In its submission **AGL** noted that: *"recall time will be subject to the generators willingness to commit resources to returning the unit to service. The willingness to commit resources will be influenced by a number of factors including the commercial settings of the company and forecast market outcomes...will be unique to each generator ...will mean the calculation of recall times will be inconsistent between generators and subject to change."*<sup>62</sup>

**AGL** further noted that: *"The issue could be in part resolved if the recall time is based on a scenario of no limit of commercial resources. However, whilst this may be useful for AEMO in*

61 NER cl. 3.7.1(b) which will become the "PASA OBJECTIVE" under this draft rule. It states "The PASA is a comprehensive program of information collection, analysis, and disclosure of medium term and short term power system security and reliability of supply prospects so that Registered Participants are properly informed to enable them to make decisions about supply, demand and outages of transmission networks in respect of periods up to 2 years in advance (or up to 3 years in advance, where specified). NER cl. 3.7.1(d) adds to this by saying "AEMO must use its reasonable endeavours to ensure that it publishes sufficient information to allow the market to operate effectively with a minimal amount of intervention by AEMO"

62 Stakeholder submission: AGL, p.1

*the context of assessing least cost options for issuing directions, this extreme scenario may be of limited value to market participants or potential new entrants.*<sup>63</sup>

The Commission acknowledges that a range of factors will influence a generator's calculation of recall time, and that this will be unique to each generator, but notes that this is already the case when generators estimate daily PASA availability under the current rules.

"PASA availability" can be summarised as the physical plant capability in a particular period taking into account the ambient weather conditions expected at the time when the Region where the generating unit is located experiences the 10% Probability of Exceedance (POE) peak load.<sup>64</sup>

As well as taking into account ambient weather conditions and 10% POE peak load when providing each unit's PASA availability, a generator would form an organisational view of a unit's capabilities, and the future operating environment based on a range of factors, including commercial settings and assumptions.

The same PASA availability definition and the same organisational view of a unit's capabilities and the future operating environment would apply when a generator is calculating recall time information, as it does when calculating daily PASA availabilities. To provide further guidance to participants, the draft rule specifically refers to recall time under "normal conditions" to clarify that the recall time provided under the draft rule should represent a participant-driven recall, and not a recall under AEMO direction.

## **2. Stakeholder view: A new requirement to provide recall time information would duplicate other rules requirements**

A number of stakeholders noted that recall time information is provided by participants under other rules requirements and that this draft rule would duplicate these.

**Alinta** said: *"The proposal will not substantially promote information transparency. Rather, Alinta Energy considers that this proposal could lead to duplication of information and an increase administrative burden on participants."*<sup>65</sup> Alinta noted specifically AEMO's recall portal as a place where recall time is already collected.

**AGL** said: *We consider the proposed rule does not improve AEMO's access to generator availability information. AEMO must have continuous access to information regarding generator operational availability to effectively manage the power system...such as cl 4.9.9...disclosure of the expected recall time [for 'mothballed' generator unit]... In the case of*

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63 *ibid*

64 The definition of PASA availability as set out in Chapter 10 of the NER is "the physical plant capability (taking ambient weather conditions into account in the manner described in the procedure prepared under [clause 3.7.2\(g\)](#)) of a scheduled generating unit, scheduled load or scheduled network service available in a particular period, including any physical plant capability that can be made available during that period, on 24 hours' notice. For a wholesale demand response unit, the maximum MW wholesale demand response available in a particular period, including any wholesale demand response that can be made available during that period, on 24 hours' notice." The MT PASA process description (which is prepared under NER cl. 3.7.2(g)) further provides on page 8 that "generators should take into account the ambient weather conditions expected at the time when the Region where the generating unit is located experiences the 10% Probability of Exceedance (POE) peak load" and that "The actual level of generation available at any particular time will depend on the condition of the generating plant, which includes factors such as age, outages, and wear. Another important factor with respect to output is the reduction in thermal efficiency with increasing temperature."

65 Submission to the consultation paper: Alinta, p.1

*planned and unplanned outages...detailed information regarding GPS compliance, the planned works, the schedule of works, and the return to service and testing plan (if required)."*<sup>66</sup>

**CS energy** said: "One area of potential duplication is the overlap between the proposed rule change and AEMO's existing process for submitting recall information of scheduled generator outages."<sup>67</sup>

**Stanwell** said "While these existing reporting obligations are used for different purposes, Stanwell considers the additional MT PASA reporting obligations being proposed by AEMO duplicate much of the already reportable short, medium, and longer-term information, and provides little additional benefit to generator resource planning."<sup>68</sup>

Under the NER recall time information is collected by AEMO through:

- AEMO's outage recall portal – this framework requires generators to submit outage recall information at AEMO's request when a low reserve condition is identified. AEMO may only request if it is required in order to estimate the latest time that it would need to intervene – this is usually the generators in the relevant region/s where the intervention is forecast, although it might cover another region if that would alleviate the need to implement an intervention event.<sup>69</sup> The information is not published.
- NER clause 4.9.9 under which scheduled generators must notify AEMO of any events that change or are likely to change the operational availability of a generating unit to inform/support ongoing operation of the power system

Under these requirements AEMO only requests the information within the bounds of the rules requirement, the recall information generally relates to operational timeframes and the information is not made public.

The Commission acknowledges this existing recall time information but considers that the draft rule would enable a different type of information that would be provided to a broad range of stakeholders (not just AEMO). The requirement under this draft rule would collect recall time information from scheduled generating units with a particular reason code as specified by AEMO, for every 24 hour period in the 36-month time horizon of MT PASA, and the information would be published for all interested stakeholders to use. Furthermore, the new unit recall time information relates to normal conditions after a period of unavailability (as defined in the RSIG), whereas the existing recall time information relates to how quickly a unit could return to service under AEMO direction.

AEMO has indicated that with this new unit recall information collected as part of the MT PASA process, the need for ad-hoc requests for similar information would likely reduce.

### **3. Stakeholder view: Recall times would be challenging to estimate as it will change leading up to and during an outage**

<sup>66</sup> Submission to the consultation paper: AGL, p.2

<sup>67</sup> Submission to the consultation paper: CS Energy, p.2

<sup>68</sup> Submission to the consultation paper: Stanwell, p.2

<sup>69</sup> NER Cl. 4.8.5A

The time it takes to recall a unit from an outage can vary depending on a range of factors, including the nature of the outage, the status of any works underway, availability of resources, generators' willingness to commit resources to return the unit to service and other factors both internal and external to the business making those decisions.

Some stakeholders were concerned that the range of factors impacting their recall time estimate will mean they are unable to provide information that meets the "current intentions and best estimates" test.<sup>70</sup> This is especially relevant for certain types of outages where:

- an estimated recall time requires an engineering assessment
- the estimated recall time changes regularly
- the unit is not recallable for a period of time.

Stakeholders were concerned that this could result in recall information that provides minimal benefit to stakeholders, but presents significant cost and risk to the generators in providing it.

- **AGL** said "*Depending on the status of the works, the recall time could change multiple times. The frequency and marginal adjustments of the recall information may have minimal benefit to the market but present significant costs to the generator.*"<sup>71</sup>
- **CS energy** said "*Return to service times cannot be guaranteed as challenges can arise when returning a plant to service*"<sup>72</sup>

Given the MT PASA covers a period seven days to 36 months ahead of real time, participants will be estimating the recall times mainly for planning purposes well-ahead of real time. Changes to recall time estimates during an outage will (for the most part) be reflected in ST PASA inputs.<sup>73</sup>

The Commission acknowledges that a variety of internal and external factors can influence the estimate of recall time and it may be challenging to estimate a unit recall time for some reason codes. The Commission also acknowledges that estimating recall times in an MT PASA timeframe is an inexact science especially as the relevant period moves further away from real time. Generators will need some flexibility. The draft rule provides that AEMO will develop the approach to collecting reason codes through the RSIG in consultation with stakeholders. The Commission has a preference for AEMO to update the RSIG so that generators can provide recall time estimates in a way that pragmatically balances accuracy with flexibility. The Commission suggests that when AEMO is updating the RSIG, it investigates whether there are some reason codes that do not require the submission of a recall time. This is because there may be some unit states where the challenges and costs associated with estimating a recall time might outweigh the benefit of providing one.

In conclusion, the Commission considers the draft rule requirement for scheduled generators to provide and AEMO to publish recall times (in association with a specified "unit state" or

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70 Stakeholder submissions: AGL, p.1, CS Energy, p.2

71 Stakeholder submission: AGL, p.1

72 Stakeholder submission: CS Energy, p. 2

73 The Commission notes that scheduled generators with planned outages that take longer than seven days will be submitting recall times for part of that planned outage through the MT PASA process also.

reason code) will support a broad range of stakeholders in making more efficient decisions. The Commission considers that AEMO, in consultation with stakeholders can develop a pragmatic approach to collecting recall times that will address the concerns raised here.

