



# REVIEW OF THE ELECTRICITY TRANSMISSION CODE

## DRAFT DECISION

**September 2011**

**ELECTRICITY**

## REQUEST FOR SUBMISSIONS

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The Essential Services Commission of SA (the Commission) invites written submissions from interested parties in relation to the draft Decision for proposed changes to the Electricity Transmission Code discussed in this paper. Written comments should be provided by **21 October 2011**. It is highly desirable for an electronic copy of the submission to accompany any written submission.

It is Commission policy to make all submissions publicly available via its website ([www.escosa.sa.gov.au](http://www.escosa.sa.gov.au)), except where a submission either wholly or partly contains confidential or commercially sensitive information provided on a confidential basis and appropriate prior notice has been given.

The Commission may also exercise its discretion not to exhibit any submission based on its length or content (for example containing material that is defamatory, offensive or in breach of any law).

Responses to this paper should be directed to:

### **Review of the Electricity Transmission Code – Draft Decision**

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### ***Public Information about the Commission's activities***

Information about the role and activities of the Commission, including copies of latest reports and submissions, can be found on the Commission's website at [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au).

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## GLOSSARY OF TERMS

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<b>AEMO</b>	Australian Energy Market Operator
<b>AER</b>	Australian Energy Regulator
<b>AMD</b>	Agreed Maximum Demand
<b>CBD</b>	Central Business District
<b>CODE</b>	Electricity Transmission Code
<b>COMMISSION, ESCOSA</b>	Essential Services Commission of SA
<b>DNSP</b>	Distribution Network Service Provider
<b>ESIPC</b>	Electricity Supply Industry Planning Council
<b>ESC ACT</b>	Essential Services Commission Act 2002
<b>MVA</b>	Mega Volt Amps
<b>MW</b>	Mega Watt – 1,000,000 Watts
<b>N RELIABILITY</b>	Means the Transmission System is able to supply maximum demand provided all of the network elements are in service.
<b>N-1 RELIABILITY</b>	Means the ability of the transmission system to continue to supply the contracted loads connected to the system even if any one element were to fail.
<b>N-2 RELIABILITY</b>	Means the ability of the transmission system to continue to supply the contracted loads connected to the system following the failure of any two single independent and diverse transmission elements.
<b>NEM</b>	National Electricity Market
<b>NER</b>	National Electricity Rules
<b>RIT-T</b>	Regulatory Investment Test - Transmission
<b>SA</b>	South Australia
<b>TNSP</b>	Transmission Network Service Provider
<b>USE</b>	Unserviced Energy
<b>VCR</b>	Value of Customer Reliability



## **1 INTRODUCTION**

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ElectraNet Pty Ltd (**ElectraNet**) operates the main electricity transmission network in South Australia and is licensed by the Essential Services Commission (**Commission**) pursuant to Part 3 of the *Electricity Act 1996* to conduct such operations. As a condition of licence, ElectraNet is required to comply with the Electricity Transmission Code (**code**), which has been made by the Commission pursuant to Part 4 of the Essential Services Commission Act 2002 (**ESC Act**).<sup>1</sup>

### **1.1 Background**

The code was first issued on 11 October 1999, at the time that the South Australian Government was preparing for the long-term lease of the Government-owned electricity assets. The code sets out the obligations that a licensed operator of a transmission system must comply with in relation to the provision of transmission services in this State. Section 2 of the code defines the service standards and incorporates specific exit point reliability standards.

The code forms part of a broader regulatory scheme for transmission in the National Electricity Market (**NEM**). The reason for regulation of the transmission system is that while in one sense it may be seen as a physical system which transports wholesale energy from generator connection points to market customers and retailers, in a fundamental sense that system provides the marketplace on which the NEM operates. Regulation of the system occurs at two levels: the National Electricity Rules (**NER**) establish technical standards, dealing with matters such as frequency, system stability, voltage and fault clearance;<sup>2</sup> jurisdictional standards, such as those set under the code, provide for security and reliability standards which align with and complement the NER technical standards. The Commission's role is confined to development and administration of security and reliability standards under the code, with the Australian Energy Market Operator (**AEMO**) having responsibilities under the NER.<sup>3</sup>

The code applies to all licensed transmission entities; however, the exit point reliability standards apply only to ElectraNet. That is because the exit points (or groups of exit points) specified, owned and operated by ElectraNet, are those which provide electricity to ETSA Utilities (for distribution to all customers connected to the National Electricity Market in this State) and a small number of directly connected customers. Those exit points therefore have a significant role in and impact on electricity supply in this State. To the extent that other transmission entities have exit points, those points serve only another transmission entity (for example, an interconnector which connects only to ElectraNet's network) or a dedicated customer in a remote area; in either case,

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1 Refer <http://www.escosa.sa.gov.au/library/080703-ElectricitySystemControlLicenceVaried-ElectraNet.pdf> to obtain a copy of ElectraNet's transmission licence; <http://www.escosa.sa.gov.au/electricity-overview/codes-guidelines-rules/electricity-codes.aspx> to obtain a copy of the Electricity Transmission Code.

2 Refer Schedule 5.1 of the NER, available from the Australian Energy Market Commission website at <http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>

3 For further information on AEMO's role, refer the AEMO website at [www.aemo.com.au](http://www.aemo.com.au)

there is no justification at present for setting exit point standards for those connection points.

The code establishes various categories into which individual exit points are placed. Currently, there are six categories, with each category having defined reliability and supply restoration standards. The standards are graduated, with Category 1 having the lowest reliability and supply restoration requirements and Category 6 (the Adelaide Central Area) having the highest. The establishment and population of each category and its associated standards is achieved following economic analysis of the value of reliability for each exit point and the capital costs of improving reliability over time. The standards require, in effect, a level of security (also referred to as spare capacity or redundancy) to be built into ElectraNet's transmission system so that it can maintain electricity supply even with equipment failures due to faults, incidents and outages.

For categories which have lower reliability requirements, ElectraNet is currently permitted to meet its obligations by use of transmission assets (transmission lines and transformers) or, where it is efficient to do so, by alternative means such as the purchase of other forms of network support arrangement (such as generation or use of a distribution network solution). In such circumstances, ElectraNet can agree to deliver a capacity (an agreed maximum demand, **AMD**) up to 20% in excess of the installed capacity of its transmission assets.

For categories with higher requirements, ElectraNet must meet its obligations through transmission solutions only; there is also a general prohibition preventing ElectraNet from contracting for an amount of AMD in excess of 100% of installed line and transformer capacity.

Overall, the effect of the code is to require ElectraNet to plan, develop and maintain its transmission system such that the standards are met in relation to each exit point or group of connection points.

A key point of interaction between the code and the NER arises from the requirement under the NER that any new asset constructed by ElectraNet, including those required to meet a standard mandated under the code, must satisfy a regulatory test referred to as a Regulatory Investment Test – Transmission (**RIT-T**).<sup>4</sup> As provided for in the NER,

- (b) *The purpose of the regulatory investment test for transmission is to identify the credible option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market (the preferred option). For the avoidance of doubt, a preferred option may, in the relevant circumstances, have a negative net economic benefit (that is, a net economic cost) where the identified need is for reliability corrective action.*

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4 Refer National Electricity Rules, clause 5.6.5B *et seq*, available on the AEMC website at <http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>; Australian Energy Regulator, 2010, *Regulatory investment test for transmission*, <http://www.aer.gov.au/content/index.phtml/itemId/730920>

For a reliability augmentation to satisfy the regulatory test, the transmission entity must demonstrate that the proposed new transmission asset is necessary so as to meet the minimum network performance requirements set out in the NER, relevant legislation, regulations or any statutory instruments which apply to that entity.

### **1.2 *ElectraNet's obligations in meeting the standards***

Importantly, whatever the means by which ElectraNet chooses to meet the exit point reliability standards, two principles apply: the manner in which the standard is met should be as efficient, technically and economically, as possible and the obligation to meet and maintain those standards is the responsibility of ElectraNet alone.

In the latter context, this means that where ElectraNet may choose to rely on network support arrangements to meet the reliability standards at the relevant exit point, for example, through the use of ETSA Utilities' distribution system, the costs of doing so (including the costs of any upgrades to those network support arrangements to ensure ongoing adherence to the exit point reliability standards) are to be borne by ElectraNet and recovered through prescribed transmission service charges.

The code does not require any other party, regulated or otherwise, to make any investment nor does it have anything to say about the manner in which such an investment, when sought by ElectraNet, is to be funded – the assumption of the code is that ElectraNet will source and fund such investments.

The Commission does, however, acknowledge that where, as a result of a change in a standard applicable to ElectraNet at an exit point, a person taking supply from that exit point must augment its system to take an increased supply, then that person will be responsible for sourcing and funding that element.

### **1.3 *Review of the exit point reliability standards***

The current approach to reliability standards established under the code is transparent and administratively simple. Since the reliability categories are fixed, ElectraNet is obliged to ensure that reliability standards are met and is also required to choose the least-cost option in providing a reliable transmission network subject to the requirements of the National Electricity Rules (**NER**).

As may be appreciated from the nature and scope of transmission operations, exit point reliability standards are one of the drivers of ElectraNet's revenue requirements. Hence, any changes to the exit point reliability standards over time will have cost implications for ElectraNet and therefore price implications for South Australian consumers.

It is therefore important that those standards are set in an efficient manner; appropriately balancing the need for reliability of supply and the costs of operating and maintaining the transmission system which are ultimately borne by South Australian consumers. This implies a need for on-going review and oversight of the standards; a function undertaken by the Commission. A periodic review of this nature



must consider load growth and the means by which ElectraNet can provide flexible solutions to reliability augmentations at the lowest possible cost to South Australians.

For the purposes of ElectraNet's revenue allowance for the 5-year regulatory period to 30 June 2018, the Australian Energy Regulator (**AER**) will, during 2012-13, be reviewing ElectraNet's proposed revenue requirements. Given that timing, it is necessary for the Commission to review whether or not there is a need to vary any of the existing exit point reliability standards for that regulatory period. This will allow cost variations arising from any exit point reliability standard variations (whether upwards or downwards) to be taken into account.

In March 2010, as a key input into the Commission's review, the Commission requested the AEMO to investigate the transmission network exit point reliability standards specified in the code to determine their appropriateness for the coming regulatory period. AEMO's report was provided to the Commission in December 2010 and is available on the Commission's website.<sup>5</sup>

Specifically, AEMO was asked to consider:

- ▲ How should connection point reliability be established?
- ▲ Is the current reliability standard for each connection point appropriate?
- ▲ Should the reliability standards for any connection points be improved, taking into consideration load growth, demographic changes, and/or network developments (transmission and distribution) etc?
- ▲ If the reliability standard of any connection point is considered to be inappropriate, what should the standard be and what network extension and/or augmentation would be required to meet such a standard in a cost effective and efficient way (transmission and/or distribution)? What would be the indicative capital cost required to meet the new standard?

## **1.4 Reliability terminology**

Terminology such as "N", "N-1" and "N-2" is used in section 2 of the code (and throughout this Draft Decision) to describe levels of reliability of the ElectraNet transmission system.

**N reliability** means that the transmission system is able to supply the maximum demand, provided that all the network elements are in service. This means that the loss of a single transmission element (a line, a transformer or other associated equipment) could cause supply interruption to some customers.

A higher level of reliability is provided by **N-1 reliability**. With this reliability standard no customers would be affected even with one network element out of service. It is also possible to define N-1 reliability for a percentage of the time or for a percentage of the maximum demand.

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<sup>5</sup> Refer the Commission's website at <http://www.escosa.sa.gov.au/projects/165/review-of-the-electricity-transmission-code.aspx>

**N-2 reliability** means that no customers would be affected even if two network elements were out of service. This is a very high level of security that is expensive in terms of capital expenditure. Accordingly, this level of reliability is generally limited to Central Business District (CBD) areas where such a high level of security is deemed necessary.

The current code specifies reliability standards for N, N-1 or N-2 connection capacity as appropriate at each category. These reliability standards, except for Category 1, may be delivered through any means, including transmission network capability, distribution network capability, and demand management or generation alternatives.

As these standards are overtaken by growth in demand over time, the code requires ElectraNet to augment the relevant connection point and, where necessary, the transmission network. ElectraNet is also required to use its best endeavours to correct any breach of the performance standards in the code within twelve months and, in any event, no later than three years.

In the case of a new connection point, ElectraNet is required by clause 2.12 to seek the approval of the Commission for the applicable reliability standards which must be developed having regard to a range of factors including size of the load, value of lost load (that is, the economic cost to customers of a supply failure), types and numbers of customers supplied through the connection point, location and costs of the installation of transmission assets relevant to the connection point.

Each exit point on the South Australian transmission system operated by ElectraNet is listed according to its category in the following table:

**Table 1 - Existing reliability exit point categories**

CATEGORY NAME	CONNECTION POINT
Category 1	<ul style="list-style-type: none"> <li>• Baroota</li> <li>• Dalrymple</li> <li>• Florieton SWER</li> <li>• Kanmantoo Mine</li> <li>• Leigh Creek Coal *</li> <li>• Leigh Creek South</li> <li>• Mannum/Adelaide 1 *</li> <li>• Mannum/Adelaide 2 *</li> <li>• Mannum/Adelaide 3 *</li> <li>• Middleback*</li> <li>• Millbrook *</li> <li>• Morgan/Whyalla 1 *</li> <li>• Morgan/Whyalla 2 *</li> <li>• Morgan/Whyalla 3 *</li> <li>• Morgan/Whyalla 4 *</li> <li>• Mt Gunson</li> <li>• Murray/Hahndorf 1 *</li> <li>• Murray/Hahndorf 2 *</li> <li>• Murray/Hahndorf 3 *</li> <li>• Neuroodla</li> <li>• Roseworthy*</li> <li>• Stony Point (Whyalla Refiners) - distribution</li> <li>• Stony Point*</li> <li>• Waterloo- until 31 December 2009</li> <li>• Whyalla LMF</li> <li>• Davenport *</li> <li>• Pimba *</li> <li>• Woomera*</li> <li>• Wudinna (until 30 June 2009)</li> </ul> <p style="text-align: right; font-size: small;"><i>* denotes a customer but does not include a distributor</i></p>
Category 2	<ul style="list-style-type: none"> <li>• Ardrossan West</li> <li>• Kadina East</li> <li>• Wudinna (on and from 1 July 2009)</li> <li>• Yadnarie</li> </ul>

CATEGORY NAME	CONNECTION POINT
Category 3	<ul style="list-style-type: none"> <li>Port Lincoln</li> <li>Snuggery Rural</li> <li>Whyalla Terminal – Main Bus (until 30 June 2010)</li> </ul>
Category 4	<ul style="list-style-type: none"> <li>Angas Creek</li> <li>Berri/Monash</li> <li>Blanche</li> <li>Brinkworth</li> <li>[Bungama and Pt Pirie]</li> <li>Clare North</li> <li>Coonalpyn West</li> <li>Dorrien</li> <li>Templers</li> <li>Hummocks</li> <li>Keith</li> <li>Kincraig</li> <li>Mannum</li> <li>Mobilong</li> <li>Mt Barker</li> <li>Mt Gambier</li> <li>North West Bend</li> <li>Playford</li> <li>Snuggery Industrial</li> <li>Tailem Bend</li> <li>Waterloo – from 1 January 2010</li> <li>Whyalla Terminal – Main Bus (on and from 1 July 2010)</li> <li>Penola West</li> <li>[Dry Creek West, Kilburn, Lefevre, New Osborne and Torrens Island 66kV]</li> <li>[Happy Valley, Magill and Morphett Vale East]</li> <li>[Para and Parafield Gardens West]</li> </ul>
Category 5	<ul style="list-style-type: none"> <li>[Dry Creek East, Magill and Northfield]</li> </ul>
Category 6	<ul style="list-style-type: none"> <li>Adelaide Central [East Tce, new CityWest substation]</li> </ul>

The existing broad requirements of each code reliability category are summarised in the following table:

**Table 2 - Existing reliability category requirements**

CATEGORY	LINE RELIABILITY	TRANSFORMER RELIABILITY	TIME TO RESTORE LINE AFTER FAILURE	TIME TO RESTORE TRANSFORMER AFTER FAILURE	TIME TO RESTORE TO RELIABILITY STANDARD
1	N	N	2 days	8 days	N/A
2	N	N-1	2 days	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr
3 <sup>6</sup>	N-1	N-1	2 days	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr
4	N-1 Continuous	N-1 Continuous	12 hours	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr

<sup>6</sup> Category 3 connection points are to be restored to equivalent line and transformer capacity within one hour of an interruption of either transmission element.

