

30 July 2018

Mr John Pierce
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Australian Energy Market Commission
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By electronic submission

Dear Mr Pierce

National Electricity Amendment (Enhancement to the Reliability and Emergency Reserve Trader) Rule 2018 – Consultation Paper

Thank you for the opportunity to comment on the consultation paper to the Australian Energy Market Commission's (AEMC) Enhancement to the Reliability and Emergency Reserve Trader (Enhanced RERT) rule change process.

Operating the National Electricity Market (NEM) in real-time is becoming increasingly challenging as the resource mix has begun to transition to a more decentralised and less controllable system. Reliability risk has evolved into a dynamic, complex mix of interlinked drivers over different time frames. In this context, AEMO has begun to assess operational reliability in the NEM, and the potential need for clearer frameworks, complementing the existing Reliability Standard, guiding how reliability is achieved in real time. As the RERT mechanism will continue to be a crucial safety net against the cost and risk of reliability shortfalls, AEMO has proposed to enhance its effectiveness through a longer procurement and contracting timeframe, linking its procurement closer to AEMO's real-time operation based on a broader assessment framework, and product standardisation.

AEMO believes our Enhanced RERT proposal is consistent with the AEMC's assessment principles in the consultation paper, as it is aimed at delivering an efficient reliability safety net at lower cost with very limited potential of distortion in the energy market. AEMO has proposed this submission with the following objectives:

- Add new analysis and information that has been prepared since the original rule change request
- Address industry concerns that have been raised regarding the RERT (primarily related to costs and risk of market distortion)
- Address questions in the AEMC's consultation paper

AEMO's submission contains the following key messages:

- The enhanced RERT proposal is aimed at providing a more effective safety net at lower total cost in an energy market with an increasingly volatile supply-demand balance. Its potential for market distortion will be small compared to the potential efficiency improvement.

ENHANCED RERT SUBMISSION COVER LETTER

- Having a longer procurement lead time of one year and the option to contract for up to three years contributes to a more efficient safety net by providing more certainty to potential suppliers and reducing total procurement costs.
- The current reliability standard based on average annual USE does not consider the uncertainty dimension of a more volatile market, and has an inherent disconnect with AEMO's operational reliability decision-making.
- Linking the RERT procurement to the reliability standard may be inefficient and could lead to higher costs and reliability risk for consumers. The RERT procurement decision should be assessed against a broader framework that considers both the cost and risk of unserved energy versus the cost of the RERT.

In the attached submission, AEMO has described in some detail the issues above and our responses to some of the questions in the consultation paper. If you would like to discuss the contents of this submission further, please do not hesitate to contact Paddy Costigan on 03 9609 8407 or Paddy.Costigan@aemo.com.au.

Yours sincerely



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Attachment: Submission to the Enhanced RERT Rule Change Direction Paper

**Submission to the Enhanced RERT Rule
Change Direction Paper**

July 2018

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1. Introduction

AEMO welcomes the opportunity to comment on the Australian Energy Market Commission's (AEMC) Consultation Paper on the Enhanced Reliability and Emergency Reserve Trader (RERT) rule change proposal¹. The Consultation Paper sets out the AEMC's assessment principles and asks for stakeholders' views on various issues related to the design of the Enhanced RERT including:

- Procurement lead time of the RERT
- The appropriateness of the reliability standard
- The determination of procurement trigger and volume, and its governance and transparency
- Various aspects of the enhanced RERT product

Operating the National Electricity Market (NEM) in real time is becoming increasingly challenging. Over recent years, the resource mix has begun to transition to one that is increasingly decentralised and less controllable, as conventional thermal generation is replaced by variable renewable capacity. Traditional risk conceptions informing how reserve capacity is managed to achieve and maintain the supply-demand balance may be challenged as the generation mix transitions, potentially restricting the effectiveness of the operational levers at AEMO's disposal.

Driven by investment and operational decisions on both the demand and supply side, reliability risk has evolved into a dynamic, complex mix of interlinked drivers affecting system operation over different time frames. Operational processes and standards need to continue to evolve to ensure the long-term interests of consumers continue to be served.

During the 2017/18 summer, AEMO had to dispatch resources under the RERT mechanism for the first time in response to a forecast reliability shortfall. This was due to the impact of a number of inter-related risks on the supply-demand balance in SA and Victoria, including extreme hot weather and the reduced performance or unavailability of aging assets. The nature, extent and complexity of reliability risks will continue to be present as the resource mix continues to evolve.

