Reliability Panel
AEMC

REVIEW

Reliability Panel AEMC

ISSUES PAPER

Review of the Reliability and Emergency Reserve Trader (RERT)

3 August 2010

Submissions due 17 September 2010. Reference: REL0041
Issues Paper

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005 to be the rule maker for national energy markets. The AEMC is currently responsible for rules and providing advice to the MCE on matters relevant to the national energy markets. We are an independent, national body. Our key responsibilities are to consider rule change proposals, conduct energy market reviews and provide policy advice to the Ministerial Council as requested, or on AEMC initiative.

About the AEMC Reliability Panel

The Panel is a specialist body within the AEMC and comprises industry and consumer representatives. It is responsible for monitoring, reviewing and reporting on the safety, security and reliability of the national electricity system and advising the AEMC in respect of such matters. The Panel's responsibilities are specified in section 38 of the National Electricity Law (NEL).

Reliability Panel Members

Chairman

Neville Henderson, Commissioner, Australian Energy Market Commission

Other AEMC Reliability Panel Members

Gavin Dufty, Manager Policy and Research, St Vincent de Paul Society, Victoria

Hugh Gleeson, Chief Executive Officer, United Energy

Mark Grenning, Chief Advisor Energy, Rio Tinto

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1 Introduction

1.1 Purpose of this Paper

The purpose of this Issues Paper is to seek views of stakeholders as to key issues associated with the expiry of the Reliability and Emergency Reserve Trader (RERT) and to assist and facilitate stakeholder consultation on the Reliability Panel (Panel) Review of the RERT as required by the Australian Energy Market Commission (AEMC) Terms of Reference (ToR) and requirements under the National Electricity Rules (Rules). This paper outlines the background to the RERT and key issues for consideration.

The Panel is a specialist body within the AEMC. It comprises industry and consumer representatives and is responsible for monitoring, reviewing and reporting on the safety, security and reliability of the national electricity system and advising the AEMC in respect of such matters. The AEMC is the national body responsible for the Rules that govern the operation of the National Electricity Market (NEM).[1] It is also responsible for the market development of the NEM.

1.2 The RERT Review

Clause 3.20 of the Rules provide for the RERT and its operation. The Rules also specify that the RERT is to expire on 30 June 2012, or alternatively on a date determined by the AEMC on the advice of the Panel in accordance with clause 3.20.9 of the Rules. Under clause 3.20.9 of the Rules, the Panel must, no later than one year prior to the date that the RERT is due to expire, complete a review of the RERT.

On 5 July 2010, the AEMC provided the Panel with ToR for a review of the reliability and emergency reserve trader (RERT Review) in accordance with the requirements under the Rules.[2]

The ToR require the Panel to undertake a review of the RERT arrangements under the Rules to determine whether the mechanism should expire on, or prior to 30 June 2012, or whether the RERT should be extended beyond the current expiry date, and, if so, to what date.

The AEMC ToR specify that the Review should specifically:

- consider if the RERT mechanism is required to ensure that the reliability of supply in a region or regions meets the relevant power system security and reliability standards and where practicable, to maintain power system security;
- examine the potential and/or actual effectiveness of the RERT arrangements as specified in the Rules;

1 The AEMC's responsibilities are specified in section 29 of the National Electricity Law (NEL).

2 ToR are provided in Appendix A.

- consider the national electricity objective (NEO) contained in section 7 of the National Electricity Law (NEL) when it considers issues that arise in the review and when making associated recommendations.

The ToR indicate that the Panel, in assessing the above, is not required to consider whether alternative arrangements should be put in place of the RERT.

The Panel must submit a written report to the AEMC on the Review setting out its recommendations, reasoning, and the procedure followed by the Panel in undertaking the review or determination.[3] The AEMC on receipt of the written report from the Panel of the RERT Review, may, taking into account the report, make a determination that the RERT is to expire and specify the date of expiry.[4]

1.3 Consultation process and review timetable

For this Review, the Panel is required to follow the consultation processes as set out in clause 8.8.3 of the Rules. The following key dates outline the key milestones, including stakeholder consultation that will be undertaken for the Review. The Panel intends to involve stakeholders by seeking initial comments and submissions on each of its key reports and by holding two public meetings during the course of the Review.

Indicative timetable

Milestone	Date
Issues Paper	2 August 2010
Public Forum	2 September 2010
Close of submissions on Issues Paper	17 September 2010
Draft Report	12 November 2010
Close of submissions on Draft Report	22 December 2010
Public Meeting	19 January 2011
Final Report	28 February 2011

1.4 Linkages to other relevant reviews or processes

There are a range of reports that are relevant to the issues to be considered in this Review, and which stakeholders should have regard to in conjunction with this Issues Paper. These reports are available at www.aemc.gov.au and include:

- Reliability Panel, Amended RERT Guidelines, Final Report (16 June 2010);

3 Clause 8.8.3 (j) of the Rules.

4 Clause 3.20.9 (d) of the Rules.

- Reliability Panel, Reliability Standard and Setting Review, Final Report (30 April 2010);
- Reliability Panel, Review of the Operational Arrangements for the Reliability Standard, Final Report (21 December 2009);
- AEMC, Improved RERT Flexibility and Short-notice Reserve Contracts, Rule Determination (15 October 2009);
- Reliability Panel, NEM Reliability Settings: Improved RERT Flexibility and Short-notice Reserve Contracts, Rule Change Proposal (10 August 2009);
- Reliability Panel, RERT Guidelines, Final Report (24 November 2008); and
- Reliability Panel, Comprehensive Reliability Review, Final Report (21 December 2007).

1.5 Submissions to this Issues Paper

The Panel invites comments from interested parties in response to this Issues Paper by 5pm (Australian Eastern Standard Time) on 17 September 2010.