CATEGORY	LINE RELIABILITY	TRANSFORMER RELIABILITY	TIME TO RESTORE LINE AFTER FAILURE	TIME TO RESTORE TRANSFORMER AFTER FAILURE	TIME TO RESTORE TO RELIABILITY STANDARD
5	N-1 Continuous	N-1 Continuous	4 hours	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr
6 (to 31/12/11)	N <sup>7</sup>	N	4 hours	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr
6 (from 31/1/12)	N-1 Continuous	N-1 Continuous	4 hours	As soon as possible to avoid outage due to subsequent transformer failure	Target:1yr, Max:3yr

## 1.5 Process

In April 2011, the Commission released an Issues Paper that sought comment from interested parties on recommendations for amendments to the code set out in the AEMO report.<sup>8</sup> In addition to the review of connection point reliability, the AEMO report canvassed various amendments to existing clauses of the code and the inclusion of new clauses which AEMO considered may be useful to the extent that there are any interpretational ambiguities within the code.

The Commission received submissions on the Issues Paper from ETSA Utilities and ElectraNet Pty Limited.

This Draft Decision is based on the Commission's primary objective specified in section 6 (a) of the *ESC Act*; to protect the long-term interests of SA consumers with respect to the price, reliability and quality of electricity services. The Draft Decision also takes into account the views expressed by stakeholders in the submissions received and subsequent discussions.

<sup>7</sup> The effect of Categories 5 and 6 provides for N-1 at an operational level, however this not a regulatory requirement.

<sup>8</sup> A copy of the Issues Paper may be access from the Commission's website at <http://www.escosa.sa.gov.au/projects/165/review-of-the-electricity-transmission-code.aspx>

## 2 CONNECTION POINT RELIABILITY CATEGORIES

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The approach adopted by AEMO in conducting the exit point study involved a probabilistic cost-benefit approach to compare the capital cost of moving to the next reliability category with the value of the increased reliability delivered to the relevant connection point.

In conducting the assessments, various matters arise in terms of the structure of the categories, resulting in recommendations by AEMO for some amendments to the existing categories. The Issues put to stakeholders for comment are discussed in turn.

### 2.1 ISSUE 1 - AEMO's assessment methodology

*“The Commission seeks stakeholder comment on AEMO's assessment methodology for proposed category upgrades based on annual cost of unserved energy”.*

The assessment process for each exit point involved the following considerations:<sup>9</sup>

- ▲ Calculating the average number of hours each exit point will be without power. This probabilistic method relies on typical failure rate data, which is based on historical observations, and is collected for different categories of equipment (transformers, lines, cables) at different voltage levels.
- ▲ Multiplying the number of outage hours by the exit point demand to establish the number of megawatt hours (MWh) that, on average, are unable to be supplied each year.
- ▲ Assessing the value of lost customer load or unserved energy,<sup>10</sup> as being the number of lost MWh multiplied by the value of unserved energy to customers. The value developed for this review for South Australia was \$45,767/MWh with sensitivities of +/-20%.
- ▲ For exit points with a high value of lost customer load, comparing the capital cost of upgrading to a higher reliability standard with the benefit in reduced unserved energy provided by the upgrade.

#### 2.1.1 Comment received

ElectraNet supported the methodology used by AEMO, noting that it provided a robust assessment framework and provided consistency to future assessment point reclassifications.

Similarly, ETSA Utilities expressed no concerns with the methodology.

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<sup>9</sup> A detailed review of the methodology is set out in Chapter 4 of the AEMO report.

<sup>10</sup> The unserved energy reliability standard is a measure of the expected amount of energy at risk of not being delivered to consumers due to a lack of available capacity. Refer “Reliability Standard and Reliability Settings Review” 30 April 2010 [www.aemc.gov.au](http://www.aemc.gov.au)

### **2.1.2 The Commission’s analysis and Draft Decision**

The Commission notes that there are no concerns raised in either submission regarding the assessment methodology. The same economic assessment technique used by AEMO was used in the previous review of the code during 2005/06 and was considered by the Commission at that time to be an appropriate means by which the impacts of reliability improvements on the long-term interests of consumers could be considered. The Commission is unaware of any reason to depart from its earlier position on this matter.

***Draft Decision 1***

***The Commission has not been presented with any evidence which would require it to depart from its previous position of support for the broad methodology adopted by AEMO in assessing exit point reliability standards. The Commission therefore accepts that methodology as an appropriate means by which to derive outcomes for each connection point reliability category in the code.***

## **2.2 ISSUE 2 – Assumptions used by AEMO in its review**

*“The Commission seeks stakeholder comment on the assumptions used by AEMO for its review of the exit point reliability standards”.*

The AEMO exit point study was based on assumptions made on the components listed below. A more complete description of the assessment methodology and the assumptions used can be found in Chapter 4 of the AEMO report.

### **2.2.1 Network Demand**

The maximum demand forecasts at connection points used for the AEMO assessment are ETSA Utilities’ medium growth connection point forecasts and represent the summer peak demand forecasts.

AEMO argues that transformers are more likely to fail when under stress during peak load periods, hence the forecast maximum demand was assumed for calculating the value of expected unserved energy due to transformer outages. Transmission line and cable faults are generally less dependent on line loading and as such, an average load factor was used to convert the maximum demand to average demand, which was then used when calculating the value of expected unserved energy due to line outages.

An average load factor was used for calculating the value of expected unserved energy due to line outages and expected unserved energy during planned outages, including demand not met due to forced outages for planned maintenance. The

average load factor applied to all connection points was 49%, based on the 2009/10 South Australian total system load duration curve.

### **2.2.2 Transmission system reliability**

The expected hours of unserved energy per annum for each connection point was calculated using ElectraNet's historical data on the average failure rates and outage durations due to planned and unplanned outages which was compared with industry-wide statistics for consistency.

When applying the failure rates, it was assumed that single supply lines are maintained through live line techniques to minimise supply outages to radial connection points. It has also been assumed that single supply lines have zero annual maintenance outage hours.

Overhead transmission lines are shown to be highly reliable and terminal stations connected by four or more transmission lines, such as Para, Davenport, and Robertstown, are expected to be particularly reliable points of supply. The probability of having three or more concurrent line outages is very low and therefore these supply points are almost always expected to be capable of supplying power to the local transmission network. It is the reliability of the transmission network directly supplying a connection point that predominantly determines the overall connection point reliability.

Probabilistically, these highly reliable supply points are expected to contribute negligibly to amounts of unserved energy, with the majority of unserved energy being caused by the network connecting these supply points to the connection point.

Highly reliable terminal stations with four or more connecting transmission lines have been used as reference points, and the reliability of each connection point was based on the transmission plant reliability between these supply points and each connection point.

### **2.2.3 Value of customer reliability (VCR)**

Value of customer reliability (that is, the average value, on a \$/MWh basis, that customers place on electricity) for the Victorian region were originally estimated in 1997, using direct survey methods. This work was updated for AEMO in 2002 and 2008. The baseline VCR is indexed to Victorian income measures between surveys so that the values are updated annually to reflect current income growth and consumption shares for identified economic sectors (agricultural, industrial, commercial, and residential).

In 2010, AEMO undertook to develop VCR estimates for regions other than Victoria using existing Victorian survey data to calculate individual VCRs. The 2007 VCR for each sector and each region was updated to 2010 values using an indexation method.

The regional data on outages and sector consumption were provided by the distribution network service providers (DNSPs) within each region.

The VCR developed for South Australia was \$45,767/MWh (in 2010 dollars) and was used by AEMO as a base value in its report to the Commission. The sensitivity analysis for that VCR applied values of \$38,240 and \$53,295 (in 2010 dollars).

#### **2.2.4 Transmission upgrade costs**

Transmission augmentation projects were nominated by ElectraNet. Those augmentation projects and the associated transmission costs are outlined in ElectraNet's Annual Planning Report.<sup>11</sup> Where included, additional distribution costs were provided by ETSA Utilities, based on recent connection cost estimates obtained for similar projects.

Sensitivity analysis was performed with variations of  $\pm 30\%$  on these cost estimates.

A comparison of the transmission augmentation costs supplied by ElectraNet and the costs used by AEMO when undertaking its planning functions found the two sets of costs to be reasonably consistent.

#### **2.2.5 Economic assumptions**

AEMO's cost-benefit assessment was performed for the period from 2010/11-2029/30. Based on information provided by ElectraNet, a new transformer was assumed to have an asset life of 45 years, and a new transmission line or underground cable was assumed to have an asset life of 55 years.

The annual payments resulting from each investment were calculated using the appropriate asset life and an assumed real discount rate of 10% (for the base case), with sensitivities of 7% and 13%. These assumptions are consistent with the RIT-T, which specifies that the assessment must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector.

The RIT-T also suggests that the sensitivity testing should be performed with the lower bound being the AER-mandated regulatory real pre-tax weighted average cost of capital (WACC) for transmission investments.

The annual capital costs payments and the costs of unserved energy were discounted to a net present value using the same discount rates (and sensitivities). A terminal value approach was used to reflect the value of the capital expenditure and the unserved energy at the end of the assessment period (2029/30). To calculate the terminal value it was assumed that the last year's unserved energy costs continued in perpetuity.

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<sup>11</sup> Refer to ElectraNet web site <http://www.electranet.com.au/assets/Uploads/annualplanningreport2010.pdf>

## 2.2.6 Comment Received

ETSA Utilities expressed no concerns over the assumptions relating to exit point reliability used by AEMO in its review.

ElectraNet stated that it “broadly supported” the assumptions but noted that the forecasts for connection point maximum demand used in the review were based on ETSA Utilities’ medium growth forecasts. ElectraNet put that, in its view, the forecasts do not reflect the potential impact of uncommitted significant step load increases in the ETSA Utilities distribution network, whereas they may be accounted for in the high growth forecasts.

By way of example, ElectraNet noted a demand increase of 40-80MW on the Eyre Peninsula to account for possible mining demand. ElectraNet proposed an amendment to clause 2.12 of the code such that it allows for a review of an existing connection point (under the current assessment methodology) in response to material change in demand and that criteria should be specified to address any change to an existing connection point classification.

## 2.2.7 The Commission’s analysis and Draft Decision

In regard to ElectraNet’s concerns, the medium growth demand forecasts provided by ETSA Utilities, and used by AEMO to compile its report, represent the undiversified maximum demand forecast. This means that no diversification (i.e. reduction) factor is applied to the demand based on patterns of consumption. The approach to forecasting demand growth by ETSA Utilities could therefore be considered conservative.

The medium growth demand forecast may well include the impact of committed (known) load increases at a connection point. However, to consider uncommitted loads, such as in the high growth example for the West Coast as noted by ElectraNet, may lead to the over-design of the networks. This ultimately impacts on the cost of electricity to customers. The value of customer reliability (VCR) is based on a known customer base and type and not on hypothetical values. Nonetheless, any increase in demand at a connection point brought about by a “drop-in” load may render the capacity of the connection point unsatisfactory. In effect, this is a capacity issue rather than a reliability issue. Upgrading a connection point, associated with “drop-in” loads, is considered further in Section 3.1 of this Draft Decision Paper.

### ***Draft Decision 2***

***The Commission is satisfied that the assumptions used by AEMO for its review of the exit point reliability standards provide a sound basis for the review.***

### 2.3 ISSUE 3 - Specific exit point categories

*“The Commission seeks stakeholder comment on:*

*The proposal to upgrade the Baroota and Dalrymple exit points from Category 1 to Category 2 and associated issues; and*

*The proposed timing of the Baroota and Dalrymple exit point upgrades”.*

When assessing the value of expected unserved energy on a probabilistic basis, AEMO found that the Category 1 exit points at Baroota and Dalrymple showed a positive net present value based on the capital cost estimates to install a new supply transformer at each connection point.

AEMO identified that upgrading the reliability of supply at both the Baroota and Dalrymple exit points from Category 1 to Category 2 is economically appropriate within ElectraNet’s upcoming regulatory period (2013-2018).

Currently, Baroota and Dalrymple are among the few remaining Category 1 exit points (other than small pumping station loads and remote mining sites). AEMO recommended increasing the reliability standard of these two exit points from Category 1 to Category 2; from ‘N’ (line and transformer) to ‘N’ (line) and ‘N-1’ (transformer); thus adding a level of redundancy at each exit point.

Baroota has a forecast maximum demand of approximately 10MW, and Dalrymple has a forecast maximum demand of approximately 12MW. The assessment of each exit point by AEMO shows that installing an additional exit point transformer is economically justifiable based on the expected level and annual cost of unserved energy. Each installation requires both transmission and distribution elements to be augmented.

Table 3 and Table 4 show the net present value of installing additional transformers at Baroota and Dalrymple within the 2013-2018 regulatory period to be positive. Sensitivities to VCR, discount rate and augmentation costs can be found in Appendix D of the AEMO report, while detailed connection point assessments for these and other connection points can be found in Appendix F of that report.

**Table 3 - Baroota economic assessment**

Reliability standard category	2017/18 forecast demand (MW)	Expected unserved energy (MWh/annum)	Annual cost of unserved energy (\$USE)
Category 1	10.0	103	\$5,548,000
Category 2	10.0	7	\$163,000
<b>Annual Benefits in 2017/18</b>			<b>\$5,385,000</b>
<b>NPV net benefits of augmentation (over 45 year project life)</b>			<b>\$13,263,000</b>

**Table 4 - Dalrymple economic assessment**

Reliability standard category	2017/18 forecast demand (MW)	Expected unserved energy (MWh/annum)	Annual cost of unserved energy (\$USE)
Category 1	12.1	128	\$5,615,000
Category 2	12.1	12	\$310,000
<b>Annual Benefits in 2016/17</b>			<b>\$5,305,000</b>
<b>NPV net benefits of augmentation (over 45 year project life)</b>			<b>\$27,743,000</b>

With the Baroota and Dalrymple installations demonstrating positive net economic benefits of approximately \$13 million and \$28 million (respectively) over the life of the assets, AEMO recommends moving the Baroota and Dalrymple exit points from Category 1 to the Category 2 reliability standard.

To allow reasonable time for the proposed augmentations, the proposed timing for reclassification is as follows:

- ▲ Baroota reclassified to Category 2 effective from 1 December 2017; and
- ▲ Dalrymple reclassified to Category 2 effective from 1 December 2016.

