

17 May 2007

Mr Ian C Woodward
Chairman, Reliability Panel
Australian Energy Market Commission
PO Box H166
Australia Square NSW 1215

Dear Mr Woodward

Comprehensive Reliability Review

Thank you for the opportunity to respond to the March 2007 Interim Report of the AEMC Reliability Panel.

Enertrade's submission proposes raising the value of lost load (VOLL) to \$15,000 in order to provide the opportunity for further revenue to cover the costs and risks of building adequate generation to meet the reliability standard. We also support further investigation of the range of capacity market mechanisms proposed in the Interim Report with a view to being ready to implement these options if it becomes apparent that the increase in VOLL has not been sufficient to induce adequate new generation capacity into the market.

Yours sincerely

Luke Berry
MANAGER, REGULATORY AND COMPLIANCE

I Executive Summary

Formulating the Reliability standard

The reliability standard should measure reliability in major load sub-regions with the NEM. This would help align the NEM-wide reliability measures with the reliability measures in the reliability limb of the regulatory test (which require delivery of reliability outcomes on a sub-regional basis).

Adapting the measure recognises that reliability shortfalls across major sub-regions are not acceptable to customers, even where reliability across the NEM or a region on average meets the reliability standard.

The system restart ancillary service (SRAS) divides regions into sub-regions for the purposes of the provision of SRAS services. These sub-regions represent one basis for determining areas for the measurement of reliability.

Providing correct market signals to meet the Reliability Standard

Enertrade support raising VOLL to \$15,000 as an interim measure for addressing the risk of insufficient generation to meet the Reliability Standard (noting, in particular, that the alternative concepts have only been briefly described in the Interim Report and the Interim Report considered it would take 3-5 years to introduce them). Enertrade supports further investigation of the Reliability Ancillary Service and capacity market concepts in the event that lifting VOLL to \$15,000 does not adequately address the generation shortfall.

The \$15,000 level is reasonably consistent with the quantitative analysis performed by the Review (which found (p.52) that a VOLL of \$12,500 was needed to induce sufficient new generation to cover future reliability requirements) while also allowing a margin for inflation and for the asymmetric risk to users if VOLL is set too low (i.e. the cost of interruptions is much higher than the cost of a small amount of overbuilding of generation that might result from VOLL rising more strictly necessary).

Enertrade supports further research, market monitoring, and rule development such that the market is ready to make the transition to capacity markets if and when it becomes apparent that the reliability settings, including a VOLL of \$15,000, is insufficient to deliver adequate reliability within the NEM.

II Formulating the Reliability Standard

Enertrade supports the view expressed in the Interim Report (p. 34) that reliability performance needs to be measured within each region rather than simply NEM-wide. Enertrade considers that as a practical matter, NEM-wide performance at the Reliability Standard level may conceal areas of significant and enduring poor performance, particularly as the way the Standard is bound to deliver performance in some areas that is significantly above average.¹ In particular, regions with less-well developed transmission networks are more likely to experience uneven performance around the average.

Enertrade considers that, in order to meet community expectations, NEM performance needs to be measured in major sub-regions within the NEM where significant load is located. Enertrade would not envisage performance would be measured across more than two or three sub-regions within each region. The major sub-regions designated for the purposes of system restart ancillary services could form one basis for determining significant sub-regions for the purposes of measuring performance.

An advantage of this approach is that it aligns the Reliability Standard with the natural outworking of the reliability limb of the Regulatory Test, under which transmission network service providers are expected to build transmission network or source non-network solutions to deliver acceptable levels of reliability to major subregions. It is also consistent with NEMMCO operating practice to take measures to ensure delivery of electricity to major load centres rather than just on average across a region.

[DN Derek – do you have any more info to add on existing NEMMCO practice??]

III Addressing future reliability performance in the NEM

William Hogan's paper on resource adequacy² indicates the problem of the 'missing money' which arises when energy market prices are artificially constrained by placing a cap on maximum prices. The missing money represents the shortfall in revenue that occurs when prices would naturally rise above the artificial cap on the market.