1.5.1 Lodging a submission electronically

Submissions must be lodged online through the AEMC's homepage at www.aemc.gov.au using the link entitled "online lodgement".

The submission must be on letterhead (if an organisation), signed and dated by the respondent, and the submission must be in PDF format.

Upon receipt of the electronic version of the submission, the Panel will issue a confirmation email. If this confirmation email is not received within 3 business days, it is the submitter's responsibility to ensure successful delivery of the submission has occurred.

1.5.2 Lodging a submission by mail

The submission must be on letterhead (if an organisation), signed and dated by the respondent. The submission should be sent by mail to:

The Reliability Panel
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

or by Fax: (02) 8296 7899.

The envelope or fax must be clearly marked with the project reference code: "REL0041".

Except in circumstances where the submission has been submitted electronically, upon receipt of the hardcopy submission the Panel will issue a confirmation letter. If this confirmation letter is not received within 3 business days, it is the submitter's responsibility to ensure successful delivery of the submission has occurred.

2 Background to the RERT

2.1 Brief history of the RERT

Since the commencement of the NEM, the market operator (which is now known as the Australian Energy Market Operator (AEMO)) has had the power to contract for reserves (termed "reserve trading"). Reserve trading essentially enabled the market operator to procure additional reserves if a shortfall of reserves was forecast. It acted as a safety net in the event that the NEM did not deliver sufficient reserves to ensure that the Reliability Standard of 0.002% unserved energy (USE) was met.

Over time, the power for the market operator to operate the Reserve Trader has been reviewed and the associated sunset clause extended. For example, in 2006, following a Rule Change Proposal (and proposed Rule) by the Reliability Panel, the Rules were amended to extend the Reserve Trader provisions until 30 June 2008. Further, in 2008, following the Reliability Panel's Comprehensive Reliability Review, and subsequent Rule change proposal by the Panel, the Rules were amended and the original reserve trader provisions were redesigned to incorporate the current RERT provisions. The main operational changes at that time included:

- allowing the market operator to contract for reserves up to nine months ahead of a projected shortfall, instead of six months; and
- allowing the market operator to perform multiple tendering rounds, instead of being limited to one, so that the level of reserve contracting can be adjusted as more information becomes available.

In March 2009, as part of the Review the Operational Arrangements for the Reliability Standard, the Panel reviewed the need and possible design of a short notice version of the RERT for use in critical emergencies. The subsequent Rule change proposal was approved by the AEMC and the Rules were amended to:

- provide for long, medium and short-notice reserve contracting;
- clarify that AEMO may form a RERT panel; and
- clarify that AEMO may use reserve contracts during a system security event.

2.2 Current RERT mechanism

Under the Rules, the current RERT mechanism allows AEMO to intervene in the market to ensure reliability of supply and to maintain power system security. That is, the RERT enables AEMO to contract for additional reserves up to nine months ahead of a period where reserves are projected to be insufficient to meet the relevant power system security and reliability standards, and, where practicable, to maintain power system security and to dispatch these additional reserves should an actual shortfall occur. AEMO can contract for reserve under a range of timeframes, including:

- at least ten weeks notice of a reserve shortfall (long-notice RERT);
- between ten and one weeks notice of a reserve shortfall (medium-notice RERT); and
- between seven days and three hours notice (short-notice RERT).

The RERT is implemented by AEMO and allows:

- AEMO to obtain capacity that may not otherwise be available to the market;
- parties who have non-market generation capacity to make themselves known to AEMO and to declare what price those parties would need to be paid to use that capacity; and
- individual or groups of consumers to declare what remuneration they would need to be paid to have their load shed in excess of the saving in market price.

The Rules determine that the costs for contracting for reserves are shared between the affected jurisdictions, following consultation between jurisdictions (clause 3.20.3(c) of the Rules). Market Customers in these jurisdictions are allocated a share of the regional costs, based on their relative energy consumption between 8am and 8pm.[5]

In order to implement the RERT, the Rules require the Panel to publish guidelines which outline the operation of the RERT (clause 3.20.8 of the Rules). AEMO must have regard to these guidelines, where relevant, when exercising the RERT. In addition, AEMO is required to publish RERT procedures which detail the operation of the RERT (clause 3.20.7 of the Rules).

In June 2010, the Panel published the revised RERT Guidelines[6] which include amendments which were approved by the AEMC as part of the Improved RERT Flexibility and Shot-notice Reserve Contracts Rule.[7] The Panel notes that AEMO has recently commenced it's consultation on the Procedure for the exercise of the RERT.[8]

2.3 Use of the reserve trader

Since the start of the NEM, the reserve trader has been used twice by the National Electricity Market Management Company (NEMMCO).[9] NEMMCO contracted for 84 MW of additional reserves for the South Australian and Victorian regions for February 2005 based on forecasts in mid-late 2004 which showed a potential shortfall of 195 MW. The cost of acquiring these services was $1.035m. NEMMCO also acquired an

5 In accordance with clause 3.15.9(e) of the Rules.

6 In accordance with clause 11.31.3(d) of the Rules.

7 More information is available on the AEMC website at www.aemc.gov.au/Electricity/Rule-changes/Completed/Improved-RERT-Flexibility-and-Short-notice-Reserve-Contracts.html.

8 More information is available on the AEMO website at http://aemo.com.au/electricityops/rert.html.

9 On 1 July 2009 NEMMCO's responsibilities were transferred to AEMO.

additional 375 MW of reserves for the same regions for the summer of 2005/06 based on delays in the commissioning of Basslink and Laverton North power station. Acquiring these services cost approximately $4.4m. In both cases the reserves were not dispatched as conditions during those periods were favourable.[10]

The Panel notes that since the introduction of the current RERT mechanism in 2009, one participant has joined the RERT panel. Furthermore, the current RERT has not yet been exercised by AEMO.[11]

10 AEMC Reliability Panel, 2006, Comprehensive Reliability Review, p.42.

11 AEMO, Submission on the Consultation on the Amended RERT Guidelines, p.1.

3 Current framework in the NEM for ensuring reliability

Continuity of electricity supply depends on there being an adequate level of generation and network assets being available (supply reliability) and operated safely and securely (power system security). The NEM aims to deliver reliable and secure electricity supply to consumers. To a substantial number of consumers this constitutes uninterrupted supply.