### 2.3.1 Comment Received

ETSA Utilities supported the proposal to upgrade the Baroota and Dalrymple connection points from Category 1 to Category 2. ETSA Utilities noted that it will be required to incur capital expenditure in respect of its distribution network for both connection points in the amount of approximately \$16 million in conjunction with the connection point reliability upgrade<sup>12</sup>. ETSA Utilities made no comment on the timing of the upgrade.

ElectraNet also supported the reclassification of Baroota and Dalrymple connection points from Category 1 to Category 2 from December 2017 and December 2016 respectively. ElectraNet supports the timing of the proposed connection point reclassification period, (December) in the relevant years, as it is of the view that a mid-regulatory year date aligns more closely to summer peak demand and avoids an arbitrary deadline of 30 June that might otherwise apply 12 months after the new code takes effect.

ElectraNet also put a view that if the regulatory investment test supports that reinforcing the 33kV network is the most efficient option, then it should be pursued as a distribution augmentation. ElectraNet considers that the cost of a distribution investment, which passes the applicable regulatory investment test, should be recovered directly by ETSA Utilities from customers via distribution charges. ElectraNet asserts that it is not clear how the recovery of cost for distribution

<sup>12</sup> ETSA Utilities' costs were included within AEMO's cost-benefit analysis shown in Tables 2 and 3.

investments via transmission charges is consistent with the prevailing Rules framework.

ElectraNet is also concerned that, where it is required to satisfy the requirements of the code at connection points to the distribution network, there is no complementary obligation on ETSA Utilities to be ready to take supply within the same timeframe.

### **2.3.2 The Commission's analysis and Draft Decision**

ElectraNet believes that ETSA Utilities should be responsible for capital expenditure for any distribution work required by ElectraNet to meet its reliability standard. However, the overarching obligation is for ElectraNet to achieve the level of reliability mandated by the code at the connection point in accordance with the outcome of the regulatory investment test. Thus the Commission is not, on that basis, persuaded by ElectraNet's argument in this area.

There are two considerations in assigning responsibility for capital expenditure when upgrading connection point reliability. First, ETSA Utilities is required to make ready its distribution assets to be capable of conveying the demand available at the connection point. In the case of the Baroota and Dalrymple connection points, the installation of an additional transformer, which is the obligation of ElectraNet, requires ETSA Utilities to construct connection assets to link its distribution assets to the new transformer. ElectraNet has carried out its obligation in providing the required level of reliability. The onus is then on ETSA Utilities to ensure that the level of reliability is replicated through the availability of its distribution network.

Second, if the regulatory investment test dictates that the increased reliability obligation (N-1) should be implemented by a distribution network augmentation, then the cost of providing the level of reliability is the responsibility of ElectraNet in accordance with its obligations to provide that level of reliability.

The Commission's position, as noted earlier in this Draft Decision and in the Issues Paper, is that exit point reliability standards apply to ElectraNet and that it is the responsibility of ElectraNet to meet and fund implementation of those standards in the most efficient economic and technical manner possible. While it is appropriate for ETSA Utilities to fund and manage network augmentations downstream of an ElectraNet exit point in order to receive higher levels of supply, works related to the exit point itself, or upstream, are ElectraNet's responsibility.

When assessing the value of expected unserved energy on a probabilistic basis, AEMO found that the Category 1 exit points at Baroota and Dalrymple showed a positive net present value based on the capital cost estimates to install a new supply transformer at each connection point.

AEMO noted that its economic assessment identified that upgrading the reliability of supply at both the Baroota and Dalrymple exit points from Category 1 to Category 2 is economically appropriate within ElectraNet's upcoming regulatory period (2013-2018).

The Commission is confident that AEMO has made its assessment of the Baroota and Dalrymple connection points in a sound manner, taking into account the timing of the upgrade in consideration of both ElectraNet's and ETSA Utilities' regulatory reset processes.

**Draft Decision 3**

**The Commission will reclassify the Baroota and Dalrymple connection points from Category 1 to Category 2 from December 2017 and December 2016 respectively.**

**2.4 ISSUE 4 – Category 5 exit points**

*“The Commission notes that moving the Category 5 connection points to Category 4 does not reduce the reliability standard of the connection points supplying the surrounding suburbs, i.e. the N-1 continuous reliability standard is maintained.*

*The Commission seeks stakeholders' comment on the recommendation by AEMO to move the current Category 5 exit points to Category 4 (i.e. to provide an N-1 reliability standard, where N-1 is defined as N-1 continuous) and remove the existing Category 5 from code”.*

The Adelaide eastern suburbs exit points of Dry Creek East, Magill (East), and Northfield are currently Category 5 exit points. In its report, AEMO noted that there is a higher reliability standard for Category 5 than for any other category due to the fact that the exit points in this category are, until 1 January 2012, the only way in which supply is brought into the Adelaide Central<sup>13</sup> region by ElectraNet.

The transmission line and transformer capacity requirements at Category 5 exit points are defined, in part, by an equation in clauses 2.9.1 and 2.9.2 of the code based on demand at the connection point as well as the demand within the Adelaide Central region as follows;

2.9.1 (c) provide **N-2 equivalent line capacity** for at least X% of Z, where:

(i) Z = the sum of the **agreed maximum demand** for all **connection points** within Category 5 and Category 6;

(ii)  $X\% = Y\% + \left(\frac{100\% - Y\%}{2}\right)$  ;

(iii)  $Y\% = \left(\frac{AMD_{CBD}}{Z}\right) \times 100$  ; and

(iv)  $AMD_{CBD}$  = the **agreed maximum demand** for **Adelaide Central**;

2.9.2 (c) provide **N-2 equivalent transformer capacity** for at least X% of Z, where the terms X% and Z have the meanings given in clause 2.9.1(c);

<sup>13</sup> As defined in the code – the area of Adelaide located east of West Terrace, North of South Terrace, west of East Terrace and south of the River Torrens.

A similar mathematical approach was used in the code prior to the Category 6 reliability standard and was intended to represent the requirement for an increased reliability standard in the Adelaide Central region rather than in the Eastern suburbs themselves.

The 2006 code review established Category 6, which includes the existing East Terrace and the future City West (to be commissioned by 31 December 2011) exit points, which directly serve Adelaide Central, with the intention of defining the Adelaide Central region's current and future reliability standard. However, the previous code review retained Category 5 connection points, Dry Creek East, Magill (East), and Northfield, to cover the time until the new City West exit point is commissioned and the Adelaide Central Area has an N-1 capability.

As a result, AEMO recommended that, given that the new version of the code will come into effect from 2013 when the Adelaide Central Area has N-1 capability, the exit points in Category 5; namely Dry Creek East, Magill (East), and Northfield be moved back into Category 4, as the additional support they provide will no longer be required. In effect, this will require the current Category 5 be removed from the code (making current Category 6 into a new Category 5).

#### **2.4.1 Comment Received**

ETSA Utilities expressed no concerns with the proposal to move the current Category 5 connection points to Category 4 and renaming Category 6 as Category 5 (thus reducing the number of categories).

ETSA Utilities also noted that, with the provision of a second transformer at Mt Barker South, it is likely that the Mt Barker connection point will cease operation. ETSA Utilities therefore put a view that the amended code should either include Mt Barker South as a Category 4 connection point or list Mt Barker and Mt Barker South as a combined connection point. Further, ETSA Utilities advised that the City West Substation will have two connection points; one for Metro South and one for the Adelaide Central Area. As a consequence, ETSA Utilities believes that City West should be become two connection points e.g. City West South and City West ACR; the former as a Category 4 connection point and the latter as a Category 5 connection point.

ElectraNet submitted that it is appropriate to move the current Category 5 loads to Category 4, noting that there is no effective reduction in the transmission reliability standards applying to the grouped connection points.

ElectraNet contended that historically, the formulae associated with the current Category 5 have proven difficult to interpret and harder still to explain to customers. ElectraNet agrees that, following the construction of the City West substation and the planned decommissioning of the Magill-Whitmore Square distribution cable, there is no ongoing requirement for the existing Category of load to be defined in the code.

## 2.4.2 The Commission's analysis and Draft Decision

The Commission notes that ETSA Utilities and ElectraNet both support moving the current Category 5 connection points to Category 4. Moving the Category 5 connection points to Category 4 does not reduce the reliability standard of the connection points supplying Adelaide's surrounding suburbs.

As outlined in the Issues Paper, the overall number of categories would be reduced with Category 6 connection points being renamed Category 5. The identification of additional connection points for Mt Barker and City West advised by ETSA Utilities were also raised by ElectraNet, along with further clarification of the identification of other existing connection points. The Commission has accepted the advice of the parties in relation to those matters and a summary of connection points as revised is set out in Table 5, below. However, the Commission also notes ElectraNet's regulatory obligation under clause 2.12 of the current code to submit applicable standards for new connection points to the Commission for approval. The Commission would expect such an application to be made as a part of this code review process.

ETSA Utilities' concerns regarding its obligation (or otherwise) to provide network support for the purposes of ElectraNet's reliability obligations under N-2 standards is discussed in section 3.2 of this Draft Decision.

### ***Draft Decision 4***

***The Commission's draft decision is that the current Category 5 exit points will be moved to Category 4 as proposed by AEMO. The existing Category 5 and associated arrangements, providing for network support arrangements for the Adelaide Central Area, will be removed from the code. The existing Category 6 classification will be renamed Category 5.***

***Amendments to connection point descriptors, as put forward by ElectraNet and ETSA Utilities, will be included for further consultation as proposed.***

**Table 5- Summary of proposed connection point categories**

Category	Connection Point [ ] = Grouped	
Category 1	<ul style="list-style-type: none"> <li>• Baroota (until 1 December 2017)</li> <li>• Dalrymple (until 1 December 2016)</li> <li>• Davenport *</li> <li>• Florieton SWER</li> <li>• Kanmantoo Mine</li> <li>• Leigh Creek Coal *</li> <li>• Leigh Creek South</li> <li>• Mannum/Adelaide 1 *</li> <li>• Mannum/Adelaide 2 *</li> <li>• Mannum/Adelaide 3 *</li> <li>• Middleback*</li> <li>• Millbrook *</li> <li>• Morgan/Whyalla 1 *</li> <li>• Morgan/Whyalla 2 *</li> </ul>	<ul style="list-style-type: none"> <li>• Morgan/Whyalla 3 *</li> <li>• Morgan/Whyalla 4 *</li> <li>• Mt Gunson</li> <li>• Murray/Hahndorf 1 *</li> <li>• Murray/Hahndorf 2 *</li> <li>• Murray/Hahndorf 3 *</li> <li>• Neuroodla</li> <li>• Pimba *</li> <li>• Roseworthy*</li> <li>• Stony Point (Whyalla Refiners) - distribution</li> <li>• Stony Point*</li> <li>• Whyalla <b>Terminal</b> LMF</li> <li>• Woomera*</li> </ul> <p style="font-size: small; margin-top: 5px;">* denotes a customer but does not include a distributor</p>
Category 2	<ul style="list-style-type: none"> <li>• Ardrossan West</li> <li>• Baroota (on and from 1 December 2017)</li> <li>• Dalrymple (on and from 1 December 2016)</li> </ul>	<ul style="list-style-type: none"> <li>• Kadina East</li> <li>• Wudinna</li> <li>• Yadnarie</li> </ul>
Category 3	<ul style="list-style-type: none"> <li>• Port Lincoln</li> </ul>	<ul style="list-style-type: none"> <li>• Snuggery Rural</li> </ul>
Category 4	<ul style="list-style-type: none"> <li>• Angas Creek</li> <li>• <b>[Berri/Monash]</b></li> <li>• Blanche</li> <li>• Brinkworth</li> <li>• Clare North</li> <li>• Coonalpyn West</li> <li>• Dorrien</li> <li>• Templers</li> <li>• Hummocks</li> <li>• Keith</li> <li>• Kincaig</li> <li>• Mannum</li> <li>• Mobilong</li> <li>• <b>[Mt Barker, Mt Barker South]</b></li> <li>• Mt Gambier</li> </ul>	<ul style="list-style-type: none"> <li>• North West Bend</li> <li>• Penola West</li> <li>• <del>Playford (Davenport West)</del></li> <li>• Snuggery Industrial</li> <li>• Tailem Bend</li> <li>• Waterloo</li> <li>• Whyalla Terminal – Main Bus</li> <li>• <b>[Bungama and Pt Pirie]</b></li> <li>• <b>[Dry Creek (West), Kilburn, LeFevre, New Osborne and Torrens Island 66kV]</b></li> <li>• <b>[Happy Valley, Magill (South) and Morphett Vale East, City West (South)]</b></li> <li>• <b>[Para, Munno Para and Parafield Gardens West]</b></li> <li>• <b>[Dry Creek (East), Magill (East) and Northfield]</b></li> </ul>
Category 5	<ul style="list-style-type: none"> <li>• Adelaide Central <b>[East Tce, City West (ACR)]</b></li> </ul>	

### 3 AEMO'S PROPOSED AMENDMENTS TO THE ELECTRICITY TRANSMISSION CODE

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In its report, AEMO proposed various amendments to existing clauses and the inclusion of new clauses in the code. This section of the Draft Decision reviews the submissions received on the various code amendments proposed by AEMO and outlines the Commission's draft decisions and the associated reasons with respect to these amendments.

#### 3.1 ISSUE 5 – Timeframe to remedy exit point reliability breaches

*“In amending the timeframe to remedy a breach of the reliability standards in the Electricity Transmission Code, a number of amendments proposed by AEMO are to be considered, namely;*

- *the amendment of clause 6.3.1;*
- *the introduction of a new definition of forecast agreed maximum demand;*
- *the amendment of clause 2.6.3, 2.7.3, 2.8.3, 2.9.3 and 2.10.3; and*
- *the introduction of new clause 6.3.2*

*The Commission seeks comment on the proposal to amend the timeframe to remedy a breach of the reliability standards and the amendments to the code above. The Commission also seeks stakeholder views on any other matters that may further clarify ElectraNet's responsibilities in resolving breaches, simplifying the definition of timelines and allowing for the impact of unanticipated increases in demand and unforeseen 'drop-in' customers (and specification of their limits) in the planning and remediation process.”*

Network planning by ElectraNet to meet the transmission code reliability standards is based on contracted agreed maximum demand. Currently, the agreed maximum demand is contracted on a 12-month forecast and could be considered to provide limited opportunity for planning. A small error in the demand forecast would not have a significant impact. However, if the demand forecast is substantially overstated, the TNSP could be forced to invest unnecessarily to meet what may be perceived as an illusory reliability standard.

The majority of transmission network augmentations have protracted lead-times. It is therefore inevitable that the reliability standard will rarely be achieved within the 12-month obligation to rectify a breach under the code provisions. That requirement may be found, for example, in clause 2.6.3 of the code (dealing with transformer repair obligations for Category 4) in the following terms (noting that equivalent provisions appear in respect of each Category):

*In the event that agreed maximum demand at a connection point or group of connection points exceeds the equivalent line capacity or equivalent*

*transformer capacity standards required by this clause 2.6, a transmission entity must:*

- (a) use its **best endeavours** to ensure that the **equivalent line capacity** or **equivalent transformer capacity** at the **connection point** or group of **connection points** meets the required standard within 12 months; and*
- (b) ensure that the **equivalent line capacity** or **equivalent transformer capacity** at the **connection point** or group of **connection points** meets the required standard within 3 years.*

AEMO noted that it was advised by ElectraNet of the difficulty it experienced in receiving regulated funding to complete augmentations within the 12-month best endeavours period because of the timeframe permitted by the code to rectify such a breach within a 3-year period.