In this context, AEMO has begun to assess operational reliability in the NEM, and the potential need for clearer frameworks, complementing the existing Reliability Standard, guiding how reliability is achieved in real time. The RERT mechanism will continue to play a crucial role as a strategic reserve, providing a safety net for consumers in the future in the face of increasing uncertainty. AEMO seeks to maximise the effectiveness of this safety net and has therefore proposed the following in its Enhanced RERT rule change request:

- Extending the procurement lead time to a year and having the option of contracting for up to three-years. This will facilitate a better planned and more competitive procurement process, so that RERT quantities can be acquired at lowest cost.
- Linking the RERT procurement to a broader cost and risk assessment framework, which will balance the cost and risk of unserved energy against the cost of RERT procurement.
- Designing standardised RERT products to enable more competition and enhance the efficiency of both the procurement and the operation of the RERT.

The remainder of the submission is organised as follows:

- Section 2 on the consistency of the RERT with the AEMC's assessment principles
- Section 3 on the procurement lead time and multi-year contract
- Section 4 on AEMO's rationale for delinking RERT procurement with the reliability standard
- Section 5 on the broader assessment framework for determining the RERT procurement
- Section 6 on AEMO's recommendation on the level of prescriptiveness of the RERT on various aspects of the enhanced RERT design.

2. The AEMC's assessment principles

¹ AEMC, *Consultation Paper, National Electricity Amendment (Enhancement to the Reliability and Emergency Reserve Trader) Rule 2018*

In its consultation paper, the AEMC proposed that it will assess the proposal based on three principles² of minimising market distortion, minimising direct cost and promoting reliability of the power system. AEMO believes our Enhanced RERT proposal is consistent with the principals as it is aimed at delivering an efficient reliability safety net at lower cost with very limited potential of distortion in the energy market.

2.1 Delivering reliability to reflect willingness to pay

The RERT should ensure that reliability can be delivered to a level consistent with the valuation placed on it by customers. This contrasts with involuntary load shedding, which is a blunt instrument that curbs supply to customers regardless of their willingness to pay. The current estimate of the NEM-wide Value of Customer Reliability (VCR)³ is significantly higher than the market price cap (MPC), which is the highest price a participant can receive in the energy market. As AEMO has recommended in our submission⁴ to the AEMC's Estimating Customer Reliability rule change process, the granularity of the VCR can be further refined based on location, customer segment, time of day/season and outage durations. If there are resources with dispatch costs between the VCR and the MPC that can be procured at low availability cost, it would seem more efficient to contract them under the RERT and dispatch them according to their marginal cost before involuntary load shedding.

2.2 The RERT and market efficiency

Some industry participants have expressed concerns about the potential distortionary impact of the RERT, and suggested that it could:

- Remove the incentive for in-market participants to respond when AEMO has procured a large amount of RERT, or
- Attract resources away from the energy market

AEMO considers the potential for market distortion is very limited for both the operation and long term dynamic investment in the market.

2.2.1 Incentive for in-market participants

The RERT will be activated when AEMO forecasts that reserve is required to ensure reliability of supply, or to maintain power system security, with insufficient in-market responses available before the last possible moment (based on activation lead time). At times of supply scarcity, the NER provides for RERT to be activated only after all valid dispatch bid and offers have been exhausted⁵. This should not dis-incentivise responses from market participants in a competitive market, especially given intervention pricing will preserve the price signal to the participants. In other words, how much RERT AEMO has in stock, and whether AEMO exercises the RERT or not, does not interfere with the participants' incentive to respond to market signals and manage their portfolio exposure in a competitive market.

This is what occurred on 30th November 2017 when AEMO activated the RERT due to the lack of sufficient market responses to a forecast LOR2 condition. A more detailed account of the event is contained in an Annexure of our Summer Operations Report 2017-18.⁶ It is worth noting that AEMO activated three RERT contracts within two hours. Had there been a market response, RERT would not have been activated on the day.

2.2.2 Long term dynamic efficiency

The concern that the RERT would attract resources away from the energy market seems somewhat unfounded in a competitive market, where non-transient market power cannot be sustained due to competition from multiple suppliers. Given the RERT is intended to be activated only after exhausting all in-market responses during times of supply scarcity, if a participant withholds its resources from the energy market in the hope of receiving a higher payment by signing the RERT, it will be out-ranked by other suppliers who directly offer their capacity into the energy market.

It is possible that if the availability payment were too high, it could potentially make the provider favour the RERT even if they do not expect to be dispatched. AEMO recognises this potential source of market distortion and has suggested that the AEMC could consider capping the availability payment. Together with the NER requirement⁷ that

² *ibid*, pp 24-25.