### 3.3 How reason codes and recall times may work in practice

With the new information collected and published under the draft rule as well as existing availability information collected as part of the MT PASA process, stakeholders would have access to three key pieces of information about a scheduled generating unit's future availability:

1. daily megawatt availability (existing requirement) — this indicates whether a unit could be available or not during that period
2. the reason (economic or physical) a unit is not available — this indicates how possible it is that a unit's availability may change and under what conditions
3. the recall time (where required for a specified unit state) — this indicates how quickly a unit's availability could change.

Together this information allows stakeholders to form more a more nuanced view of what the supply outlook may look like under different future scenarios.

Below are some examples of the reason and recall information that could be associated with different availability scenarios. Note these are illustrative only — the reason code and recall time approach will be developed by AEMO in consultation with industry.



**Table 3.1: Illustrative examples of generator availability scenarios under the draft rule**

SCENARIOS	PASA AVAILABILITY (MW)	REASON	RECALL TIME (DAYS)
fully available	500	available	N/A
partially unavailable due to physical limitations	300	available - physically limited	2 or N/A
forced outage	0	unavailable - physical	7
planned maintenance - flexible	0	unavailable - physical, flexible	7
planned maintenance - inflexible		unavailable - physical, inflexible	14 or N/A
reserve shutdown	0	unavailable - economic	2
seasonal shutdown	0	unavailable - economic	90
dry storage	0	unavailable - economic	180

Source: AEMC

Note: these examples are illustrative only. AEMO will be developing form and approach for reason codes and recall time information as part of an update to the RSIG. This will be done in consultation with industry.

## 3.4 Compliance, enforcement and penalties

The reason and recall information submitted under this draft rule must represent the participant's current intentions and best estimates and is recommended to be classified as a tier 1 civil penalty provision.<sup>74</sup> Failure to submit the required information, or providing inaccurate information, carries a maximum penalty for corporations of \$10 million, or if greater, three times the benefit obtained from the breach if this can be determined, or if not, 10% of annual turnover of the corporation.<sup>75</sup> In addition to the MT PASA compliance and enforcement framework, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" so their generating units comply with relevant generator performance standards, regardless of their availability.

This is the same compliance and enforcement framework scheduled generators are subject to when providing their daily PASA availabilities under the existing rules.

Some stakeholders noted that the "current intentions and best estimates" test coupled with the high penalty will result in high costs of compliance. **CS energy** noted that it may lead to conservative provision of recall times and undermine the intent of the rule change.<sup>76</sup> The

<sup>74</sup> NER clause 3.7.2 (d1)

<sup>75</sup> Section 2AB(1c) of the NEL.

<sup>76</sup> Submission to the consultation paper: CS Energy, p.3

Commission notes that scheduled generators are already subject to the same test and penalty when providing daily PASA availabilities under the current process. Under the existing process, if a unit is unavailable, the PASA entry would be zero megawatts. The next non-zero entry would be informed by an internal organisational view of the reason for the outage and the unit capabilities around recall. The new requirement extends the level of detail reported to AEMO associated with the current PASA availability entry but is not, at its core, a new concept for the business when considering its obligations around PASA currently.

The compliance and enforcement framework including the penalty should always reflect the criticality of the obligation it relates to. The Commission considers that, as with the PASA availability information, the new reasons and recall information must be accurate so that it can be relied upon to inform operational and investment decisions and will therefore recommend that this new obligation be classified as a tier 1 civil penalty provision. However, the Commission notes that participants need flexibility to adjust decisions and information. Not having flexibility to change information could result in inefficient decisions being made based out of date information.

The draft rule provides for accuracy in the way the new requirements are clearly set out in the rules with local definitions for 'unit state' (reasons) and 'unit recall time' also forming part of the draft rule.<sup>77,78</sup> Accuracy is also provided for in the "current intentions and best estimates" test and the tier one civil penalty. This is consistent with the existing clause in MT PASA and with similar ST PASA and ESOO provisions.<sup>79</sup>

The draft rule enables flexibility as it allows for the form of the new information to be detailed in the RSIG. Stakeholders will have the opportunity to have input in how AEMO details the requirements as the draft rule requires AEMO to consult with stakeholders when updating the RSIG to implement this rule and also have regard to the PASA objective when developing the details and approach for collecting and publishing reasons and recall times.<sup>80</sup>

### 3.4.1

#### Using reason and recall time information as part of other compliance frameworks

Generally speaking, information collected and published under the rules can be used by the AER as an input to a range of monitoring and compliance activities.<sup>81</sup>

For example increasing transparency around the reasons why a generator is unavailable and its recall time may provide an extra level of granularity for the AER to use as part of its general market monitoring functions. The AER notes that this information may be used to assess how the market may have been informed regarding the reasons and duration of an outage. Where there is a recall time, it is possible, if such information is used by AEMO for example, to inform RERT activation, that the AER may use this to investigate whether the

<sup>77</sup> CS Energy views expressed on p.3 of its submission was that any new requirement be clearly articulated and prescriptive in the rules

<sup>78</sup> See proposed new rule 3.7(a0) of the amending rule.

<sup>79</sup> See NER clause 3.7.2(d), clause 3.7.3(e) (ST PASA) and clause 3.13.3A(g)(3) (ESOO).

<sup>80</sup> NER cl. 3.7.1(b) has been formally labelled the "PASA objective" under this draft rules. For more information on the PASA objective see section 3.5.3.

<sup>81</sup> See for example section 18D(1)(a) of the NEL which provides that the AER must, in performing the AER wholesale market monitoring functions in relation to a wholesale electricity market, use publicly available information to identify any relevant matter referred to in section 18C(1), which deals with one of the AER's wholesale market monitoring functions.

unit was actually made available within a reasonable allowance by the market participant according to its “best estimate”. Ultimately, given the longer term outlook of MT PASA (168 hours from dispatch), the AER considers it unlikely that any of the provided information would have pricing implications.

The ESB noted and the rule change request suggested that reason and recall information collected under this draft rule could be used by the AER to inform both its assessment of compliance under the current notice of closure arrangements as well as its general market monitoring functions.<sup>82</sup>

The current notice of closure rules require generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER.<sup>83</sup> AEMO publishes closure dates as a public record of notice of closure and the AER has a record of units that have been given exemption.<sup>84</sup> AER notes that the introduction of reasons and recall times may have a limited impact on the AER’s compliance and enforcement actions under the current notice of closure framework in practice.

Despite the potential limitations in using reason and recall time information collected under the draft rule, the Commission considers the new information will still be a valuable input for a broad range of stakeholders when looking to understand, in a general sense how generator behaviour is influencing market outcomes.

## 3.5 Timeline and process for implementing the draft rule

There are three key milestones in relation to the Commission’s draft rule:

1. Updates to the RSIG and MT PASA process description by **30 April 2023** (see Section 3.5.1 for detail)
2. Updates to other relevant AEMO guidelines and processes to streamline the collection of generator availability information where practical (see Section 3.5.2 for detail)
3. Expected commencement of the rule (if made) on **9 October 2023** (see Section 3.5.1 for detail).

### 3.5.1 Timeline for implementation

The implementation timeline dates have been set in consultation with AEMO to allow both participants and AEMO to consolidate changes to systems to minimise the total implementation cost.

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82 Rule change request from AEMO on 15 December 2021: *Enhancing information on generator availability in MT PASA*, page 4. See: <<https://www.aemc.gov.au/sites/default/files/2021-12/ERC0338%20Rule%20change%20request%20pending.pdf>>. See also Energy Security Board: *Post 2025 Market Design Final Advice to Energy Ministers Part B* 27 July 2021, page 26. Available here: <<https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>>

83 NER clause 2.10.1(c2).

84 Closure dates for all registered participants can be found on AEMO’s generator information page at: <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information>

### Commencement date

**9 October 2023** was selected as the draft rule implementation date.<sup>85</sup> This is when scheduled market participants must begin submitting the additional information required under this rule through AEMO's MT PASA system. The date aligns with the implementation of the Commission's *Fast frequency response market ancillary service* rule (FFR rule), allowing both to be implemented in a streamlined way.<sup>86</sup> The implementation of the FFR rule necessitates several changes to AEMO's participant market portal, as well as participant bidding systems — which are often also used for MT PASA submission. Consequently, AEMO recommended that the commencement date for this rule be set to align with the FFR rule so that these changes can be bundled together to require a single update to the market portal and participant systems.