Clause 6.3.1 of the code aids in reducing the likely period of breach by placing a best endeavours obligation on the transmission entity to obtain planning approvals and acquire easements based on forecasts prior to agreed maximum demand breaching the required reliability standard. Clause 6.3.1 provides as follows:

*A **transmission entity** must use its **best endeavours** to obtain all necessary planning approvals and acquire all necessary easements on the basis of forecast demand prior to **agreed maximum demand** breaching the reliability standards specified in this industry code.*

Due to the difficulties in contracting agreed maximum demand beyond a 12-month forecast, AEMO recommended that clause 6.3.1 be expanded to include forecast agreed maximum demand and a best endeavours obligation on the transmission entity to complete all necessary design work, approvals and acquisitions outlined as follows:

*6.3.1. A **transmission entity** must use its **best endeavours** to complete all necessary design work, obtain all necessary planning approvals and acquire all necessary land and easements on the basis of forecast demand prior to **forecast agreed maximum demand** breaching the reliability standards in this industry code so as to ensure they are in a position to meet their obligations.*

Consistent with that recommendation, AEMO also proposed wording for a new definition to be included in the section 10.1 (definitions) of the code, as follows:

***Forecast agreed maximum demand** means the **agreed maximum demand** forecast for a given year that is provided by the customer three years prior to when the **agreed maximum demand** is contracted.*

AEMO suggested that the proposed amendments to clause 6.3.1 would assist in reducing any breach period and also proposed that the 3-year grace period should be removed from the code to clarify the application of the 12-month best endeavours obligation to rectify any breach.

Under that proposed amendment, changes to each of clauses 2.6.3, 2.7.3, 2.8.3, 2.9.3 and 2.10.3 will be required, demonstrated as follows:

*2.6.3. In the event that **forecast agreed maximum demand at a connection point** or group of **connection points** exceeds the **equivalent transformer capacity** standard required by this clause 2.6, a **transmission entity** must:*

*(a) ~~use its **best endeavours** to~~ ensure that the **equivalent transformer capacity** at the **connection point** or group of **connection points** meets the required standard within 12 months; ~~and~~*

*~~(b) ensure that the **equivalent transformer capacity** at the **connection point** or group of **connection points** meets the required standard within 3 years.~~*

However, the eventual contracted agreed maximum demand may possibly exceed the forecast agreed maximum demand as a result of unanticipated increases in demand such as customer spikes that were not included in the forecast demand. To avoid such unforeseen demand increases giving rise to a possible reliability breach, AEMO has recommended the inclusion of the following additional clause which allows such a breach to be remedied within a 3-year period rather than 12 months;

*6.3.2. A **transmission entity** must ensure a breach in the reliability standard is remedied within 12 months of the **forecast agreed maximum demand** exceeding the reliability standard. In the case of a breach not appearing in the **forecast agreed maximum demand** prepared 3 years prior, such breach is excluded from the 12 month obligation and the **transmission entity** must use its **best endeavours** to remedy the breach within 12 months from the time of the breach and must, in any case, remedy the breach within three years from the time of breach.*

The proposed tightening of the timeframe to a mandatory obligation of 12 months is intended to provide greater certainty in resolving a breach of the reliability standards. The 3-year agreed forecast demand period presents an extended forward planning window and should provide the appropriate indicators as to the probability of a breach of the reliability standard at a given connection point. The NER prescribes minimum planning period for the purposes of the annual planning reviews for distribution and transmission network service providers.<sup>14</sup> ETSA Utilities provides 10-year connection point demand forecasts to ElectraNet which ElectraNet uses in its Annual Planning Report in determining network planning on a 20-year horizon. Trend analysis of the forecast demand data should also provide an indication of load growth areas.

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<sup>14</sup> Refer NER rule 5.6.2(d) <http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>

### **3.1.1 Comment Received**

ETSA Utilities expressed no concern with the proposed amendment of clause 6.3.1, the new definition of forecast agreed maximum demand or the amendments proposed for clauses 2.6.3, 2.7.3, 2.8.3, 2.9.3 and 2.10.3.

However, in relation to clause 6.3.2, ETSA Utilities noted that while it understood the thrust of the proposal, it had some concern should a constraint associated with a “drop-in” (unanticipated and unforeseen) load occur early in ElectraNet’s regulatory period. In such a circumstance, ETSA Utilities noted that ElectraNet would not be funded to undertake the augmentation required for the additional demand. ETSA Utilities is of the view that funding of the augmentation should be considered in any change in obligations.

In its submission, ElectraNet put the following propositions:

- ▲ The proposed amendment to clause 6.3.1 provides clear guidance regarding the level of preparatory work ElectraNet is required to undertake on the basis of uncontracted forecast agreed maximum demands.
- ▲ The impact of the proposed changes to clause 2.6.3, 2.7.3, 2.8.3, 2.9.3 and 2.10.3 poses significant risk in advancing transmission developments and augmentations to meet uncommitted forecast increases in demands when the forecast agreed maximum demands are uncontracted and there is no recourse against customers for the accuracy of their forecasts. It argued that if the forecast demands do not materialise, all customers will pay, needlessly, for the augmentations.
- ▲ The definition of forecast agreed maximum demand should relate to either the agreed medium peak demand forecast provided by ETSA Utilities, or a forecast agreed between the parties in the case of direct connect customers, rather than simply a set of numbers provided by the customer.
- ▲ It is concerned that the proposed definition of forecast agreed maximum demand could imply that the forecast agreed maximum demand will automatically be contracted at the conclusion of the three year forecast period. To address this concern, it proposed that the forecast agreed maximum demand is “agreed with” the customer three years prior to when the agreed demand “is required” to be contracted.
- ▲ It is of the view that the proposed amendments to clauses 2.6.3, 2.7.3, 2.8.3, 2.9.3 and 2.10.3 should express the intent that, in accordance with these clauses, *“a transmission entity must use its best endeavours to ensure that the equivalent transformer capacity (or equivalent line capacity) at the connection point or group of connection points meets the required standard within 12 months of the forecast date of the applicable capacity being exceeded”*.
- ▲ Underpinning its submission is a view that positive variances to forecast agreed maximum demand should be effectively dealt with whether these are due to forecast inaccuracies brought about by unforeseen increases in growth

rate or step loads. Any demand in excess of that forecast three years prior must therefore be dealt with separately to the incremental load growth, as outlined by proposed clause 6.3.2. ElectraNet does not believe that a materiality threshold is relevant to the proposed clause, as the investment lead time, in its view, is the key issue.

- ▲ ElectraNet believes the proposed approach provides a consistent minimum three-year notice period for any required augmentations, noting that the code should recognise that there may still be circumstances which challenge the achievement of these timeframes such as long transmission line augmentations, particularly where triggered by large, remote step load increases.

### **3.1.2 The Commission's analysis and Draft Decision**

There were no objections by ElectraNet or ETSA Utilities to the proposed amendment to 6.3.1.

Clause 6.3.1 of the code aids in reducing the likely period of breach by placing a best endeavours obligation on the transmission entity to obtain planning approvals and acquire easements based on forecasts prior to agreed maximum demand breaching the required reliability standard.

The inclusion of the completion of all design work and land acquisitions with the other elements of the process in remedying a breach of the reliability standards assures that those aspects are considered early in the process, particularly where the outcomes are reliant on project elements that may become protracted. The forecast agreed maximum demand provides a three-year planning horizon which is based on longer term trend data from ETSA Utilities' 10-year connection point forecasts and ElectraNet's 20-year planning horizon as set out in its Annual Planning Report. The Commission is of the view that the 3-year forecast agreed demand period presents an extended forward planning window and should provide the appropriate indicators as to the probability of a breach of the reliability standard at a given connection point.

It should be noted that clause 2.10 (Category 6 loads) and its sub-clauses would be deleted from the code with the renaming of Category 6 to Category 5.

ElectraNet argued that a best endeavours standard should apply in ensuring that a connection point(s) meets the required standard within 12 months of the forecast date of the applicable capacity being exceeded. However, the Commission believes that a mandatory timeframe is appropriate given the preceding 3-year forecast period. A best endeavours standard opens the possibility of further extending the remediation period.

In regard to forecast agreed maximum demand, ElectraNet proposed that the demand forecast should be *agreed with* the customer rather than *provided by* the customer. The Commission notes that this would provide a platform for negotiation which would establish the basis on which the agreed maximum demand forecast is based; whether the ETSA Utilities' medium growth forecast (summer peak demand forecasts) or medium peak demand forecast, as proposed by ElectraNet, are used. Such negotiations on the agreed forecast however, may give rise to disputes and subsequent resolution procedures involving an independent arbitrator. However, this may not be appropriate in circumstances where the customer is an entity other than ETSA Utilities.

The Commission acknowledges the impact of possibly inaccurate demand forecasting and step load increases brought about by unforeseen and unanticipated loads. However, the Commission believes that there is a sufficient experience in demand forecasting for deriving general demand growth for reviewing exit point capacity. As noted previously, ETSA Utilities and ElectraNet use 10/20-year forecast/planning horizons in determining the requirements for network capability.

Demand increases due to unforeseen and unanticipated loads can be difficult to plan for. Whereas a high growth demand forecast scenario may consider a 40-80MW mining load increase on Eyre Peninsula as noted by ElectraNet in its submission, it would be inefficient to provide for the additional capacity based on a possibility and not a certainty. As an unforeseen and unanticipated load, such a demand requirement would be subject to commercial arrangements between the provider, be it ETSA Utilities or ElectraNet, and the customer.

The proposed new clause 6.3.2 provides a best endeavours standard to remedy a breach that does not appear in the forecast agreed maximum demand within 12 months of time of the breach. The new clause mandates a 3-year timeframe to remedy the breach. The Commission considers that this provides adequate time to resolve a breach in relation to the capacity of a connection point. However, the magnitude of what could be determined unanticipated increases in load or unforeseen and unanticipated loads should be specified for the purposes of the proposed clause 6.3.2.

To simplify the approach, the Commission believes that a separate clause, inclusive of the intent of amendment to clause 2.[6-9].3 and new clause 6.3.2 proposed by AEMO, could be added to Chapter 2 of the code. The introduction of the separate, expanded clause 2.11 in lieu of the proposed clause 6.3.2 removes the need to repeat clause 2.[6-9].3 for each category and connects the obligations of the transmission entity.

### **Draft Decision 5**

**The Commission's draft decision is that:**

**Clause 6.3.1 will be amended to read:**

*"A **transmission entity** must use its **best endeavours** to complete all necessary design work, obtain all necessary planning approvals and acquire all necessary land and easements on the basis of forecast demand prior to the **forecast agreed maximum demand** breaching the reliability standards in this industry code so as to ensure that the **transmission entity** is in a position to meet its obligations."*

**A new definition for forecast agreed maximum demand will be included in Section 10.1 of the code (definitions) as follows:**

*"Forecast agreed maximum demand means the **agreed maximum demand** forecast for a given year that is agreed with the **customer** three years prior to when the **agreed maximum demand** is required to be contracted."*

**New clause 2.11 "Obligations to provide sufficient capacity following changes in agreed forecast maximum demand" will be added:**

*2.11.1 Subject to clause 2.11.2, in the event that a change in **forecast agreed maximum demand** at an **exit point** or group of **exit points** will result in a future breach of a standard specified in this clause 2, a **transmission entity** must ensure that the **equivalent capacity** at the **exit point** or group of **connection points** is sufficient to meet the required standard within 12 months of the identified future breach date.*

*2.11.2 Where a change in **forecast agreed maximum demand** at an **exit point** or group of **exit points** under clause 2.11.1 was not able to be identified by the **transmission entity** in the **forecast agreed maximum demand** 3 years prior, a **transmission entity** must:*

- (a) use its **best endeavours** to ensure that the **equivalent capacity** at the **exit point** or group of **connection points** is sufficient to meet the required standard within 12 months of the identified future breach date; and*
- (b) in any event, ensure that the **equivalent capacity** at the **exit point** or group of **connection points** is sufficient to meet the required standard within 3 years of the identified future breach date.*

### **3.2 ISSUE 6 – Reliability standard – Adelaide Central Region (ACR)**

*“Noting that the current provisions of the code require the provision by ElectraNet of an N-1 exit point reliability standard to the Adelaide Central Area from 1 January 2012 and that this level of reliability will be provided by independent and diverse transmission entry points which themselves come from diverse parts of the ElectraNet network, the Commission seeks stakeholder comment on whether or not there is a need to amend the code to further enhance the reliability standard (whether interruptible or continuous) to Adelaide Central during the 2013 to 2018 regulatory period.*

*In particular, the Commission seeks comment on the need for a heightened level of reliability and the costs and benefits associated with such a proposal.”*

Under current code provisions, Category 5 and Category 6 exit points comprise some grouped exit points that, together with ETSA Utilities’ meshed distribution network, supply Adelaide Central and surrounding suburbs. The current provisions of the code are intended to deliver a highly reliable electricity transmission supply to Adelaide Central and Adelaide’s surrounding suburbs.

The existing Category 5 requires ElectraNet to provide transmission line capacity and transformer capacity at the grouped exit points of Dry Creek East, Magill and Northfield, as follows:

- ▲ N-1 equivalent capacity for 100% of agreed maximum demand equal to that of Adelaide’s surrounding eastern suburbs’ load;
- ▲ N-1 equivalent capacity for 100% of agreed maximum demand equal to that of Adelaide Central’s load;
- ▲ N-2 equivalent capacity for 50% of agreed maximum demand equal to that of Adelaide’s surrounding eastern suburbs’ load; and
- ▲ N-2 equivalent capacity for 100% of agreed maximum demand equal to that of Adelaide Central’s load (obligation via Category 5) post 31 December 2011.

Importantly, this required level of reliability is for the Dry Creek East, Magill, and Northfield group of transmission exit points, and not the main Adelaide Central (Category 6) exit point of East Terrace.

For the Adelaide Central Area, the code currently provides that ElectraNet is to provide N transformer and transmission line capacity until the end of 2011, after which time it is required to provide N-1 transformer and transmission line capacity. That N-1 capacity is itself required to be provided by means of an independent and diverse substation located west of King William Street.

