3 May 2013

Mr John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

Via website: www.aemc.gov.au

Dear John

Review of the National Framework for Transmission Reliability – Reference EPR0028

Grid Australia welcomes this opportunity to provide a submission to the AEMC's Issues Paper on the review of the national framework for transmission reliability. Grid Australia supports the development of a nationally consistent approach to setting transmission reliability standards.

From Grid Australia's perspective, the debate surrounding the design of reliability standards has sometimes become unnecessarily polarised. At its most simplistic, probabilistic planning is characterised as 'economically efficient', while deterministic standards are characterised as 'redundancy standards' that fail to consider the associated costs and benefits. In reality, however, there is substantially more middle ground shared by these two approaches than is recognised in the simplified debate.

Grid Australia accepts that economic efficiency should underpin the setting of reliability standards. However, it is also important to note that economic efficiency does not necessarily equate to maximising the expected net benefit of an outcome. In situations where there is a very small probability of an adverse outcome, customers may prefer an outcome that provides a lower expected net benefit if the risks of a catastrophic network failure are avoided. Some degree of additional network redundancy may therefore provide economically efficient and cost-effective insurance against such events. Judgment must therefore also be exercised in setting an economically derived reliability standard.

Grid Australia considers that the AEMC's starting point for its current review is soundly based. In particular, transmission reliability standards should be economically derived, but expressed deterministically.

Grid Australia's proposed approach for developing and applying economically derived, but deterministically expressed transmission reliability standards is based on the following principles:

- Reliability standards must be 'fit for purpose'.

- A body independent of the investment decision-maker should set the reliability standards.
- Reliability standards should be economically derived.
- There are significant advantages in expressing an economically derived reliability standard in a simple, deterministic form.
- Economically derived reliability standards should include a consideration of high impact, low probability events.
- The standard-setting body should have flexibility to update the reliability standards and TNSPs must comply with the reliability standards.
- The Rules already provide an effective mechanism for revenue adjustment if reliability standards change.
- Probabilistic planning does not imply a need for central planning or rate of return regulation.
- AEMO's contingent project proposal will undermine economic efficiency.

The attached submission expands on Grid Australia's proposed approach and builds on the approach outlined in its November 2012 submission to the Productivity Commission.

We look forward to having the opportunity to discuss our submission with the Commission and staff. Please do not hesitate to contact me on (08) 8404 7983 if you wish to discuss any aspect of this submission.

Yours sincerely

Rainer Korte

Rainer Korte
Chairman
Grid Australia Regulatory Managers Group

Review of the National Framework for Transmission Reliability

Submission in response to the AEMC Issues Paper

3 May 2013

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1. Introduction and background

Grid Australia welcomes this opportunity to provide a submission to the AEMC's Issues Paper on the review of the national framework for transmission reliability. Grid Australia supports the development of a nationally consistent approach to setting transmission reliability standards.

Before turning to the detail of the AEMC's current review, it is helpful to provide some high level remarks regarding transmission reliability standards. From Grid Australia's perspective, the debate surrounding the design of reliability standards has sometimes become unnecessarily polarised. At its most simplistic, probabilistic planning is regarded as 'economically efficient', while deterministic standards are regarded as 'redundancy standards' that fail to consider the associated costs and benefits.

In reality, however, there is substantially more middle ground shared by these two approaches than is recognised in the simplified debate. It remains a fact that transmission companies in many major economies around the world continue to apply some form of deterministic planning standard. This is because deterministic standards reflect engineering experience and – albeit implicitly – considerations of costs and benefits. As pointed out in KEMA's 2008 report for the Reliability Panel[1]:

> "Deterministic transmission planning methods have been used for transmission system planning throughout the worldwide power industry for many decades and will, no doubt, continue to be used for years to come. [...]
>
> Because there are so many possible system conditions that could occur in the future, deterministic criteria are set to test the system to see that it is robust enough that it can survive the many other events that are not actually being studied."

The current reliability standards have been set on behalf of the demand side, independently of the TNSPs. The nature of the transmission networks and technologies has traditionally resulted in the setting of deterministic standards at a fairly broad level. However, better technologies and improved understanding of risk will allow a more granular approach to be developed over time. In doing so, improved considerations of costs and benefits may be factored into the setting of standards and investment decision analyses.

Grid Australia therefore considers that the AEMC's starting point for its current review is soundly based. In particular, transmission reliability standards should be economically derived, but expressed deterministically. The AEMC explained that such an approach is consistent with its terms of reference and the regulatory framework[2]:

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[1] KEMA, International Review of Transmission Reliability Standards, Additional response regarding probabilistic planning methodologies, 31 July 2008, page 3.

[2] AEMC, Review of the National Framework for Transmission Reliability: Issues Paper, 28 March 2013, page iii.

> "The Commission has previously recommended that a national framework for transmission reliability should be based on reliability standards which are economically derived, but expressed in terms of the level of redundancy that TNSPs should build to. This provides certainty and transparency as to the level of reliability that is required of TNSPs while also promoting economically efficient transmission planning and investment. This is consistent with the ex ante incentive based economic regulatory framework that has generally been adopted for economic infrastructure. It is also consistent with our terms of reference, which requires the national framework to take account of the trade-off between the cost of investing in and maintaining transmission networks and the value placed on reliability by customers."

Against this backdrop, the AEMC highlights two sets of issues that should be resolved through the current review[3]:

> "We consider there are two broad sets of issues to resolve in further developing this national framework:
>
> - determining the extent to which flexibility should be provided in the framework to allow investments to be advanced or deferred on an economic basis, and how this should be accommodated within the wider regulatory frameworks; and
> - more detailed issues around how the national framework would operate in practice."

The Issues Paper provides a useful examination of these issues and raises a number of questions. The Issues Paper has assisted Grid Australia in developing its thinking on these matters, particularly with regard to the interaction between transmission reliability standards and the revenue setting process. In this context, it is noted that recent refinements to the economic regulatory framework[4] are relevant to the design of a national framework for transmission reliability.

This submission is structured as follows:

- Section 2 provides a summary of Grid Australia's overall position on the national framework for transmission reliability.
- Section 3 provides a further explanation of Grid Australia's proposed approach to determining and applying transmission reliability standards. This section also explains that an economically derived reliability standard must consider the potential exposure to high impact low probability events.
- Section 4 sets out responses to questions relating to the AEMC's approach, scope and principles for the transmission workstream of its review.
- Section 5 addresses questions regarding the role of transmission reliability standards and their interaction with the revenue-setting process.

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3 Ibid.

4 Specifically, the Final Rule Determination on the National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012.

- Section 6 discusses the expression of transmission reliability standards and the standard setting process.
- Section 7 addresses matters relating to governance under the national framework.
- Section 8 sets out responses to questions relating to accountability and compliance obligations

2. Summary of Grid Australia's position on transmission reliability standards

Grid Australia's proposed approach for developing and applying transmission reliability standards is based on the following principles:

- Reliability standards must be 'fit for purpose'.
- A body independent of the investment decision-maker should set the reliability standards.
- Reliability standards should be economically derived.
- There are significant advantages in expressing an economically derived reliability standard in a simple, deterministic form.
- Economically derived reliability standards should include a consideration of high impact, low probability events. International best practice would inform the derivation of appropriate standards.
- The standard-setting body should have flexibility to update the reliability standards.
- TNSPs must comply with the reliability standards.
- The Rules already provide an effective mechanism for revenue adjustment if reliability standards change.
- Probabilistic planning does not imply a need for central planning or rate of return regulation.
- AEMO's contingent project proposal will undermine economic efficiency.

Each of these points is discussed in turn in the following sections.

2.1 The reliability standards must be 'fit for purpose'.

Grid Australia supports the AEMC's principle that reliability standards should be clearly specified by connection point or some other readily understandable basis. The framework should not be a "one size fits all" approach. Rather it should address the specific circumstances, and allow for standards to differ across and between networks according to the value placed on reliability by customers and the costs of providing different levels of reliability. Grid Australia therefore strongly agrees with the AEMC's comment that[5]:

> "The intention of the framework is not to result in a consistent level of transmission reliability across the NEM. Rather, the purpose of the framework is to provide a nationally consistent approach to how reliability standards are developed, described and reported on."

2.2 A body independent of the investment decision-maker should set the reliability standards.

This approach avoids any suggestion that the body responsible for setting the standard has a commercial interest in the outcome.

2.3 The reliability standard should be economically derived.

Grid Australia accepts that economic efficiency should underpin the setting of reliability standards. However, for transmission networks this concept is more complex to apply in practice.

For example, transmission reliability cannot be driven by output based measures in the Service Target Performance Incentive Scheme. In contrast to distribution networks, the infrequency of transmission outages and the potential for very significant loss of load makes output based measures impractical. Instead, transmission reliability standards must be input based. The differences between transmission and distribution networks are discussed in further detail in response to question 1(a) in section 4.1 of this submission.

