30 June 2006

By email: panel@aemc.gov.au

Dear Sir or Madam,

TRUenergy submission to Issues Paper: Comprehensive Reliability Review

Thank you for this opportunity to provide the attached comments upon the issues paper. Please accept our apologies to its lateness.

TRUenergy has also assisted the preparation of the NGF position and supports that submission.

Your Sincerely,

Ben Skinner
Senior Regulatory Manager, Wholesale Markets

Summary

TRUenergy believes that the outcome-based unserved energy target is economically and mathematically superior to other reliability mechanisms. The current target, 0.002%, implemented accurately, is the appropriate economic trade off between supply cost and customer benefit. It is also about one-tenth the expected unserved energy level of distribution networks, therefore it need not be a major focus for stakeholders.

TRUenergy is concerned that whilst the standard is strong, it has not been implemented well. The reliability planning process has been affected by conservative biases and overstated demand forecasts. These processes need to be overhauled.

Price caps are inevitable in the NEM, however we should attempt to lessen their influence. TRUenergy supports an increase in the VoLL and CPT caps with a defined time frame and then no revisit to the decision for 5 years. The CPT cap, if triggered should apply for a full quarter. Coincident with that, we believe there should also be a physical force majeure-based market suspension, and propose a very simple and unambiguous trigger.

TRUenergy supports the termination of the reserve trader. However should that not be feasible, its replacement with permanent reserve generation, i.e. scenario 6, would be preferable.

Scenario 2: 30 minute reserve, is worthy of further investigation as both a way of better managing short-term dispatch and potentially making up for the peaking generation income shortfall caused by the 5:30 anomaly.

Questions from Issues Paper

> *1. Is there now, or is there likely to be in the future, a problem with supply reliability in the NEM?*

By any reasonable measure, NEM reliability has been satisfactory and consistent with a developed nation's power system. The only significant "interruption" was caused by an industrial dispute in 2000. The issues paper has incorrectly attributed a large amount of Victorian 2000 load reduction that was purely the result of excessive mandatory restrictions as "unserved energy"[1]. If these restrictions had not been imposed, energy interruption would have been minimal.

In the medium term outlook there is unlikely to be any genuine reliability problem. However external observers are given a perennial impression that the industry is on the verge of crisis, and reserve trader has been imposed in two summers. TRUenergy suggests that the industry itself is responsible for this poor self-promotion: through unnecessarily alarmist portrayals.

Inevitably the longer-term is uncertain, and challenges will be faced, such as:

- An ever-more peaky demand curve;
- The growth of intermittent generation, making the residual demand peakier still;
- Uncertainties relating to potential carbon costs and controls;
- Uncertainties caused by various government subsidies and other interventions, increasing risks on the residual supply businesses.

Other things being equal, attaining an equivalent level of reliability in the presence of these factors will require higher price caps.

But the absence of a serious reliability problem is not a cause to ignore reliability settings. The presence of price caps and intervention will always imply a degree of inefficiency that will ultimately be borne by the consumer.

> *4. If no, what improvements to the operation of the reliability settings should be made?*

The Reliability Panel's unserved energy target is appropriate. Improvements to its interpretation are required. Where possible, probabilistic approaches should be used rather than deterministic simplifications which can introduce errors.

The VoLL price cap should be raised (subject to a substantial lead time), whilst the market suspension clauses should be relied upon as the primary risk mitigation measure for participants, with both a physical and financial trigger.

> *8. In conducting its analysis of the reliability settings, are there particular kinds of analysis or methodologies that the Panel should undertake or follow?*

Modelling should attempt to capture the effects described in the dot points to Q1 and the typical current new entrant costs. We discourage the use of modelling that relies

[1] **Issues paper Pg 15. Victorian long-term average of 0.011%**

upon a “market power” bidding scenario to create the conditions to deliver new plant, as this requires a particular industry structure that would be speculative in the longer term.