### Updates to guidelines and procedures

**30 April 2023** was selected as the date by which AEMO must update the *RSIG* and *MT PASA process description*.<sup>87</sup> By this time, AEMO *must* have consulted on and updated the *RSIG* and *MT PASA process description* to include the new provisions relevant to this rule. AEMO expects to release draft updates by the end of 2022. This would allow AEMO four months from the expected publication of the final rule to produce the draft and another four months for AEMO to consult on the drafts and make the final guidelines and procedures.<sup>88</sup> It would then allow participants over five months to update their systems and procedures accordingly.

## 3.5.2

### Guideline updates

The additional information to be collected from participants under this draft rule necessitates updates to several guidelines to give market participants guidance on how the rule will operate in practice. The Rules require AEMO to follow the Rules consultation procedures when updating the *RSIG*, generation information guidelines, and EAAP guidelines, and as such, stakeholders will be consulted on the revisions.<sup>89</sup> The *MT PASA process description* is not subject to the same rules requirement for consultation. However, AEMO has indicated to the Commission that it will undergo consultation when updating this document as well.

### Reliability standard implementation guidelines

AEMO is required to consult on and update the *RSIG* to include the collection and use of the additional data on recall times and reason codes required by this draft rule by 30 April 2023. In developing the updated *RSIG*, AEMO should consider the principles defined in the *PASA objective*.

<sup>85</sup> See the transitional provision in clause 11.[xxx].1 of the amending rule

<sup>86</sup> For more information on this rule, see the rule change project page — <https://www.aemc.gov.au/rule-changes/fast-frequency-response-market-ancillary-service>

<sup>87</sup> See the transitional provision in clause 11.[xxx].3 of the amending rule

<sup>88</sup> The draft rule does not explicitly require AEMO to release draft guidelines by this date. However, this provides about an extra month added to the 14 weeks specified under AEMO's rules consultation procedures. The Commission notes that these are currently under consideration in the *Improving consultation procedures in the Rules* rule change request.

<sup>89</sup> See clause 11.[xxx].2(b) of the amending rule and existing NER clauses 3.7F(e) and 3.7C(q), respectively.

### **MT PASA process description**

The MT PASA process description must be updated by 30 April 2023 to include the collection of recall time and reason code information. Notably, the MT PASA process description will not need to be updated to include the *use* of the new information as this rule does not require its use in the reliability or loss of load probability runs. This is covered in more detail in section 3.6 below.

### **Streamlining**

In responding to the consultation paper, many generator stakeholders noted that they considered that the new information collection requirements in AEMO's proposed solution were similar to or duplicative of existing information requirements on generators.<sup>90</sup> Existing requirements that are similar are listed in Appendix E, with more information on whether they are materially duplicative or not.

The Commission acknowledges that AEMO may request and participants must provide information related to their availability from time to time. This information assists AEMO in operating a secure and reliable power system and market, but it is not provided regularly on a unit by unit basis, and is not standardised and not always granular. The Commission expects that the information provided through the MT PASA process under this rule will decrease the volume of ad-hoc requests AEMO makes to participants.

Where the Commission has identified existing information requirements that are similar to those contemplated under the draft rule, the Commission is recommending that information collection be streamlined. For example the new information on recall times and reason codes collected under this rule could be used in place of information presently collected from participants. Two streamlining opportunities have been identified below. These will be considered by AEMO when it considers how best to implement the draft rule.

### ***Generation information guidelines***

Currently, AEMO conducts an annual survey of generator information — the generation information survey — with quarterly updates requested from participants to ensure the survey is up to date. Data is collected on general generator capability, expected availability in each season, and other generator plant information. This information is then used to produce reliability forecasts, among other things, in AEMO's ESOO report.

To reduce any ambiguity for participants on what information should be provided in these surveys, AEMO plans to propose an update to its Generator Information guidelines to clarify what information, and in what circumstances, should be provided via Generation information surveys. AEMO will aim to make any relevant updates to the *Generation information guidelines* in parallel with the other guideline updates necessitated by this rule.

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<sup>90</sup> Submissions to the consultation paper: AGL, p. 2; Alinta Energy, p. 1; CS energy, p. 2

### ***Energy adequacy assessment projection (EAAP) guidelines***

AEMO's EAAP report provides information on the impact of potential energy constraints, such as water storages during drought conditions or constraints on fuel supply for thermal generation, on supply adequacy in the NEM. Under the EAAP data collection program, scheduled generators are required to submit information on their expected availability to produce energy, particularly with regard to energy supply constraints.

AEMO is already required to use MT PASA as an input into EAAP<sup>91</sup> so the risk of duplication is low, however the additional information on recall times and reason codes collected under this draft rule may reduce the volume and frequency of information that participants will need to provide to AEMO through the generator energy limitation framework (GELF) submissions. AEMO has indicated that it will seek to review, and, if appropriate, update its *EAAP guidelines* so as not to duplicate information collected under this rule.

### **3.5.3**

#### ***Alignment with Updating short term PASA rule***

Stakeholders noted that ST and MT PASA work together and any changes made should ensure alignment between the two.<sup>92</sup> As this rule will commence almost two years before *Updating short-term PASA*, this rule has been made such that it can leverage and integrate effectively with it. The *Updating short term PASA* final rule introduces two components that are related to this rule:

- **A revised definition of PASA availability** — that removes the reference to the 24-hour recall period and instead provides that relevant participants should specify the capacity that can be made available within a given recall period in accordance with the RSIG. AEMO's intention is to separately define the recall period for ST PASA and MT PASA in the RSIG. AEMO has noted that it intends for the MT PASA period to remain as the capacity that can be made available within 24 hours. Thus, for the purposes of MT PASA reporting and assessments, there is likely to be no practical difference between the two approaches once the definition commences, however, AEMO will consult on the new RSIG when it undertakes the update process. This new definition and approach to specifying the PASA availability period in the RSIG will commence on 31 July 2025.<sup>93</sup>
- **The PASA objective** — the PASA objective defines the broad philosophy that AEMO would adhere to when administering the PASA system. Defining a PASA objective was consulted on as part of the *Updating Short Term PASA* final rule and the Commission decided it was necessary given the move to a principles-based approach to ST PASA. While the approach to MT PASA remains broadly prescriptive, the Commission considers the PASA objective to be a useful guiding philosophy for AEMO to consider when it develops guidelines and procedures relating to MT PASA. Given that the draft rule will commence before *Updating ST PASA*, this draft rule inserts the PASA objective from *Updating ST PASA* into the NER.<sup>94</sup> For the purposes of this rule, the PASA objective is

91 NER rule 3.7C(b)(6)(A).

92 Stakeholder submissions: CS Energy, p.2, Shell p.3, Stanwell, p.3

93 Schedule 1 of the National Electricity Amendment (Updating Short Term PASA) Rule 2022.

94 For more information on the PASA objective, see the *Updating short term PASA draft determination*, p 22.

intended to focus AEMO on collecting information in a way that means Registered Participants are properly informed to enable them to make decisions about supply, demand and outages up to three years in advance.<sup>95</sup>

### 3.5.4 Alignment with *Integrating energy storage systems into the NEM* final rule

On 2 December 2021, the Commission made the *Integrating energy storage systems into the NEM* final rule in response to a rule change request from AEMO.<sup>96</sup>

The final rule makes several changes to better integrate storage and hybrid systems, and allow greater participation in the market. It also adds flexibility into the rules to create a framework that facilitates innovation in how the market supplies energy reliably and securely to meet the long-term interests of energy consumers.

One of the changes in that rule was that Scheduled storage assets (5 MW and above) that can transition between generation and consumption linearly (with no dead band around zero) will participate in central dispatch and will be labelled as a “scheduled bidirectional unit”. A scheduled bidirectional unit would face many of the same requirements as other scheduled generating units.

To align with this general intent, the Commission’s view is to require scheduled bidirectional units to provide reason code and recall times, in the same way as scheduled generating units do, from 3 June 2024, when the *Integrating energy storage systems into the NEM* rule commences.

## 3.6 Link between this draft rule and the MT PASA reliability assessment

This rule will not change the way AEMO undertakes its reliability assessment in MT PASA. That is, AEMO will undertake the MT PASA reliability assessment for a two-year forecast horizon based on the capacity that generators can make available given 24 hours of notice, as is the case presently.

One of the principal functions of MT PASA is for AEMO to assess the power system’s projected performance against the reliability standard.<sup>97</sup> To perform this task AEMO compares available generation in the system with forecast demand, to assess the probability of lost load.