It is also important to note that economic efficiency does not necessarily equate to maximising the expected net benefit. In situations where there is a very small probability of an adverse outcome, customers may prefer an outcome that provides a lower expected net benefit if the risks of a catastrophic network failure are avoided. Some degree of additional network redundancy may therefore provide economically efficient and cost-effective insurance against such events.

It must also be recognised that judgment must be exercised in setting an economically derived reliability standard. As discussed in further detail in section 3.2

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5 AEMC, Review of the National Framework for Transmission Reliability: Issues Paper, 28 March 2013, page 14.

of this submission, probabilistic planning sometimes conveys a false sense of precision in its cost-benefit analysis. An overly precise cost-benefit analysis does not make the resulting reliability standard more efficient than an approach that considers customers' preferences in a more holistic manner.

In setting an economically-derived standard, therefore, it is essential that the independent body takes account of all information that is available regarding customer-specific preferences for a particular level of reliability. For instance, directly-connected large transmission customers may have a specific view on the value they place on reliability, or VCR. In addition, it is expected that a transparent understanding of reliability of supply is of particular interest to investors choosing where to site new loads. The standard-setter should be required to take all such information into account, to ensure that the standard is consistent with the delivery of economically efficient outcomes in accordance with the national electricity objective.

2.4 There are significant advantages in expressing an economically derived reliability standard in a simple, deterministic form.

Although the reliability standard should be economically derived, there are considerable benefits in expressing the standard deterministically. As noted by the AEMC, a deterministic reliability standard provides certainty and transparency for all stakeholders regarding the level of reliability a TNSP is expected to provide. It also provides a means of ensuring that TNSPs are held accountable for meeting the standard.

Grid Australia notes that an economically derived, but deterministically expressed reliability standard implicitly exposes customers to load at risk. This exposure may be expressed in a number of different ways. For example, the standard may mandate a minimum redundancy level of N, but require the installation of additional capacity to meet an N-1 standard when certain conditions are met, such as:

- when the maximum load that may be interrupted by a credible contingency is expected to exceed 25 MW at a 50th percentile demand forecast; or
- when the maximum hours where load is at risk following a credible contingency event is expected to exceed 100 hours[6].

It should be noted that current reliability standards in Tasmania explicitly provide for an exposure to loss of load. While the standard-setter may determine that no exposure is appropriate at a particular connection point for a first contingency, the proposed approach will improve the granularity of reliability standards, and enhance economic efficiency.

An overarching requirement is that the reliability standard should be expressed in a manner that facilitates transparency, compliance and accountability. The precise

[6] These examples are provided for illustrative purposes only.

form of the deterministically expressed standard is a matter for the standard-setting body to determine, having regard also to the need for the standards to be expressed in a form that is meaningful to customers. The standards are expected to vary across connection points and TNSPs.

2.5 Economically derived reliability standards should include a consideration of high impact low probability events.

A probabilistic planning approach determines that a transmission project is justified if the expected benefit exceeds its cost. The expected benefit depends on:

- the expected amount of unserved energy that is avoided if the project goes ahead; and
- the value that customers place on that unserved energy.

However, both of these elements are subject to considerable uncertainty. For example, the expected amount of unserved energy will depend on a number of variables, including the nature and type of plant failure and the operational circumstances at the time the failure occurs.

Furthermore, under a probabilistic planning approach, high impact low probability events are given a weighting in the cost-benefit analysis that accords with the very low probability of the event occurring. In doing so, the analysis seeks to maximise the expected net benefits. However, it does not recognise that customers and the broader community would find widespread or prolonged outages unacceptable, even if the probability of occurrence is very low.

Grid Australia therefore considers that reliability standards should reflect a more comprehensive view of potential future outcomes, and the value that the community may be prepared to pay to avoid being exposed to the more extreme potential outcomes. An economically derived, but deterministically expressed probabilistic planning should have regard to:

- the maximum exposure that consumers may face under alternative planning scenarios that examine the consequences of transmission plant failure; and
- the community's willingness to pay to avoid exposure to high impact low probability events.

2.6 The standard-setting body should have flexibility to update the reliability standards.

Grid Australia's suggested planning approach recognises that:

- Reliability standards will be based on information and assumptions that will change over time; and

- Investment decisions will be more efficient if reliability standards are updated periodically.

Grid Australia regards the delivery of economically efficient outcomes as the primary goal of a national framework for transmission reliability. Ensuring that the application of reliability standards is based on valid assumptions and forecasts will promote the achievement of this goal.

Accordingly, Grid Australia proposes that reliability standards be reviewed and set independently of the TNSP in advance of the commencement of each regulatory period. The standard-setting body would also set out the assumptions and forecasts that underpin the reliability standard at each connection point.

During the course of a regulatory period, the TNSP must inform the standard-setting body if the original assumptions or forecasts at a connection point are no longer valid (as explained in section 3.1, the standard-setting body would specify the tolerances or boundaries outside which a change in forecasts or assumptions would warrant a review of the reliability standard). The TNSP will analyse the implications for the reliability standard at that connection point, and make a recommendation to the standard-setting body. The standard-setting body would determine the new reliability standard, taking into account the TNSP's recommendation. The TNSP will be accountable for complying with the updated reliability standard determined by the independent body.

2.7 TNSPs must comply with the reliability standards.

The AEMC's Issues Paper notes that a number of regulatory issues arise if the reliability standard is applied flexibly by the TNSP during a regulatory period. In particular, a concern has been expressed that regulated revenue may be set on the basis of one reliability standard, but the TNSP may have discretion to adopt a more flexible (and possibly lower) standard when investment decisions are made. In this example, a TNSP would obtain a windfall gain.

Grid Australia agrees with the concerns expressed in the Issues Paper. Grid Australia's position is that the reliability standards set by the independent body must be met by the TNSP. This approach ensures transparency, aids compliance and accountability, and delivers consistency between the revenue-setting process and the reliability standards actually delivered. Therefore, Grid Australia does not regard the degree of flexibility discussed in the Issues Paper as appropriate.

However, as noted in section 2.6 above, Grid Australia maintains its position that the national framework should provide flexibility to allow the reliability standards to be updated by the standard-setting body. The TNSP concerned would be required to comply with the updated standard.

2.8 The Rules already provide an effective mechanism for revenue adjustment if reliability standards change.

The Rules allow for the pass through of material cost changes (including cost reductions) if a service standard event occurs. A change in the reliability standard at a connection point would constitute a service standard event, and any material cost impacts on the TNSP (either increases or decreases) may be addressed through a revenue adjustment.

Therefore, the possibility of augmentation capital expenditure being deferred or brought forward does not warrant the adoption of a 'low powered' regulatory regime. Indeed, this would constrain the efficiency benefits that can be derived from the regulatory framework. The AER is currently developing new incentive mechanisms to strengthen the incentives to deliver capital expenditure efficiencies. It is also noteworthy that the Transmission Frameworks Review concluded that[7]:

> "Ex ante revenue allowances provide a strong incentive for TNSPs to minimise their costs over the regulatory period since TNSPs are able to profit by spending less than their allowed revenue allowance. Ex ante revenue allowances also provide incentives for TNSPs to reduce their overall costs by making trade-offs across their network and prioritising projects."

It would be a retrograde step if decisions were made now which resulted in augmentation capital expenditure being no longer subject to the ex ante incentive framework.

It should also be recalled that the AER has significant powers to ensure that a TNSP's capital expenditure allowance satisfies the Rules requirements. This issue has recently been subject to a detailed review by the AEMC in its examination of the AER's rule change proposal[8]. While setting appropriate expenditure allowances for augmentation capital on an ex ante basis may be challenging, the AER has the appropriate tools and processes to undertake this task. Grid Australia cautions against a substantial weakening of the incentives provided by an ex ante allowance.

2.9 Probabilistic planning does not imply a need for central planning or rate of return regulation.

The AEMC's Issues Paper may be interpreted by some stakeholders as suggesting that a probabilistic planning approach requires:

- AEMO to undertake the role of independent transmission planner; and
- capital expenditure to be remunerated on an 'as you go' basis.

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[7] Ibid, page 84.

[8] AEMC, Final Rule Determination on the National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012.

Although Victoria has adopted a probabilistic planning approach, it does not necessarily follow that the Victorian transmission planning and regulatory arrangements are also required to be implemented across the rest of the NEM. In fact, Victorian distributors also employ probabilistic planning, but they maintain responsibility for network augmentation which is remunerated through an ex ante framework.

The purpose of a reliability standard is to identify the need to augment network capability (whether through network or non-network options), and the optimal timing of investment to meet those needs. A TNSP is capable of implementing any type of reliability standard, including one based on probabilistic planning. In this context, it is worth noting that the AEMC's Transmission Frameworks Review Final Report[9] has affirmed the Commission's views that:

- In order for effective planning and investment decisions to occur, the institutions or bodies who are responsible for these tasks must face appropriate incentives.
- Financial incentives are likely to provide the most robust and transparent driver for efficient decision making.
- Efficient outcomes can best be promoted by aligning the commercial incentives on businesses with the interests of consumers.
- The view that financial incentives are likely to lead to more efficient outcomes is widely held (and practised) by regulators internationally, as well as in Australia. While all entities are subject to various forms of incentives, financial incentives provide an understandable and transparent approach to influencing behaviour.
- TNSPs are best placed to make investment decisions since they face financial incentives. These investment decisions are bounded by incentives and regulation, which are developed and overseen by the AER.