> *9. Which scenarios in Appendix 2, if any, would you like to see further developed in the Panel’s analysis and why?*

Scenario 2, the new ancillary service has some promise in resolving two major dispatch and pricing issues in the NEM:

- The 5/30 anomaly that can reduce returns to peaking generators by up to 15%; and

- Inter-temporal dispatch issues, where the lack of a look-ahead scheduling mechanism can result in short-term extreme prices unreflective of the genuine supply-demand conditions. E.g. short-term ramp constraints can result in large volumes of willing supply remaining uncleared.

These are spot market design issues that at the margin do affect reliability or the market’s tolerance to a high VoLL. It is outside the Panel’s expertise to attempt to resolve these completely itself, but the panel could request the AEMC and/or NEMMCO to work with industry to design options for resolution.

Scenario 6, Reserve Generation, if offered to the market at VoLL, is a less severe market distortion and more cost effective than some other methods of “guaranteeing” reliability, including the reserve trader.

Standby plant held in reserve is not really consistent with the energy-only market design. It implies that the plant will be idle whilst the market is clearing well above its marginal cost, and that its cost will be recovered across customers regardless of their contribution to the issue. However the actual burden of this inefficiency is minor, and would amount to a customer levy of no more than 1-2% of regulated network charges.

Because it is procured over a long timeframe, it is likely to be of lower annual cost than a sporadic reserve trader where a new supplier would need a full capital return from just one year.

It is thus clearly preferable to reserve trader, and less distortionary to market-based investments than subsidised plant that is introduced directly into the market, or new transmission purely justified on reliability.

We suspect its scope could be widened to include demand-side participation with reliable characteristics.

> *10. Is a measure based on unserved energy the most appropriate form of standard?*

Yes, as the issues paper describes, this is an “outcome based” standard, attempting to address the issue that really matters: the amount of energy actually interrupted. This also reflects the economic impact of the load shedding. Quantification of the nature of the event, i.e. depth and frequency, is a distraction and is not necessary.

Input-based deterministic measures are poor simplifications of an outcome based standard, not appropriately adapting for the market as it grows. With the benefit of modelling software, the simplicity of those measures are no longer relevant.

> *12. Is it desirable, and are there ways, to broaden the form of the standard to incorporate a range of reliability-related considerations? If so, which considerations and why?*

No, the Unserved Energy is the amount of load that is actually at risk and is what should be used to assess the economic trade-off of increased supply. Variations that discuss scenarios, such as extreme events, tend to distract stakeholders from an appropriately dispassionate view.

> *13. Should the standard be determined on a NEM-wide basis or separately for each region?*

Whilst there are economic arguments for having different regional standards (where the VCR level differs), this would be inconsistent with the intent of the NEM and would raise practical difficulties. For example, it may imply that VoLL should differ and that would cause serious dispatch difficulties.

The standard should be further nationalised, by having the actual calculations performed only on a NEM-wide basis. The standard should be considered as met if it is reached across the NEM generally, not necessarily in every region.

> *14. Is the level of the current NEM reliability standard appropriate? If not, what level would be appropriate and why?*

0.002% equates to 10.5 minutes per year interruption for each customer. As indicated in Appendix 5, typical distribution interruption levels are 100 minutes for urban customers and 200 minutes for rural. Therefore any further reduction upstream is unlikely to be noticed by the customer despite an increase in cost.

Any revaluation should be probabilistically modelled on a purely economic basis considering the impact of load shedding against the cost of increased supply. We discourage international comparisons as these are often affected by complex regulatory and political histories.

We also discourage consideration of the spread of unserved energies across a spectrum of scenarios. Only the *expected* (i.e. average) level of unserved energy forecast is economically relevant. Discussion of extreme scenarios causes alarmist distraction.

The NGF submission includes analysis of the optimal economic trade off between the value of customer reliability against the increased cost of supplying it. Whilst it varies over time and between regions, on average the standard should be slightly higher than the current 0.002%. In TRUenergy's opinion this evidence supports status quo.