### 3.6.1 The draft rule does not extend the reliability assessment

Shell Energy and the EUAA suggested in their submissions that the reliability assessment be extended to 36 months, referring to the benefits that ERM suggested it would provide in their

<sup>95</sup> While the PASA objective refers only to Registered participants, NER cl. 3.7.1(d) refers to sufficient information to *allow the market to operate effectively* with a minimal amount of intervention by AEMO and thus broadens the stakeholders that are relevant to consider when deciding what information should be collected under PASA.

<sup>96</sup> More information on the final rule can be found here: <https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem>

<sup>97</sup> Clause 3.7.2(f)(6)(ii) of the NER

March 2019 rule change request —*Improving transparency and extending duration of MT PASA*.<sup>98</sup> These included that extending the duration of the reliability assessment would:

- complement the Retailer Reliability Obligation<sup>99</sup>
- support wholesale demand response in the NEM
- better align with three year notice of closure<sup>100</sup>

At that time AEMO estimated the costs of this change to be around \$800,000 of upfront costs and an ongoing annual cost of \$150,000.<sup>101</sup> The Commission considered this proposal at the time and found that the cost to AEMO to implement the change outweighed the anticipated benefits given AEMO's advice that the quality of the third year forecast would be low.

In the time since this rule was made in 2020, the market has not changed in a way that would materially increase the benefits of extending the MT PASA reliability assessment. Thus, the costs of extending the assessment would have to have materially decreased to warrant doing so. AEMO provided an update to the previous cost estimate at the request of the AEMC and has confirmed that the costs would be broadly similar to what was previously estimated, noting some escalation from these figures is likely to have occurred since this time. AEMO considers committing resources to extend the MT PASA reliability assessment from 2-3 years would mean taking resources away from other higher priority reforms.

### 3.6.2

#### The draft rule does not include unit recall time in reliability assessment

The unit recall time information collected under the draft rule will not be used to alter the modelling approach for the MT PASA.

In responding to the consultation paper, **Shell** suggested that the recall information provided under this rule should be used in the assessment.<sup>102</sup> The Commission notes that, in line with AEMO's rule change request and the ESB's recommendation, recall times provided under this draft rule would not be included in the reliability assessment - while the timeframes are consistent, the purposes they serve are different.<sup>103 104</sup> Including them would require AEMO to conduct multiple reliability assessments and increase the resourcing requirement.<sup>105</sup> Additionally, ESB noted that setting a number of prescribed recall times for different modelling runs may misrepresent the variety of operating conditions generators may select in the future, and may therefore not provide any insight into potential generator response to any reliability concerns.<sup>106</sup>

98 see: <https://www.aemc.gov.au/rule-changes/improving-transparency-and-extending-duration-mt-pasa>

99 The Commission notes that AEMO's ESOO, and not the MT PASA reliability assessment, supports the operation of the RRO. Under the RRO, The AER may trigger the RRO if AEMO identifies, through its ESOO forecast, a material reliability gap in the NEM three years and three months out.

100 The current notice of closure rules (NER cl. 2.10.1(c2)) require generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER.

101 AEMO submission to *improving transparency and extending duration of MT PASA* draft determination, 9 January 2020, p.4

102 Shell, Submission to the ERC0338 consultation paper, 3 March 2022, p.3

103 AEMO, *Enhancing information on generator availability in MT PASA* rule change request, 15 December 2021, p.8

104 ESB Post-2025 Market design final advice to Energy Ministers, Part B, 27 July 2021, p.27. <https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>

105 Origin noted in its submission (p.1) that this would "be more efficient than requiring market participants to complete multiple versions of MT PASA with availabilities defined over different return to service durations. This is because it would avoid duplication of processes and provide a clearer view of the generator recall times."



The Commission now understands after further discussions with **Shell** that they were not referring to doing multiple reliability assessments but instead, suggesting the ST and MT PASA recall periods, for the purposes of defining “PASA availability” be different. The current 24 hour period is, in Shell’s view, arbitrary, and could be any period. Shell suggests that a new recall period could be used as the input to the single modelling run for the MT PASA reliability assessment, as per the current process.

The Commission has determined to leave the PASA availability definition at 24 hours in this draft rule. However, we note that under the *Updating Short Term PASA* final rule that will commence in July 2025, the PASA availability definition will be amended to delete the reference to the 24-hour notice period and instead provide that relevant participants should specify the capacity that can be made available within a *given* recall period in accordance with the RSIG. This means that AEMO will update its RSIG, in consultation with stakeholders, to provide for this change. In doing this AEMO will consider whether the given recall period should be different for MT and ST PASA. Stakeholders may wish to make the case for why a different period is more suitable to assist in planning over the medium term while the RSIG is open for consultation.

### 3.7 Interactions with the ESB’s capacity mechanism

Two stakeholders suggested that this reform was not necessary as it would be made redundant by the introduction of a capacity market.<sup>107108</sup> The Commission disagrees with this assessment because we consider the draft rule to be in the interests of consumers on an enduring basis. Improving information transparency on availability would only help complement and support any capacity mechanism (noting that this is being progressed by the ESB). For example, providing better information on generator availability over the medium term to potential investors in firming generation or demand response capability will allow them to make more informed and efficient investment decisions.

### 3.8 Notifying jurisdictions of changes in reliability conditions of that jurisdiction

The Commission does not propose any new formal reporting obligations on AEMO to be drafted into the rules to support further notification to jurisdictions of changes in reliability standards. This is because there is already a range of formal and informal mechanisms for AEMO and jurisdictions to engage on matters of reliability and security.

The rule change request notes that AEMO’s current obligations under the NER are to publish an updated reliability forecast (in an ESOO update) should a material change occur.<sup>109110</sup>

106 *ibid*

107 Submission to the consultation paper: Stanwell, p.1,3,5

108 Submission to the consultation paper: Alinta, p.2,3

109 Rule change request from AEMO on 15 December 2021: *Enhancing information on generator availability in MT PASA*, page 9-10. See: <https://www.aemc.gov.au/sites/default/files/2021-12/ERC0338%20Rule%20change%20request%20pending.pdf>.

110 In the event AEMO becomes aware of a significant change in generator availability in a manner that materially changes its most recent ESOO, clause 3.13.3A(b) of the NER requires AEMO to, as soon as practicable, publish information in a descriptive form that is consistent with its ESOO and if appropriate, publish on its website, an updated reliability forecast

In addition to this, AEMO plays a range of jurisdictional specific roles when it comes to supporting reliability in those jurisdictions. For example:

- The South Australian Advisory Functions (SAAF) is a collection of independent reports prepared by AEMO and published for the South Australian jurisdiction under Section 50B of the National Electricity Law. Under these provisions, the South Australian Government may also request AEMO to undertake additional advisory functions for the South Australian Declared Power System.<sup>111</sup> Through the SAAF, AEMO provides (among other things) advice on the Supply adequacy and system security outlook or the South Australian Power system.
- In Victoria, AEMO has several unique jurisdictional roles including planning the Victorian transmission network and energy emergency management responsibilities.<sup>112</sup><sup>113</sup> Through these functions AEMO supports Victoria in delivering secure and reliable outcomes in a wide range of ways.
- AEMO is in discussions with New South Wales to establish a process for AEMO in its role as NSW Energy Security Target (EST) Monitor to formally notify NSW if there has been a material change in relevant MT PASA or ESOO inputs (including, but not limited to, generator availability and planned transmission and distribution outages and limits) that has the potential to result in a breach of the EST.<sup>114</sup>

It is worth noting that AEMO is also in regular discussions with all jurisdictions on a range of matters including ongoing reliability and security issues.

Stakeholders did not comment on this matter in response to the consultation paper however Energy Ministers had noted, when agreeing to the ESB's recommendation that was the catalyst for this rule change request, that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard. The Commission is satisfied that this already occurs under current arrangements.