In light of these considerations, there is no reason why an independent not-for-profit transmission planner is required to preside over probabilistic planning.

In addition, there is no reason to suppose that a probabilistic planning approach could not be remunerated through an ex ante capital expenditure allowance. The reliability standard is a key input to the programme of augmentation capital expenditure. However, the reliability standard does not affect the challenges of delivering the capital expenditure efficiently, nor does it imply that different incentive mechanisms are warranted.

[9] AEMC, Transmission Frameworks Review, Final Report, 11 April 2013, page 45

2.10 AEMO's contingent project proposal will undermine economic efficiency.

The Issues Paper asks whether a change in reliability standards during a regulatory period could be addressed through the contingent project mechanism. As already noted in section 2.8 above, the Rules contain provisions that allow for the pass through of material cost changes (including cost reductions) if there is a change in the reliability standard at a particular connection point. It is therefore unnecessary to extend the contingent project provisions to include augmentation capital expenditure. Furthermore, as explained below, a contingent project approach would undermine economic efficiency.

In a recent submission to the AEMC[10], AEMO suggested that the contingent project provisions provide a mechanism for protecting customers from project deferral as a result of demand forecasts being lower than expected. AEMO argues that there is no efficiency detriment in remunerating all augmentation capital expenditure through this mechanism – which means that projects would be remunerated on an 'as you go' basis.

However, Grid Australia notes that a contingent project approach only provides incentives to minimise the capital expenditure associated with a particular project. It therefore undermines any initiatives that would reduce capital expenditure across a number of projects.

TNSPs are continually examining measures to improve business processes, including procurement and outsourcing arrangements, which drive efficiencies across capital projects and programmes. Demand-side management is another area that could affect a number of capital expenditure projects. AEMO's proposal would significantly reduce the incentives for TNSPs to pursue initiatives that drive efficiencies across capital projects. This is a significant weakness of AEMO's contingent project proposal.

3. Explanation of Grid Australia's proposed approach

3.1 Framework for determining and implementing the standard

Grid Australia's November 2012 submission to the Productivity Commission outlined an approach for developing and applying economically derived, but deterministically expressed reliability standards. That proposal aimed to address the concern that economically derived but deterministically expressed standards may not be sufficiently flexible to accommodate changes in the nature of costs and benefits that underlie them. Grid Australia explained that[11]:

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[10] AEMO submission to AEMC's review of the implications of differences between actual and forecast demand for the network regulatory frameworks, 15 March 2013.

[11] Grid Australia, Submission to the Productivity Commission's draft report on its Inquiry on Electricity Network Regulation, 20 November 2012, page 27.

> "In this [proposed] approach the standard for each transmission connection point is reviewed regularly (say every 5 years) on an economic cost benefit basis and expressed deterministically. The review should consider the economic cost benefit of increasing, maintaining and reducing the standard at each connection point."

The AEMC's Issues Paper has identified a concern that Grid Australia's proposal may be perceived as providing TNSPs with flexibility to effectively vary the standard when evaluating a particular transmission investment decision. Specifically, concerns arise if a TNSP's regulated revenue allowance is set on the basis of a particular reliability standard, but a varied (possibly lower) standard is applied by the TNSP when investment decisions are made.

Grid Australia maintains its view that the framework should provide sufficient flexibility for the reliability standards to be updated, but this should not be at the TNSP's discretion. The following builds on Grid Australia's earlier submission to the Productivity Commission:

- Grid Australia continues to advocate that a body independent of the TNSP should set the reliability standard. Reliability standards will be set periodically for each TNSP so that they are finalised prior to the TNSP commencing its revenue cap proposal. The reliability standard would be an important input to the AER's determination of an efficient ex ante capital expenditure allowance for each TNSP.

- The reliability standard at each connection point would be published, including details of the input assumptions and load forecasts (subject to any applicable confidentiality requirements). The standard determined by the independent body must also be consistent with all information that is available regarding customer-specific preferences for a particular level of reliability.

- The independent body would also indicate the sensitivity of the reliability standard at each connection point to changes in load forecasts or other assumptions. For example, the standard-setting body may indicate that a reliability standard at a connection point remains valid providing that:

  - the growth in projected peak demand (at some defined probability of exceedance) does not fall outside the range of, say, 0.8% to 2.0% per annum; or

  - the assessed VCR applying at the relevant connection point remains within, say, +/- 15% of the VCR applied in setting the standard.

  In this way, the independent body would specify the tolerances or boundaries outside which a change in forecasts or assumptions would warrant a review of the reliability standard.

- Prior to commencing a RIT-T process, the TNSP would be required to check whether the key assumptions underpinning the reliability standard at the applicable connection point(s) remain valid in terms of the tolerances or boundaries (described above) specified by the independent body. Grid Australia proposes that this reconsideration should be limited to projects that exceed the RIT-T threshold specified in clause 5.16.4(z1)(1) of the NER, given the materiality of these projects and their potential impact on the TNSP's revenue requirements.

- If the TNSP finds that there has been a material change[12] in assumptions, then the TNSP would use the best available information to repeat the analysis applied by the independent body to establish the existing connection point standard. The TNSP would then prepare a report setting out the results of its analysis, including a recommended reliability standard, expressed deterministically. The report would be published.

- The standard-setting body must determine the reliability standard to apply at the relevant connection point(s) having regard to the TNSP's report. The standard-setting body's determination must consider, but does not have to accept the recommendation put to it by the TNSP, and it may confirm that the existing standard remains appropriate despite the new information. The standard-setting body must publish its findings, including the reliability standard (expressed deterministically) to be applied at the relevant connection point(s).

- The TNSP must then apply the updated reliability standard determined by the standard-setting body.

- Where a change in the reliability standard materially affects the costs of providing prescribed transmission services, an adjustment to the TNSP's revenue may be made through the cost pass through provisions contained in clause 6A.7.3 of the Rules. These provisions allow a revenue cap to be varied if a service standard event takes place that materially affects the TNSP's costs.

- The pass through provisions are symmetrical, in that they provide for reductions or increases in revenues, depending on whether a change in reliability standard has the effect of materially decreasing or increasing the costs of providing prescribed transmission services. Therefore, under these provisions, neither the TNSP nor consumers are exposed to the prospect of material windfall gains or losses arising from a change in reliability standards during a regulatory period.

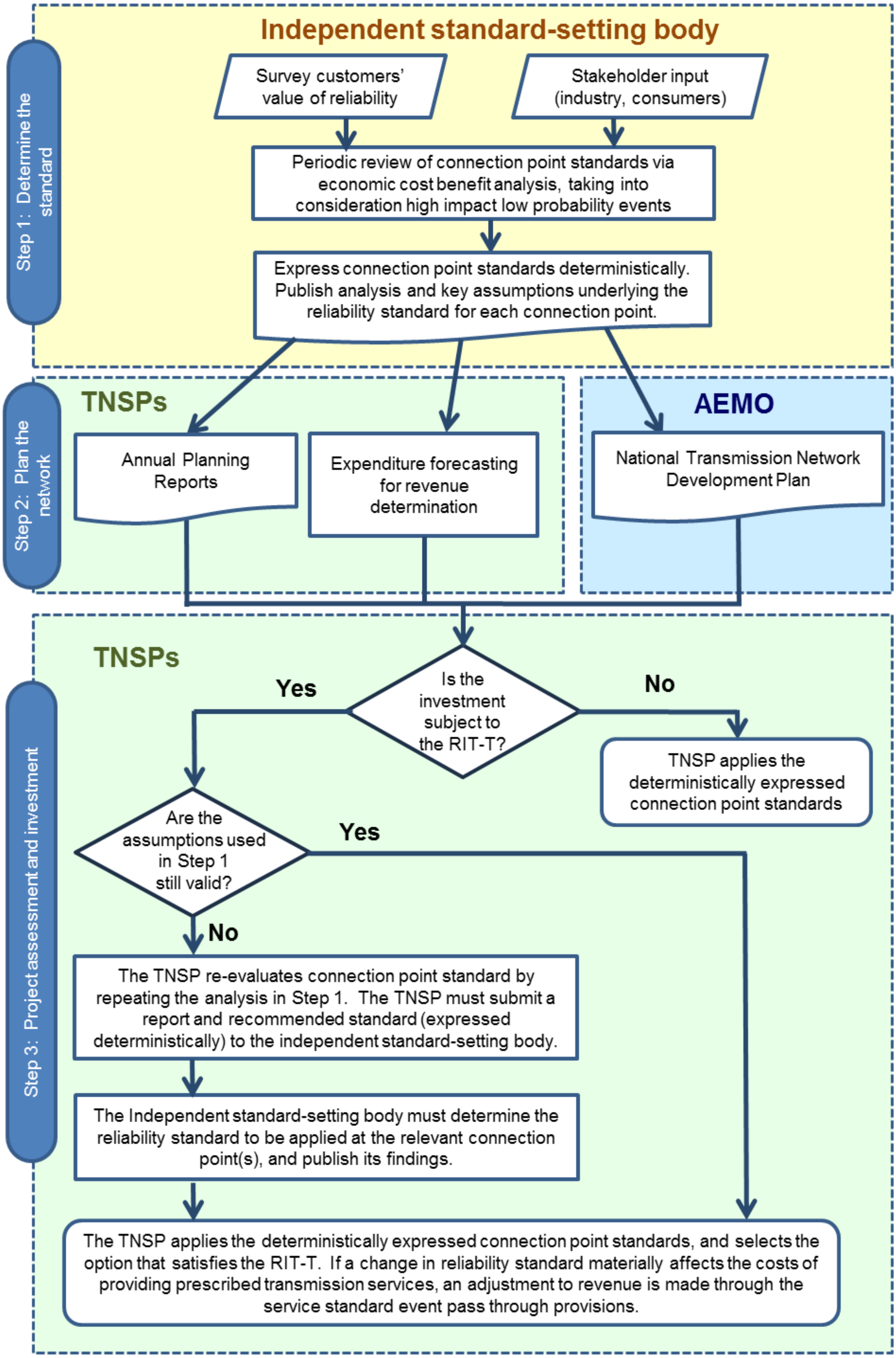
- Grid Australia's proposal provides for the independent determination of economically derived but deterministically expressed reliability standards. As noted by the AEMC, this provides certainty and transparency regarding the level of reliability that TNSPs are required to deliver. This, in turn, provides a means of ensuring that TNSPs are held accountable for meeting the standard.

