



Electricity Transmission Code review

Final decision

September 2016

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Glossary of terms

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CBD	Central business district
Code	Electricity Transmission Code
Commission	Essential Services Commission of South Australia established under the Essential Services Commission Act 2002
Draft Decision	Commission's draft decision in relation to its review of the Code, published in March 2016
DSD	Department of State Development
EENS	Expected energy not served
Electricity Act	Electricity Act 1996
ENA	Energy Networks Association
ESAA	(Former) Energy Supply Association of Australia
ESC Act	Essential Services Commission Act 2002
Issues Paper	Commission's issues paper in relation to its review of the Code, published in October 2015
MW	Megawatt
NEM	National energy market
NER	National electricity rules
RIT-D	Regulatory investment test for distribution
RIT-T	Regulatory investment test for transmission
TNSP	Transmission network service provider
VCR	Value of customer reliability

1 Executive summary

The Essential Services Commission (**Commission**) has undertaken a review of the transmission network reliability standards and other obligations under the Electricity Transmission Code (**Code**).

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. It sets out the obligations that a Transmission Network Service Provider (**TNSP**) must comply with in relation to the provision of transmission services in this State.

The purpose of the review was to ascertain whether or not amendments are required to the Code in order to maintain its relevance and to ensure that consumers' long-term interests are protected through its regulatory arrangements. The review was timed to ensure that any consequential financial impacts arising from amendments can be factored into the revenue submission that will be made by South Australia's major TNSP, ElectraNet SA Pty Ltd (**ElectraNet**), to the Australian Energy Regulator (**AER**) for the regulatory period from 1 July 2018 to 30 June 2023.

This final decision follows the Commission's publication of an issues paper in October 2015 (**Issues Paper**) and a draft decision in March 2016, and incorporates all relevant issues raised during those stakeholder consultations. The final outcomes of this review are summarised in Table 1-1.

Table 1-1: Summary of final decisions

Upgrades to exit point reliability categories	No exit points will be upgraded to a higher reliability category within the Code as a result of this review.
Ardrossan and Yadnarie exit point reliability standards	The existing reliability categorisations of the Ardrossan West and Yadnarie exit points will be maintained at the current Code standard. However, the two exit points will be reassessed if and when replacement of any asset is required (due to end of life or asset failure).
Amendment to availability standard for Port Lincoln exit point	The availability standard of 95 percent that applies to network support arrangements under clause 2.12.1 of the Code will be maintained. The wording of clause 2.12.1 of the Code will be amended to clarify the 95 percent availability standard.
Amendments to definitions of reliability categories	<p>The amendments proposed by the Australian Energy Market Operator and ElectraNet, to include economic network or network support arrangements in the definitions of Categories 1 and 2, will not be made. Rather, clause 2.3.1 of the Code will be amended to clarify that the reliability standards expressed in the Code are minimum reliability standards (as opposed to fixed standards).</p> <p>The restoration requirements in Category 5 of the Code, will be amended to reflect the actual network support capacity of 176MW (rather than 65 percent of contracted agreed maximum demand). Additional changes will be made to reflect that these restoration requirements are 'best endeavours' requirements.</p>

Reliability standard flexibility	An additional clause will be included in the Code to oblige ElectraNet to submit a revised cost benefit analysis to the Commission, prior to committing to proposed material maintenance or growth capital investment projects that are required in order to meet reliability standards above 'N' equivalent (or Category 1).
Explicit outcomes-based standards	<p>The reliability category definitions in clauses 2.5 to 2.9 of the Code will be amended to confirm that alternative solutions can be utilised to meet exit point reliability standards, provided that they result in the same or better outcomes currently achieved through the use of transmission lines and transformers.</p> <p>As a consequence of the above, clause 2.12 of the Code will be amended to remove infrastructure specific references.</p>
Demand management incentive opportunities	An additional clause 1.3.3 will be added to the Code, which makes it clear that the Code does not inhibit innovation.
Connections to non-distributors	Clause 2.4 of the Code will be amended to clarify the limit of ElectraNet's responsibility (to its own infrastructure, rather than those owned and/or operated by its customers) at exit points to non-distribution customers.
Cessation of country connection points	Clause 2.18 of the Code will be amended so that any proposal to decommission country (transmission) connection points will require the approval of the Commission, rather than the AER.
Energy cap planning reliability standards	Energy cap planning will not be incorporated into the Code.
Other miscellaneous amendments	<p>The reference in the Code to the "Energy Supply Association of Australia" will be replaced with a more general reference to industry bodies.</p> <p>The legacy transitional demand forecasting arrangement in clause 2.11.3 of the Code will be replaced with an ongoing demand forecasting arrangement.</p>

2 Introduction

In anticipation of a new five year regulatory control period to commence from 1 July 2018 for South Australia's major electricity transmission business, ElectraNet Pty Ltd (**ElectraNet**), the Essential Services Commission (**Commission**) has, through a public process, reviewed and amended the terms of the Electricity Transmission Code (**Code**).