In the NEM, the VOLL mechanism caps wholesale prices in a way that has the power to reduce electricity revenues and discourage generation. VOLL distorts prices to the extent that the cap is likely to bind. In practice, as the NEM typically reaches VOLL a number of times each year, generators do lose revenue due to its presence.

¹ Generation and transmission are typically built in major increments. Therefore, depending on the rate of growth in demand, there is likely to be significant excess capacity in particular areas following new investment. Excess capacity would be most likely to occur in regions such as Queensland, where there are significant transmission constraints as it is more difficult to export such capacity to other areas.

² Hogan, William W., *On an "Energy Only" Electricity Market Design for Resource Adequacy*, Center for Business and Government, Harvard, September 23, 2005. See http://ksghome.harvard.edu/~whogan/Hogan_Energy_Only_092305.pdf

The Reliability Panel's quantitative analysis confirms the impact of VOLL on generator revenues, by indicating that a lift in VOLL to around \$12,500 would induce additional generation needed to meet the reliability standard (p. 52). In the absence of an increase in VOLL or some other mechanism to replace the money lost through the imposition of a cap, reliability will be compromised. The policy debate on reliability needs to recognise that there is a clear trade-off between reliability and VOLL, and that VOLL at the present level may not be consistent with reliability performance at the Reliability Standard.

VOLL also impacts the contract market. By limiting the upward movement of prices, VOLL reduces retailer incentives to contract and the overall level of hedging. The presence of the cap discourages participants from hedging exposure that they would hedge if there was no cap on the market price. This is because retailers hedge because they wish to reduce volatility and cap their exposure and VOLL limits volatility and exposure. Raising the level of VOLL should increase the liquidity of the hedge market.

Setting the level of VOLL

As the Interim Report notes, the level of VOLL should be set with an eye to the asymmetric risks of over-supply of generation capacity and availability against undersupply. As the Interim Report notes:

Investment too early may result in some additional cost to consumers; however, investment too late may result in failure to deliver the desired level of supply reliability. ... With electricity considered an essential service, doubtless many would perceive an increased failure to supply as a greater evil. (p. 29)

Enertrade maintains that VOLL should be set at the level at which customers would turn off rather than continue to consume energy. Studies noted in Enertrade's previous submission have suggested that this value sits at around \$30,000. Setting VOLL at this level is consistent with the concept of VOLL as a proxy for customer demand in circumstances where customers are not directly exposed in real time to wholesale market prices. It is also consistent with the NEM objective of creating a market with energy price signals that provide the correct incentives for an efficient energy market.

Having said that:

- many in the market are concerned about the increased volatility of lifting VOLL to a level around \$30,000;
- some are concerned about market power issues; and
- the quantitative analysis on the impact of VOLL in the Interim Report suggested that raising VOLL to \$12,500 would induce sufficient new generation to cover future reliability requirements.

In view of these competing concerns, Enertrade supports raising VOLL to \$15,000 level as a reasonable compromise. At \$15,000, the level of VOLL is reasonably consistent with the Review's quantitative analysis while also allowing the asymmetric risks identified above, and for the impact of inflation.

Addressing concerns in the Interim Report with raising VOLL

The Interim Report raises a number of concerns with raising VOLL as a mechanism to induce additional generation investment:

- raising VOLL would increase volume risk for generators as the result of forced outages, and thus may discourage contracting.
- raising VOLL may not encourage sufficient new longer-term contracts to underwrite new investment;
- raising VOLL would increase the volatility of revenues for generators, raising the cost of funds;
- raising VOLL may increase the volatility of prices, to the detriment of customers;

Raising VOLL would be likely to induce greater retailer interest in contracting, and preparedness to contract at increased prices. This would lead to increased revenues for generators. This increased level of contracting would smooth the volatility that would come from pure exposure to spot prices in a market with an increased VOLL.

Generators may not be exposed to increased revenue volatility from an increase in VOLL – this depends on the extent of vertical integration with retailers.