[12] As already noted, the independent standard-setting body would provide guidance on the circumstances in which the assumptions or forecasts applied in setting the standard are no longer valid.

- Grid Australia's proposal is consistent with the National Electricity Objective because it promotes efficient investment by:
  - ensuring that TNSPs are accountable for complying with a transparent, economically derived and independently determined reliability standard at each connection point;
  - providing a mechanism for the reliability standard at a connection point to be updated if circumstances change materially;
  - ensuring that TNSPs and customers are not exposed to material windfall gains or losses as a result of a change in the reliability standard at a connection point; and
  - maintaining the ex ante approach to setting capital expenditure, which provides strong incentives for TNSPs to deliver efficiency improvements.

The diagram on the following page depicts the proposed framework.

Framework for developing and applying economic reliability standards



3.2 Consideration of high impact, low probability events

Grid Australia considers that economically derived reliability standards should include a consideration of high impact, low probability events.

Probabilistic planning is sometimes regarded as being the single, correct economic approach to assessing reliability. The objective of probabilistic planning is to identify options that maximise the expected net present value. Expected value is a measure of the average value of a range of possible future outcomes, some of which may vary significantly from the average.

Under a probabilistic planning approach, high impact low probability events are given a low weighting in the evaluation of expected costs and benefits, reflecting the very low probability of such events occurring. However, the total costs of widespread or prolonged outages are likely to be very high. The probabilistic approach assumes that customers and the community are only concerned about expected outcomes (cost multiplied by probability) rather than the total exposure. However, it is reasonable to expect that customers and the community are risk averse in terms of their appetite for exposure to high impact, low probability events[13]. This consideration suggests that there is likely to be a desire to avoid extreme events, even if the probability of their occurrence is very low.

This issue has been examined in a report to AEMO on VCR, prepared by Oakley Greenwood in 2011, as follows[14]:

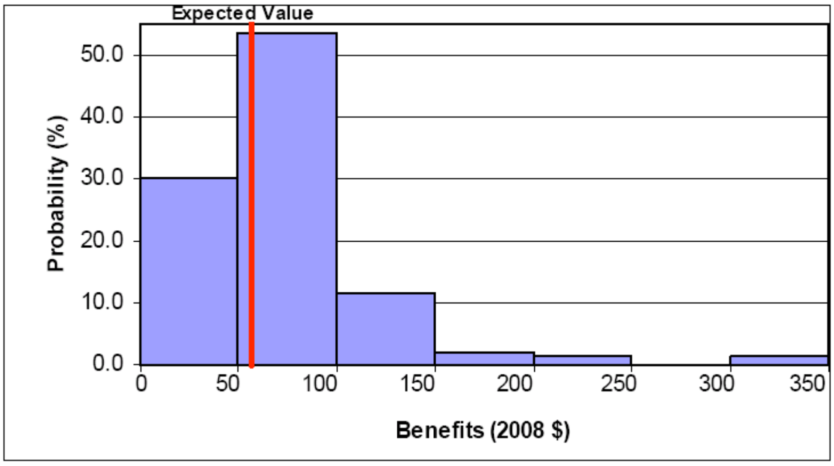
> "By contrast, the value of avoiding cascading outages in a broad area of the power system following a single thermal failure requires consideration of costs that potentially go far beyond the sum of the direct and indirect costs experienced by individual electricity users. These include the social disruption costs that were addressed in part in the 2007 Victorian VCR, but can also include the costs of so-called high impact, low probability (HILP) events, such as the transmission failure that occurred in Auckland in 2006. Incorporation of HILP events within the VCR will therefore require additional analysis. In the first instance, additional effort will be required to assess the actual level of cost experienced in HILP events. In addition, some alteration would need to be made to the VCR calculation method in order to incorporate HILP costs – or these costs would need to be considered separately. This is because the VCR calculation method weights the costs of outage events by their probability of occurrence only. As a result, the contribution of HILP events to the VCR would be reduced to almost zero."

The treatment of high impact, low probability events is a very important issue to be considered in establishing transmission reliability standards, and in assessing the benefits of a proposed network augmentation. The following diagram, which is

[13] Risk aversion is a concept that has been illustrated by economists through numerous experiments, first pioneered by Maurice Allais in the Allais Paradox in 1953. See Allais, Maurice, (1953), Le Comportement de l\'Homme Rationnel devant le Risque: Critique des Postulats et Axiomes de l\'Ecole Americaine, Econometrica; and Allais, Maurice, (1997), An Outline of My Main Contributions to Economic Science, The American Economic Review.

[14] Oakley Greenwood, Valuing Reliability in the National Electricity Market, Final Report, March 2011, page 39.

reproduced from a report prepared for the California Energy Commission in 2005, shows the range of benefits and probabilities associated with a proposed transmission investment.[15]



The above figure shows that the expected benefit from a proposed project is approximately $56 million. If, for example, the expected cost of the augmentation is $60 million, the project will have a negative net benefit and, under a strict probabilistic approach, would not proceed. However, careful regard must be given to the outlier benefit of $350 million, which may reflect the possibility of a high-impact outage. While a probabilistic approach weights this outcome by a low probability of occurrence, alternative decision-making criteria - such as least regrets or no regrets - could legitimately attribute much greater weight to this outcome.

As already noted, the application of probabilistic analysis typically ignores the customers' exposure to high impact, low probability events. However, it is reasonable to expect that customers and the wider community would be prepared to pay a premium - analogous to insurance - to reduce their exposure to high impact, low probability events.

Accordingly, Grid Australia considers that:

- An "economic approach" to setting reliability standards should not be constrained to seeking a solution that maximises expected net present value. The application of a decision rule that is confined to maximising expected NPV may lead to the selection of economically inefficient options, insofar as options that would deliver a higher utility are foregone.

- An "economic approach" to setting reliability standards should therefore seek to define reliability standards that maximise utility, recognising that customers and the community are likely to derive utility from measures that may have a negative expected NPV, but which nonetheless limit exposure to high impact low probability events.

[15] Pinnacle Consulting, Assessing High Impact Low Probability Events, Final Report, October 2005, page 7.

- The maximisation of utility - not expected net present value - is consistent with the requirements of the national electricity objective.

- The determination of reliability standards should reflect a comprehensive view of potential future outcomes, and the value that the community may be prepared to pay to avoid being exposed to the more extreme potential outcomes.

- An economically derived, but deterministically expressed planning standard should therefore have regard to:

  – the maximum exposure that consumers may face under alternative planning scenarios that examine the consequences of transmission plant failure; and

  – the community's willingness to pay to avoid exposure to high impact low probability events.

Given the above, the determination of transmission reliability standards is likely to involve a consideration of the maximum exposure from a transmission outage, in addition to the expected exposure. These considerations require the exercise of judgment by the independent standard-setter, and cannot be determined through a mechanical or formulaic approach. In these circumstances, reference to accepted international good practice may assist in guiding that judgment[16].

4. Approach, scope and principles for the transmission workstream

4.1 Consistency with the distribution workstream

The Issues Paper explains that, where possible, the AEMC will seek to maintain consistency between the reliability frameworks for distribution and transmission networks. For example, SCER has requested advice on the following common framework issues:

- the trade-off between the cost of investing and maintaining networks and the value placed on reliability by customers;

- the development of a mechanism for measuring and regularly updating VCRs; and

- the ability for jurisdictions to transfer responsibility for applying the framework to the AER.