Reliability in the NEM is a measure of the adequacy of the electricity generating systems and networks to meet the demand of consumers. Reliability depends on:

- whether there is sufficient generation available for a given region of the NEM to meet the consumer demand in that region; and
- the availability and adequacy of the transmission and distribution networks to deliver electricity from the generators to consumers.

From a consumer's perspective, reliability is affected by every element in the electricity supply chain. The Panel notes that consumers who experience supply interruptions are unlikely to be concerned with the type of supply interruptions, that is, from a consumers perspective, the lights are either on or not. Under the current NEM framework however, supply interruptions are categorised to enable more targeted mechanisms to be developed to ensure optimal power system performance and that supply is delivered to consumers as efficiently as possible.

Under the NEM framework, supply interruptions are categorised in accordance with the relevant stage of the supply chain, namely, as either generation, transmission or distribution. Supply interruptions are also categorised according to the cause of the problem, that is, either as a reliability related event or security related event. These are described below:

- Reliability events are characterised as those supply interruptions caused by a lack of capacity due to power system equipment reaching operating limits and occurs when all reserve capacity is exhausted, such as a supply interruption caused by insufficient generation or network capacity to meet consumer load. The likelihood of reliability events can generally be predicted ahead of real-time as demand and generation availability forecasts reveal supply deficits. As such, reliability events can be planned for and consumer load shedding can be managed.
- Security events are characterised as those supply interruptions caused by the rapid disconnection of power system equipment from service due to either equipment failure or the activation of protection systems, such as the simultaneous tripping of more than one generating unit due to a system disturbance, or the tripping of several transmission lines due to a bushfire. Security events occur when reserve capacity may still be available in the system, but cannot be accessed. Security events generally cannot be predicted ahead of real-time as equipment failure is sudden and unexpected. As such, load shedding

is generally indiscriminate, and is most often location specific or triggered automatically under the NEM's under frequency load shedding arrangements.

3.1 Reliability Standard

Reliability of the generation sector in the NEM is measured by the Reliability Standard.[12] The Reliability Standard includes USE associated with the generation sector and those transmission components that impact the inter-regional transmission flows. In some circumstances, it may include transmission components that influence flow to the regional reference nodes. In effect, this means that it excludes distribution and those transmission components that do not impact on inter-regional transfer capability. Distribution networks are subject to performance standards that are set and monitored by jurisdictional bodies. The Reliability Standard is the primary mechanism for encouraging the market to deliver enough capacity to meet consumers' demand for electricity. Effectively, the Reliability Standard is a measure of the expected amount of energy at risk of not being delivered to consumers due to available capacity.

In operational terms, the level of the Reliability Standard specifies how much USE is acceptable as a percentage of annual demand. The level is currently set at 0.002% USE per annum measured over the long term. On average, this is equivalent to the interruption of supply to every consumer in a region for approximately 10 minutes each year. The Reliability Standard is measured over the long term because it is not possible to guarantee that USE will not exceed 0.002% in any one year. The Reliability Standard is designed to deliver an expectation of 0.002% USE in a year. However, it is possible that the USE will be greater than 0.002% in some years and will be less than 0.002% in other years. The Reliability Settings for the NEM are designed such that on average, over the long term, the power system will achieve 0.002% USE.

AEMO aims to not exceed the Reliability Standard for each year. Due to demand and generator availability uncertainty, AEMO cannot guarantee that the USE would not be greater than 0.002% in any year. If AEMO's analysis determines that it is likely that the Reliability Standard will not be achieved in a year, AEMO can contract for reserves under the RERT provisions to increase the probability of achieving the Reliability Standard. In real-time, AEMO targets zero USE by taking all possible action to avoid involuntary load shedding. AEMO is able to target zero USE in real-time because close to dispatch it has a higher degree of certainty regarding demand and equipment availability and thus the likelihood of a capacity shortfall. However, USE can still occur if AEMO is unable to find sufficient reserves, particularly if it only has less than three hours notice.

In June 2010 the Reliability Panel completed the Review of the Reliability Standard and Reliability Settings.[13] As part of this Review, the Reliability Panel was required to

12 The Reliability Standard is available on the AEMC website at: www.aemc.gov.au/Panels-and-Committees/Reliability-Panel/Guidelines-and-standards.html.

13 The Final Report for the Review of the Reliability Standard and Reliability Settings can be found at: www.aemc.gov.au/Market-Reviews/Completed/Review-of-the-Reliability-Standard-and-Settings.html.

report on the Reliability Standard that it recommends should apply from 1 July 2012. The Reliability Panel determined to retain the current form, scope and level of the Reliability Standard, but to consider performance against the standard each year, rather than the current practice of measuring compliance over a ten year moving average. The aim of this change is to provide continuous improvement to the processes that monitor and maintain reliability in the NEM.