> *15. What level of VCR is appropriate and how, and on what basis, should it be measured?*

The 2002 CRA study of Victorian VCR appears to be about the best assessment to date. We suspect this data, if used appropriately, could be sufficient to provide economic support to the current target. However if the panel were to propose a change, an updated study would be recommended.

> *16. Should the reliability standard be treated as a cap or as a target? If the latter, should the standard be expressed as a range for NEMMCO to target?*
> *17. Should the standard be defined more precisely, for instance in terms of an average or a maximum over a period of time?*

Simulation modelling will find the economically optimal unserved energy for the *expected* (i.e. average) level of unserved energy across hundreds of simulated years. Applying the target as a cap on all years is mathematically inconsistent. The current standard is already expressed as a long-term average and that should be reinforced.

Arguably, NEMMCO does not accurately implement that intent. The conversion of the unserved energy target into reserve thresholds does attempt to average the unserved energy across many scenarios. However the resulting thresholds themselves should then be seen as a target rather than a cap.

Confusion may have arisen from clause 4.2.7(c), where a reliable operating state is achieved when the reserves are “at least equal” to the required levels defined by the reliability standards. This should be clarified to be a measure over time and over the whole NEM rather than by region.

> *18. Should the standard be reviewed regularly and, if so, how often? Alternatively, should there be specific triggers for initiating a review? If so, what should those triggers be and why?*

TRUenergy suggests a review frequency of about every 5 years.

> *19. Should there be greater clarity in terms of the definition of bulk transmission? If yes, how should it be defined?*

The unserved energy standard should apply to load that is shed across the region broadly, and not be affected by local network issues, such as a failure in a radial transmission line to a specific load zone. This would be load that is within the same supply/demand balance as the regional reference node.

The best way to clarify this is that load shed attributed to the standard refers only to load that is shed commensurate with 3.9.2(e) and (f). These are the clauses that define exactly when NEMMCO is to apply VoLL to a regional reference node.

> *20. Are there additional considerations which should be included in the standard to reflect regional concerns, for example, stricter standards for high-load areas such as CBDs?*

No, these should be handled by the load shedding priorities as managed by the network service provider.

22. Should the scope of the standard be extended to encompass matters currently treated as system security issues such as multiple contingency events? Should near misses be reported?

As reliability standards are associated with having sufficient underlying supply to meet demand, the standard should only measure events that additional supply would have mitigated.

System security issues and associated near misses should be clearly defined as external to the measure as they are operational matters and not addressable through the reliability standard. It is important to quarantine statistics on load shed from this kind of system security incident from that shed by a shortfall in capacity, as the response is different.

23. Are there other matters that should be included or excluded from the standard's scope?

TRUenergy believes that panel's past practice of attributing the entire demand reduction due to mandatory customer restrictions as unserved energy should be discontinued. Only the load that would have been shed in the absence of the restrictions should be attributed.

24. Should specific 'exogenous' matters such as industrial action be included or excluded? If so, what factors and why?

Yes, as the approach to rectifying these other matters is likely to be quite different. Building more power stations is not a sensible response to the risk of industrial action.

Other matters that need to be explicitly excluded include load lost due to malicious damage and major network collapse, such as system black.

25. Do the current price mechanisms encourage appropriate investment? Explain why or why not.

In general, the current price mechanisms do encourage appropriate investment and are superior to the mechanisms when VoLL was $5,000/MWh. To date, the pricing arrangements have elicited sufficient new investment to meet the 0.002% standard, notwithstanding the occasional use of reserve trader.

Of course, this backward view should be tempered by the uncertainties caused by the matters discussed in our dot points to Q1. It may be that price caps that are not significantly impairing the investment signal now will cause difficulties at a later stage.

Note that the current CPT is $75,000 per MW. This implies that an open-cycle gas turbine can not recover one full year's capital return (about $80-$100,000/MW) in one event prior to the administered price trigger.