[16] KEMA's 31 July 2008 report to the Reliability Panel, titled *International Review of Transmission Reliability Standards: Additional response regarding probabilistic planning methodologies*, provides a helpful overview of international practice in relation to transmission reliability standards.

The AEMC notes, however, that while there could be benefits in maintaining high level consistency between the frameworks for transmission and distribution, there are also fundamental differences between transmission and distribution networks. In particular:

- In contrast to transmission networks, the actual performance of distribution networks in terms of supply interruptions (e.g. number or duration of supply interruptions) can be more easily observed.

- Distribution networks are the source of the majority of supply interruptions, due to the large and radial nature of distribution networks. Transmission networks are designed to provide a backbone capability to transport generation to load centres. A transmission failure is much less likely to arise, but has the potential to cause widespread outages.

- Distribution networks generally undertake a large number of relatively small investments, while transmission networks generally undertake a small number of large investments.

The Issues Paper comments that these differences mean that while consistency at a high level in setting reliability standards is possible, the detail of how each framework operates and the types of standards and incentives that should apply will need to differ.

Question 1 (a) Which components of the national framework for transmission reliability should be made consistent with the national framework which will be developed for distribution reliability?

Grid Australia agrees with the AEMC that there are important differences between transmission and distribution networks that must be taken into account in developing and applying the reliability standards framework. A key difference is that the reliability performance of distribution networks is more readily managed through output-based measures. The Service Target Performance Incentive Scheme (STPIS) applying to DNSPs is capable of encouraging economically efficient levels of reliability. This is because distribution investment can be targeted to efficiently improve reliability monitored by output-based measures (such as SAIDI and SAIFI), which are less likely to be significantly affected by a small number of events.

In contrast, transmission network reliability is more appropriately monitored through input-based measures, such as compliance with a deterministically expressed reliability standard. Output-based performance measures for transmission networks are more likely to be affected by a small number of loss of supply events. This performance characteristic, and the larger cost and scale of transmission investments, makes it impractical to rely on the STPIS to remunerate transmission investment.

While Grid Australia recognises the attraction of developing a common approach across transmission and distribution networks, in practice the differences between the two networks may suggest that there is limited scope for a common approach to be applied. Grid Australia notes that the AEMC will consider the distribution reliability standards in a separate workstream. Given the significant differences between the networks, Grid Australia supports this approach.

Question 1 (b) Which components of the framework for transmission reliability should differ from the framework for distribution reliability?

As noted in response to question 1(a), there may be limited scope for the same approach to reliability standards to be applied across distribution and transmission networks. Grid Australia's submission is therefore focused on developing an appropriate approach for setting transmission reliability standards.

4.2 Scope of the national framework for transmission reliability standards

The Issues Paper comments that the scope of a national framework for transmission reliability should include the following features:

- **Expression of standards**. How standards are described across the NEM.
- **Methodology for setting standards**. The process used to set standards, including the factors which are taken into account in setting standards.
- **Institutional and governance arrangements**. The bodies which are responsible for setting standards and monitoring compliance under the national framework. The institutional and governance arrangements would also determine the incentives and penalties for transmission networks to meet their reliability standards.
- **Reporting arrangements**. The process for reporting and publishing the standards that each TNSP is required to meet, as well as information on the actual level of reliability achieved.

The Issues Paper also notes on page 14 that:

> "The intention of the framework is not to result in a consistent level of transmission reliability across the NEM. Rather, the purpose of the framework is to provide a nationally consistent approach to how reliability standards are developed, described and reported on."

Grid Australia concurs with the AEMC's comment that the purpose of the framework is to provide a nationally consistent approach, but not to result in a uniform level of transmission reliability across the NEM.

Question 2 (a) Are there any components of the proposed scope for the national framework for transmission reliability that should be considered out of scope?

Grid Australia considers that the proposed scope is appropriate.

Question 2 (b) Should any additional components be included in the scope of the framework?

Grid Australia is not aware of any additional components at this stage. It is noted that the description of the scope could be extended to specifically include the setting of the VCR. However, the Issues Paper makes it clear that the VCR is included in the scope for the framework. Grid Australia notes that it has lodged a submission to AEMO's Value of Customer Reliability Issues Paper. We wish to draw the AEMC's attention to that submission, and we would encourage the AEMC to take this submission into account in the course of its review.

4.3 Principles for the transmission workstream

The Issues Paper proposes the following principles, which are based on those used in the AEMC's 2010 Updated Final Report, to guide the transmission workstream.

Transparency:	The process for setting standards and the standards themselves should be transparent, and stakeholders should have the opportunity to provide input on proposed changes to the standards. The process and reasons for setting transmission reliability standards should be clearly explained.
Governance:	The standards should be set by a body that is separate from the TNSP that must apply the standard. However, the framework should allow standards to be determined by the standard-setter following consultation between the standard-setter and the TNSP. The consequences of not following the standards should be clearly defined along with the processes for enforcing the standards. TNSPs should be held accountable for ensuring that the standards are met, as well as for compliance with requirements under relevant STPIS.
Economic efficiency:	Standards should be set using an economic assessment process that compares the cost of undertaking and maintaining transmission investments against the value customers place on reliability.
Fit for purpose:	Standards should be clearly specified by connection point or on some other readily understandable basis. The framework should not be a "one size fits all" approach. Rather it should allow for standards to differ across networks according to the

	value placed on reliability by customers and the costs of providing different levels of reliability.
Effectiveness:	The framework should enable investment to proceed in a timely manner and meet customers' expectations relating to the value they place on reliability. The framework should allow standards to be met through innovative and efficient means and should not be biased towards network solutions where non-network options can provide a comparable level of reliability. The framework should allow joint planning to be undertaken between TNSPs and between TNSPs and DNSPs to deliver the appropriate level of reliability at each connection point.

Question 3: Are the proposed principles for the transmission workstream appropriate in guiding the development of the AEMC's advice?

Grid Australia strongly supports the AEMC's principles. However, there are four points of clarification that Grid Australia would like to raise:

- As already noted, the reliability standard has no practical implication for the STPIS in transmission networks. This contrasts with the situation applying to distribution networks where there are relatively frequent outages that impact customers and it is possible to calibrate the STPIS to reflect estimates of the value to customers of reliability. The same situation does not apply in relation to transmission networks, because it is it impractical to rely on the STPIS alone to remunerate transmission investment.Grid Australia concurs with the AEMC that reliability standards should differ across and between networks according to the value placed on reliability by customers and the costs of providing different levels of reliability. Grid Australia notes that where differences in reliability standards arise across networks, the joint planning obligations in the Rules should provide an appropriate vehicle for the parties to agree a view on an economically efficient outcome.

- The inherent uncertainty of each parameter in a reliability standard should be made explicit to policymakers and the public (that is, the uncertainty in predicting transmission element outages, the uncertainty in estimated VCR values, and the uncertainty of anticipating how much load will be shed when contingencies occur).

- Grid Australia supports the principle of economic efficiency, which the AEMC describes as comparing the cost of undertaking and maintaining transmission investments against the value customers place on reliability. Grid Australia agrees with this description, but it is important to note that the value that customers place on reliability must include a consideration of high impact, low probability events. As explained in section 3.2 of this submission, an evaluation approach that focuses only on the expected (or average) benefit of a transmission investment will understate the value that customers place on reliability. This understatement arises because customers are risk averse, and will therefore place extra value on the benefit of avoiding widespread or prolonged outages compared to the expected value implied by its probability of occurrence.

5. Role of transmission reliability standards and interactions with the revenue determination process

5.1 Potential benefits of fixed transmission standards

The Issues Paper explains that the AEMC's 2008 Final Report and 2010 Updated Final Report on the Transmission Reliability Standards Review recommended a national framework be developed on the basis of reliability standards, which are economically derived and expressed on an N-x basis.

The Issues Paper notes that an economically derived, but deterministically expressed reliability standard may provide certainty regarding the level of reliability that should be provided by TNSPs. At the same time, however, the Issues Paper noted the potential reduction in economic efficiency if the costs and benefits that were used to set the reliability standard are no longer valid.

The Issues Paper also explains that an alternative to a fixed approach to setting reliability standards is to conduct a project by project assessment. The AEMC notes this would change the role of reliability standards from a strict compliance obligation that TNSPs must plan and adhere to as a condition of their licence, to more of a benchmark or initial screening test.

Question 4 (a) **Do fixed transmission standards offer benefits in terms of certainty and transparency?**

Grid Australia's view is that clearly defined 'fixed' transmission standards provide significant benefits in terms of certainty, transparency and accountability. As explained in section 3.1 of this submission, such an approach can be implemented in a way that provides a mechanism for ensuring that the costs and benefits of network investment are considered in setting the reliability standards. Moreover, the publication of a clearly articulated reliability standard at each connection point provides a mechanism for monitoring compliance.

Question 4 (b) **Would a five-yearly review process adequately reflect changes in the costs and benefits associated with meeting reliability standards?**

There is a concern expressed in the Issues Paper is that a fixed reliability standard introduces the possibility that the underpinning assumptions or forecasts are no longer valid at the time of an investment decision. The trade off, therefore, is between the benefits of a fixed standard and the possibility that the investment outcomes may be less efficient if the standard employs assumptions or forecasts that are out of date.