That substation is currently under construction by ElectraNet and is referred to as the City West substation.<sup>15</sup>

This regime was established by the Commission in 2006. In its Final Decision on exit point reliability standards, the Commission noted that:

*For connection points that are assigned to Category 6 (being any connection points for the Adelaide Central area), the Commission's Final Decision is that ElectraNet will be required, from 1 July 2008, to provide a level of reliability for transmission lines and transformers such that:*

- ▲ *until 31 December 2011, 100% of AMD can be supplied provided that all relevant lines and transformers are in service (that is, an N reliability standard); and*
- ▲ *after 1 January 2012, 100% of AMD can be supplied provided that all relevant lines and transformers are in service, even in the event that one line or transformer is out of service (that is, an N-1 reliability standard).*

*This outcome is achieved through specification of standards for transmission line and transformer capacity for two distinct periods (1 July 2008 to 31 December 2011; and 1 January 2012 onwards). There are two elements to that process, with the second element further divided based on the two time periods. First, ElectraNet is prohibited (by clauses 2.10.1(a) and 2.10.2(a) respectively) from contracting with its customers to deliver amounts of AMD in excess of 100% of the installed line or transformer capacity.*

*Secondly, the reliability standards for both transmission lines and transformers are specified by reference to requirement in the period 1 July 2008 to 31 December 2011 and then from 1 January 2012 onwards.*

*In relation to the period 1 July 2008 to 31 December 2011, clauses 2.10.1(b) and 2.10.2(b) require ElectraNet to be able to supply AMD provided that all relevant lines and transformers are in service. That is, the required standard for both transmission lines and transformers for this period is N.*

*After 1 January 2012, clauses 2.10.1(c)(i) and 2.10.2(c)(i) require ElectraNet to be able to supply AMD even in the event that one transmission line or transformer (noting that equivalent capacity is not applicable to Category 6 – all capacity must be actual capacity) is out of service; i.e. the standard applicable after 1 January 2012 is N-1.*

*Supporting the requirements of clauses 2.10.1(c)(i) and 2.10.2(c)(i) in relation to the N-1 standard, clauses 2.10.1(c)(ii) and 2.10.2(c)(ii) require the relevant capacity to be provided by means of independent and diverse substations, which must be commissioned and available by 1 January 2012,*

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<sup>15</sup> Refer ElectraNet website: <http://www.electranet.com.au/network/current-planned-developments/near-metro/adelaide-central-reinforcement/>

*one of which must be located west of King William Street. This mandatory obligation, which is unusual in its specificity, is appropriate in this case to ensure diversity in the transmission system supplying the Adelaide Central area.<sup>16</sup>*

Notwithstanding the current N and N-1 obligations on ElectraNet established under the code, there is some inherent operational network support capacity for Adelaide Central which is provided by ETSA Utilities' network. That support, while not mandated as a regulatory exit point reliability requirement under the code, provides ElectraNet with operational redundancy for Adelaide Central – but only following switching and the possible loss of up to 50% of the load in the eastern suburbs of Adelaide, depending on load conditions at the time. As has been previously recognised by the Commission, the capacity for ETSA Utilities to provide this level of network support is expected to diminish over time due to demand growth in Adelaide Central and surrounding suburbs.<sup>17</sup>

In its report, AEMO has noted this underlying operational network support provided to Adelaide Central by ETSA Utilities' sub-transmission and distribution network and the fact that, following the commencement of the N-1 exit point reliability standard for that area from 2012, it will operationally be the case that, in certain circumstances, equivalent operational N-2 reliability may be achieved. The AEMO report therefore suggested that, to the extent that there is a need for an enhanced standard to be mandated for Adelaide Central, the code would need to be amended in that regard.

The Commission notes that the proposal suggested by AEMO would involve a change to the position adopted by the Commission in 2006. That is to say, in 2006 the Commission, relying on advice from the then Electricity Supply Industry Planning Council, determined that the relevant regulatory standard to apply to ElectraNet for exit point reliability into the Adelaide Central area should move from N to N-1 from 2012.

While the Commission considered the need for further enhancement of exit point reliability for Adelaide Central during the 2006 review, at that time it concluded that:

*Taking into consideration the very high costs associated with reinforcing supply to the Adelaide Central area with additional transmission entry points, the Commission is satisfied that the risk of sustained outages in the Adelaide Central area is minimised if ElectraNet installs an additional*

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<sup>16</sup> Essential Services Commission, Review of the Reliability Standards specified in clause 2.2.2 of the Electricity Transmission Code, Final Decision, pages 39 to 40. Available at <http://www.escosa.sa.gov.au/library/060906-ElectricityTransmissionCode-ReliabilityStandards-FinalDecision.pdf>

<sup>17</sup> Essential Services Commission, Review of the Reliability Standards specified in clause 2.2.2 of the Electricity Transmission Code, Final Decision, pages 25 to 26 and page 31. Available at <http://www.escosa.sa.gov.au/library/060906-ElectricityTransmissionCode-ReliabilityStandards-FinalDecision.pdf>

*independent and diverse transmission entry point into the Adelaide Central area in the near future.*<sup>18</sup>

The Commission went on to note that the existence of ETSA Utilities' network support as described above would provide an equivalent operational N-2 outcome in certain circumstances, albeit that the reliability of that outcome would diminish over time given load growth.

The question posed by the Commission in the Issues Paper as a result of AEMO's proposition was whether or not, having established but not yet implemented (in the sense that the City West substation is not required to be operational until 1 January 2012) the formal N-1 exit point reliability standard, the Commission should consider further enhancing the exit point reliability standard for, or some time during, the 2013 to 2018 regulatory period?

In posing that question, the Commission noted that it ultimately is one which is to be answered on efficiency grounds, through the conduct of a cost/benefit analysis in a manner consistent with the provisions of the NER.

### **3.2.1 Comment Received**

In its response, ETSA Utilities submitted that a mandatory requirement should be placed on ElectraNet for a Network Support Agreement with ETSA Utilities, where ETSA Utilities is requested to provide operational support for ElectraNet to meet its obligations under the code. The formal agreement should specify the terms and conditions associated with the support arrangements.

Furthermore, ETSA Utilities considered that any requirement of the code, specifying continuous N-2 standards for the ACR, should be delayed until after 2018 (e.g., 2020) in line with what ETSA Utilities considers to be good industry practice.

ElectraNet put the view that the N-1 standard for Adelaide Central which applies from 1 January 2012 is appropriate given the high cost to customers of providing an additional diverse supply for what it deems to be extremely low-probability events. ElectraNet noted that its understanding of AEMO's recommendation in AEMO's report, with respect to the provision of an N-2 standard for the CBD, related to the clarification of the existing (Category 5) code provision rather than arguing the economic efficiency or technical merit of an increased N-2 standard. ElectraNet noted that an economic assessment by AEMO clearly does not support the provision of an N-2 standard to the CBD (a copy of that assessment is contained in Appendix 1 to this Draft Decision).

ElectraNet also noted that while the capability to provide a degree of additional, non-continuous, support to the CBD via the distribution network currently exists

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<sup>18</sup> Essential Services Commission, Review of the Reliability Standards specified in clause 2.2.2 of the Electricity Transmission Code, Final Decision, page 27. Available at <http://www.escosa.sa.gov.au/library/060906-ElectricityTransmissionCode-ReliabilityStandards-FinalDecision.pdf>

due to the historical design of the network, it did not consider it prudent or efficient to require this be increased to an N-2 standard.

The code obligations for fault restoration are interpreted by ElectraNet as being intended to establish an operational standard requiring real time response, and not a planning standard designed to drive the need for additional investment or contracted network support at the expense of network customers. ElectraNet considers that it would be useful to clarify this intent more explicitly in the Code.

ElectraNet asserted that the use of any available distribution capacity to support the CBD following an interruption affecting the East Terrace or City West substations is best addressed by the maintenance of appropriate operational protocols between ElectraNet and ETSA Utilities. ElectraNet also put a view that the obligation to maintain supply should be expressed using a best endeavours standard as the level of available distribution network support will decline over time as demand grows.

Ultimately, ElectraNet submitted that, as analysis does not justify an N-2 reliability standard in the CBD at this time, the option of such a standard should be reconsidered at a future review of the code. However, should reclassification to an N-2 reliability standard be considered, ElectraNet put a further submission that, if a distribution network option is determined to be the most efficient solution, it is proper that this investment is delivered and costs recovered directly by ETSA Utilities from customers via distribution charges, which ElectraNet believes to be consistent with the intent of the joint planning framework under the NER. In the case of network support secured by ElectraNet through non-distribution solutions such as demand side participation or generation support, the network support pass-through provisions of the NER would apply.

### **3.2.2 The Commission's analysis and Draft Decision**

For the Adelaide Central Area, ElectraNet is to provide N-1 transformer and transmission line capacity from 1 January 2012. This will not change in moving to a revised version of the code to apply from July 2013; the N-1 capacity will continue to be provided by means of an independent and diverse substation located west of King William Street.<sup>19</sup>

An enhanced reliability standard is not supported at this time by either ElectraNet or ETSA Utilities. An assessment, as alluded to by ElectraNet in its submission, was provided by AEMO subsequent to the final report to the Commission. The assessment did not justify the cost of an enhanced (N-2) reliability standard. The assessment can be found in Appendix 1 of this Decision Paper.

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<sup>19</sup> The connection point, referred to as the City West substation, is currently under construction by ElectraNet. Refer ElectraNet website: <http://www.electranet.com.au/network/current-planned-developments/near-metro/adelaide-central-reinforcement/>

Neither ElectraNet nor ETSA Utilities supported the need for an N-2 reliability standard at this time; this was considered an issue which should be considered in a subsequent review of the code for the regulatory period 2018-23. ETSA Utilities' view seems to be based on what it perceives to be "good industry practice"; ElectraNet's view seems to be based on the AEMO assessment. In both cases, the parties have noted that Adelaide Central has not, at the time of this review, even moved to an N-1 scenario, remaining at N reliability levels until the end of this year. As such, it would be premature to move to an enhanced level of reliability.

Based on the Commission's position in respect to the 2006 review of exit point reliability standards as described above and the assessment provided to the Commission by AEMO, the Commission is not of a mind to mandate a further enhanced reliability standard for the exit points supplying Adelaide Central at this time. As noted in ElectraNet's submission, the failure of the N-1 transmission capability would be a low-probability event for which the high cost to customers of providing an additional diverse connection point, would not be appropriate. The Commission is mindful of the need to ensure that consumers pay no more than the efficient cost of supply and this is a key factor in its decision not to further consider enhancement of reliability standards for Adelaide Central at this time.

#### ***Draft Decision 6***

***The Commission's draft decision is that it will not seek to enhance the current N-1 reliability standard of connection points supplying Adelaide Central at this time. The decision is based on an assessment by AEMO that demonstrates that the high cost of an enhanced standard is not justified at this time. This aligns with the Commission's objectives to protect the long-term interests of SA consumers with respect to the price, reliability and quality of electricity services.***

***The requirement for an enhanced reliability standard may better form a part of the review of exit point reliability standards in time for the subsequent revenue reset submission by ElectraNet.***

### **3.3 ISSUE 7 - Planning**

*“The Commission seeks comment on the appropriateness of the proposal by AEMO to include an additional clause in the code (proposed clause 6.4.1).”*

In addition to the obligations of the NER for joint planning,<sup>20</sup> the AEMO report proposed that a new clause be included under section 6 of the code, as follows:

6.4.1 Where the most economically feasible option to meet the reliability standards of clauses 2.5 to 2.10 relies on a combination of transmission and sub-transmission services, the **transmission entity** must ensure that the reliability standard required by that category is capable of being delivered to the **agreed maximum demand** points within that category, including for any contingency events that the category requires for that reliability category.

That proposal reinforces the view of the Commission that it is ElectraNet’s responsibility under the code to ensure that, where it chooses to rely on non-transmission options to meet its exit point reliability obligations, it needs to ensure that such options are firm, robust and available to meet the needs of South Australian consumers.

#### **3.3.1 Comment Received**

ETSA Utilities expressed no concerns with the additional clause as proposed by AEMO. However, ETSA Utilities submitted that where it is required to provide Network Support to ElectraNet for it to satisfy its (reliability) obligation, such support should be subject to a formal Network Support Agreement.

ElectraNet noted that AEMO's proposed clause 6.4.1 is consistent with the directions given by the Commission and would require ElectraNet to be responsible for the provision of both transmission and distribution components of any required augmentation to meet the reliability standards. ElectraNet believes that the provision is neither fair nor reasonable and might leave it exposed to costs which it may not be able to recover.

In the absence of any specific obligation on ETSA Utilities to comply with the timing requirements of the Code, ElectraNet asserted that there is no means by which it can force ETSA Utilities to meet timeframes; nor for ElectraNet to recover charges levied by ETSA Utilities for the provision of any required distribution services via a network support pass-through.

ElectraNet argued that if ETSA Utilities did not implement the distribution solution (determined as the best option by a regulatory investment test) within the timeframes mandated by the code, ElectraNet may be forced to advance the next most economically feasible option to satisfy the timing requirements of the code.

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<sup>20</sup> Refer NER Clause 5.6.2 (c) <http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>

ElectraNet submitted that, in its view, this would not to be in the best interests of customers.

ElectraNet also put the view that a joint planning provision must recognise that where the most economically feasible option is a combination of transmission and distribution components (or indeed only a distribution option), then that option must be funded and delivered by the respective parties on a regulated basis, consistent with the intent, as understood by ElectraNet, of the joint planning arrangements under the NER.

### **3.3.2 The Commission's analysis and Draft Decision**

The Commission understands that the intent of AEMO's proposal is to place the onus on the transmission entity to ensure that the reliability standards are not compromised by the choice of the combination of transmission services delivering the services at the connection point.

It is noted that ETSA Utilities has no concerns regarding the introduction of the proposed clause but is insistent on the need for a formal Network Support Agreement as noted previously.

The Commission understand ElectraNet to be concerned with the ramifications of the inability of ETSA Utilities, whether by choice or circumstance, to meet the regulatory timelines required by the code in addressing capacity requirements or reliability obligations. ElectraNet's concerns relate to a lack of its own powers to ensure that a non-transmission solution is implemented in a timely manner and the financial issues around provisions for cost recovery.

Although the concerns expressed on the issue in ElectraNet's submission are aimed at distribution solutions, non-transmission solutions are not limited to distribution services. The reliability standard and capacity requirements of the Category 3 connection point at Pt Lincoln are dependent on the provision of local generation. The choice of a generation solution is based on economic rationale; it is not economically efficient to duplicate the transmission line to Pt Lincoln.

From the Commission's perspective, the important point is that the service provided must meet the requirements of the code. It is therefore incumbent on ElectraNet, not the alternative service provider, to ensure that its obligations are met. The type and standard of service is a contractual arrangement between ElectraNet and that provider, funded by ElectraNet. The proposed clause 6.4.1 is not restricted to distribution solutions. Obviously, the code cannot, and should not, discriminate between the types of services employed by ElectraNet for network support arrangements.

The Commission considers that the proposed new clause 6.4.1 promotes identification of the most economically viable reliability solution.

**Draft Decision 7**

***The Commission's draft decision is that the proposed clause 6.4.1 confirms ElectraNet's responsibility under the code to ensure that, whatever the best option to meet its exit point reliability obligations, transmission or non-transmission, such options must be firm, robust and available to meet the needs of South Australian consumers.***

***The Commission will include new clause 6.4.1 in the following terms:***

*"Where the most economically feasible option to meet the reliability standards of clauses 2.5 to 2.9 relies on a combination of transmission and sub-transmission services, the **transmission entity** must ensure that the reliability standard required by that category is capable of being delivered to the **agreed maximum demand** points within that category, including for any contingency events that the category requires for that reliability category."*

### **3.4 ISSUE 8 - Limitation on supply from non-network support**

*"The Commission seeks comment on the recommendation by AEMO for the removal of clauses 2.5.1(a), 2.5.2(a), 2.6.1(a), 2.6.2(a), 2.7.1(a), 2.7.2(a), 2.8.1(a), 2.8.2(a), 2.9.1(a), 2.9.2(a), 2.10.1(a) and 2.10.2(a) from the code, leaving the option on how to provide equivalent line capacity to the transmission entity.*

*The Commission also seeks the views of stakeholders on the proposed amendments to clause 2.11.1 and the introduction of clause 2.11.2 which seek to deliver the appropriate level of reliability where network support options are utilised."*

Currently, to meet the reliability standards, the agreed maximum demand for each connection point category must not exceed 100% of line capacity or 100% of transformer capacity or, in the case of Categories 1, 2 and 3, 120% of line or transformer capacity where appropriate network support arrangements are in place.

However, limiting the agreed maximum demand based on network capability may impose a requirement for transmission network augmentation on ElectraNet, notwithstanding that a more cost-efficient, reliable option of local non-transmission support may be available.