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111 This is a jurisdictional-specific function of AEMO under its 'additional advisory functions' in South Australia. More info here: <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/south-australian-advisory-functions>

112 In order to effectively plan what transmission network infrastructure is needed, AEMO follows a defined planning process and methodology that draws on key reports, projections and feasibility studies, including the Victorian Annual Planning Report (VAPR) and regulatory investment tests for transmission. More info here: <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/victorian-planning>

113 AEMO's emergency management responsibilities in Victoria are detailed in the Victorian Electricity Emergency Communications Protocol (VEECP). The VEECP was established to ensure timely advice and information is coordinated between stakeholders when responding to an energy incident. Signatories to the VEECP include AEMO, Victorian distribution businesses, the Victorian Government, and emergency services across Victoria. More info here: <https://aemo.com.au/en/energy-systems/electricity/emergency-management/victorian-role>

114 The EST Monitor is established under New South Wales jurisdictional legislation being the *Electricity Infrastructure Investment Act 2020*. More information about the EST Monitor can be found here: <https://www.energy.nsw.gov.au/government-and-regulation/electricity-infrastructure-roadmap/entities-delivering-roadmap#-the-energy-security-target-monitor>

## ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER Commission	Australian Energy Regulator See AEMC
DUID	dispatchable unit identifier
ENCRC	Energy National Cabinet Reform Committee
ESB	Energy Security Board
ESOO	Electricity statement of opportunities
MT PASA	Medium term projected assessment of system adequacy
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National electricity objective
NER	National Electricity Rules
PASA	Projected assessment of system adequacy (see also MT PASA and ST PASA)
ST PASA	Short term projected assessment of system adequacy
RSIG	Reliability Standard Implementation Guidelines

## A RULE MAKING PROCESS

### A.1 The rule change request

On 15 December 2021 AEMO submitted a rule change request to the AEMC identifying that changes in generator operating regimes, driven by the rapid transition of the NEM's generation fleet to a lower-emissions generation profile, may bring uncertainties and therefore challenges in maintaining system security and reliability.<sup>115</sup>

AEMO proposes that more detailed information be collected and published about scheduled generator availability in the MT PASA. Specifically, the proposed rule amends clause 3.7.1 and 3.7.2 of the NER and relevant definitions so that generators would report, and AEMO would publish, a unit's status through reason codes, and associated recall times when triggered through a reason code.

The rule change request notes that this would improve the transparency of information available to market participants, jurisdictions, and market bodies. This information would allow for improved operational, market and investment decisions by all stakeholders.

The request actions the ESB's *managing early exists* recommendation from the post 2025 reform package - a suite of reforms made by the ESB to meet the needs of the energy transition underway.<sup>116</sup> The ESB recommendation, and as a result, this rule change request, seek to increase information provision around mothballing and seasonal shutdowns to support notice of closure requirements.

The rule change request includes a draft rule and a copy can be found on the AEMC website.<sup>117</sup>

### A.2 Rationale for the rule change request

The rule change request states that the rapid transition of the NEM's generation fleet to a lower-emissions generation profile will bring uncertainties and therefore challenges in maintaining system security and reliability.

It then refers to the ESB's *post-2025 market design final advice to energy ministers*, and documents in particular noting that the transition will drive further changes to plant operating regimes whereby owners of legacy thermal generation seek to reduce their overheads if low wholesale prices are expected.<sup>118</sup> These changes may include mothballing of units for prolonged periods of time and/or seasonal shutdowns or cyclical running regimes.

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<sup>115</sup> Changes in operating regimes could include mothballing of units for prolonged periods of time and/or seasonal shutdowns or cyclical running regimes e.g. weekday/weekend, day/night

<sup>116</sup> See ESB's recommendation 1(a)(ii) which is to: Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability. In agreeing to the recommendation National Cabinet noted that the rule change request should be prepared in consultation with senior officials and that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard.

<sup>117</sup> The rule change request submitted by AEMO on 15 December 2021 can be found here: <https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa>

<sup>118</sup> ESB's post 2025 market design final advice documents can be found here: <https://esb-post2025-market-design.aemc.gov.au/final-advice-july-2021>

The challenges identified in the rule change request include:

- operational challenges such as a reduction in available units leading to lack of reserve or essential system services, as well as a lack of standardised information on when generators are available or could be made available into the future
- limitations on the ability of participants to use MT PASA reporting for coordinating maintenance schedules
- increased complexity for the AER in assessing compliance under the current notice of closure arrangements
- weakened investment signals for potential replacement plant if it is unclear why existing units are unavailable.

### A.3 Solution proposed in the rule change request

The key change proposed by AEMO in the rule change request is the reporting and publication of:

- a unit's status through reason codes via MT PASA in accordance with the relevant international standard, tailored to a domestic context<sup>119</sup>
- recall times via MT PASA when triggered through a reason code.

AEMO proposes amendments to clause 3.7.1 and 3.7.2 of the NER and relevant definitions to bring this change into effect.

### A.4 The rule making process to date

On 3 February 2022, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.<sup>120</sup> A consultation paper identifying specific issues for consultation was also published. Submissions closed on 3 March 2022.

The Commission received eight submissions as part of the first round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination. A summary of the issues raised in submissions and the Commission's response to each issue is contained in Appendix C.

### A.5 Consultation on draft rule determination

The Commission invites submissions on this draft rule determination and more preferable draft rule by **7 July 2022**.

Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than **2 June 2022**.

<sup>119</sup> IEEE Std 762-2006: *Definitions for use in reporting electric generating unit reliability, availability and productivity*

<sup>120</sup> This notice was published under s.95 of the National Electricity Law (NEL).

Submissions and requests for a hearing should quote project number **ERC0338** and may be lodged online at <https://www.aemc.gov.au/contact-us/lodge-submission>.

## B BACKGROUND AND CONTEXT

This section covers the context of this rule change and the historical events that led to the rule change request being submitted to the AEMC.

### B.1 Context for recent concerns around generator availability

Starting with the closure of Northern and Hazelwood power station in 2016 and 2017, a number of events have occurred that have shaped the public dialogue around generator availability. These are summarised in the table below:

**Table B.1: Key events in public discussion of future thermal generator availability**

DATE	EVENT
2015 -2016	Playford B power station closure in October 2015 and Northern power station closure in May 2016 — 11 months notice of closure was provided. Following closure, there were large increase in SA wholesale electricity prices.
September 2016	South Australia black system event — creating widespread concern and a public dialogue around power system security and reliability.
March 2017	Hazelwood power station closure — five months notice of closure was provided. Following its closure there were large increases in VIC wholesale electricity prices.
November 2018	AEMC makes <i>Generator three-year notice of closure</i> rule — introducing the requirement for generators to provide 36 months notice to the market of their intention to close. The rule was made to promote reliability outcomes in the NEM, such that the market is provided with sufficient notice of closures to enable the market time to respond, minimising the likelihood of any price shocks. A more fulsome summary can be found below.
July 2019	Retailer reliability obligation (RRO) introduced to provide stronger incentives for market participants to invest in the right technologies in regions where it is needed, to support reliability in the NEM. Notice of closure period increased to 42 months to better align with RRO.
2019-2021	Liddell power station closure date is changed multiple times in response to changing market conditions and stakeholder concern about reliability — highlighting the multiple factors weighing on generators' decisions to exit the market.
2020-2021	ESB conducts post-2025 project, developed reforms to meet the needs of the transition. A key workstream of this was focussed on options to support resource adequacy and manage thermal exit.
February 2020 - 2021	VIC & QLD Experiencing similar periods of negative pricing to SA — but both states have multiple coal plants, unlike SA — concerns they may

DATE	EVENT
	seasonally shut down to avoid low wholesale prices.
November 2020	RRO trigger changed to align the declaration of a forecast reliability gap with the interim reliability measure (no more than 0.0006 per cent unserved energy per annum) that commenced in August 2020. Energy Ministers agreed to this to improve reliability during the transition to the post-2025 market design.
March 2021	Energy Australia reached an agreement with the Victorian Government to close Yallourn power station in mid-2028 in a way that delivers an orderly retirement of the power station. Under the agreement, EnergyAustralia would retire Yallourn in mid-2028 - four years earlier than previously planned - and build new storage capacity through a 350 MW, four hour, utility scale battery project that will be completed by 2026. While consistent with notice of closure arrangements, it increased concerns that coal-fired power stations may exit the market earlier than expected due to continuing decreases in daytime wholesale prices.
September 2021	ESB's Post 2025 reform package agreed by National Cabinet including resource adequacy mechanism actions
October 2021	Torrens island unit B1 mothballed with a return to service period of 6 months — highlighting the potential benefit of standardising and automating the gathering of information on their availability if more units start to follow this trend.
February 2022	AGL announced that Bayswater power station would be closing two years earlier in 2033, and Loy Yang A power station would be closing 3 years earlier in 2045.
February 2022	Origin announced that the closure of Eraring power station would be brought seven years forward to 2025
April 2022	Federal Energy Minister, Angus Taylor submitted a rule change request to the AEMC to increase the notice of closure period to five years, as well as making it more difficult for generators to mothball indefinitely prior to their closure.

Source: the information in this table has been collated by the AEMC based on publicly available information.

While the impacts of these events on power system security and reliability have varied from minimal to material, unexpected changes in unit availability continue to be a concern. As well as events that have contributed to this concern, Table B.1 shows the range of actions that have already been taken to address it.

In looking to further address concerns around future unit availability, the ESB considered — amongst other options — expanding notice of closure requirements as discussed below.