In any case, even where generators are fully exposed to the volume risk from an increase in VOLL, they have a wide range of options to smooth revenue volatility and limit exposure to forced outages. For example, they can diversify the location of their generation mix, cross-contract with other generators in different locations to synthetically increase their generation portfolio, reduce their contract levels across their portfolio, or contribute to augmentation of the transmission grid (as some generators have already done) to enable them to cover contract positions while benefiting from high spot prices.

Using these strategies, increased VOLL is likely to deliver greater revenues without necessarily increasing risk or revenue volatility. The ultimate mix of arrangements will depend on generators' risk appetite, the natural diversity of their portfolio, and the degree of vertical integration with retail interests.

The final concern with raising VOLL is that it might lead to greater volatility in prices for customers. While this is true, customers can reduce volatility by increased contracting, which is in fact one of the objectives of raising VOLL in the first place. Over the long term, the alternative of leaving VOLL at artificially low levels is likely to result in unacceptably low levels of reliability, which is a less palatable choice for customers.

Enertrade notes that the degree of concern from generators about the risks associated with forced outages and of customers with increased volatility depends on the level at which VOLL is set. Raising VOLL from \$10,000 to \$15,000 would not cause undue concern.

Whether further interventions might cause further distortions in the Energy Only Market

The Interim Report canvasses a wide range of capacity market mechanisms to deliver additional revenue that recognises the value of capacity as distinct from dispatch. Enertrade considers that, in theory, there is significant value in holding available capacity even if it is not dispatched on a given occasion, and therefore finding mechanisms to reward capacity deserve investigation.

In practice, problems emerge in the interaction of energy and capacity markets. The design of effective capacity markets therefore depends critically upon ensuring capacity markets do not undermine the efficiency of energy market. Commentary suggests this is an extremely difficult task (eg Bidwell³, Joskow and Tirole⁴), even by those commentators that support capacity markets.

Enertrade considers that the energy only market design of the NEM is simple, competitive, reasonably efficient, and well understood by NEM participants. Introducing capacity market mechanisms, unless carefully conceived and designed, may distort the energy only market in unpredictable ways, resulting in unintended and undesirable consequences. Capacity markets involve generators negotiating through the additional risks of capacity markets, including the risks around not being able to generate when called upon to do so, VOLL being set too low (as initially occurred in Western Australia), or greater supervisory involvement, leading to increased regulatory risk for participants.

Within capacity markets, regulators would need to make a number of decisions with significant and difficult to predict impacts in the overall market. Hogan notes that a capacity market implies that:

appropriate capacity choices must be identified by means other than market participants responding to incentives provided through energy prices. This creates a need for central planning and greater prescription by regulators. ... regulators act on behalf of customers to take on more of the risks inherent in the long term investment decisions” (p.5)

Regulators would also need to decide how high to set the penalty for generators in the RAS or capacity market failing to generate when called upon to do so.

Bidwell notes the difficulty involved in deciding where to set the required level of capacity in a capacity market:

³ Bidwell, Miles, *Reliability Options: A market-Oriented Approach to Long-Term Adequacy*, Electricity Journal 18(5): 11-25, June 2005.

⁴ Joskow Paul, and Jean Tirole, *Reliability and competitive electricity markets*, forthcoming Rand Journal of Economics, June 20, 2006, See <http://www.ksg.harvard.edu/hepg/Papers/Joskow.Tirole.Reliability.Apr.04.pdf>

stems from the requirement that the market designer be able to accurately guess the future cost of building a peaker including the risk premium and to then position the demand curve so that this price will be associated with the quantity of capacity that represents the desired amount of reliability. Engineering studies can estimate the physical cost of building a peaker, but the risk of building a peaker is a significant unknown component of total cost. (p. 13)

Joskow and Tirole note a number of problems that can arise in practice in selecting the right amount of capacity to build. One problem they point to is the so-called knife edge problem, where too much capacity induces a massive drop-off in energy market prices, while too little capacity induces a rapid build-up in energy market prices. The result is a binomial result, where the combination of energy and capacity revenues are either grossly inadequate or grossly generous, with few states of equilibrium in between. Joskow and Tirole consider that “under certain contingencies the market price, and the associated scarcity rents available to support investments in generating capacity, are extremely sensitive to small mistakes or discretionary actions by the system operator” (p. 33).