³ This is the aggregate NEM wide value as published in AEMO's 2014 *Value of Customer Reliability Review Final Report*, p2

⁴ AEMO, *Establishing Values of Customer Reliability Rule Change – AEMO submission*,
<https://www.aemc.gov.au/sites/default/files/2018-06/AEMO.pdf>

⁵ Clause 3.8.1.4 of the NER

⁶ AEMO, *Activation of unscheduled reserves for Victoria – 30 November 2017*, available at:

https://www.aemo.com.au/-/media/Files/Media_Centre/2018/Annexure-A_30-November-2017.pdf

⁷ Clause 3.20.3 (h) of the NER

AEMO not to procure reserve that is otherwise available to the market, this will further reduce participants' incentives to withhold resources from the energy market.⁸

2.2.3 Market distortion with insufficient RERT

Just like over-procuring, not having sufficient RERT could cause market distortion and result in long-term inefficiencies, as AEMO might be forced to use direction, which includes involuntary load shedding, more often in a market with a more volatile demand and supply balance. In addition to the direct costs associated with these forms of intervention, they can lead to market distortion in the long term:

- Frequent directions not only increase short-term operating costs to generators, but can lead to higher maintenance cost and disruption in their maintenance cycles. This could make it difficult for participants to optimise their portfolio and lead to early and inefficient exit of existing plant.
- More frequent load shedding could attract intervention directly from the government in the electricity market.

3. Procurement lead time and multi-year contracting

On 21st June 2018, the AEMC made a rule to re-instate the Long Notice RERT, which allows AEMO to contract up to nine months ahead of the projected shortfall.⁹ In its determination, the AEMC agreed that the longer lead time reduces the barrier to reserve participation, and will allow AEMO access to a wider range of reserve providers.¹⁰ Longer procurement lead time will also give AEMO sufficient time to plan the procurement process, and carefully evaluate offers from competitive tenders. These factors will contribute to lower RERT procurement costs. Extending the procurement lead time to one year will unlock further benefit in these aspects.

While AEMO proposed to contract for up to three years, this will be done only if it is expected to lead to lower cost of RERT consistent with the RERT Guidelines and 3.20.2(b) of the NER. For example, in year t , AEMO identifies persisting gaps for year $t+1$, $t+2$ and $t+3$. In this case, signing a three-year contract for part of the volume gap could offer greater certainty to the resource provider and avoid administrative overheads, leading to lower total procurement costs.

AEMO notes the one-year RERT procumbent lead time is consistent with AEMO's role of "Procurer of Last Resort" in the draft National Energy Guarantee (NEG) design, and will continue to work with the AEMC to ensure the enhanced RERT design is consistent with the NEG.

4. The reliability standard and RERT procurement

4.1 Inconsistency between the reliability standard and real-time operation

The reliability standard for generation and inter-regional transmission elements of the NEM is the maximum expected annual unserved energy (USE) in a region¹¹, and its level is currently set at 0.002%. In the Medium Term Projected Assessment of System Adequacy (MT PASA), AEMO forecasts the annual percentage of USE over a two-year horizon,¹² and identifies a potential breach of the reliability standard in a region if the annual weighted average USE exceeds 0.002% in that region.

⁸ AEMO, *Proposal for an Enhanced Reliability and Reserve Trader (RERT)*, p7

⁹ AEMC, *Rule Determination, National Electricity Amendment (Reinstatement of long notice Reliability and Emergency Reserve Trader) Rule 2018*

¹⁰ *Ibid*, pp 20-21.

¹¹ Clause 3.9.3C(a) and (b) of the NER. It excludes unserved energy associated with power system security incidents such as multiple contingency events, transmission and distribution network outage, etc.

¹² MT PASA currently uses 1600 simulations consisting of different demand, intermittent generation and plant outage scenarios.

Operational reliability refers to the management of supply and demand over operational timeframes (minutes, hours and days). Operational reliability intervention decisions are currently based on forecast LOR 2 and 3 conditions in the Short Term PASA (ST PASA) process over a six-day study time frame, updated every two hours. Additionally, a 'pre-dispatch' forecast to the end of the next market day is updated every half hour.