28. Are the current price mechanisms appropriate tools for limiting the exposure of market participants to extreme price outcomes?

TRUenergy supports the concept of a financially triggered CPT as the primary risk mitigation measure for participants. Unlike VoLL, it sets a theoretical maximum value at risk and protects the market from systemic financial collapse. However it can be triggered, released and re-triggered in successive weeks. TRUenergy suggests the CPT should be increased in both value and time, so that it would apply as a maximum price average over, say, a full quarter.

> *29. If no, what are the most appropriate alternative mechanisms? What are the relevant settings and why?*

Whilst the CPT price threshold should be high, TRUenergy supports an immediate physical market suspension trigger to protect participants in the case of a major power system disruption that the reliability mechanisms were not intended to address. The obvious example is a major network failure, significant enough to cause major generator and customer disruption, but not so severe to be classified as a system black condition.

The challenge with such physical triggers is that their definition needs to be unambiguous and simple to observe in real time. Our suggestion is a 20% load loss in any load region. This is indicative that a disruption has occurred that is beyond the capabilities of any reasonable investment incentive mechanism to prevent.

> *30. What impact will the changing generation mix, particularly the increased use of non-scheduled generation such as wind, have on reliability outcomes? Should there be improvements to the price mechanisms to take that impact into account?*

As discussed earlier, the increase in intermittent generation makes the residual demand to be served by traditional generation peakier. Other things being equal, this requires a higher price cap to deliver the same reliability standard.

Traditional generation invests in response to market prices. These market prices are clearly influenced not only by the supply/demand balance, but also the competitive structure and incentives upon participants. Recent investments have occurred in response to these drivers, but there is no certainty that those drivers will remain. For example, the approaching termination of the NSW Electricity Tariff Equalisation Fund is likely to affect generator bidding behaviour.

A danger exists if we make a presumption that the historical structures and bidding incentives will continue into the distant future. It is possible that in future prices will more closely approximate the “ideal competition” model.

Thus, in calculating the appropriate price caps to deliver reliability, there is a danger if the modelling depends upon assumptions regarding future generator bidding behaviour. A safer approach is to model returns and new entry points on the basis of marginal cost bidding.

> *31. Would the introduction of improved forward market mechanism contribute to reliability outcomes? Provide full details of your proposal and supporting data.*

The NEM's secondary markets have been very successful in providing options for willing participants. The growth in the Sydney Futures Exchange facility is evidential of further maturing of the sector[2]. It will continue to evolve and any mandated centralised activity is unnecessary. Perennial discussions of such arrangements by regulators undermine these markets' development.

The forward markets are a key link in the investment chain. However TRUenergy cannot see any reason why a centrally facilitated or mandated forward market would make this link any stronger than that which is developing between willing participants presently.

NEMMCO's efforts to provide re-allocation options to reduce the collateral burden have been excellent, and we can expect that these options will gradually become more used by participants.

> *32. Are there ways that NEMMCO could improve its forecasting accuracy that would enhance reliability outcomes?*
> *33. Are consumers able to signal their reliability-related prices to the wholesale market effectively? If no, why not and how could that signalling be improved?*

Wind forecasting

In recent years we have seen a degradation of short-term load forecasting performance in South Australia due to the growth in intermittent generation. We are pleased to note that NEMMCO is working to address this issue.

Wind forecasting in medium to long-term analysis will always be challenging as NEMMCO attempts to apply a deterministic % reliability of its capacity to the available supply. At present the assumptions used are very conservative, which needs to be corrected as more wind reliability history becomes available.

TRUenergy's view is that the growth in random intermittent generation reinforces the need for probabilistic modelling over deterministic calculations in all timeframes. This leaves less room for error, judgement and conservative bias.