The Code establishes the standards of service that ElectraNet must meet in providing transmission services in South Australia and, in that sense, is an input into ElectraNet's overall revenue requirements. Those requirements are regulated by the Australian Energy Regulator (**AER**) under the provisions of the National Electricity Rules (**NER**).

The purpose of the review was to ascertain whether or not amendments were required to the Code in order to maintain its relevance and to ensure that consumers' long-term interests are protected through its regulatory arrangements. The review was timed to ensure that any consequential financial impacts arising from amendments can be factored into the revenue submission that will be made by ElectraNet to the AER for the regulatory period from 1 July 2018 to 30 June 2023.

2.1 Background

Licensing of electricity transmission businesses in South Australia is one of the Commission's statutory functions. ElectraNet operates the main electricity transmission network in South Australia and holds an appropriate licence issued by the Commission pursuant to Part 3 of the Electricity Act 1996 (**Electricity Act**).

As a condition of its licence, ElectraNet is required to comply with the Code, an industry code made by the Commission pursuant to section 28 of the Essential Services Commission Act 2002 (**ESC Act**). In setting the terms and provisions of the Code, the Commission seeks to meet its primary statutory objective (as specified in section 6 of the ESC Act): to protect the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services.

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. It sets out the obligations that a Transmission Network Service Provider (**TNSP**) must comply with in relation to the provision of transmission services in South Australia. It generally applies to both ElectraNet and the Murraylink Transmission Company (the operator of the Murraylink interconnector that links the Victorian transmission grid at Red Cliffs to the ElectraNet grid at the Monash substation near Berri), although the exit point reliability standards under the Code apply only to ElectraNet.

Importantly, the Code only applies to the extent that a TNSP provides services relating to the operation of a transmission network, transmitting electricity between electricity businesses (generators and distributors) and from electricity businesses to end-use customers (usually the distribution network operator but, in limited cases, end-use customers).

To the extent that a TNSP also provides other services in the electricity supply industry (for example, ElectraNet also performs a system control role in this State), those functions are regulated outside of the scope of the transmission licence and the Code. This means that if, for example, a TNSP wanted to operate a standalone electricity undertaking outside of the National Electricity Market (**NEM**), such as in a remote area of the State or in the case of a new development supplied by means other than the NEM, then a different regulatory scheme would apply to it for those operations.

In the context of the provision of transmission services, however, the Code forms part of a broader regulatory scheme for transmission in the NEM. The reason for regulation of the transmission system is that while, in one sense, it may be seen as merely the physical system which transports wholesale energy from generator connection points to market customers and retailers, in a more fundamental way it provides the means by which the NEM operates.

Regulation of the system occurs at two levels: the NER establish technical standards, dealing with matters such as frequency, system stability, voltage and fault clearance. Jurisdictional standards, such as those set under the Code, provide for security and reliability standards which align with, and complement, the NER technical standards.

A key point of interaction between the Code and the NER arises from the requirement under the NER that any new assets 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**).

The purpose of the RIT-T is to identify the credible option that maximises the net present value of the economic benefit of transmission investment to those who produce, consume and transport electricity in the market. 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 that apply to that entity.

The Commission's role is to develop and administer security and reliability standards under the Code. The Australian Energy Market Operator (**AEMO**) has responsibilities under the NER for technical matters. As noted above, the AER is responsible for regulation of the revenue that transmission businesses are permitted to earn, having regard to the standards set by the Commission and AEMO.

2.2 Overview of the Code

The Code sets out various requirements that TNSPs must meet as a condition of holding an electricity transmission licence in South Australia. These requirements (which are additional to those imposed under the NER and the Electricity Act) include:

- ▶ service standards
- ▶ requirements relating to interruptions
- ▶ design requirements
- ▶ technical requirements
- ▶ general requirements
- ▶ access to sites requirements
- ▶ telecommunications access requirements, and
- ▶ emergency requirements.

A key element of the Code is the setting of exit point reliability standards that ElectraNet must comply with.

The Code contains five reliability categories for exit points on ElectraNet's transmission network. Each exit point category has specific reliability and supply restoration standards.

Category 1 has the lowest reliability and supply restoration requirements and Category 5 has the highest. The categorisation of exit points is based on the Commission's periodic assessments as to whether the costs of replacing or augmenting each exit point are outweighed by the value to customers of the differential in reliability that would result. The existing reliability categories are summarised in Table 2-1 below:¹

Table 2-1: Summary of existing reliability categories

Reliability category	Reliability (refer to 2.2.1 below)	Time to restore to N line equivalent capacity	Time to restore to N transformer equivalent capacity
1	N line and transformer	2 days	8 days
2	N line, N-1 transformer	2 days	8 days
3	N-1 non-firm line and transformer ²	1 hour	1 hour
4	N-1 line and transformer	4 hours (best endeavours) for grouped exit points and 12 hours (best endeavours) for all other exit points	4 hours (best endeavours) for grouped exit points and 12 hours (best endeavours) for all other exit points
5	N-1 line and transformer provided from independent and diverse transmission substations	At least 65 percent within 4 hours	At least 65 percent within 4 hours

In effect, the standards require a level of security (also referred to as redundancy) to be built into ElectraNet's transmission system so that it can, in most cases, maintain a continuous electricity supply. Further, when network elements fail, the standards require restoration within specified timeframes.