3.2 Reliability Settings to implement the Reliability Standard

The market price cap (MPC), the market price floor and the Cumulative Price Threshold (CPT) are the key price mechanisms within which the wholesale spot market seeks to balance supply and demand, and deliver capacity to meet the Reliability Standard. The level of the MPC and the market price floor are crucial because they provide key signals for supply and demand-side investment and usage. For example, if the MPC is set too high, Market Customers (retailers or consumers that are directly exposed to the spot price) and generators can be exposed to very large financial risks. However, if set too low, there may be insufficient incentives to invest in new generation capacity and demand-side response to meet the Reliability Standard. The MPC is currently set at $12 500/MWh and the market price floor is currently set at -$1 000/MWh.[14]

The CPT is an explicit risk management mechanism designed to limit participants' exposure to protracted high prices in the wholesale spot market. The CPT is currently set at $187 500/MWh.[15] If the sum of the half-hourly wholesale market spot prices over a rolling seven-day period exceeds this threshold, AEMO must impose an administered price cap (APC) until sustained high prices fall away. The APC is specified in a schedule published by the AEMC. The APC is currently $300/MWh (and -$300/MWh for the administered price floor) for all regions of the NEM, for all time periods.

As part of the Review of the Reliability Standard and Reliability Settings, the Reliability Panel recently reported on the Reliability Settings that should apply from 1 July 2012. The Reliability Panel found that there was not sufficient evidence that the target reliability would not be delivered to warrant increasing the risks created by significant real increase in the MPC or CPT. However, the Panel noted the possibility that capital costs of new generation may increase and may erode the real value of the Reliability

14 On 1 July 2010 the level of the MPC increased to $12 500/MWh as part of the National Electricity Amendment (NEM Reliability Settings: VoLL, CPT and Future Reliability Review) Rule 2009 No. 13, available at www.aemc.gov.au/Electricity/Rule-changes/Completed/NEM-Reliability-Settings-VoLL-CPT-and-Future-Reliability-Review.html.

15 On 1 July 2010 the level of the CPT increased to $187 500/MWh as part of the National Electricity Amendment (NEM Reliability Settings: VoLL, CPT and Future Reliability Review) Rule 2009 No. 13, available at www.aemc.gov.au/Electricity/Rule-changes/Completed/NEMReliability-Settings-VoLL-CPT-and-Future-Reliability-Review.html.

Settings. As such, the Panel recommended that the MPC and the CPT should be indexed to account for this change.[16]

3.3 Meeting the Reliability Standard - Minimum reserve levels

To determine whether the NEM is likely to meet the Reliability Standard, operational and planning decisions are made on a continuous basis. To allow these continuous decisions to be made, it is necessary to convert the 0.002% USE standard into an equivalent minimum reserve level (MRL), such that it is expected that the Reliability Standard will be met if the reserves in a given region equal or exceed the MRL for that region. That is, the MRLs "provide AEMO with an operational indicator as to whether each region is expected to meet the Reliability Standard. When a region's reserve margin falls below the MRL, AEMO may intervene in the market to maintain power system reliability."[17] Therefore, the MRLs need to be sufficiently large to minimise the risk of not meeting the Reliability Standard while not leading to excessive or unnecessary interventions.

The MRL is defined in terms of the minimum level of installed generating capacity and assumed interconnector support in excess of the 10% probability of exceedence (POE)[18] maximum demand in each region of the NEM required to achieve 0.002% expected USE in all regions simultaneously over a financial year.

There are important interactions between the Reliability Settings and the MRLs that impact the NEM's performance against the Reliability Standard. For example, an increase in the MRLs for each region (e.g. to reflect higher demand forecasts) would require greater amounts of reserve capacity. Given the role of the MPC in signalling the profit opportunities for investors, setting MRLs at a higher level may require an increase in the level of the MPC to attract additional investment.

Similarly, an increase in the level of the Reliability Standard (i.e. requiring greater reliability) is likely to require an increase in the MPC in order to signal the appropriate level of investment to meet the higher standard. If the price signal is ineffective at signalling the amount of investment required, AEMO may intervene more frequently to contract for additional generation or demand-side response to address any potential capacity shortfalls.

16 The Final Report for the Review of the Reliability Standard and Reliability Settings can be found at: www.aemc.gov.au/Market-Reviews/Completed/Review-of-the-Reliability-Standard-and-Settings.html.

17 AEMO, Electricity Statement of Opportunities, 2009, section 5.2.

18 The probability, as a percentage, that a maximum demand level will be met or exceeded (for example, due to weather conditions) in a particular period of time. For example, for a 10% POE maximum demand for any given season, there is a 10% probability that the corresponding 10% POE projected maximum demand level will be met or exceeded. This means that 10% POE projected maximum demand levels for a given season are expected to be met or exceeded, on average, 1 year in 10.

3.4 Intervention mechanisms

The reliability safety net refers to AEMO's powers to intervene in the market to address potential shortfalls of supply against the Reliability Standard. AEMO can exercise these powers when there:

- has been a failure of the market to deliver sufficient reserves; or
- is a risk to the secure and safe operation of the power system.

AEMO can intervene by procuring additional reserve (the RERT) or by issuing directions or instructions. Clause 4.8.9 of the Rules explicitly outlines AEMO's obligations in respect of reliability directions and is not subject to a sunset clause. Reliability directions are not considered in this review.[19]

3.5 Information

The Reliability Standard is also operationalised through the provision of information to market participants and other stakeholders. Under the Rules, AEMO operates a number of processes, over a range of time horizons, to inform the market of the current and projected levels of available reserves in relation to the MRLs, including:

- Electricity Statement of Opportunities (ESOO) - capacity availability over ten years;
- medium-term projected assessment of system adequacy (PASA) - capacity availability over two years;
- short-term PASA - capacity availability over one week;
- pre-dispatch - capacity availability and price over the next two days; and
- energy adequacy assessment projection (EAAP) - energy availability over two years.

The purposes of these processes are to:

- inform market participants of periods of low reserves (expected to correspond with higher prices) in order to elicit a market response; and
- determine whether the available reserves are likely to be sufficient to meet the Reliability Standard and, where appropriate and allowed under the Rules, whether intervention is required to increase the available reserves.

19 More information on market interventions can be found in section 2.5 of the Final Report of the Review of the Operational Arrangements for the Reliability Standard.