Simulating the reliability of wind requires the development of new techniques to accurately represent them. TRUenergy suggests that the reliability panel may wish to promote an industry working group to ensure such development occurs and that the mechanisms promoted are free from bias.

DSR forecasting

Forecasting accuracy across all timeframes is severely hampered by unknowns in estimating the level of demand-side response to high prices. Reviewing historical demands at different prices does not produce useful data. Surveying retailers and network service providers has also given inconclusive results.

TRUenergy believes this is already a significant source of error and is increasing with the good growth in demand-side response. We suspect, anecdotally, that reserve

[2] See ERAA submission

trader may have been averted had a better demand-side forecast been available in the last two years. Our inability to provide evidence of this claim only reinforces the need for better data.

Having observed this matter over some time, there appears no alternative but a rule to require demand-side responders and aggregators to provide data similar to generators. A rule change is required such that wherever a price-sensitive demand of greater than 30MW is controlled by one body, data must be provided to the long and short-term forecasting systems.

Long to medium term demand forecasting

Surprisingly, NEMMCO does not actually perform any of the demand forecasting for its MTPASA and Statement of Opportunities. These are collated from the individual Jursidictional Planning Bodies and entered into these systems. This provides challenges regarding consistency and in calculating the probabalistic diversity of regional demands. It also confuses accountability for demand accuracy. This role should transfer to the one single national body that is actually forecasting reserves. At present this is NEMMCO.

The last 6 years have shown consistent failures for the Victorian and South Australian demands to reach the 50% and never the 10% forecasts. These forecasts and their promoters' questionable "weather corrected actuals" have lost credibility in the industry.

Upon NEMMCO taking over the role, a long-term Key Performance Indicator (KPI) could be created that would promote accountability for accuracy. Over a 5 year timeframe, there are 50 forecasts created (5 regionsx2 seasonsx5 years) creating a good sample size to show accuracy and bias. The KPI would be met if in a rolling 5 years the actual unadjusted demands fell outside and within the 10%, 50% and 90% ranges according to the statistical confidence intervals.

36. How often should the price mechanism settings be reviewed and why?

Ideally, TRUenergy would like the price caps moved to a point where they are unlikely to affect reliability and then left alone for at least 5 years, to improve certainty. However this would require a price cap of at least $20,000/MWh and a CPT allowing at least 3 years return of an open-cycle gas turbine within one season.

If the panel chooses not to implement those significant increases, then there remains a risk to reliability, and revisiting the price cap regularly will be necessary.

37. Are the triggers as currently specified appropriate? What additional triggers would be useful?

The panel should not leave itself exposed to a very difficult decision in a future year. If it decides that the price cap is not affecting investment at present, and decides to defer a change to a time when the market is "tighter", it will face a much more difficult decision as it will need to raise the cap when prices are already volatile. This would exacerbate the boom bust cycle. In fact, the best opportunity to raise the cap is when it is having little effect and prices are moderate.

38. Does NEMMCO intervene in the market too often? Should intervention be seen as part of the 'normal' workings of the market, or should there be continued effort to treat intervention as exceptional and to expect the market to deliver investment sufficient to maintain reliability to the level of the reliability standard?

Yes, NEMMCO has intervened by reserve trader unnecessarily-in the last two summers where the actual demand never came close to the forecasts the intervention was based upon.

In 2001 it directed a power station to defer a unit outage by two days. The benefit in terms of avoiding a very low risk of shortfall was far outweighed by the resulting NEM-wide compensation cost of $23m.

These matters should not be ignored. Interventions must be treated as exceptional and subject to external scrutiny.

39. Does the reliability safety net remain an appropriate mechanism for managing against the risk of market failure? If yes, should NEMMCO's intervention powers be extended indefinitely or for a specific period of time and why? If no, what constitute appropriate alternative measures?

The reliability safety net's design of procuring reserve with a few months' notice and a few months' contract time is hardly an effective way to provide new capacity. Its use in the last two years has shown that it cannot procure more than a very small quantity, and was capacity that may well have been in the market anyway in the absence of the safety net.