### BOX 1: SUMMARY OF NOTICE OF CLOSURE PROVISIONS

In 2018 following concerns around the high and volatile wholesale energy prices that occurred after the closure of Northern and Hazelwood power stations, the AEMC made the *Generator three year notice of closure* Rule.

The Rule requires participants to advise AEMO of the expected closure year for all their scheduled and semi-scheduled generation units over 30MW. It also requires generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER. Civil penalties apply if generators fail to comply with their obligations (NER clause 2.10.1).

The AER maintains flexibility in determining what criteria to apply when considering applications for exemption and assesses each application on a case by case basis. In general, they are guided by the NEO but it also provides a brief, non-binding list of factors that may be given regard to, including, but not limited to:

- the reliability and security impact of the generator's early exit - the AER will engage with AEMO as it considers applications for exemption to further its understanding of this issue and may also talk to relevant network service providers
- plans for replacing the capacity being retired, if any
- whether the application for exemption is necessitated by a requirement to meet a competing or changing legal or regulatory obligation
- if the application for exemption is necessitated by urgent and unforeseen circumstances.

The rule does not constrain decisions by generators to place generating units into dry storage (i.e. mothball them) or to otherwise make them temporarily unavailable. Until their classification is terminated, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" and so their generating units comply with the relevant generator performance standards, regardless of their availability.

Also, until their classification is terminated, AEMO can direct them to generate if AEMO is satisfied that it is necessary to do so to maintain or re-establish the power system to a secure operating state, a satisfactory operating state, or a reliable operating state.

Note: More information can be found on the *Generator three year notice of closure project page* which can be found here: <https://www.aemc.gov.au/rule-changes/generator-three-year-notice-closure>

Note: More information about the AER's *Generator notice of closure guideline* can be found here: [https://www.aer.gov.au/system/files/Generator%20notice%20of%20closure%20exemption%20guideline\\_1.pdf](https://www.aer.gov.au/system/files/Generator%20notice%20of%20closure%20exemption%20guideline_1.pdf)

## B.2 ESB post 2025 reforms

In October 2021, the National Cabinet endorsed the final package of reforms presented by the ESB as agreed by the ENCRC in September 2021.

The ESB's post 2025 market design reforms detail a redesign of the NEM to enable the provision of the full range of services to customers necessary to deliver a secure, reliable and

lower emissions electricity system at least cost. They are spread across four reform pathways:

1. resource adequacy
2. essential system services
3. transmission
4. distributed energy resources.

The rule change request discussed in this consultation paper is part of the resource adequacy pathway. The ESB recommended six actions to support the orderly retirement of thermal generators and timely investment in an efficient mix of new resources. These actions are:

- adopting investment principles for jurisdictional schemes
- information gathering and provision
- managing early exits
- implementing a jurisdictional strategic reserve
- implementing a NEM-wide ministerial trigger for T-3 instruments under the RRO
- developing a new capacity mechanism.

This rule change request actions the "*managing early exits*" recommendation and is based on the ESB's recommendation to improve the information provided to, and published by, AEMO through its MT PASA process. The specific recommendation agreed by Energy Ministers and endorsed by the National Cabinet, was to "*Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability*".<sup>121</sup>

In agreeing to the recommendation National Cabinet noted that:

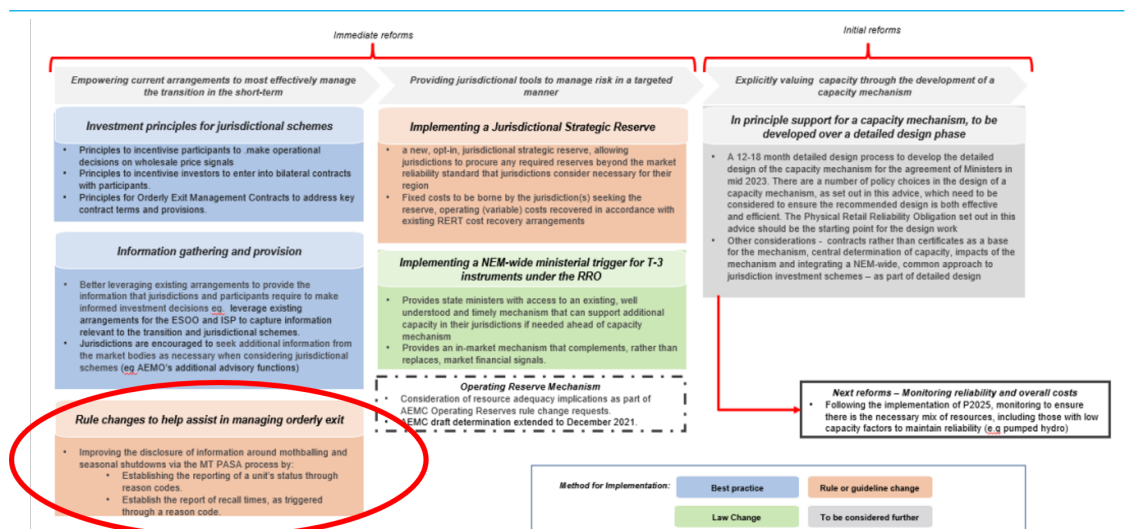
1. **the rule change request should be prepared in consultation with senior officials:** the ESB and energy senior officials were consulted on the development of the rule change request at an Energy Senior Officials Meeting in November 2021, and
2. **that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard:** the rule change request notes that this aligns with AEMO's current obligations under the NER to publish an updated reliability forecast — in an ES00 update — should a material change occur. It is also worth noting that AEMO is in regular discussions with jurisdictions on a range of matters including ongoing reliability and security issues. Therefore, the rule change request does not propose further formal reporting obligations to be drafted into the NER at this time. AEMO is in discussions with relevant jurisdictions to adopt any process changes by which any material changes to reliability are communicated to relevant jurisdictions.

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<sup>121</sup> See recommendation 1(a)(ii) in the summary of the final reform package agreed by Energy Ministers in response to ESB post 2025 market re-design recommendations at: <https://www.energy.gov.au/sites/default/files/2021-10/Summary%20of%20the%20final%20reform%20package%20and%20corresponding%20Energy%20Security%20Board%20recommendations0.pdf>

The changes to MT PASA have been proposed in the context of a range of other reforms that seek to ensure resources are available when needed as the power system transitions. Below is a diagram that shows this rule change in the context of other resource adequacy reforms recommended by the ESB.

**Figure B.1:** MT PASA enhancements in the context of other ESB resource adequacy and ageing thermal reforms



Source: ESB post 2025 market design final advice to Energy Ministers Part B, 27 July 2021, page 20.

The ESB’s objective for this recommendation is to bolster current exit arrangements to help manage orderly exits as the power system transitions. The ESB noted that the changes to the MT PASA process increase information around mothballing and seasonal shutdowns by providing greater transparency around when generators will be available to supply, and the lead time required for recall from an outage.

ESB described the costs and benefits of their recommendation in the table below:

**Table B.2:** Costs and benefits outlined by ESB

	<b>BENEFITS:</b>	<b>COSTS</b>
<b>Reasons</b>	<ul style="list-style-type: none"> <li>Implemented with minimal changes to NER</li> <li>Simple, automated, and transparent means of collecting and reporting participant information</li> <li>Clear compliance obligations for participants to update</li> </ul>	<ul style="list-style-type: none"> <li>Requires clear definitions of individual reason codes</li> <li>Requires scheduled generators to submit reason codes</li> <li>Additional reporting by AEMO (if not automated)</li> <li>Updates required to AEMO procedures and</li> </ul>

	<b>BENEFITS:</b>	<b>COSTS</b>
	<p>immediately once decisions to change unit availability are made</p> <ul style="list-style-type: none"> <li>• International precedent for use of IEEE Std 762-2006, tailored to a domestic context</li> <li>• Improve information to support the AER’s monitoring functions and compliance assessment</li> </ul>	<p>guidelines</p> <ul style="list-style-type: none"> <li>• Anticipated low/medium implementation and ongoing costs for AEMO/participants</li> </ul>
<b>Recall times</b>	<ul style="list-style-type: none"> <li>• Implemented with minimal changes to NER</li> <li>• Provides more granular information to all stakeholders including how existing participants availability may change if units are recalled</li> <li>• Avoids automated publishing of additional reliability runs, however provides for greater flexibility in modelling sensitivity analysis of real-world outcomes</li> <li>• Allows for submission of a range of recall times, capturing a variety of operational cases</li> <li>• Improve information to support the AER’s monitoring functions and compliance assessment</li> </ul>	(same as above)

Source: ESB, *post 2025 market design final advice to Energy Ministers Part B*, 27 July 2021, page 25-26

The idea of additional MT PASA modelling runs with alternative prescribed recall times (e.g. 7 days, 1 month) was discussed as part of the ESB’s April consultation paper. However, in its final advice to Energy Ministers, the ESB noted that setting prescribed recall times for such

modelling may misrepresent the variety of possible scenarios and not provide useful insight into potential reliability outcomes.<sup>122</sup> ESB also noted that additional modelling runs would require AEMO resourcing and given the unclear benefits to the market, ESB recommended the collection and publication of reason codes and recall times to supplement to MT PASA modelling runs instead of being an input.