4 Key issues for the Review

As discussed in section 2, the RERT was primarily designed to manage only small levels of reserve shortfalls that are not enduring. The RERT was designed with a sunset clause. The Panel notes that previous forms of a reserve safety net have been reviewed by the Panel and extended as appropriate. However, generally, it was considered by the Panel, that in the longer term, the market should ideally be able to operate without the need for a distortionary mechanism such as the RERT.[20]

In considering the issue of whether the RERT mechanism is required to ensure that the reliability of supply in a region or regions meets the relevant power system security and reliability standards and where practicable, to maintain power system security, it is important to consider a number of issues. These include: the reliability outlook for demand and available capacity in the NEM going forward and the key factors/influences for driving investment.

4.1 Performance against Reliability Standard/Adequacy of reserve levels

The Panel notes that since the commencement of the NEM, the security and reliability of electricity supply has been sound. Technical performance has been maintained and market signals have promoted acceptable performance against the Reliability Standard.[21] Over the past 10 years, the average annual USE was well within the Reliability Standard of 0.002% for all regions and for the NEM as a whole. During this time, the average annual regional USE has exceeded the Reliability Standard twice, in Victoria and South Australia, in 2008-09, during a 1 in 20 year event.

4.2 The outlook for Reliability

AEMO provides a range of information to the market about emerging reserve deficits, specifically via its ESOO. The ESOO is prepared annually by AEMO and provides a ten year projection of the supply demand balance for both summer and winter maximum demand conditions. The ESOO includes projections of:

- the maximum summer and winter demands under different temperature and economic growth conditions;
- the available installed generation in each region;
- the available demand side response during periods of high demand; and

20 AEMC Reliability Panel Rule change proposal, NEM Reliability Settings Information, Safety Net and Directions, February 2008, p.11.

21 Table 5.1 of the Final Report for the Review of the Effectiveness of NEM Security and Reliability Arrangements in light of Extreme Weather Events shows the performance of the NEM against the Reliability Standard for the past 10 years.

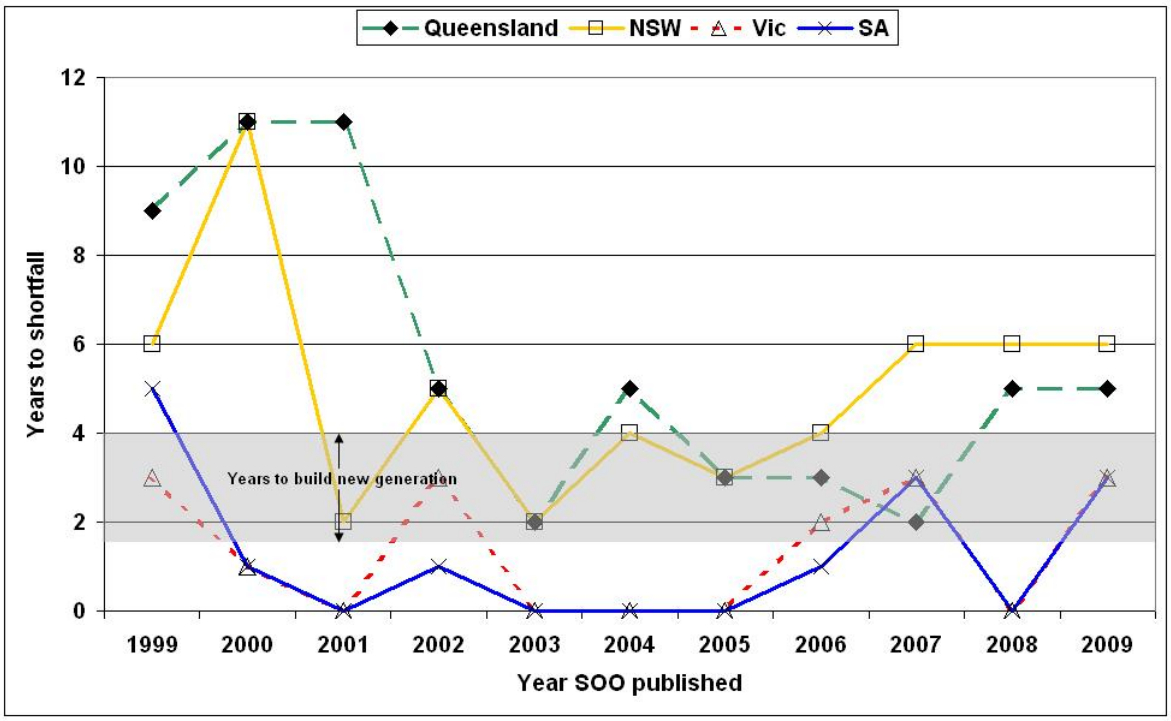
- the inter-regional transfer capability of the NEM transmission network.

Investors in the NEM rely on the ESOO as an important source of information. Periods of low projected reserves in the ESOO indicate likely periods of high prices and, therefore, are expected to encourage investment in additional capacity in the associated regions. If the market design is working, and the need for new investment is being appropriately signalled and incentivised, then the reserve shortfalls projected in the ESOO should never eventuate.

The AEMO 2009 ESOO predicts that NEM-wide energy demand is forecast to grow at 1.9% per annum over the next 10 years while the peak demand is forecast to grow at 2.5%. The ESOO also shows that the differential growth between energy and maximum demand varies between the respective NEM regions.

Figure 4.1 below illustrates the years until reserve shortfall as projected for each publication of the ESOO. To simplify the chart, Tasmania has not been included because Tasmania is not capacity constrained but rather energy constrained. The ESOO only considers capacity and cannot indicate a reserve shortfall due to energy limitations. As such the ESOO generally projects adequate reserves for the full ESOO outlook period for Tasmania.[22] As illustrated, the ESOO projected years until reserve shortfall changes from year to year as new generation is committed to and demand forecasts are revised.