AEMO has put a view that the amount of supply that can be provided from network support arrangements or non-network support options should be based on the reliability and economics of utilising non-network support in comparison with augmenting the transmission network.

The Category 3 connection point at Pt. Lincoln is a case in which investment in local generation is more cost efficient to meet the required reliability standard as compared

to duplicating the transmission line that supplies Pt. Lincoln (refer Appendix A of the AEMO report).

However, where a network support arrangement provides a high proportion of network capacity, i.e. greater than 120%, it should provide the equivalent level of reliability that would be required of the transmission network.

The proposed amendments allow the reliability of network support arrangements to be lower if they are only in place for peak shaving requirements. However, if the network support arrangement is in place to supply a higher proportion of the demand it is required to have an equivalent level of reliability that would be expected from a transmission network option.

To achieve an equivalent level of reliability from network support arrangements, as can reasonably be expected from a transmission network option, it is anticipated that the network support options will require additional levels of redundancy.

### **3.4.1 Comment Received**

ETSA Utilities suggested that the proposed amendments appear to be more complicated and confusing than the existing clauses, noting ambiguity in the proposed wording of clause, 2.11.1(b). ETSA Utilities contended that the “20%” reference as proposed in the AEMO report would be clearer if it was stated as “above 120% of agreed maximum demand”.

In principle, ElectraNet considered the proposed amendments reasonable, noting that, as proposed, a network support arrangement providing up to 120% of the AMD must satisfy a less onerous reliability standard than one providing above 120% of the AMD. In the latter case ElectraNet considers that it is not clear whether the more onerous reliability standard would apply to the entire network support arrangement or only that portion required to satisfy the demand in excess of 120% of the AMD. The former would trigger a requirement for an entirely new network support arrangement while the latter would allow a more measured approach to incremental load growth, and is consistent with ElectraNet's understanding of the intent of this provision.

In the event that a network support arrangement is pursued in lieu of a transmission augmentation, ElectraNet notes that these options typically require significant investment and a long contractual commitment (of the order of 10 years).

### **3.4.2 The Commission's analysis and Draft Decision**

This same issue arose in the Final Decision of the previous code review in 2006 and the Commission made reference to the matter as follows:

*In the Discussion Paper, the Commission canvassed the proposition that the Category 1 definition be amended such that only 80% of AMD need be provided by line and transformer capacity, with up to 20% of the remaining*

*AMD able to be supplied through non-network options. This would provide flexibility to ElectraNet in meeting its Category 1 reliability obligations during peak load conditions. Such additional flexibility should result in reducing future capital expenditure by ElectraNet, thereby reducing transmission costs to consumers in the future.*

*Submissions to the Commission noted that recognition of the role of alternate non-network supply arrangements for Category 1 connection points could also be achieved through permitting ElectraNet to be able to contract for an AMD that is higher than the capacity of the network (lines and transformers) by a specified amount, say 20%. Such an approach for Category 1 connection points was therefore incorporated into the Draft Decision, requiring ElectraNet to establish appropriate non-network support contract(s) if the AMD exceeds line and transformer capacity.<sup>21</sup>*

AEMO put a view in its report that the amount of supply, that can be provided from network support arrangements or non-network support options, should be based on the reliability and economics of utilising non-network support in comparison with augmenting the transmission network. In support of the proposed code amendments, AEMO suggested that limiting the supply that can be provided by network support arrangements potentially conflicts with the NER's intent, where non-network options must be considered as alternatives to network augmentation.

The means by which non-transmission support is provided to meet the required demand, that proves cost-efficient and reliable, perhaps should not be limited, but should be encouraged where possible to mitigate the imposition of more costly transmission network augmentation. The most cost-efficient option will be determined by the RIT-T and if the regulatory test supports a non-network solution then that option would be adopted.

The Commission notes the in-principle agreement of ElectraNet to AEMO's recommendation. As it stands, ElectraNet is only permitted to contract up to the physical capacity limits of its transmission assets. However, ElectraNet can contract for up to 120% of the physical capacity of its transmission assets for Categories 1-3, provided that it has alternative support arrangements which can deliver the equivalent reliability and capacity. By providing equivalent line capacity to all connection point categories as proposed, the way is made clear to provide the agreed maximum demand by a mix of options. It is questionable as to what additional capacity can be safely and sensibly relied on by way of alternative support arrangements. In the 2006 code review, the amount of 20% (for categories 1-3) of the installed transmission capacity was settled on as an acceptable upper limit. This upper limit however, was based on historic operational practices, i.e. the short-term overload ratings of assets, and might be considered as limiting the use of non-network support.

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<sup>21</sup> Refer Commission's web site <http://www.escosa.sa.gov.au/library/060906-ElectricityTransmissionCode-ReliabilityStandards-FinalDecision.pdf>

However, there does seem to the Commission to be some merit in the proposal of AEMO, as it may serve to permit more efficient solutions to be implemented.

Under the AEMO proposal, ElectraNet could contract to the extent it deems satisfactory (depending on the outcome of an RIT-T), provided it has a robust mix of transmission and network support arrangements to do so regardless of the installed transmission capacity.

Where the contracted AMD equals or is less than 120% of installed transmission line and transformer capacity, it could use network support arrangements up to that amount to deliver the AMD. In such cases, the necessary reliability standard for the network support arrangements would be set at 95% availability.

Where, on the other hand, the contracted AMD is greater than 120% of installed transmission line and transformer capacity, the required reliability of the network support arrangements would need to be at least that of a transmission line or transformer. The Commission notes that, for the period 2005 to 2009, the average circuit availability reported by ElectraNet was 99.5% (with a target availability for that period of 99.25%).<sup>22</sup>

The AEMO proposal could be considered as managing the reliability of the risk assessment of mixed system options as opposed to managing the reliability of firm transmission assets. The important consideration is the maintenance of the appropriate level of reliability for customers.

The reliability standard for contracted demand that is up to 20% greater than the installed line or transformer capacity presently applies to Categories 1-3 only. The Commission is of the view that the proposition put by AEMO appears to have efficiency benefits and, provided appropriate reliability standards for varying levels of contracted AMD are specified, then it would be supportive of the AEMO proposal. To achieve the appropriate level of certainty, the Commission would propose to set network support reliability levels as follows:

- ▲ where network support is used and the contracted AMD does not exceed 120% of installed transmission line and transformer capacity – at 95% availability; and
- ▲ where network support is used and the contracted AMD exceeds 120% of installed transmission line and transformer capacity – 100% of the network solution at least equal to the availability standard applicable to the relevant transmission line and transformer.

The Commission also considers that the proposed inclusion of a new clause is appropriate to ensure that formal agreements exist for network support arrangements as opposed to the “automatic” arrangement that has existed in the Adelaide Central area. AEMO’s proposal stated that network support capability and

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<sup>22</sup> Refer Essential Services Commission, *2009/10 Annual Performance Report*, November 2010, at Table a%.15, page 152. Available from the Commission’s website at [http://www.escosa.sa.gov.au/library/101124-AnnualPerformanceReport\\_2009-10.pdf](http://www.escosa.sa.gov.au/library/101124-AnnualPerformanceReport_2009-10.pdf)

availability “should” be ensured; however, the Commission is of the view that a formal agreement should be mandatory. The Commission understands that ETSA Utilities supports this position.

**Draft Decision 8**

**The Commission will amend the provision for contracted maximum demand to permit ElectraNet to contract for levels of AMD above the installed transmission line and transformer capacity on the following terms:**

- **where network support is used and the contracted AMD does not exceed 120% of installed transmission line and transformer capacity – the network support must have 95% availability; and**
- **where network support is used and the contracted AMD exceeds 120% of installed transmission line and transformer capacity – the network support must have a level of availability at least equal to the availability standard applicable to the relevant transmission line and transformer.**

**The Commission will include a new clause (2.12) as follows;**

**2.12 Contracted agreed maximum demand and network support arrangement requirements**

2.12.1 **Where a transmission entity has a network support arrangement in place and delivers transformer or transmission line capacity by means of equivalent capacity, the transmission entity may contract for any amount of agreed maximum demand provided that:**

- (a) **if the level of contracted agreed maximum demand is less than 120% of the installed transformer or transmission line capacity, the network support arrangement must have at least 95% availability for the 12 months to 30 June each year; and**
- (b) **if the level of contracted agreed maximum demand exceeds 120% of the installed transformer or transmission line capacity, the network support arrangement must have a level of availability at least equal to the availability standard applicable to the relevant transformer or transmission line.**

2.12.2 **Where a transmission entity relies on a network support arrangement provided by an independent network support provider to meet the required transformer or transmission line capacity, the transmission entity must enter into a network support agreement with that network support provider to ensure the capability and availability of the network support arrangement.**

2.12.3 **Where a transmission entity does not have a network support agreement in place, the transmission entity must not:**

- (a) **contract for an amount of agreed maximum demand which is greater than 100% of the installed transmission line and transformer capacity at the exit point; and**
- (b) **except in cases where the network support arrangement is provided by the transmission entity, rely on a network support arrangement to meet the required transformer or transmission line capacity.**

### **3.5 ISSUE 9 - Murraylink capability and assessment of reliability standards**

*“The Commission notes that network plant failures and demand in associated NEM regions can influence the achievement of reliability standards where there is a dependence on interconnection. Having regard to that matter, should these influences be considered in assessing the overall value in meeting the transmission reliability standards for South Australia? If so, should consideration of such influences be only limited to Victoria or should the wider impacts of the interconnected transmission network e.g. other inter-regional constraints, be considered?”*

*The Commission seeks the views of stakeholders on the proposed introduction of clauses 6.4.2 and 6.4.3 which are designed to clarify the capability of the Murraylink interconnector.”*

ElectraNet currently includes the capability of Murraylink in its assessment of the Riverland area reliability. The capability of Murraylink is prescribed in the connection agreement for the provision of prescribed transmission services between the parties. ElectraNet is also reliant on AEMO for the available level of inter-regional transfer capacity (i.e., via the constraint equation) at times of peak demand.

Transfer from Victoria to South Australia via the Murraylink interconnector is determined by factors in regions other than South Australia, such as voltage stability and thermal line constraints in Victoria. Murraylink’s design transfer capability (220MW) is based on a Victorian demand of 9,600MW. This transfer capability decreases by approximately 5MW for each 100MW increase in Victorian demand above 9,600MW.

AEMO recommends that the capacity of Murraylink should be calculated using the Murraylink transfer limit equation and assuming worst-case peak-demand conditions, including applying the Victorian maximum demand forecast. In addition, AEMO considers it appropriate for ElectraNet to approach other TNSPs to undertake joint planning (as required by the NER) to identify the most economically viable solution to meet reliability standards.

The recommended inclusion of a new clause 6.4.1 (refer section 3.3 above) promotes identification of the most economically viable reliability solution; whether through augmentation of any utilities’ transmission or distribution networks or new generation. AEMO proposes a further extension to that new clause to assist in clarifying the treatment of Murraylink’s capability and to ensure that contingencies in networks other than ElectraNet’s transmission system are considered in meeting the reliability standards.

This is because contingencies in the sub-transmission network or other regions can potentially have a higher impact on supply capability through Murraylink than outages

on ElectraNet's transmission network. The additional sub-clauses under the new joint planning clause are proposed by AEMO as follows:

6.4.2. A **transmission entity** which provides **equivalent transmission line capacity** or **equivalent transformer capacity** for the purposes of Chapter 2 must consider network plant failures in any NEM region, including distribution systems, where such plant failures might impact on the applicable level of redundancy or reliability.

6.4.3. For the purpose of assessing **connection point** reliability, the capability of the Murraylink interconnector should be calculated using the Murraylink transfer limit equation under peak Victorian demand conditions.

### **3.5.1 Comment Received**

ETSA Utilities submitted that it has no objection to the introduction of clauses 6.4.2 and 6.4.3 and is of the view that TNSP's should consider contingent events and demand in other NEM Regions where an event or demand will influence an interconnector and that interconnector is relied upon to meet TNSP's reliability standards. ETSA Utilities believes that the majority of these considerations should focus on Victoria but may need to include other significant events in other NEM jurisdictions.

ElectraNet supported the proposed amendment as it provides additional clarity in the assessment of the Riverland area reliability. It put the view that the capacity of the adjoining New South Wales network also needs to be considered in making assessment of the capability of the Murraylink interconnector.

### **3.5.2 The Commission's analysis and Draft Decision**

The AEMO report recommended that the capacity of Murraylink should be calculated using the Murraylink transfer limit equation and assuming worst-case peak-demand conditions, including applying the Victorian maximum demand forecast. Contingencies in other regions (or the sub-transmission network) can potentially have a higher impact on supply capability through Murraylink than outages on ElectraNet's transmission network.

The Commission notes the concurrence of views in ElectraNet's and ETSA Utilities' submissions on this issue. Both organisations are of the opinion that events in the broader NEM should be considered in addition to events in Victoria. Thus, the Commission considers it appropriate, as recommended by AEMO, for ElectraNet to approach other TNSPs to undertake joint planning (as required by the NER) in determining the most economically viable solution to meet its reliability and capacity standards.

### **Draft Decision 9**

**The Commission’s draft decision is that the code should be amended to require consideration by ElectraNet of the broader impacts on the provision of transmission network capability and reliability to the Riverland via Murraylink.**

**The Commission proposes to introduce new clauses 6.4.2 and 6.4.3 in the code as follows:**

6.4.2. A **transmission entity** that provides **equivalent transmission line capacity** or **equivalent transformer capacity** for the purposes of Chapter 2 of this code must consider network plant failures in any NEM region, including distribution systems, where such plant failures might impact on the applicable level of redundancy or reliability.

6.4.3. For the purpose of assessing **connection point** reliability, the capability of the Murraylink interconnector should be calculated using the Murraylink transfer limit equation under peak Victorian demand conditions.

### **3.6 ISSUE 10 - Clarification that Category 3 loads have an N-1 interruptible reliability level**

*“The Commission seeks comment on the proposed amendment of clauses 2.7.1(b) and 2.7.2(b) which would provide that Category 3 loads do not require an N-1 supply on a firm, uninterruptible basis.”*

The N-1 capacity of Category 3 loads can be provided by transmission system capability, distribution system capability, generation capability, or any combination of these where load interruptibility may be required to meet the reliability standard.

There are two Category 3 connection points, Pt. Lincoln and Snuggery. The Pt. Lincoln connection point is interruptible as, once transmission supply is lost, back-up generation, requiring time to start, must be brought on-line and associated switching must occur prior to restoration. Therefore, while there is N-1 capability, that can only be invoked once those processes have occurred.

When an interruption occurs at Snuggery, manual switching is required for network restoration. Restoration of the equivalent line and transformer capacity at these two connection points must occur within one hour. These operations required to restore supply after interruption are referred to as “post-contingent operations”.

Without altering obligations under the existing Category 3 reliability standards, AEMO recommended that clause 2.7.1 (b) and 2.7.2 (b) be expanded to further clarify what it considers to be “the intent”, and confirm that Category 3 loads do not require an N-1 supply on a firm, uninterruptible basis.

As a result, AEMO proposes the amendment of clause 2.7.1 (b) and 2.7.2 (b) to include the phrase “through post-contingent operation” as follows:

2.7.1 (b) provide **equivalent line capacity** such that at least 100% of **agreed maximum demand** can be met, through post-contingent operation, following the failure of any relevant **transmission line** or **network support arrangement**;

2.7.2 (b) provide **equivalent transformer capacity** such that at least 100% of **agreed maximum demand** can be met, through post-contingent operation, following the failure of any installed **transformer** or **network support arrangement**;

### 3.6.1 Comment Received

Both ETSA Utilities and ElectraNet support the proposed code amendment clarifying the Category 3 reliability standard. Neither organisation provided any argument or comment to the contrary in their submissions.