The ESB did not recommend implementing the other changes that were considered in the April Options paper. The options and reasons for not recommending them are listed below.

- **Amending AEMO's Generator Information Survey (GIS)**, in order to collect additional information from generators. **ESB did not recommend this option** given the GIS's focus on longer term reliability and manual collection.
- **Expanding the notice of closure requirements** to include mothballing such that any significant early withdrawal of capacity from the market in the notice period requires an exemption. **ESB did not recommend this option** given stakeholders consider the existing notice of closure exemption arrangements to be sufficient to manage early exits and the information captured through the proposed changes to MT PASA may be used by the AER as part of its existing monitoring functions and inform its assessment of compliance under the current notice of closure arrangements.
- **Establishing an Integrated process to manage early exit:** a System and Market Impact Assessment framework would consider the operational risks and challenges to reliability and security and likely impact on wholesale prices that may arise from an earlier closure of certain designated coal and gas fired generators. If all other potential alternative options have been exhausted, an Orderly Exit Management Contract would be used as a last resort.<sup>123</sup> **ESB did not recommend this option** because the benefit of implementing a new prescriptive exit process was incremental at best and it came with considerable costs and additional regulatory burden and had the potential to undermine the role of the market.<sup>124</sup>

The ESB referenced stakeholder feedback as the key reason for not recommending these options stating that:

*"Stakeholders were generally supportive of the concept of increased information provision in relation to orderly exit. However, many submissions noted that additional provisions targeting mothballing and/or seasonal shutdowns could easily become onerous and a barrier to efficient operational decisions by diminishing the flexibility of participants to operate their plant in response to prevailing market dynamics. Further, stakeholders consider the existing*

122 ESB post 2025 market design final advice to Energy Ministers Part A, 27 July 2021, page 27. The document can be found here: <https://esb-post2025-market-design.aemc.gov.au/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>

123 Orderly Exit Management Contracts are bilateral arrangements (usually between a government and a closing generator) that help to ensure that generator does not exit the system until sufficient capacity can be brought online to replace it. The terms of these contracts are bespoke. See the explanation relating to the resource adequacy mechanisms and ageing thermal retirement reforms here: <https://www.energy.gov.au/sites/default/files/2021-10/Resource%20adequacy%20and%20ageing%20thermal%20generation%20retirement1.pdf>

124 While the ESB did not make a recommendation for the use of orderly exit management contracts, it proposed that certain jurisdictional investment scheme principles should apply to them where they were used. National Cabinet has endorsed Energy Ministers' decision for further consideration of these contracts. This work will be carried out by the ESB, and will need to complement the design work on a capacity mechanism. See: <https://www.energy.gov.au/government-priorities/energy-ministers/priorities/national-electricity-market-reforms/post-2025-market-design>

*notice of closure exemption arrangements to be sufficient to manage early exits and largely opposed broadening the current exemption from notice process to include mothballing.*

*The ESB acknowledges the concerns of stakeholders and considers that changes to the notice of closure requirements should:*

- 1. ensure any changes are sufficiently flexible to adapt to a changing environment,*
- 2. establish where possible simple, automated, and transparent means of collecting and reporting participant information, and*
- 3. avoid undue regulatory burden on participants, market bodies and jurisdictions.<sup>125</sup>*

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<sup>125</sup> *ESB post 2025 market design final advice to Energy Ministers Part A, 27 July 2021, page 25. The document can be found here: <https://esb-post2025-market-design.aemc.gov.au/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>*

## C SUMMARY OF ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the first round of consultation on this rule change request and the AEMC’s response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in this table.

**Table C.1: Summary of other issues raised in submissions**

STAKEHOLDER	ISSUE	AEMC RESPONSE
Ergon Energy Queensland (p.2)	Ergon Energy Queensland suggested that a return to service date (or range of dates) could be added to improve MT PASA information further. It considers recall times provide limited benefit.	Return to service date can already be inferred through daily PASA availability information that is already provided by participants in MT PASA. A non-zero amount entered for PASA availability indicates that a generator could be available within that 24 hour period. Note MT PASA availability indicates the capacity that <i>could</i> be available for that period. This is distinct from a participant’s intention to generate.
Origin (p.1)	Origin Energy suggested that the new unit status reporting requirements should be limited to a one-year outlook to reduce the administrative burden. It noted that participants would not be able to confidently schedule the mothballing or temporary commercial withdrawal of units more than one year ahead, given uncertainty around changing market dynamics.	MT PASA requires participants to provide information about their current intentions and best estimates. This means participants need only enter an outage in MT PASA once it is known.  The Commission understands that collecting information for only a 12-month outlook would not change the implementation and compliance costs materially. If anything, costs may increase given the system configuration required to implement differing treatments of information

STAKEHOLDER	ISSUE	AEMC RESPONSE
<p>Stanwell (p.5) and CS Energy (p.2)</p>	<p>CS Energy suggested reason codes and recall times would not have a material impact on the outcome of potential replacement plant business cases.</p> <p>Stanwell considered that for investment decisions it is unlikely to matter whether a unit is available on 25 hours' notice or 3 or 7 days - it is more likely investors would look to longer term reporting.</p>	<p>provided over 1-year and 3-year timeframes.</p> <p>The Commission considers that the reason and recall time collected and published under the draft rule would improve transparency around investment opportunities. Through MT PASA, investors will have access to:</p> <ol style="list-style-type: none"> <li>1. daily megawatt availability which could indicate whether a unit could be available or not during a period</li> <li>2. the reason a unit not available which could indicate how possible/likely it is that a unit's availability may change and under what conditions</li> <li>3. the recall time which could indicate how quickly a unit's availability could change.</li> </ol> <p>Together this information allows stakeholders to form more a more nuanced view of what the supply outlook may look like under different future scenarios and inform investment decisions.</p>
<p>Stanwell (p.3)</p>	<p>Stanwell points out that for generators which are "PASA available" but may expect to be offline for portions of the day (e.g., storage, gas peakers, or 2-shifting coal units), neither the current, nor the proposed MT PASA data sets will provide any detail of such intra-day</p>	<p>This draft rule does not intend to support AEMO or other stakeholders in identifying or responding to power system needs in operational timeframes. MT PASA is primarily a medium-term planning tool. MT PASA availability indicates capacity that <i>could</i> be</p>



STAKEHOLDER	ISSUE	AEMC RESPONSE
	<p>operation.</p> <p>Stanwell also suggests that an alternative mechanism targeted at providing more information on standby modes, could be implemented potentially relating to ST PASA rather than MT PASA.</p>	<p>available for a relevant period seven days to 36 months in the future but is distinct from a participant's <i>intention</i> to generate during that period. AEMO has a range of other operational tools it uses to understand and respond to power system needs that may arise from intra-day cycling.</p>
Stanwell (p.4)	<p>Stanwell raises specific concerns relating to specific reason codes for example:</p> <ul style="list-style-type: none"> <li>- that reason codes are not relevant if you know that the unit can be brought into service and what lead time is required</li> <li>- whether partial deratings would require a reason code and/or additional reporting</li> </ul>	<p>The form and approach for collecting and publishing both reason codes and recall times will be developed by AEMO and reflected in updates to the Reliability standard implementation guidelines (RSIG). AEMO is required to consult with stakeholders through the <i>Rules consultation procedures</i> when updating the RSIG to reflect this draft rule.</p>
Stanwell (p.5)	<p>Stanwell raised a concern relating to how AEO might recall an asset under the draft rule including:</p> <ul style="list-style-type: none"> <li>• How will decisions be made by AEMO to recall an asset and which asset(s)?</li> <li>• Is there an order of priority or set of criteria for selecting how and when an asset is recalled noting several assets may be in flexible operating mode and have a recall time of 36-48 hours?</li> <li>•</li> </ul>	<p>The draft rule would require scheduled generators to provide a "unit state" or reason code explaining its availability or unavailability and a "unit recall time" to indicate the period in which the plant could be made available under normal conditions after a period of unavailability, not "if directed" by AEMO. This is consistent with the purpose of PASA which is to collect and publish information that can help participants make informed decisions and to allow the market to operate effectively with minimum amount of intervention by AEMO.</p>

STAKEHOLDER	ISSUE	AEMC RESPONSE
	<ul style="list-style-type: none"><li>• What are the potential financial implications (whether penalties or compensation) for asset recall where timing does not exactly match published information or the reason for the recall does not come to pass?</li><li>• How would the recall mechanism integrate with existing AEMO backstop powers – particularly short-term RERT?</li></ul>	<p>The draft rule would not change the way AEMO undertakes its reliability assessment in MT PASA. The draft rule will not change the process AEMO uses to intervene in the market.</p>

## D LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this draft rule determination.

### D.1 Draft rule determination

In accordance with s. 99 of the NEL the Commission has made this draft rule determination in relation to the rule proposed by the Australian Energy Market Operator (AEMO)

The Commission's reasons for making this draft rule determination are set out in Section 2.2.