Grid Australia favours the use of the most accurate, up-to-date information for investment purposes. It does not follow, however, that the reliability standards for a connection point should be reviewed at the time of each investment decision. Grid Australia considers that constantly revisiting the reliability standards would be an administratively burdensome approach. Instead, Grid Australia considers that the reliability standard at a connection point should be reviewed if the underpinning assumptions and forecasts are no longer valid. The details of Grid Australia's proposed approach are explained in section 3 of this submission.

5.2 Providing for flexibility in transmission reliability

The Issues Paper summarises Grid Australia's suggested approach to reliability standards in its submission to the Productivity Commission's draft report on the Inquiry on Electricity Network Regulation. In that submission, Grid Australia proposed that under a national reliability framework, standards could be departed from for projects that satisfy the RIT-T threshold if defined criteria are met, such as a material change in input assumptions since the reliability standards were set.

Grid Australia has clarified its proposed approach in section 3 of this submission to address the concerns raised by the Issues Paper.

Question 5(a) Is there merit in having a flexible approach to reliability standards under the national framework?

Grid Australia considers that it is appropriate to update the reliability standard if the assumptions or forecasts on which the original standard was based are no longer valid. This flexibility ensures that the reliability standard remains economically sound.

However, it is not appropriate for any difference to arise between:

- the approach for setting the standard at the commencement of the 5 yearly regulatory period, and
- the approach for determining the updated standard during the regulatory period.

While the standard may be updated, as already noted, the approach to setting the standard itself should not be changed, Also updating of the standard should not be at the discretion of the TNSP, but the independent standard setting body.

Question 5(b) Should Grid Australia's proposed criteria of the need to conduct a RIT-T and a material change in circumstances be used to determine when TNSPs are able to undertake a further economic assessment which would allow them to depart from their transmission reliability standards?

As explained in section 3 and in the answer to question 5(c) below, as part of specifying the standard, the standard-setting body would also specify the assumptions and forecasts on which the standard is based. The reliability standard at a particular connection point should be subject to review if:

- there is a material change in the assumptions and forecasts; and
- the project is a RIT-T project, and therefore a change in the reliability standard may have a material effect on the TNSP's capital expenditure.

If these conditions were met, the TNSP would conduct a review of the existing reliability standard at that connection point and report back to the standard-setting body. Importantly, however, the determination of the reliability standard at that connection point would be a matter for the independent body, not the TNSP.

The TNSP would be responsible for complying with the reliability standard as determined by the standard-setting body.

Question 5(c) How should a "material change in circumstances" be defined?

The material change in circumstances would be defined by the standard-setting body at the time that the five-yearly review of reliability standards. Specifically, the standard-setting body would set out the assumptions and forecasts that underpinned the reliability standard at each connection point. The standard-setting body would also specify the tolerances or boundaries outside which the reliability standard should be reviewed. For example, the reliability standard may assume that the load at risk at a connection point should not exceed 50 MW, or it may assume that that the peak demand grows by a minimum of 0.5% per annum.

It will be a matter for the standard-setting body to specify the relevant assumptions and forecasts at each connection point, and the boundaries outside of which a change in those assumptions and forecasts would warrant a re-examination of the standard.

Question 5(d) Should any other requirements be met before TNSPs are able to depart from their standards?

As explained above, the TNSP should not be able to depart from the reliability standard. However, the independent body may amend the reliability standard - if there has been a material change in circumstances as described above - having regard at all times to specific information about the customers' preferred level of reliability.

5.3 Implications for the revenue determination process of a flexible approach to reliability

Question 6(a) **Is a flexible approach to transmission reliability consistent with setting ex ante revenue allowances for transmission augmentation?**

Grid Australia considers that no special issues arise in relation to the change in reliability standard during a regulatory period. The Rules provide for the pass though of material cost increases or decreases if there is a change in regulatory obligations during a regulatory period. The relevant provisions are set out in the definition of a "service standard event" and the cost pass through provisions in clause 6A.7.3 of the Rules.

It is also noted that there is no reason to suppose that the change in assumptions or forecasts would be more likely to lead to a relaxation of the reliability standard (and deferral of capital expenditure), as opposed to more onerous reliability standards and increased capital expenditure requirements. Grid Australia's position is that the existing revenue setting arrangements are more than capable of addressing a change in reliability standards.

Question 6(b) **Would the RIT-T process provide sufficient transparency to address the regulatory risks of inefficient investment deferral, or would wider changes be required?**

An economically derived, deterministically expressed reliability standard would provide a simple and effective mechanism for monitoring compliance with the reliability standard. This aspect of the reliability standard would allow the AER to identify uneconomic deferral of capital expenditure in a way that would not be available under a probabilistic planning approach.

5.4 Potential use of the contingent project mechanism

The Issues Paper suggests that use of the contingent project mechanism in clause 6A.8 of the Rules provides a possible option to address the implications for revenue determination of a flexible approach to reliability standards. In particular, it is suggested that the mechanism could be developed to allow the AER to re-open a revenue determination if:

- a cost benefit assessment clearly demonstrates that it would economic to depart from the standard; and
- a departure from the reliability standard is approved by the relevant standard setter.

Question 7(a) If a change in the revenue determination process is required, would the use of the contingent project mechanism be an appropriate way to address this?

No. The contingent project mechanism provides a means of regulating large and uncertain capital expenditure projects. It is not equipped to address the cost implications that arise from a change in the timing of a capital expenditure project if a reliability standard is updated part way through a regulatory period. In particular:

- Clause 6A.8.1(b)(2)(i) of the Rules only allows the AER to accept a project as a contingent project if the proposed contingent capital expenditure:

  > "is not otherwise provided for (either in part or in whole) in the total of the forecast capital expenditure for the relevant regulatory control period."

- Clause 6A.8.1(c)(2) states that a contingent project must be subject to a trigger event, which must satisfy a number of requirements, including being:

  > "a condition or event, which, if it occurs, makes the undertaking of the proposed contingent project reasonably necessary in order to achieve any of the capital expenditure objectives."

As already explained, the cost pass through arrangements set out in clause 6A.7.3 of the Rules provide the best vehicle for addressing a service standard event such as a change in the connection point reliability standard part way through a regulatory period. Those provisions obviate the need for any "change in the revenue determination" to address the cost and revenue implications that may arise from a change in reliability standards during a regulatory period. The contingent project provisions were developed for an entirely different purpose.

Question 7(b) What implications could the increased use of the contingent project mechanism have for the role of ex ante revenue determinations in incentivising efficient investment?

The use of contingent projects would be a fundamental change to the ex ante revenue determination process and its incentive properties. Grid Australia agrees with the following observation in the Issues Paper[17]:

> "More generally, a movement away from an ex ante revenue allowance for TNSPs to the increased use of regulator approved project by project assessments would represent a fundamental change to the form of incentive regulation currently in place in the NEM. The increased use of the contingent project mechanism could limit the effectiveness of the incentives that arise from the AER setting an ex ante revenue allowance, and has the potential to lead to responsibility for investment decision making being transferred from TNSPs to the AER. This raises concern about the potential implications that this may have for efficient service provision by TNSPs."

[17] AEMC, Review of the National Framework for Transmission Reliability: Issues Paper, 28 March 2013, page 33.

Grid Australia also concurs with the following findings of the Transmission Frameworks Review[18]:

> "Ex ante revenue allowances provide a strong incentive for TNSPs to minimise their costs over the regulatory period since TNSPs are able to profit by spending less than their allowed revenue allowance. Ex ante revenue allowances also provide incentives for TNSPs to reduce their overall costs by making trade-offs across their network and prioritising projects."

A project by project revenue allowance would have significant implications for the achievement of future efficiency gains. A project by project capital expenditure allowance is only capable of providing incentives in relation to that particular project. Therefore, it fails to provide any incentive to undertake initiatives that are likely to drive efficiency improvements across a number of projects.

Company-wide initiatives that improve procurement, outsourcing, project delivery and governance all have the capacity to deliver efficiencies across projects. Cross company initiatives such as condition-based monitoring and demand side management may allow a number of projects to be deferred economically. A regulatory approach that removes incentives to explore such initiatives would be a retrograde step.

6. Expression of transmission reliability standards and the standard setting process

6.1 Expression of transmission reliability standards

The Issues Paper notes that one of the key features of a national framework would be consistency in the expression of standards across the NEM. This would enable standards to be compared and understood on a common basis.

A national reference standard template would need to be able to accommodate the range of reliability outcomes and customer types across the NEM. The template might therefore be based around set categories of reliability, similar to the approach used in South Australia, or it might seek to allow greater flexibility, for instance by setting out parameters that could be used to more precisely define the level of reliability at each connection point.

The Issues Paper also notes the AEMC's expectation that the detail of the national reference standard template would be developed through a separate consultation process as part of the implementation of the national framework, if the national framework is endorsed by SCER.

[18] AEMC. Transmission Frameworks Review Final Report, April 2013, page 84.