### 3.6.2 The Commission’s analysis and Draft Decision

The Commission notes that the amendment to clauses 2.7.1 (b) and 2.7.2(b) is supported by ElectraNet and ETSA Utilities

The proposed amendment of clauses 2.7.1 (b) and 2.7.2(b) is based on practical operational issues. Under the current code requirements, restoration of the equivalent line and transformer capacity at the two affected connection points, Pt. Lincoln and Snuggery, must occur within one hour and manual network switching during the restoration process requires an interruption to supply. The elapsed time to invoke generation supply at Pt. Lincoln also must be taken into consideration.

#### **Draft Decision 10**

***The Commission’s draft decision is to clarify the code to ensure that it is clear that the N-1 requirement for Category 3 loads is of a non-continuous nature. As a result, it proposes that clauses 2.7.1 (b) and 2.7.2(b) be amended as follows:***

***2.7.1 (b) provide **equivalent line capacity** such that at least 100% of **agreed maximum demand** can be met through post-contingent operation following the failure of any relevant **transmission line** or **network support arrangement**;***

***2.7.2 (b) provide **equivalent transformer capacity** such that at least 100% of **agreed maximum demand** can be met through post-contingent operation following the failure of any installed transformer or **network support arrangement**;***

### 3.7 ISSUE 11 - Quality of supply and system reliability

*“The Commission seeks comment on the appropriateness of AEMO’s proposed amendment of clauses 2.1.1 and 2.1.2 which AEMO considers will assist in avoiding any misinterpretation of the reliability standards regarding load shedding in the code.”*

Clause 2.1.1 and 2.1.2 are concerned with the quality of supply and system reliability respectively. The clauses are designed to ensure that load is not shed by ElectraNet under normal and reasonably foreseeable operating conditions in the planning, development and operation of its network to achieve the reliability standards.

Although these clauses relate to the quality of transmission services, rather than the reliability standards, AEMO believes that these clauses can potentially be misinterpreted to contradict the reliability standards defined in the code.

To clarify the intent of the code, AEMO recommends that clauses 2.1.1 and 2.1.2 be modified to be subject to the clause 2 reliability standards, as follows:

*2.1.1. Subject to the service standards specified in this clause 2, a transmission entity must use its best endeavours to plan, develop and operate the transmission network to meet the standards imposed by the National Electricity Rules in relation to the quality of transmission services such that there will be no requirements to shed load to achieve these standards under normal and reasonably foreseeable operating conditions.*

*2.1.2. Subject to the service standards specified in this clause 2, a transmission entity must use its best endeavours to plan, develop and operate the transmission system so as to meet the standards imposed by the National Electricity Rules in relation to transmission network reliability such that there will be minimal requirements to shed load under normal and reasonably foreseeable operating conditions.*

#### 3.7.1 Comment Received

ETSA Utilities noted that was not concerned by the proposed amendment clarifying clauses 2.1.1 and 2.1.2.

ElectraNet considered the practical implementation in meeting its quality and reliability standards whilst avoiding load shedding is assisted by the proposed amendments to clauses 2.1.1 and 2.1.2.

ElectraNet noted, for example, that strengthening the requirement to minimise shedding the entire load to undertake planned outage works at remaining Category 1 sites would require minor works. ElectraNet believes that this would achieve a material improvement in customer reliability outcomes at these locations at minimal cost.

### **3.7.2 The Commission’s analysis and Draft Decision**

The Commission notes that the amendment to clauses 2.1.1 and 2.1.2 is supported by ElectraNet and that ETSA Utilities is unconcerned regarding the amendment.

While the amendment is of little or no consequence to ETSA Utilities, ElectraNet highlights an example of providing continuity of supply to Category 1 sites during planned outages in its submission. It should be noted that the two clauses apply to all connection points. The intent is to ensure that load shedding is not used as a load management tool and that no parts of the network are disconnected to achieve quality and reliability standards in other parts of the transmission system under circumstances where load could possibly be shed to maintain such things as voltage fluctuation, distortion, unbalance or stability levels within the requirements imposed on the TNSP.

The intention of the additional words “*Subject to the service standards specified in this clause 2,*” is to ensure that load can still be shed following loss of a network element, such as under Category 1 connection points, where there is only a single element supply.

AEMO’s proposed additional wording ensures that any minimum requirements set out under clause 2 of the code are not overwritten by potentially less onerous requirements set out in NER Schedule 5.1; so the code remains the minimum service level required, including for the quality of transmission services and for network reliability.

***Draft Decision 11***

***The Commission’s draft decision is that the amended clauses proposed by AEMO will clarify the intent of the code and assist in avoiding misinterpretation of the reliability standards. The Commission supports the amendments to clauses 2.2.1 and 2.2.2 and will amend as follows:***

*2.1.1. Subject to the service standards specified in this clause 2, a **transmission entity** must use its **best endeavours** to plan, develop and operate the transmission network to meet the standards imposed by the **National Electricity Rules** in relation to the quality of **transmission services** such that there will be no requirements to shed load to achieve these standards under normal and reasonably foreseeable operating conditions.*

*2.1.2. Subject to the service standards specified in this clause 2, a **transmission entity** must use its **best endeavours** to plan, develop and operate the transmission system so as to meet the standards imposed by the **National Electricity Rules** in relation to **transmission network** reliability such that there will be minimal requirements to shed load under normal and reasonably foreseeable operating conditions.*

### 3.8 ISSUE 12 - New connection points

*“The Commission seeks comment on AEMO’s proposed amendment of clause 2.12.1 to ensure that it cannot be interpreted as applying to new generation connection points.”*

Clause 2.12 of the code outlines ElectraNet’s approval process for establishing new connection points.

Consistent with AEMO’s understanding of the intent of the transmission reliability standards, AEMO recommends that the requirement to consult with the Commission on the establishment of new connection points be clarified, so it only applies to new transmission customer and distributor connection points and not new generator connection points

#### 3.8.1 Comment Received

ETSA Utilities submitted that it is concerned about the reasons behind exempting new connection points with generators from the applicable standards. However, ETSA Utilities noted, in subsequent discussion, that it may not have appreciated the import of the issue raised by AEMO and, on further consideration, agreed with AEMO’s proposal.

ElectraNet supported the proposed amendment of clause 2.12.1, noting that, in its experience, generators have from time to time sought to establish that the exit point reliability standards apply to generators and house supplies. ElectraNet believes it would be useful for the code to highlight that exit point reliability standards are only applicable to customer and distribution connection points.

ElectraNet does not consider that the distance from Adelaide Central (clause 2.12.1 (e)) is a relevant criterion for assessment in determining the appropriate category of a new connection point.

ElectraNet also reiterated its concern that code provision should be made for the re-classification of connection points in the event of a material increase in demand.

#### 3.8.1 The Commission’s analysis and Draft Decision

The terminology in clause 2.12, referring to a **connection point**, covers all connection types, direct-connect (transmission) customers, generators and distributors, and does not discriminate as to the type of connection to the transmission network (whether importing or exporting electricity).

The issue raised by ElectraNet is specific to generators, which substantially export electricity to the transmission network via **entry points**; in particular that generators have sought to establish that the reliability standards at an **exit point** apply to their generators and house supplies. The Commission notes that an **exit point** is a

connection point where a customer imports electricity *from* the transmission network; there is a distinction between the types of customer that are subject to the applicable standards specified in clause 2.12 of the code.

As it stands, clause 2.12.1 satisfies all customer types and can be applied to both entry and exit points where the transmission entity is establishing new connection points. Clause 2.12.1 does not set the connection point standards but provides for the transmission entity to nominate the standard for the type of connection.

ElectraNet noted the distance from Adelaide Central, 2.12.1(e), as superfluous information for developing a connection point standard. Locality is important in assessing the relevant connection point standard. However, such information is related to VCR, which is determined based on locality and load type. The Commission considers therefore, that the distance from Adelaide Central is inconsequential and is satisfied that it can be deleted from the criteria in developing a connection point standard.

***Draft Decision 12***

***The Commission is satisfied that the code defines the application of reliability standards to connection points where electricity exits the transmission network through clauses 2.3 and 2.4. The Commission therefore does not propose to amend clause 2.12.1 except for the removal of the reference to the distance from Adelaide Central (2.12.1(e)).***

## 4 ADDITIONAL CONNECTION POINT STUDIES

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AEMO included additional connection point studies in its report which it considered worth noting due to the level of expected unserved energy.

### 4.1 ISSUE 13 - New connection points

*“The Commission seeks the views of interested parties as to the appropriateness of creating/upgrading connection points presented by AEMO in its review of the code. Consideration should be given to cost benefit, demand growth, generation proposals, unaccounted-for new load connections and lower cost alternatives to transmission network solutions.”*

The connection point reliability at Pt. Lincoln and the capacity of the electrical supply system to the Fleurieu Peninsula are of particular interest to the Commission as the level of reliability at Pt. Lincoln is perceived as “degrading” with no available alternative transmission line options and the Fleurieu Peninsula is experiencing steady and firm growth. The Kadina East and Pt. Lincoln connection points were identified by AEMO for detailed assessment due to the amount of expected unserved energy.

#### 4.1.1 Comment Received

ETSA Utilities expressed no issues with connection points identified by AEMO for upgrading, other than its concern that the retention of Pt. Lincoln as a Category 3 rather than Category 4 potentially limits/inhibits new connections within the region given the limited capacity and radial nature of the existing 132kV supply. Further, it submitted that retention in Category 3 may limit operational flexibility to undertake work on the transmission line, i.e. outages required to perform maintenance.

ElectraNet is concerned that the growing level of interest from prospective mining loads has not been taken into consideration in the potential reclassification of the Pt. Lincoln connection point. As noted previously, ElectraNet considered it appropriate to allow for the reclassification of existing connection points during a regulatory control period where material load changes occur that were not forecast.

Given that there is, at present, uncertainty regarding the Fleurieu Peninsula connection point, ElectraNet is of the view that the appropriate classification of the connection point is best dealt with via clause 2.12.

#### 4.1.2 The Commission’s analysis and Draft Decision

The major issue raised in the submissions is the concern of both ETSA Utilities and ElectraNet in respect of the Pt. Lincoln connection point and the limit to connection opportunities under the current arrangements. The Commission acknowledges the limits on operational flexibility as highlighted by ETSA Utilities; however, AEMO’s analysis, based on unserved energy alone, indicates that a reliability upgrade cannot be justified in the near future and that a significant increase in demand would be required to do so.

Further, it is difficult to commit to a higher level of reliability on the basis of prospective customers or possible missed opportunities due to network limitations. AEMO recommended that ElectraNet investigate alternative augmentation options to meet the continuing Category 3 obligations beyond 2017/18 (noting that ElectraNet is concerned that major line augmentation will be required on Eyre Peninsula by approximately 2017/18).

The Commission does not support upgrading of the Category 3 connection point at Pt Lincoln on the basis of AEMO's cost-benefit analysis. However, the Commission is aware of the impact of unanticipated and unforeseen loads in the Eyre Peninsula, where the mining industry is involved. The factors of location and demand may play an important part in any augmentation of the network. In addition, a customer would be required to contribute to the capital cost of the works which may or may not require reinforcement of the Pt. Lincoln connection point. The primary concern is the uncertainty of the size, nature and location of an unanticipated and unforeseen load and the commitment to expenditure based on such uncertainty is not justifiable.

ElectraNet's question of the reassessment of connection point categories can be best addressed via a request for a code amendment, which can occur at any time. Any material change in demand which impacts significantly on a connection point would be assessed by the Commission and, if the assessment proves sound, receive its approval.

For the Fleurieu region, the joint Regulatory Test between ETSA Utilities and ElectraNet will identify the most efficient option to provide a transmission solution to the region. AEMO's assessment, based on estimated augmentation costs, shows that a Category 4, N-1 reliability standard provides positive benefits over the life of the asset. Once the outcomes of the RIT-T are known, the Commission will act on the approval of the reliability standard for the connection point.

There were no issues raised regarding the other connection point studies provided by AEMO and it is expected that a further review of the code will identify the need for any further upgrades.

***Draft Decision 13***

***The Commission is satisfied that the additional connection point studies presented by AEMO in its report were given appropriate consideration in each assessment. The concerns raised in the submissions regarding the additional assessments are noted. The Commission sees no need to alter the connection point upgrade recommendations made by AEMO and is satisfied that the additional connection point studies require no further assessment or action for the purposes of this code review.***

***The reassessment of connection points as submitted by ElectraNet could be addressed via a request to the Commission for a code amendment.***

## 5 CLAUSE 6.2.5 – SWITCHING MANUAL

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The amendment to clause 6.2.5 was raised by the Commission following concerns by ETSA Utilities that it may have breached its obligations under clause 6.2.5 and by the reporting practices of other responsible parties. Clause 6 of the code addresses the requirement of a switching manual which is developed between transmission entities, system controllers, generators and distributors.

ETSA Utilities' concerns were raised by the number of switching incidents that routinely occur due to the number of switching operations it carries out and that lodging a report for each incident within 20 business days, as required by the code, makes reporting these incidents an onerous process.

### 5.1 ISSUE 14 – Reporting of switching incidents

*“The Commission seeks comment from interested parties as to the appropriateness and frequency for reporting switching incidents by ElectraNet and ETSA Utilities in the context to the number of incidents, the severity of the incidents and the impact on the transmission network”.*

Clause 6.2.5 requires an electricity entity to report to the Commission, within 20 business days, all breaches of its internal switching manual including breaches by contractors or customers of which it becomes aware (who are contractually bound to comply with the entities' internal manual).

Switching incidents occur much less frequently on ElectraNet's transmission network than occur on ETSA Utilities' distribution network. This is due to the nature of the distribution network, where switching is required more frequently for things such as access for customer work, network faults and switching due to third party causes such as pole collisions and cables being damaged by excavation.

ElectraNet has reported around six switching incidents each year over the past 3 years. ETSA Utilities, by comparison, has reported between 20 and 40 switching incidents per year over the past six years, of which between 15 and 25 are due to human error. The Commission is concerned that, with the number of switching incidents that occur on the distribution network, the reporting of each incident within 20 business days involves an obligation that, due to the number of events, makes a breach of clause 6.2.5 more likely.

It may be considered that the reporting requirements for ElectraNet should be more stringent than that of ETSA Utilities, as there is possibly greater potential to compromise system security by switching incidents on the transmission network than the impact of switching incidents on the local distribution network.

Under the current code provisions, the reporting of switching incidents by ElectraNet to the Commission is effective and assists the Commission in monitoring the performance of ElectraNet. However, in terms of the likelihood of ETSA Utilities'

switching incidents affecting the transmission network, the current requirement for reporting may exceed the benefits of monitoring ETSA Utilities' performance.

Because of the number of incidents, the provision of collective reports by ETSA Utilities to the Commission on a regular basis, e.g. monthly or quarterly rather than individual reports within 20 business days, could be considered. Such a proposal may allow for more relevant reporting based on the number of incidents as shown in the frequency of switching incidents by ETSA Utilities.

However, having regard to the potentially serious nature of switching incidents, an integral part of any such proposal would involve a grading of incidents, with different reporting requirements applying to different grades. For example, where injury or major asset damage occurs as a result of a switching incident, such matters would continue to be required to be reported to the Commission within current timeframes. For more minor incidents, a monthly (or other appropriate time period) batched report of incidents may suffice to ensure appropriate oversight of this important regulatory area.