Extreme events with the potential for high impact occur relatively frequently in the power system. To date, however, such events have rarely led to involuntary load shedding, due to higher available reserve margins and less volatility in the supply-demand balance. The embedded resilience in the system has decreased with recent market developments. Over recent months, AEMO has been investigating and quantifying the nature of operational reliability challenges in relation to the changing dynamics of the power system, including:

- The retirement of thermal generation and the aging of the existing fleet have reduced the safety margin in some regions.
- The growing renewable fleet has increased the system's exposure to extreme weather events, including wind/solar drought, or a sudden change in the availability of these sources.
- AEMO's Integrated System Plan (ISP) shows high solar energy correlation across the NEM, and high correlation of wind energy within states. This means increasing volumes of VRE will increase volatility in electricity market dispatch.
- Extreme weather conditions might be reasonably expected to become more frequent and can cause coincident risks to the system. For example, high temperature can be correlated with high system demand, low wind availability and derating of thermal generation.
- Increasingly challenging system operation due to increased forecast uncertainty (driven by increasing volumes of variable renewable generation), increasingly challenging shoulder seasons, and difficulties in scheduling maintenance (both generation and transmission).

The current risk profile is unprecedented in its complexity, meaning power system operation is now at its most challenging since the formation of the NEM. The changing environment has stretched the limits of the existing operational reliability framework, and real time processes and tools. AEMO's challenge is to maintain reliability, utilising a fleet of assets and resources on the system that now has different operating characteristics to before. These challenges are universal, presenting internationally even in larger systems.

AEMO's ongoing work is indicating a disconnect between the existing reliability standard set at an annual ceiling on expected unserved energy and expectations for real-time operation:

- The reliability standard is intended to serve as a 'planning' standard, signalling to policy makers and the market the need for long-term investment. *At the planning stage*, the average USE can be within the reliability standard, even if a number of individual scenarios might contain high levels of USE.
- "In real-time during periods of supply scarcity, however, AEMO is required to use its reasonable endeavours to dispatch bids and offers, then activate reserve, before utilising its powers of direction (such as to initiate load shedding).

Given the increasingly dynamic and complex risk profile, there may be a need for clearer frameworks, or clarity on the interpretation of existing mechanisms, guiding how reliability is achieved in real time.

4.2 Lack of uncertainty dimension in the reliability standard

The RERT can be considered as an "insurance product" for the NEM and its end consumers. The main value of an insurance product arises from the amount of protection it offers in plausible extreme conditions. When a typical household decides whether to buy car insurance, it does not make the purchase conditional on the annual expected loss in accidents exceeding some percentage of household income. Instead, it will likely assess the cost of insurance, potential losses in accidents, especially those arising from extreme events and the likelihood of those events happening. Similar insurance consideration should be given to the reliability of energy supply. This is particularly important given reliability related USE is likely to be correlated with high demand periods during extreme weather conditions, where a sudden loss of power could lead to significant community costs, for example, due to health-related issues. However, this is not reflected in the current reliability standard, which is based on annual USE.

AEMO considers the focus of the current rule change process should be on the procurement of the RERT, which, as argued below, should be delinked from any planning reliability standard. However, AEMO considers it may be worth investigating, in a separate forum, the economic basis of the current reliability standard and whether it adequately reflects the economic cost and risk trade-off.

4.3 Delinking the RERT procurement from the reliability standard

The above discussion suggests there can be inefficiencies in linking the RERT procurement to the projected breach of the current reliability standard, or any alternative planning reliability standard expressed in annual terms. While AEMO can procure reserves to meet the reliability standard, the amount of prospective involuntary load shedding that would arise in some operational scenarios can be extremely large, potentially with reserve options left on the table. AEMO does not consider those outcomes would meet most stakeholder expectations. Therefore, in this rule change, AEMO seeks to clarify how uncertainty can be incorporated in determining the volume of RERT procurement.

4.4 The RERT procurement and reliable operating state

In its consultation paper, the AEMC asked whether the RERT procurement should be linked to a reliable operating state.¹³ The current definition of the reliable operating state in the NER¹⁴ is when:

- AEMO has not disconnected, and does not expect to disconnect, any points of load connection under clause 4.8.9;
- no load shedding is occurring or expected to occur anywhere on the power system under clause 4.8.9; and
- in AEMO's reasonable opinion the power system meets, and is projected to meet, the reliability standard, having regard to the reliability standard implementation guidelines.

AEMO does not think it is appropriate to link the RERT procurement to a reliable operating state.

A reliable operating state would mean no load shedding, which would be prohibitively expensive to maintain. Practically, in the first two conditions, involuntary load shedding has already occurred, or is expected to occur. Both scenarios would give AEMO zero or very limited time to procure the RERT. The third condition essentially means the RERT procurement condition would be linked to the current arrangement, which is inefficient as argued above.