Question 8(a) Should the national reference standard template specify categories of reliability that each connection point should be allocated to or could greater flexibility be provided for by setting out parameters to be used to define the level of reliability at each connection point?

As noted in the answer to question 4(a), the publication of a clearly articulated reliability standard at each connection point provides a mechanism for monitoring compliance. Grid Australia regards compliance monitoring as being an important aspect of a national framework for transmission reliability standards. Transparency and performance monitoring would be enhanced if each connection point were allocated a pre-defined reliability standard from a suite of clearly defined standards.

It is also important that the standard template is not unduly restrictive. As observed by the Productivity Commission[19]:

> "The lumpy nature of the reliability categories creates inefficiencies. There are only six (soon to be five) categories into which connection points can be classified. With a limited number of defined categories, it is not possible to take a more granular approach to reliability standards. Moreover, classifications are rounded up so that there is always a bias to a higher requirement for reliability."

Grid Australia notes that the basic 'menu' of reliability standards could be given greater granularity if the standard-setting body sets conditions for the standard at each connection point. The reliability standard could specify a maximum load at risk, maximum hours for load loss exposure, or a time dimension. For example, the reliability standard could specify an N-1 reliability standard with no more than 25 MW of load being interrupted by a credible contingency event.

By allowing the basic menu to be augmented by specifying load at risk conditions, the limitations observed by the Productivity Commission are substantially addressed. More broadly, however, it may be appropriate to lose some granularity in exchange for the benefit of being able to monitor compliance with the reliability standard. The standard-setting body should exercise this judgement, subject to meeting the AEMC's guidelines (discussed further in response to question 9(a)).

Question 8(b) What parameters should be used to define connection point reliability in the national reference standard template?

Grid Australia does not consider it necessary to define the parameters in detail at this stage. As noted in response to question 8(a), Grid Australia considers that the national reference standard template should provide the standard-setting body with sufficient flexibility to ensure that the reliability standards are economically efficient. As already noted, a balance must be achieved between providing sufficient granularity to achieve economic efficiency, and providing a transparent standard that facilitates compliance reporting.

[19] Productivity Commission, Inquiry into Electricity Network Regulation, Draft Report, 18 October 2012, p511.

6.2 Economic cost benefit assessment process

The Issues Paper describes the following high-level process for setting economically efficient reliability standards:

- A cost-benefit assessment is made of differing levels of reliability at each connection point.
- The reliability standards for each connection point would then be expressed (deterministically) in a manner that is consistent with the national reference standard template.
- Where there are shown to be clear net benefits from a reduction in reliability following the economic assessment process, a connection point should be allocated a lower level of reliability.

As already noted, Grid Australia concurs with each of these points.

The Issues Paper invites stakeholder comments on:

- the process and assumptions in setting reliability standards;
- the consideration of very low probability but high impact events, which may cause protracted load curtailment; and
- the range of VCR values that should be employed in the standard setting process.

Question 9(a) What would need to be specified in guidelines governing the economic cost benefit process?

Grid Australia considers that the information set out in Box 5.1 of the Issues Paper provides a useful overview of the process for undertaking economic cost benefit analysis under the national framework. Grid Australia supports the position outlined in the AEMC's 2010 Updated Report that guidelines should be published by the AEMC[20]. It is noted, however, that the MCE subsequently concluded[21] that the AER should undertake this role in accordance with the AEMC's earlier report in 2008. Grid Australia accepts the MCE's conclusion, but recognises that there are also benefits in the AEMC undertaking this role.

The guidelines would stipulate the assumptions and methodology that must be applied when conducting economic analysis. The guidelines should also specify the 'menu' of deterministically expressed reliability standards. As discussed in response to question 8(a), the guidelines should also specify the extent to which the standard-

[20] AEMC, Transmission Reliability Standards Review, Updated Final Report, 3 November 2010, page 21.

[21] Ministerial Council on Energy, Transmission Reliability Standards Review: Ministerial Council on Energy Response to Australian Energy Market Commission Final Report, MCE, 16 November 2011, page 9.

setting body is able to enhance the granularity of the reliability standard through the inclusion of load at risk or hours at risk parameters at particular connection points.

Grid Australia expects the guidelines to address matters relating to the estimation of key input variables, and other assumptions applied in the analysis, including: demand forecasts, VCR, expected unserved energy estimates, the discount rate, and the duration of the study horizon. The guidelines should direct the standard-setting body to use bespoke values of VCR - or any other specific information regarding a customer's preferred level of reliability - for a particular customer at a particular connection point where data is available.

Grid Australia suggests that the guidelines should be updated regularly to ensure that up-to-date information is available when reliability standards are reset periodically in each jurisdiction. Furthermore, updated information will assist TNSPs to assess whether the assumptions and forecasts applied in setting an existing reliability standard at a connection point remain valid.

Question 9(b) Should the economic cost benefit process allow for the consideration of very low probability but extremely high impact events?

As already noted, Grid Australia considers that probabilistic planning may understate the value of transmission augmentation because it focuses on expected or 'average' costs and benefits. A further problem arising in the use of a probabilistic methodology for high impact low probability events is the difficulty in quantifying the probability of such events occurring. Given that such events occur very infrequently, there is insufficient data to form a robust estimate of the event's probability. It is not good practice to rely on a seemingly exact methodology in a situation where information on a major input variable is highly uncertain, and such an approach may foster a perception of spurious accuracy regarding the decision signals produced by probabilistic analysis.

In reality, there is a wide range of possible outages that may result from a transmission failure, depending on the nature and circumstances of the failure. An expected value approach will only weight these extreme outcomes by their probability of occurrence, which is typically very low. It is reasonable to posit, however, that the community is risk averse and therefore places an insurance value on investments that reduce the exposure to high impact, low probability events.

It is important that the standard-setting body should take account of high impact, low probability events in setting the reliability standard at each connection point. It is appropriate for this body to trade off the additional costs of a more onerous reliability standard against the reduced exposure to extreme events. Grid Australia considers that this judgment is unlikely to be a mechanical or formulaic approach.

Question 9(c) If so, should a different VCR be used in assessing very low probability, extremely high impact events?

It is important to recognise that VCR is the value that customers place on marginal increments or decrements in reliability, expressed in terms of a dollar value per unit of unserved energy. Customers, and the community more generally, may place a higher value on each MWh of unserved energy if there is a long or widespread outage. For example, in addition to the growing inconvenience costs, the community is likely to suffer disruption costs including reductions in public transport, health services and water and sewerage services. These factors suggest that the VCR may be higher if we are examining the cost of a widespread or prolonged outage.

However, the total costs of widespread or prolonged outages will be determined by the total volume of unserved energy multiplied by the cost of that unserved energy per MWh. A probabilistic approach will weight this very high total cost by the very small probability of occurrence. Grid Australia's concern is that this approach assumes that customers and the community are only concerned about expected outcomes (cost multiplied by probability) rather than the total exposure. However, customers and the community tend to be risk averse, which means that there is a desire to avoid extreme events, even if the probability of occurrence is very low.

Given the above discussion, there are particular challenges in deriving VCR estimates that would fully reflect the costs of high impact low probability events. Moreover, while the VCR may be higher in an extreme event for the reasons already noted, the consideration of high impact low probability events requires a different approach to assessing the costs and benefits. In particular, it is necessary to consider the insurance value provided by a higher reliability standard, which compares the 'insurance premium' (the annualised cost of the augmentation) against the insured amount (which is the maximum exposure in terms of the total value of unserved energy).

6.3 Use of the value of customer reliability

The Issues Paper notes that:

- VCR will be a key input for the national framework, as it would quantify the benefits of different levels of reliability for customers.
- To ensure the VCR reflects customers' requirements at each connection point as closely as possible, discrete VCRs for each jurisdiction or transmission network, as well as a range of customer types, would need to be developed.
- AEMO is currently undertaking a review to develop national VCRs, following a request from SCER.

The Issues Paper seeks stakeholder comments on whether it would be appropriate to test a range of values around each VCR for each connection point when determining reliability levels. The AEMC suggests that where a particular level of reliability would have net benefits under the majority VCR scenarios, a change in the reliability level could be adopted.

Question 10(a) Should a range of values around the VCR be used to assess reliability levels at connection points?

Yes. It is not appropriate to mandate an assumption that the VCR must be a point estimate when the VCR is subject to significant estimation error. The guidance should specify the VCR range for each jurisdiction, in light of advice from AEMO.

Grid Australia notes the AEMC's suggestion that the reliability standard at a connection point should deliver net benefits under the majority of VCR estimates. A more cautious view would recognise that the reliability standard at a connection point may be economic if it delivers a net benefit using the maximum permissible VCR. This approach recognises that transmission planning should be inherently conservative in erring on the side of investment. Grid Australia considers it appropriate for the standard-setting body to exercise its judgment on the appropriate reliability standard at a connection point, given the uncertainties. As previously noted however, the need to exercise judgement may be obviated if information about a customer's preferences are known - in which case the standard-setting body would be required to take that information into account.