It also creates an unhedgeable and unpredictable levy upon retailers. Fortunately the costs to date have been low as NEMMCO has used price discretion to reject some offers. A more exacting NEMMCO might have purchased reserve at many times this price and at much greater cost than its value.

If reserve must be purchased, a more effective, cheaper and predictable manner would be with long-term reserve plant as per Scenario 6.

TRUenergy believes that ideally the energy-only market should provide sufficient reserve and no reserve intervention mechanisms (beyond direction in extreme circumstances) should exist. However the reserve trader and Scenario 6 designs of holding procured capacity outside of the market at VoLL are less distortionary than having subsidised plant suppressing price. If the reliability panel is unable to convince stakeholders that the energy-only market can be relied upon, TRUenergy would prefer these options over that alternative.

40. What considerations are relevant to determining the period of extension?

The panel should terminate the safety net and replace with either Scenario 6 or nothing.

41. Can the intervention mechanism or the Panel's guidelines be further improved?

The safety net guidelines need to ensure that procured demand-side response represents genuinely new reserve. This would be helped by:

- A rule requiring demand-side transparency as described in our response to Q33; and
- Publishing the names and plants of tenderers such that the market can advise NEMMCO as to whether the capacity is in fact already available to the market by other means.

42. Is the current approach to NEMMCO's operationalisation of the standard through the reserve margin thresholds appropriate? If no, what improvements are suggested to the framework and/or the methodologies and why?

Although improvements have occurred and reserve margins fallen, there remain a number of areas of conservative biases. For example, the current margins are still subject to:

- Doubling of the generator supplied forced outage rates;
- Halving of the surveyed demand-side response volumes;
- Very low estimates of the reliability of wind farms;
- Presumption of 100% correlation of Vic & SA 10% POE demand.

The conversion of a probabilistic outcome based target into a deterministic reserve threshold is inevitably going to open the door for inaccuracy, judgement and bias. The power of computing however has lessened the need for the operational simplicity of a threshold. Medium and long-term forecasts can now be very readily done through probabilistic simulation. TRUenergy suggests that:

- MTPASA and Statement of Opportunities should show only installed plant and demand forecasts without any reserve thresholds, allowing the market to optimise its maintenance and investment response;
- The annual SOO publication could be accompanied by a forecast of expected unserved energy from a probabilistic simulation;
- The weekly MTPASA publication could also be accompanied by a routine simulation run forecasting expected unserved energies per month in the 2 year outlook period.

Only if a run produces an expected unserved energy value greater than the target over the first year would the forecast be considered to be outside a "reliable operating state."

STPASA and predispatch timeframes will still require a deterministic threshold for practicality.

43. Should the Panel explicitly approve NEMMCO's reserve margin calculations or should the Panel undertake the calculations itself? What POE or POEs should they be expressed in relation to (for example, a 10 per cent, 50 per cent or weighted average?)

NEMMCO has a history of conservatism in its calculations. Given its governance, it will be challenging to completely overcome this. The reliability panel may be more independent in its approach.

Another suggestion is for the panel to be more actively involved in determining the process for NEMMCO to follow. The rules could require that the calculation process be subject to the panel's approval and published.

> *44. Should the fuel issues and changing generation mix described above be factored into the reserve margin calculations? If yes, explain why and how?*
> *45. Would the effectiveness of the reliability settings be improved by explicitly defining contingency, short term and/or medium term capacity reserve standards? If yes, how should they be determined?*

Both these issues will be naturally better managed through a shift from reserve thresholds to probabilistic simulation forecasting.

Clearly the short-term reserve threshold would be different to the long-term one due to the different uncertainties involved. Yet NEMMCO presently implements the same margin in each timeframe, incorrectly applying a long-term reserve margin to day ahead planning. Intuitively NEMMCO's intervention criteria would be expected to be too large for short-term application.