Figure 4.1



22 Except for the 2008 ESOO which was just before the commitment of a major new power station in Tasmania.

The ESOO shows that there is sufficient generation capacity to meet the Reliability Standard up to 2011/12 in South Australia, 2012/13 in Victoria, 2013/14 in Queensland and 2014/15 in New South Wales.

4.3 Key factors for ensuring reliability

In section 3, the Panel noted the importance of the market settings for signalling supply and demand-side investment. A key issue for consideration is whether investment in generation is sufficiently timely to ensure the Reliability Standard is met (based on expected revenue returns from spot market and/or hedge contracts). Key factors for ensuring investment is timely include the willingness of investors to invest given market spot market volatility and the availability of contracting.

4.3.1 Revenue expectations and investment signals

To meet the Reliability Standard, the market must make available a minimum level of generation capacity and transmission capability. The incentives for generation capacity to be available are delivered through the wholesale market and, for transmission capability, through the regulatory framework contained in the Rules and administered by the Australian Energy Regulator (AER). The NEM design provides for periodic review of these frameworks to ensure the market signals remain appropriate.

The NEM is an "energy-only" market. This means that the predominant payment made to generators is based on the amount of energy they produce, and wholesale market customers (e.g. retailers) are charged according to how much energy their customers take from the market. This can result in prices that vary significantly, from tens to thousands of dollars, in a matter of hours. Other market designs, such as capacity markets, provide for separate payments to generators for being available to generate, and for providing reserve generation capacity.

Retailers and generating businesses both have an interest in managing the risk of price variations in the wholesale spot market. A key vehicle for market participants to manage this risk is to enter into contracts either bilaterally (e.g. between a retailer and a generator) or through exchanges.

There are a number of different types of contract, but the basic purpose of the contract is to convert a variable price (the spot price) into a fixed price (the contract price) for a specified volume. This can include contracts that cap prices at times of very high demand. The pricing of these contracts can provide important signals as to the value of additional capacity in the market.

Some of these contracts might be long term in nature. Investment in new generation might be predicated on signing such a long-term contract with a retailer. Some market participants have opted for vertical integration as a way of managing trading risk in the NEM in lieu of using contracts. Vertical integration is the consolidated ownership of both generation and retail portfolios. Instead of managing risk through contract

markets, vertically integrated players manage risk internally with their own generation capacity.

As discussed, energy market frameworks of the NEM provide incentives for participants on the supply side and demand side to make appropriate, timely decisions about production and usage in the short-term, and investment in the medium term. The principal signal of the need for new capacity is provided by the wholesale spot price. High wholesale prices signal that there may be profitable opportunities to invest in additional generation capacity.

Review of the Reliability Standard and Reliability Settings

In April 2010, the Panel completed its Review of the Reliability Standard and Reliability Settings as required under the Rules and in accordance with the ToR from the AEMC.[23] The objectives of this Review were to, amongst other things, recommend the appropriate Reliability Settings (that is, the MPC, CPT and market floor price) to achieve the Reliability Standard to apply in the National Electricity Market (NEM) from 1 July 2012, given the Reliability Standard chosen.

The Panel engaged ROAM Consulting to undertake modelling work to assist the Panel to form a recommendation as to the levels of the MPC and the CPT that should apply in the NEM. These values would take effect from 1 July 2012 and would apply for the 2012/13 and 2013/14 financial years. In considering the Reliability Settings, the Panel was required to have regard for the potential impact of any increase in the MPC on spot prices, investment and the reliability of the power system.[24]

With respect to the MPC and CPT, the Panel determined that commencing on 1 July 2012, the value of the MPC should be increased annually in real terms from $12 500/MWh according to the change in the Stage 2 (intermediate) Producer Price Index (PPI). The Panel also determined that commencing on 1 July 2012, the value of the CPT should also be increased from $187 500/MWh annually according to the same index that is applied to the MPC.

The Panel considered that the MPC and CPT were set at a level which was expected to deliver sufficient investment to meet the Reliability Standard. The Panel did note however, that it considered that the current reliability framework may be reaching the point where it is no longer adequate to achieve the multiple objectives of meeting the Reliability Standard, managing financial risk and meeting consumers' value of reliability. As a result, the Panel recommended that the AEMC should undertake a review of both the mechanism for delivery of the capacity to ensure reliability, and the impact of the risk allocation framework in the NEM on achievement of reliability in the

23 For more information see www.aemc.gov.au/Market-Reviews/Completed/Review-of-the-Reliability-Standard-and-Settings.html.

24 This requirement is identified in clause 3.9.4 of the National Electricity Rules.

long term.[25] A detailed overview of the Panel's final recommendations can be found on the AEMC's website.[26]

4.4 Broader factors which may impact on investment and reliability outcomes

Whilst the Panel has set the MPC and CPT to levels which are expected to deliver sufficient investment to meet the Reliability Standard, the Panel notes that it is important to consider that there may be some risks to reliability in the future, particularly if the market does not necessarily continue to operate in the same manner. The Panel recognises that the energy market is likely to face some challenges moving into the future, particularly in the context of tightening supply and demand, adjustments in financial markets, and the ongoing uncertainty regarding the external regulatory policies such as the Australian government proposed introduction of a potential price on carbon. The Panel considers it important to consider the broader risks/impacts that which may impact on investors response to market signals, and thus may potential impact on the likelihood of achieving expected reliability outcomes (i.e. investment in, and timing of generation to deliver reliability of supply). These are discussed further below.

4.4.1 External and policy regulatory factors

The Panel notes a significant issue for consideration is whether the energy-only market is subject to any distortions that may impact market price and thereby distort the signals for new investment, such as external policy and regulatory factors.