The capacity market partially insulates investment from the risks of the energy only market. This may cause a change in the pattern of baseload versus peak generation. It may also cause changes in risk tolerance across baseload and peak generation. For example, the RAS market may induce withdrawal of generation capacity from the energy only market to the RAS market.

The regulatory decisions involved in the operation of a capacity market may discourage new generation. For example, regulators may, for a variety of reasons, take risk-averse positions when faced with responsibility for determining adequate reliability levels. In particular, they may wish to induce too much new generation because they are not exposed to the downside of reduced profitability in the energy only market that can arise from overbuilding capacity but are exposed to criticism if they do not induce sufficient generation to meet the reliability standard. Alternatively, they may accidentally induce too much new generation because they are uncertain about the exact amount of new generation required, and cannot rely on market mechanisms to discover the right amount. Accordingly, they may act in a way that distorts the energy only market by over-encouraging generation. Evidence of this sense of regulatory overcaution is arguably present already in NEMMCO’s approach under the reserve trader provisions. The resulting impact may further withdrawal of generators from investment exposed to significant energy only market risk, and thus the ‘take-over’ of the less regulated energy market by the more regulated capacity market. That is, generators may withdraw capital unless they can be assured of earning close to their full revenue requirements from the capacity market.

Each of the regulatory decisions that must be made risks being ‘wrong’ in the sense that it departs from the outcome that would arise in a market that most efficiently delivered energy while meeting the reliability standard. Accordingly, the parameters for capacity markets would need to be carefully considered prior to being implemented.

Whether there is a need for significant change at this time

It is difficult to respond in detail to the options canvassed in the Interim Report as they are only described briefly. Developing these options to the point where participants can respond fully when take considerable time. This is particularly true given the potential, noted above, for the rules around capacity markets to affect energy markets in undesirable ways.

Enertrade considers there is presently insufficient justification for significant change to the basic design of the energy only market without at least trying the option of raising VOLL as an initial step. Australia has invested enormous effort in the design of the NEM and the above analysis indicates it would be difficult to predict the impact of a more capacity-oriented market. The experiences of other countries with capacity markets has generally been negative compared with Australia's energy only market. Enertrade would prefer raising VOLL as it maintains and reinforces the current market orientation of the NEM, and in fact mitigates the distortion to the market that arises from artificially capping prices below the level they would rise to in an unconstrained market.

Timing of any change

The Interim Report notes that generation capacity shortages leading to reliability problems are likely to emerge from around 2011 (pp. 8-9 and chapter 5). The Interim Report also notes that there would be significant effort and delay in moving to adopt the options in groups 2 and 3, including 3 to 5 years of rule development and implementation (p. 70). In view of this, Enertrade considers there is considerable merit in moving to increase VOLL at this time to address the reliability shortfall that might emerge by 2011 and which may well not be addressed in time by the introduction of capacity market mechanisms. Raising VOLL does not preclude investigating options for capacity markets in the medium to longer term if raising VOLL does not increase reliability or does so with unacceptable side effects such as increased cost of funds associated with increased revenue volatility.

Even assuming a capacity market was introduced tomorrow, it may not be clear to generators for a considerable period of time whether they should invest in the presence of capacity mechanisms, as they may simply transfer revenue from the energy only market to the capacity market, or may change the type of generation that is rewarded within the market. Generators may be reluctant to invest in such a market until the dust has settled and they have gained experience in the market. Thus it may be risky to attempt alternatives to raising VOLL at this time because generators may hold back new investments until it is impossible to build them in time to cover the supply shortfalls looming in 2011.

Given the lead time for construction of new generation, there is value in acting now to take simple measures with the existing market design to address emerging reliability problems before seeking to develop more complex and unpredictable solutions.