Question 10(b) What range of VCR values should be used?

This is a matter for the AEMC to determine, in light of the advice from AEMO. In previous VCR studies, however, Grid Australia considers that the uncertainty regarding the VCR estimates has been grossly understated. Grid Australia has raised these concerns with AEMO in our submission to AEMO's VCR review.

7. Governance under the national framework

7.1 Responsible body for setting standards and delegation of responsibility to a national body

The Issues Paper notes that the jurisdictions are currently responsible for setting transmission reliability standards. It also notes that COAG has agreed that jurisdictions should be able to transfer this role to the AER. In these circumstances, the AER could be responsible for both setting the reliability standard and monitoring compliance. The Issues Paper notes that changes may be required to the AER's legislative functions to allow it to set reliability standards and its approach would be strictly economic[22]:

[22] AEMC, Review of the National Framework for Transmission Reliability: Issues Paper, 28 March 2013, pages 41 and 42.

> "Where the AER sets standards it would be difficult for it to do so other than on an economic basis. This could mean that the AER would be required to determine standards based on the highest net benefit and other factors, such as social or community expectations, would not be incorporated."

The Issues Paper also notes that irrespective of which body sets the standard, the relevant TNSP would provide information to the standard setter on the load at each connection point and the options and costs of removing constraints.

Question 11 What should be the AER's role under the national framework where a jurisdictional government has delegated responsibility for applying the framework?

The delegation of responsibility for applying the national framework to the AER is a matter for the relevant jurisdiction. Grid Australia considers that the process for setting standards should not be affected by whether the AER or a jurisdiction performs this role. In particular, the guidance should apply equally to the AER and the jurisdictions.

Grid Australia is concerned that the AEMC draws a distinction between achieving the highest net benefit – which the AEMC regards as an economic consideration – and social and community expectations, which are not regarded as economic matters. As explained in section 3.2, an "economic approach" to setting reliability standards should not be constrained to seeking a solution that maximises expected net present value. It should instead seek to define reliability standards that maximise utility. Probabilistic planning – the goal of which is to identify options that maximise expected net present value – is sometimes regarded as the single, correct economic assessment of reliability. However, as already explained, probabilistic planning tends to understate the value that customers place on transmission augmentations because the cost benefit analysis assumes that customers are risk neutral rather than risk averse. The setting of reliability standards – whether conducted by the AER or the jurisdictions – should properly consider these matters as part of an economic assessment.

In terms of economics, if customers are risk averse the maximisation of expected net present value is not utility maximising. The recognition of this issue does not take the analysis outside the boundaries of economics, but instead provides a more comprehensive assessment of customer preferences.

7.2 Developing and approving the national reference standard template

The Issues Paper notes that SCER[23] has proposed that the AER should have responsibility for developing guidelines that would govern the setting of the reliability standards. The AEMC notes that where responsibility for setting standards has been delegated by a jurisdiction to the AER, this would provide consistency in the role of the standard setter and guideline developer. The Issues Paper also comments[24]:

"In light of the AER's responsibilities in setting standards under the national framework (if delegated by a jurisdiction) and developing guidelines for setting standards, it may be appropriate for the AER to also approve the national reference standard template."

The approach contemplated by the Issues Paper is that the AER is responsible for all aspects of guiding and setting transmission reliability standards in circumstances where the jurisdiction transfers its reliability setting role to the AER.

Question 12 Who should be responsible for developing and approving the national reference standard template?

Grid Australia accepts the SCER's view that the AER should be responsible for the guidelines. However, there remains a strong case for the AEMC to undertake this role in accordance with the AEMC's recommendations in its 2010 Updated Final Report[25].

The AEMC has significant experience in relation to reliability issues through its work with the Reliability Panel. The AER, as the economic regulator, may not have the level of technical expertise to undertake this task. In addition, there may be some benefits in combining the role of setting the national reference standard template and the guidelines for reliability-setting. These observations may indicate a need to revisit the question of whether the AER or AEMC undertakes these functions. Grid Australia would support either approach.

It should also be noted that Grid Australia sees no particular benefit in achieving consistency in the role of the standard setter and guideline developer. The guidelines must be capable of being applied by the jurisdictions if this responsibility is not transferred to the AER. Therefore, even if the AER is responsible for setting reliability standards in some jurisdictions, there is no reason to suppose that this will be the situation in all jurisdictions. The guidelines therefore must be capable of being applied independently of the guideline-setter.

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23 The Issues Paper refers to: Ministerial Council on Energy, Transmission Reliability Standards Review: Ministerial Council on Energy Response to Australian Energy Market Commission Final Report, MCE, 16 November 2011, page 9.

24 AEMC, Review of the National Framework for Transmission Reliability: Issues Paper, 28 March 2013, page 43.

25 AEMC, Updated Final Report, Transmission Reliability Standards Review, 3 November 2010, page 19.

8. Accountability and compliance obligations

The Issues Paper notes that:

- TNSPs could publish the actual level of reliability achieved compared to the level required for each connection point as part of their annual planning report.
- Reporting would ideally need to be on a redundancy basis to allow it to be compared against the reliability standard.
- Reporting on the actual level of reliability provided could serve as a useful accountability mechanism. It could also assist stakeholders, as well as AEMO in its role as national transmission planner and the AER in setting revenue allowances, to identify potential under or over investment by TNSPs.
- Notwithstanding the above, it is difficult in practice to devise output based performance reporting requirements for TNSPs.

The Issues Paper seeks comments on whether TNSPs should be required to publish the actual and required reliability standard for each connection point. In addition, the AEMC is interested in whether it would be useful to report on output-based reliability measures. For example, in some jurisdictions TNSPs are currently required to report annually on their loss of supply events.

8.1 Reporting requirements

Question 13(a) Should the national framework include reporting on the level of reliability that is provided in practice each year as well as reporting on the reliability standard for each connection point?

Grid Australia agrees that reporting on the actual level of reliability provided would serve as a useful accountability mechanism. The level of reliability actually provided by a TNSP at each connection point (measured in a form consistent with the definition of the standard) should be reported against the deterministically expressed standard. It should be noted, however, that delivery of a level of reliability in excess of the reliability standard does not necessarily imply that the TNSP has over-invested. For example, an apparent over-performance against the reliability standard may reflect compliance with a previous, more onerous reliability standard.

Question 13(b) Should any other additional reporting requirements be included in the national framework?

Grid Australia considers it appropriate to report against the reliability standards, which are to be expressed deterministically. For the reasons outlined in response to question 1, it is not appropriate to assess transmission reliability performance through output-based measures.

TNSPs are subject to service performance incentives through the STPIS and performance against the STPIS is reported. The STPIS performance measures and reporting should remain separate to the reliability setting framework that is the subject of the AEMC's current review.

8.2 Accountability and compliance obligations

The Issues Paper explains that under the national framework TNSPs would be held accountable for complying with the reliability standard. However, a question remains as to what accountability and compliance obligations TNSPs should face for not meeting their reliability standards. The Issues Paper notes that it would not be appropriate to include punitive penalties such as the loss of licence or significant financial penalties for not meeting the reliability standards in any one year.

The Issues Paper explains that under the AEMC's proposed national framework for distribution reliability, DNSPs would be required to undertake an audit each year to demonstrate they have processes in place to meet their reliability targets. The purpose of these arrangements would be to provide stakeholders with a degree of confidence that DNSPs are undertaking sufficient planning to meet these targets on average or in most circumstances.

Question 14(a) Should any additional accountability and compliance obligations be included under the national framework?

As noted elsewhere in this submission (including the answer to question 13(a)), Grid Australia considers that:

- Reliability standards should be regarded as a compliance obligation.
- TNSPs should be held accountable for complying with the standards.
- The level of reliability actually provided at each connection point (measured in a form consistent with the definition of the standard) should be reported annually by each TNSP against the standard.
- The AER's independent monitoring of TNSP performance against the standards would be the key mechanism for monitoring compliance.

Grid Australia considers that robust enforcement arrangements form an integral part of an effective accountability regime. That said, we do not consider that punitive penalties such as the loss of licence or significant financial penalties should apply if a TNSP fails to meet the reliability standards in any one year. As noted above, each TNSP should be required to produce an annual report describing the extent of its compliance with each connection point standard. The framework should also contain provisions requiring the TNSP to provide an explanation of any instances of non-compliance. The framework may also provide for escalatory measures to be applied to address any persistent non-compliance.

Question 14(b) Is a requirement for TNSPs to undertake an annual audit to demonstrate they have processes in place to meet their reliability standards appropriate?

Grid Australia regards performance reporting and independent compliance monitoring as key mechanisms for compliance monitoring. Given the emphasis that would be placed on information disclosure and compliance monitoring under the national framework, it would seem unnecessary to also impose from the outset a requirement for TNSPs to undertake an annual audit to demonstrate that appropriate processes are in place to satisfy the reliability standards.

The requirement to conduct a process audit could be imposed if the AER's routine compliance monitoring detected non-compliance. The imposition of the annual audit requirement would therefore be one of the sanctions faced by a TNSP for a breach of the reliability standard.