The Panel notes that the debate related to the introduction of a potential price on carbon is continuing and is presenting ongoing uncertainty for the market. It has been widely noted that the ongoing uncertainty related to the potential price on carbon is impacting on investors desire to invest and the timeliness of investment in generation in the market. In 2008, a report undertaken on behalf of the AEMC as part of the Review of Energy Market Frameworks in light of Climate Change Policy concluded that:

> "there is significant potential for a lack of capital to be allocated to the sector between 2008 and 2020. The majority of expenditure on capital for the sector is likely to back ended during this period given the fallout from the credit crisis and uncertainty about the way in which the market will respond to the [potential] CPRS and RET arrangements.[27]"

25 For more information see www.aemc.gov.au/Market-Reviews/Completed/Review-of-the-Reliability-Standard-and-Settings.html.

26 Ibid.

27 S3 Advisory, 2008, Financing of future energy sector investments in Australia, p.48.

4.4.2 Uptake of demand side participation

Competitive markets generally work best with an active demand side that disciplines the supply side by initiating voluntary reductions in demand as price rises. Electricity markets, however, are characterised by relatively low levels of demand side participation (DSP), and this contributes to the instability in price outcomes seen in spot prices, and hence to the volatility in investment returns to generators.

At present, DSP as a proportion of total load is still a relatively minor feature of the NEM. In particular, as noted above, direct demand-side participation as a scheduled load in the NEM has been and remains extremely limited. AEMO, in conjunction with the Load Forecasting Reference Group, surveyed network service providers, aggregators and market customers as part of the ESOO, in order to gather the extent of DSP available in each region and in the NEM overall. This survey showed a total of 754 MW of DSP was available. Of this, 195 MW was committed, meaning it had a high probability of being deployed in extreme circumstances, and 559 MW was uncommitted, meaning it may or may not be available if required. In addition, AER investigations have identified several apparent demand reductions in response to high prices, including of up to 350 MW in NSW when prices reached $8 800/MWh on 15 January 2009.[28]

The 2009 ESOO also indicated that there were a number of developments which have the potential to affect electricity usage and DSP, including the roll-out of smart metering, widespread adoption of hybrid electric vehicles, carbon capture and storage and alternative electrical energy technologies.[29]

In the Final Report for the Review of Demand-side Participation in the National Electricity Market, the AEMC concluded that the current environment where electricity is not capable of being measured, priced and controlled in real-time is likely to constrain the ability for the demand-side to participate in the electricity market at low cost. The Review considered that the introduction of smart meters and smart grids is likely to change this market significantly as it will enable active management of energy by consumers.[30]

4.4.3 Other factors - extreme weather

Extreme weather events have the potential to impact materially on the security and reliability performance of the NEM. These conditions, such as heat waves, may give risk to extreme peak demand which can exceed the generation capacity and transmission capability available at the time. Droughts can restrict generation availability, and storms and floods can damage transmission and distribution

28 AEMC 2009, Review of Demand-Side Participation in the National Electricity Market, Stage 2 Final Report, 27 November 2009, Sydney, p.5.

29 Section 8.3.3, 2009 ESOO, p.8-8.

30 The Final Report for the Review of Demand-side Participation in the National Electricity Market is available on the AEMC website at www.aemc.gov.au/Market-Reviews/Open/Review-of-Demand-Side-Participation-in-the-National-Electricity-Market.html.

networks. In addition, under a scenario in which extreme weather results in peakier demand, then it may mean that the number of hours that a new entrant open cycle gas turbine (OCGT) can run and recover its capital cost is reduced for a given level of the Reliability Standard, thus the level of the MPC would need to be higher.

Recently, the AEMC completed its Final Report to the Ministerial Council on Energy (MCE) regarding its Review of the Effectiveness of NEM Security and Reliability Arrangements in light of Extreme Weather Events.[31] This Review was to, in the context of more frequent extreme weather events, examine the current framework arrangements for managing security and reliability and to determine improvements which would strengthen the NEM's capacity to maintain security and reliability in the context of more extreme and/or frequent weather events in the future.

The Review examined the existing framework and mechanisms and considered improvements to enable consumer expectations for quality of electricity supply to be maintained in a future in which the frequency and/or severity of extreme weather events could be greater. In particular, the Review considered:

- whole of power system security and reliability;
- Reliability Standard and Reliability Settings;
- technical standards and issues;
- governance arrangements for policy decision making on the Reliability Standard and Reliability Settings; and
- demand and capacity forecasting and information.

4.5 Potential for market distortion

As stated above, the market operator has been able to contract for reserves since the start of the NEM. Since this time, there has also been concern about the impact of such a mechanism on the market and the potential for intervention mechanisms to diminish incentives for the market to respond to reserve shortfalls. In June 1998, the NECA Reliability Panel noted that:

> "...reserve trader activity should, as far as possible, not become enmeshed with investment in new resources and thereby have a long term impact on the market, but be limited to accessing resources that are otherwise available but have not been presented to the market for economic reasons.[32]"

31 The AEMC's Final Report has not been published. Further information on the review is available on the AEMC's website at www.aemc.gov.au/Market-Reviews/Open/Review-of-the-Effectiveness-of-NEM-Security-and-Reliability-Arrangements-in-light-of-Extreme-Weather-Events.html.

32 NECA Reliability Panel, 1998, Determination on Reserve Trader and Direction Guidelines, p.14.

In the Comprehensive Reliability Review, the Panel stated:

> "although it is a market distortion, on balance the costs are minimal when compared to the costs in the market overall and that if better specified, the mechanism could be less of a distortion.[33]"

The result of the Comprehensive Reliability Review was a Rule change proposal to the AEMC for the RERT which was "designed to impose minimal distortion on the operation of the NEM".[34]

Currently under clause 3.20.2(b)(1) of the Rules, AEMO is required to undertake actions that "have the least distortionary effect on the operation of the market" in exercising the RERT. This requirement is mirrored in the RERT Guidelines which specify that AEMO should minimise the distortionary effect in relation to both the short term impact on the spot prices and the long term impact on investment signals.[35] In addition, the market operator is only able to contract for reserves a short period prior to the anticipated shortfall (currently this is 9 months) to avoid diminishing market signals.