A copy of the more preferable draft rule is attached to and published with this draft rule determination. Its key features are summarised in Chapter 1 detailed in chapter 3.

### D.2 Power to make the rule

The Commission is satisfied that the more preferable draft rule falls within the subject matter about which the Commission may make rules. The more preferable draft rule falls within s. 34 of the NEL as it relates to regulating the activities of persons participating in the national electricity market or involved in the operation of the national electricity system.<sup>126</sup>

### D.3 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO. In this instance, the Commission has made a more preferable rule. The reasons are summarised in **section X**.

### D.4 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

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<sup>126</sup> (NEL ss. 34(1)(a)(i) and (iii)).

As the rule relates to parts of the NEL that currently do not apply in the Northern Territory, the Commission has not assessed the rule against the additional elements required by the Northern Territory legislation.<sup>127</sup>

## D.5 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first round consultation
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.<sup>128</sup>

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared network functions.<sup>129</sup> The more preferable draft rule is compatible with AEMO's declared network functions because they would not affect those functions.

## D.6 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the Energy Ministers' meeting that new or existing provisions of the NEL be classified as civil penalty provisions.

The Commission's draft more preferable rule inserts new clause 3.7.2(d1) in the NEL. The Commission considers that this paragraph should be classified as a tier 1 civil penalty provision for consistency with the similar provision in clause 3.7.2(d). This existing paragraph is currently classified as a tier 1 civil penalty provision under NEL Schedule 1 of the National Electricity (South Australia) Regulations.

The Commission will seek to make a recommendation to the Energy Ministers Meeting that new paragraph (d1) be a tier 1 civil penalty provision at the time the final rule is published.

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127 From 1 July 2016, the NEL, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NEL have been adopted in the NT. (See the AEMC website for the NEL that applies in the NT.) National Electricity (Northern Territory) (National Uniform Legislation) Act 2015.

128 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council. The Energy National Cabinet Reform Committee (ENCRC) and the Energy Ministers' Meeting (EMM) were established to replace the former COAG Energy Council following the disbandment of COAG in May 2020.

129 Section 91(8) of the NEL

## D.7 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NER be classified as conduct provisions.

The draft rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the draft rule be classified as conduct provisions.

## E EXISTING INFORMATION PROVISIONS RELATING TO GENERATOR AVAILABILITY

The Commission has tabulated NER requirements relating to information provision on generator availability. These are shown below:

**Table E.1: NER requirements relating to information provision on generator availability**

<b>INSTRUMENT OR PROCESS</b>	<b>DESCRIPTION</b>	<b>TIME HORIZON</b>	<b>INFORMATION COLLECTION FREQUENCY</b>
ST PASA	ST PASA is the tool AEMO uses to forecast reliability and security in the NEM up to seven days ahead. Scheduled generators must submit their available capacity under expected market conditions	Present - 7 days (Operational timeframe)	Update as frequently as changes occur
NER clause 4.9.9	Requires scheduled generators to notify AEMO of any events that change or are likely to change the operational availability of a generating unit.	Operational timeframe	Update when a generator is aware of an event that would change unit availability
MT PASA	MT PASA is the tool that AEMO uses to forecast and inform the market of reliability over the period from 7 days to 36 months ahead. This is done primarily to elicit a response from the market.	7 days - 36 months (Planning timeframe)	Update as frequently as changes occur
NER clause 4.8.5A (Outage recall portal)	Allows AEMO to request information on plant status and any expected or	Operational timeframe	As requested by AEMO

INSTRUMENT OR PROCESS	DESCRIPTION	TIME HORIZON	INFORMATION COLLECTION FREQUENCY
	planned outages and an indication of the possibility of either deferring or recalling from an outage, to determine the latest time that AEMO could intervene.		
Generator notice of closure	Scheduled generators must inform market of their intention to exit the market at least 42 months before doing so. Retirement dates cannot be moved to < 42 months from present without exemption from AER.	Planning and investment timeframe	Update as frequently as changes occur
Summer readiness reporting	Key industry players provide AEMO with the requisite information to assess the readiness of the power system to operate reliably through the summer period.	3 - 4 months (Planning timeframe)	Annually upon request from AEMO
Energy adequacy assessment projection (EAAP) / Generator energy limitation framework (GELF)	EAAP forecasts electricity supply reliability in the NEM over a 2 year horizon. It gives particular consideration to water and fuel availability and its potential variability. Generators are required to submit details on plant energy constraints to	24 months (Planning timeframe)	Annually & when new info that may materially alter most recent EAAP becomes available. GELFs submitted quarterly

INSTRUMENT OR PROCESS	DESCRIPTION	TIME HORIZON	INFORMATION COLLECTION FREQUENCY
	AEMO through the GELF		
Electricity statement of opportunities (ESOO)	The ES00 forecasts electricity supply reliability in the National Electricity Market (NEM) over a 10-year period to inform decisions by market participants, investors, and policy-makers. As part of this process AEMO surveys participants of their expected unit capability across the year.	10 years (Planning and investment timeframe)	Annual with Quarterly Updates - Generators should update AEMO as soon as practicable on any changes

Source: Compiled by AEMC from Rules



## F CURRENT ARRANGEMENTS FOR MT PASA

PASA is a key part of the reliability framework in the NEM. It is one component of the information that AEMO must publish to inform the market of prevailing and forecast conditions, and when reserves may be running low, to elicit a market response. PASA is AEMO's principal method of forecasting the adequacy of the power system to stay within the reliability standard i.e. will there be enough supply to meet forecast demand? It is a requirement under the NER that AEMO administer PASA processes.<sup>130</sup> To determine if there is sufficient capacity expected to be available to meet forecast demand over the medium term (2-3 year) time horizon, AEMO employs the medium term PASA process. MT PASA essentially "picks up" from the notice of closure and ESOO frameworks and hands-off to the ST PASA process around a week ahead of dispatch, and as such is not used for real-time or short-term decision making.

Under the current MT PASA process, AEMO collects from participants the capacity that each dispatch unit could make available given 24 hours of notice.<sup>131</sup> Participants submit their expected plant availability for the next 36 months and are required to update their PASA submission on an ongoing basis to ensure it matches their current intentions and best estimates. Notably, plant availability is distinct from a participant's intention to generate, it represents the availability of plant to generate if market conditions are favourable to do so. This is distinct from ST PASA where availability signals that a participant is willing to generate at or above a certain wholesale price.

AEMO produces 50% probability of exceedance (POE) and 10% POE demand forecasts for the next 24 months. These two forecasts and other information (from TNSPs and MNSPs, weather, wind, etc) are then combined to assess a number of factors including the likelihood of the reliability standard being breached and the probability of lost load on a given day.<sup>132</sup> The process for assessing any projected failure to meet the reliability standard is detailed in AEMO's RSIG.<sup>133</sup>

AEMO collects availability information from participants and publishes the MT PASA once a week, with daily resolution and a 24-month forecast horizon. Additional to the forecast results, they also publish availability by dispatch unit over a 36-month forecast horizon, again with a daily resolution.<sup>134</sup> Participants use this information to assist them in their operational and investment decision-making, most commonly for outage scheduling. Under the existing framework, participants can infer when outages are scheduled to end from the dates the unit has a non-zero availability.

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130 NER Clause 3.7.1 (a)

131 See the definition of 'PASA availability' as defined in the NER Chapter 10

132 For more detail on the inputs prepared by AEMO for MT PASA, see NER *Clause 3.7.2 (c)*

133 The RSIG sets out how AEMO will implement the reliability standard and the interim reliability measure. More detail on what they cover can be found in NER *Clause 3.9.3D*

134 For more detail on the information published by AEMO for MT PASA see NER *Clause 3.7.2*