#### **5.1.1 Comment received**

ETSA Utilities considered that reporting of all switching incidents in its quarterly operational performance report to the Commission would provide an appropriate mechanism and frequency.

ETSA Utilities noted its legislative obligations to report any injury to a person from shock or burns to the Technical Regulator within 1 to 10 business days. Consequently, ETSA Utilities considered that reporting such incidents to the Commission within 20 business days creates confusion and duplication and, as such, it is not an advocate of the current reporting requirements for these events.

ETSA Utilities considered that it should only be required to report switching incidents using the current timeframes (i.e., 20 business days) where the switching incident has the potential to affect (transmission) system security.

ElectraNet questioned the appropriateness of the reporting obligations relating to switching incidents and asserts that it maintains rigorous protocols for the investigation of switching incidents. ElectraNet considers that summary reporting to the Commission on a quarterly basis is appropriate.

ElectraNet submitted that the processes and procedures relating to transmission switching and the investigation of switching incidents to be a safety and technical regulation issue and would most appropriately be directed to the Office of the Technical Regulator rather than the Commission.

#### **5.1.2 The Commission's analysis and Draft Decision**

Clause 6.2.5 of the code requires an electricity entity to report to the Commission within 20 business days, all breaches of its internal switching manual including

breaches by contractually bound contractors or customers. This requirement extends to DNSPs as well as TNSPs; all licensed entities are required under the current code to report switching incidents to the Commission.

In the Issues Paper, the Commission canvassed the idea that, because of the number of incidents, the provision of collective reports by ETSA Utilities (and in effect, all DNSPs) to the Commission on a regular basis, e.g. monthly or quarterly rather than individual reports within 20 business days, could be considered. Such a proposal may allow for more relevant reporting, reflecting the number of incidents on the distribution system because of the frequency of switching and the limited impact on transmission network security.

Both submissions supported the option of reporting on a quarterly basis in line with other regulatory reporting requirements. However, ElectraNet is opposed reporting to the Commission on events where it has an obligation to report to the Office of the Technical Regulator; ElectraNet put that reporting in to the Office of the Technical Regulator is more appropriate than reporting to the Commission.

The Commission, along with industry participants and other regulatory bodies, developed the Switching Manual to define the high voltage (HV) switching and associated safety policies for all licensed electricity entities and HV customers in SA in accordance with the Electricity Act 1996.<sup>23</sup> The policies in the manual define the boundaries, interfaces, coordination requirements, and safety principles that must be observed by electrical industry participants when switching HV electrical equipment. Entities are required develop a detailed switching manual and/or safe work procedures for their staff/contractors and specific equipment. The internal manual developed by each entity must be developed in accordance with the Commission's Switching Manual policies and safety principles.

Entities must ensure processes exist to adequately and appropriately investigate and report switching incidents pertaining to their assets and employees. Switching incidents must be thoroughly investigated and reported to determine if existing work practices are adequate to cover the circumstances of the switching incident or need to be altered as a result of the findings of the investigation of the switching incident.

Clause 20.3.3 of the Switching Manual "*Reports to external organisations,*" requires that an accident, that involves electric shock caused by the operation or condition of electricity infrastructure or an electrical installation, must be reported to the Technical Regulator in accordance with Electricity (General) Regulations 1997. There is also a requirement to report these incidents to Safework SA.

Clauses 6.1.1 and 6.1.2 of the code require a transmission entity to collect information and report on power system incidents relating to its transmission system. Each power system incident must be reviewed in accordance with the

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<sup>23</sup> Refer Commission's web site <http://www.escosa.sa.gov.au/library/040622-SwitchingManual-Final.pdf>

Commission's guidelines to determine the cause of the power system incidents and minimising similar future occurrences.

The Commission notes that switching incidents are not required to be reported to an external authority unless they involve electric shock or electrical burns to an operator. However, the transmission code requires a transmission entity to report all power system incidents relating to the transmission system to the Commission. The Commission is of the view that reporting of all system incidents may, over time, reveal trends of endemic issues around deteriorating practices or deteriorating asset condition.

Clause 6.2.5 of the code extends the requirement to all entities; the system controller, transmission, generator and distributor all report breaches of their internal switching manual developed in accordance with the Commission's manual.

Understandably, there would be a duplication of reporting where electric shock or electrical burns occur as these would be brought about by a breach of operational policies and therefore captured under the requirement to report to the Technical Regulator and the Commission.

The Commission prefers to avoid the duplication of reporting and would be satisfied to receive a copy of any report of an incident that involves a breach of a switching manual. Furthermore, the Commission, having experience with the reporting process over a number of years, agrees that the provision of collective reports of switching incidents from entities on a quarterly basis would suffice for the Commission to gauge performance and trends. However, any switching incident that results in serious injury or a fatality, significant impact on the transmission system availability or significant asset damage should be reported within 20 business days or earlier where it involves a breach of the switching manual and requires a report to the Technical Regulator.

***Draft Decision Issue 14***

***The Commission will amend clause 6.2.5 of the code to provide for quarterly reporting of breaches of entities' internal switching manuals in association with regular quarterly performance reporting with serious breaches of switching manuals will be reported within 20 business days as follows:***

6.2.5 An electricity entity must report to the **Commission**, quarterly, all breaches of its internal switching manual, including breaches by a contractor or customer of which it has become aware. Any breach resulting in a fatality or serious injury, significant impact on **transmission system** availability or significant asset damage must be reported to the **Commission** within 20 **business days**.

## 6 OTHER MATTERS

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In the Issues Paper, the Commission identified various matters on which it sought the specific comment of interested parties. The Commission also sought comments on other matters which stakeholders considered ought to be addressed in the review of the code.

### 6.1 ISSUE 15 – Other matters

*“The Commission seeks comment from interested parties on other matters which should be addressed in the review of the code.”*

#### 6.1.1 Comment received

ETSA Utilities noted, in its submission, that its distribution system is normally automatically configured to supply customers in the event of the failure of ElectraNet’s system. ETSA Utilities considers that it should be indemnified for any loss where customers lose supply from a failure of its system where that failure would not normally have resulted in loss of supply to customers but was due primarily to the failure of the transmission system (i.e. the failure occurred under network support arrangements).

ElectraNet suggested a number of minor amendments to the connection point summary, Table 5 of the Issues Paper, to take into account the current configuration of the transmission network and changes proposed. ElectraNet also suggested some amendments to the Adelaide transmission network map should the Commission decide to include it in the revised code.

ElectraNet also noted that the Adelaide Central service area defined in the Electricity Transmission Code differs to the equivalent CBD area defined in the Electricity Distribution Code. ElectraNet suggested that, in the interests of consistent reliability outcomes for the CBD, it would be desirable to align these definitions at the next review of the distribution code.

#### 6.1.2 The Commission’s analysis and Draft Decision

The Commission is of the opinion that ETSA Utilities’ concerns regarding indemnity for losses (and claims against ETSA Utilities) due to interruptions that occur while providing network support to ElectraNet should be dealt with in a formal network support agreement. An agreement should be specific in the expectations of each entity such that network capability and redundant capacity are determined and the area of affected network is segregated to apportion responsibility for reliability.

A further issue for ETSA Utilities is the payment of Guaranteed Service Level (GSL) payments that ETSA Utilities is required to pay to customers for the duration and frequency of interruptions. If GSL payments are due to customers following an interruption that results as a consequence of any network support arrangements,

the Commission considers that the recovery of such payments should also form a part of the network support agreement.

The Commission notes the minor amendments suggested by ElectraNet (and ETSA Utilities) to the connection points. These amendments have been incorporated into Table 2 of this Draft Decision.

The Commission will consider ElectraNet's concerns regarding the Adelaide Central and CBD region definitions in the subsequent code review as suggested if it appears to be an issue with respect to reliability outcomes for the CBD.

Through its own further review, the Commission has identified that the restoration requirements involving the subtleties between the failure of a network element and an interruption should be clarified for each category; particularly where the line and transformer standards differ, e.g. in Category 2 exit points. In the event of an interruption, the requirement to restore supply within a short time frame is the first priority, followed by the reinstatement of the capacity/capability at the exit point.

The Commission has amended each category to clarify the restoration requirements. It should be noted that there is no change from the existing restoration requirements, which currently contain an implied obligation to restore the required standard (i.e., revert to N-1) even where there is no interruption following failure of a network element. Category 4 connection points that were previously required to provide, and still capable of providing network support to Adelaide Central, have restoration times equivalent to that under the previous Category 5.

***Draft Decision Issue 15***

***The Commission notes the additional matters submitted by respondents. Where practicable, as noted in the above discussion, proposals will be included in the draft code for further comment.***

***The Commission expects that ElectraNet and ETSA Utilities can establish responsibilities and commercial arrangements related to network support in a formal network support agreement.***

***The Commission has amended each category to clarify the restoration requirements in terms of restoration following both interruptions and network element failures.***

***Other matters will be addressed in the subsequent review of the code.***



## **7 NEXT STEPS**

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This Draft Decision on amendments to the Electricity Transmission Code will be open for public consultation until Friday 21 October 2011.

The Commission seeks comments from all interested parties on the issues raised in this Decision Paper within that timeframe.

Following the period of public consultation, and after consideration of any comments received, the Commission will prepare a final decision on the proposed changes to the Electricity Transmission Code.

The Commission expects to publish that final decision by the end of November 2011 and finalise the code changes by end December 2011.

The final code changes will take effect from 1 July 2013.

## APPENDIX 1 – ADELAIDE CENTRAL COST BENEFIT ANALYSIS

CONNECTION POINT- ADELAIDE CENTRAL			PMT <b>-\$2,211,698</b>		PMT <b>-\$17,995,183</b>				Move from N-1 line and Tx to N-2 line and Tx			
			N line and Tx Existing reliability level		N-1 line and Tx Committed reliability level after installation of City West							
Year	MW	PF	Cost of unserved energy	Cumulative cost of unserved energy	Cost of unserved energy	Annual saving of unserved energy	Annual repayments	Annual Benefits	Cost of unserved energy	Annual saving of unserved energy	Annual repayments	Annual Benefits
09/10	223	1.00	\$65,989,682	\$65,989,682	\$49,881	\$65,939,801	\$65,939,801	<b>-\$113,060,199</b>	\$6,752	\$43,129	\$43,129	<b>-\$357,956,871</b>
10/11	228	1.00	\$67,441,455	\$133,431,136	\$50,978	\$133,380,158	\$199,319,959	\$20,319,959	\$6,901	\$44,078	\$87,207	<b>-\$357,912,793</b>
11/12	233	1.00	\$68,925,167	\$202,356,303	\$52,100	\$202,304,203	\$401,624,161	\$222,624,161	\$7,052	\$45,047	\$132,254	<b>-\$357,867,746</b>
12/13	242	1.00	\$71,626,275	\$273,982,578	\$54,142	\$273,928,437	\$675,552,598	\$496,552,598	\$7,329	\$46,813	\$179,067	<b>-\$357,820,933</b>
13/14	247	1.00	\$73,175,989	\$347,158,567	\$55,313	\$347,103,254	\$1,022,655,852	\$843,655,852	\$7,487	\$47,826	\$226,893	<b>-\$357,773,107</b>
14/15	252	1.00	\$74,759,796	\$421,918,363	\$56,510	\$421,861,853	\$1,444,517,705	\$1,265,517,705	\$7,649	\$48,861	\$275,753	<b>-\$357,724,247</b>
15/16	258	1.00	\$76,378,447	\$498,296,810	\$57,734	\$498,239,076	\$1,942,756,781	\$1,763,756,781	\$7,815	\$49,919	\$325,672	<b>-\$357,674,328</b>
16/17	263	1.00	\$78,032,708	\$576,329,518	\$58,984	\$576,270,534	\$2,519,027,315	\$2,340,027,315	\$7,984	\$51,000	\$376,672	<b>-\$357,623,328</b>
17/18	269	1.00	\$79,723,363	\$656,052,881	\$60,262	\$655,992,619	\$3,175,019,935	\$2,996,019,935	\$8,157	\$52,105	\$428,777	<b>-\$357,571,223</b>
18/19	275	1.00	\$81,451,212	\$737,504,094	\$61,568	\$737,442,526	\$3,912,462,460	\$3,733,462,460	\$8,334	\$53,234	\$482,011	<b>-\$357,517,989</b>
19/20	281	1.00	\$83,217,075	\$820,721,168	\$62,903	\$820,658,265	\$4,733,120,726	\$4,554,120,726	\$8,515	\$54,388	\$536,399	<b>-\$357,463,601</b>
20/21	287	1.00	\$85,021,786	\$905,742,954	\$64,267	\$905,678,687	\$5,638,799,413	\$5,459,799,413	\$8,699	\$55,568	\$591,967	<b>-\$357,408,033</b>
21/22	293	1.00	\$86,866,200	\$992,609,154	\$65,661	\$992,543,493	\$6,631,342,906	\$6,452,342,906	\$8,888	\$56,773	\$648,740	<b>-\$357,351,260</b>
22/23	300	0.99	\$88,751,192	\$1,081,360,346	\$67,086	\$1,081,293,260	\$7,712,636,166	\$7,533,636,166	\$9,081	\$58,005	\$706,745	<b>-\$357,293,255</b>
23/24	306	0.99	\$90,677,654	\$1,172,038,000	\$68,542	\$1,171,969,458	\$8,884,605,623	\$8,705,605,623	\$9,278	\$59,264	\$766,010	<b>-\$357,233,990</b>
24/25	313	0.99	\$92,646,497	\$1,264,684,497	\$70,031	\$1,264,614,467	\$10,149,220,090	\$9,970,220,090	\$9,479	\$60,551	\$826,561	<b>-\$357,173,439</b>
25/26	320	0.99	\$94,658,656	\$1,359,343,153	\$71,551	\$1,359,271,602	\$11,508,491,691	\$11,329,491,691	\$9,685	\$61,866	\$888,427	<b>-\$357,111,573</b>
26/27	327	0.99	\$96,715,082	\$1,456,058,235	\$73,106	\$1,455,985,129	\$12,964,476,820	\$12,785,476,820	\$9,896	\$63,210	\$951,637	<b>-\$357,048,363</b>
27/28	334	0.99	\$98,816,749	\$1,554,874,983	\$74,695	\$1,554,800,289	\$14,519,277,109	\$14,340,277,109	\$10,111	\$64,584	\$1,016,221	<b>-\$356,983,779</b>
28/29	341	0.99	\$100,964,653	\$1,655,839,636	\$76,318	\$1,655,763,318	\$16,175,040,427	\$15,996,040,427	\$10,331	\$65,988	\$1,082,208	<b>-\$356,917,792</b>
29/30	348	0.98	\$103,159,810	\$1,758,999,446	\$77,977	\$1,758,921,469	\$17,933,961,895	\$17,754,961,895	\$10,555	\$67,422	\$1,149,630	<b>-\$356,850,370</b>
VCR	\$45,767	<b>Terminal Value</b>	<b>\$1,019,550,938</b>		<b>\$824,177</b>				<b>\$111,562</b>			
Discount Rate	10%											
		NPV of constraint	\$2,778,550,384		\$2,153,786				\$291,541			
		NPV savings through augmentation	\$0		\$2,776,396,598				\$1,862,245			
		NPV of benefits	\$0		\$2,597,396,598				<b>-\$177,137,755</b>			