33 AEMC Reliability Panel, 2007, Comprehensive Reliability Review, p.76.

34 AEMC Reliability Panel, Rule change proposal - Improved RERT Flexibility and Short-notice Reserve Contracts, p.22.

35 See section 5.1 of the RERT Guidelines.

5 Effectiveness of the existing RERT mechanism

The Terms of Reference for this Review require that the Panel should examine the potential and/or actual effectiveness of the current RERT arrangements as part of its advice to the AEMC.

As discussed, where the market fails to respond to signals calling for additional generation capacity, the Rules enable AEMO to intervene and procure the additional capacity necessary to meet the Reliability Standard. Where time permits, AEMO may do this through the RERT. The Panel notes that the RERT is effective at managing irregular capacity shortfalls but is not designed to manage a long term failure by the market to induce adequate investment. Further, the distortions caused by intervening in the market are such that exercising the RERT is considered a last resort.

The Panel notes that the current RERT mechanism under the Rules has not been used to date since the amendments were proposed by the Panel via the Comprehensive Reliability Review (CRR), and subsequent Rule change. The Panel also notes that stakeholders have commented previously on their views of the effectiveness of the RERT and its appropriateness.

Questions

In addition to commentary on the issues raised in this Issues Paper, the Panel is also seeking comments from stakeholders on the specific questions below.

1. The Reliability Settings have been set at levels that are expected to encourage sufficient investment in new capacity. Do stakeholders consider that the residual risk of insufficient capacity being available in the future is high enough to retain a form of reliability safety net (of similar form to the reserve trader)?

2. If a form of reliability safety net is required, do stakeholders consider that the current short, medium and long-notice forms of the RERT are effective?

3. Do stakeholders consider that the current expiry date for the RERT is appropriate and, if not, what is the most appropriate date?

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APC	administered price cap
CPT	Cumulative Price Threshold
CRR	Comprehensive Reliability Review
DSP	demand side participation
EAAP	energy adequacy assessment projection
ESOO	Electricity Statement of Opportunities
MCE	Ministerial Council on Energy
MPC	market price cap
MRL	minimum reserve level
NEL	National Electricity Law
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NEO	national electricity objective
OCGT	open cycle gas turbine
Panel	Reliability Panel
PASA	projected assessment of system adequacy
POE	probability of exceedence
PPI	Producer Price Index
RERT	Reliability and Emergency Reserve Trader
Rules	National Electricity Rules
ToR	Terms of Reference
USE	unserved energy

A Terms of Reference

Review of Reliability and Emergency Reserve Trader

(RERT Review)

AEMC Terms of Reference to the Reliability Panel

29 June 2010

Introduction

The National Electricity Rules (Rules) currently provide for a Reliability and Emergency Reserve Trader (RERT) mechanism that allows AEMO to intervene in the market to ensure reliability of supply and to maintain power system security. That is, the RERT enables AEMO to contract for additional reserves up to nine months ahead of a period where reserves are projected to be insufficient to meet the relevant power system security and reliability standards, and, where practicable, to maintain power system security and to dispatch these additional reserves should an actual shortfall occur.

The RERT was primarily designed to manage only small levels of reserve shortfalls that are not enduring. It was considered by the Reliability Panel, that in the longer term, the market should ideally be able to operate without the need for a potentially distortionary mechanism such as the RERT[1]. Therefore, the Rules specify that the RERT has a sunset period for its operation.

Scope of this Review

Clause 3.20.1 of the Rules specifies that the RERT is to expire on 30 June 2012, or on a date determined by the AEMC on the advice of the Reliability Panel in accordance with clause 3.20.9 of the Rules. Clause 3.20.9 requires that the Reliability Panel, must, no later than one year prior to the RERT is due to expire, complete a review of the RERT arrangements.

In accordance with clause 3.20.9 of the Rules, the AEMC requests the Panel to undertake a Review of the RERT mechanism and recommend to the AEMC:

[1] AEMC Reliability Panel Rule change proposal, NEM Reliability Settings Information, Safety Net and Directions, February 2008, p.11.

(1) whether the RERT should expire on, or prior to, the date specified in clause 3.20.1 of the Rules (that is 30 June 2012); or

(2) whether the RERT should be extended beyond the current expiry date referred to in subparagraph (1) and, if so, to what date.

In undertaking the Review, the Panel should:

- consider if the RERT mechanism is required to ensure that the reliability of supply in a region or regions meets the relevant power system security and reliability standards and where practicable, to maintain power system security; and

- examine the potential effectiveness and/or actual effectiveness of the RERT arrangements as specified in the Rules.

The Panel in assessing the above is not required to consider whether alternative arrangements should be put in place. The Panel is also requested to consider the national electricity objective (NEO) contained in section 7 of the National Electricity Law (NEL) when it considers issues that arise in the review and when making associated recommendations.

Process and Timing

Clause 3.20.9(b) of the Rules requires that the Panel must conduct the RERT Review in accordance with clauses 8.8.3(d) – (l) of the Rules. The AEMC also requests that the Panel involve stakeholders in the Review by seeking stakeholder submissions on key reports and hold a public forum regarding the Review. This stakeholder consultation should be included into the Panel's workprogram and timetable for the Review.

Whilst it is noted that 30 June 2011 is the timeframe provided for under the Rules for the Panel's final report, the AEMC considers that in the interests of ensuring investment certainty for the market, the Panel should submit its report as soon as practicable.