5. Procurement trigger and volume

5.1 Purpose of changing the procurement trigger

In its consultation paper, the AEMC considers that AEMO's purpose of proposing changes to the RERT procurement trigger is not clear.¹⁵ As set out in Section 4, AEMO considers the current procurement trigger to be inefficient. Our proposed changes are aimed at ensuring that an optimal level of RERT is procured to provide an effective safety net for the market and deliver the level of reliability that reflects customers' willingness to pay.

5.2 A broad assessment and procurement framework

AEMO sees benefits in assessing the procurement of RERT under a broader cost and risk assessment framework through which AEMO will regularly assess the emerging market supply/demand status. It is envisaged that AEMO will procure RERT based on the outcome at each assessment stage. Each time AEMO would consider the RERT volume already under contract, and only acquire additional amounts up to an optimal level. However, when a demand and supply gap is identified with very short lead times (e.g., in the ST PASA timeframe), it might be more practical to employ a simplified assessment option.

AEMO proposes to remove any explicit trigger for procurement, as the assessment will result in an amount of RERT to be procured, which could be zero based on the projected market conditions. The AEMC's consultation paper outlined a few assessment options, that would consider the trade-off between¹⁶:

- The avoided cost of USE due to RERT, and
- The procurement cost of RERT

AEMO agrees that these are important factors to be incorporated into the assessment framework, and notes that the assessment can be based on the simulation results from AEMO's MT PASA modelling. Given the RERT's role as a safety net for the market, the assessment option should not only adopt a "risk-neutral" framework and rank RERT

¹³ AEMC, *Consultation Paper, National Electricity Amendment (Enhancement to the Reliability and Emergency Reserve Trader) Rule 2018*, pp 35-37.

¹⁴ Clause 4.2.7 of the NER

¹⁵ AEMC, *Consultation Paper, National Electricity Amendment (Enhancement to the Reliability and Emergency Reserve Trader) Rule 2018*, p22

¹⁶ *ibid.* pp 38-39

procurement levels entirely based on average or expected cost (residual USE cost and RERT procurement cost), but also incorporate an uncertainty aspect and consider the amount of reliability risk that is mitigated during extreme scenarios within AEMO's real-time operation. In addition to cost of USE and RERT procurement, the following factors should also be considered in the assessment:

- Economic approach that also minimises total costs and 'regret' costs associated with opportunity losses under uncertainty
- Level of insurance provided by RERT
- The outcome of USE measured in terms of level (i.e., MWh), duration and probability of occurrence.

The assessment could generate several different levels of RERT depending on the applied criteria. As AEMO is required to consult with the relevant jurisdictions¹⁷, AEMO will share assessment outcomes with them and decide on the final amount after consultation.

5.3 Transparency of assessment

The industry has asked for a more transparent procurement process. AEMO acknowledges that transparency is important and is happy to work more closely with the Reliability Panel or other relevant industry bodies at various important milestones of the procurement process. AEMO has published its Summer Operations Report 2017-18 which gives a detailed description of its activities in the 2017-18 summer.¹⁸ Ultimately AEMO is also required to consult with jurisdictions to finalise the procurement amount.

5.4 Procuring RERT for system security

The NER currently allows AEMO to use the RERT to manage system security issues¹⁹. So far AEMO has not used the RERT for this purpose but considers this to be a valuable option in our toolkit. The assessment framework and options proposed in section 5, however, are for reliability issues and require an assessment of the cost and risk of USE and should not be applicable when assessing the RERT for system security purposes. For example, a gas generator might be required to run during shoulder seasons to provide system strength, which is outside its normal operating season due to the low energy prices. In this case, the generator has no incentive to hold out from the energy market (as it would not be profitable to operate in the first place), but it could be inefficient to prevent it from being contracted under the RERT to provide system strength.

6. Prescription in NER

The AEMC's consultation paper has asked about how prescriptive the NER need to be about various aspects of the enhanced RERT, including the procurement volume and other product design aspects. AEMO considers that the NER are best placed to codify important principles and frameworks that will endure ongoing market movements such as new technologies and changes in costs and operating characteristics of technologies. The detailed methodology for determining the procurement volume and other design aspects that need to adapt to market evolution more often should be left to the RERT guidelines and procedures to ensure sufficient flexibility.

¹⁷ Clause 3.20.3(c) of the NER

¹⁸ Available at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Summer-operations-report>

¹⁹ Clause 3.20.3(b) of the NER.