2.2.1 Reliability and equivalence terminology

Terminology such as 'N', 'N-1' and 'N-2' is used in the Code (and throughout this report) to describe levels of redundancy and hence, reliability of ElectraNet's transmission system. The terms are applied to transmission lines and to transformers. As explained below, different N requirements for those network elements are established across the network. Further, the Code does not mandate the use of physical lines or transformers. Instead, it requires the delivery of an outcome equivalent to the outcome that a physical line or transformer would deliver – including any N requirement.

¹ Sourced from AEMO, *Review of the South Australian Electricity Transmission Code reliability standards*, May 2015, p.9.

² 'Non-firm' means the required level of supply can be met after post-contingent operation (that is, allows for interruption).

2.2.1.1 N reliability

A transmission system with **N** reliability means that it is able to supply the required demand, provided that all the network elements are in service. The loss of a single transmission element (a line, a transformer or other associated equipment) will interrupt supply to some customers.

2.2.1.2 N-1 reliability

A level of **N-1** reliability provides a higher degree of reliability. Under this standard there would be no interruption to supply with one network element out of service. It is also possible to define **N-1** reliability in terms of a percentage of time or for a percentage of maximum demand.

2.2.1.3 N-2 reliability

N-2 reliability provides for two redundancies in the relevant system, meaning that no customers would be affected if two network elements were out of service. It provides a high level of security that is capital intensive in terms of expenditure. Accordingly, this level of reliability is generally limited to Central Business District (**CBD**) areas, where a high level of security may be deemed necessary.

2.2.1.4 Equivalence

The current Code only specifies reliability standards of **N** or **N-1** connection capacity as appropriate for each exit point category. These reliability standards, except for Category 1, may be delivered by any means, including transmission network capability, distribution network capability, and demand management or generation alternatives. The reliability standards are minimum standards; ElectraNet may choose to offer reliability performance in excess of the standards set out in the Code.

This flexibility and focus on outcomes was introduced by the Commission in 2006, by replacing the concepts of 'x line capacity' and 'x transformer capacity' with 'x **equivalent** line capacity' and 'x **equivalent** transformer capacity' in the Code. This focus has continued for each subsequent review of the Code.

The purpose of utilising an outcomes focussed regime is to provide incentives to the regulated business (in this case, ElectraNet) to meet the relevant standard in the most efficient manner available, rather than the regulator specifying the use of particular inputs.

This means that, while the outcomes sought are expressed in terms of the capacity to be delivered by particular types of plant and equipment (lines and transformers), the Code does not specify the use of only that type of plant and equipment – any solution can be utilised, provided it delivers the same, or better outcomes.

For example, it may be more effective and efficient for ElectraNet to deliver a standard through a combination of lines, transformers, generators, demand side response or battery storage. The Code facilitates this, in the context of efficiency for consumers in relation to the price, quality and reliability of electricity services.

The only limitation on that principle, in terms of the Code's scope, is that the solution is to form part of the overall transmission network. Absent that criteria, the Code (and licence) would not apply to the operations (although other regulatory controls, such as a standalone licensing and code regime, might apply in the alternative).

2.2.2 Changes to, and new, exit points

Where demand growth supersedes the standards over time, the Code requires ElectraNet to augment the relevant exit point and, where necessary, the transmission network, to meet the forecast demand. ElectraNet is required to use its best endeavours to address any forecast breach of the standards in the Code within a certain period, as defined in clause 2.11.

For a new exit point, clause 2.13 of the Code requires ElectraNet to seek the Commission's approval of the reliability standard to apply to that exit point. The standard must be developed having regard to a range of factors including:

- ▶ the size of the load
- ▶ the value of customer reliability (VCR), that is, the economic cost to customers of a supply failure
- ▶ the types and numbers of customers supplied through the exit point
- ▶ the location and cost of the installation of the assets relevant to the exit point

No new exit points were identified for the 2018 to 2023 period.

2.3 The process for this review

In November 2014, the Commission requested advice from AEMO on the exit point reliability standards specified in the Code to determine whether or not any amendment should be made to those standards in preparation for the forthcoming regulatory period. The Commission also sought advice on possible amendments to the Code that would enable greater flexibility in amending reliability standards, should circumstances materially change after commencement of a regulatory period.

In October 2015, the Commission released an issues paper³ (**Issues Paper**) that outlined and sought comments on the findings of the AEMO reports in relation to the exit point reliability standards and other related matters.

After a period of public consultation, the Commission released its draft decision in relation to this review in March 2016⁴ (**Draft Decision**). The Draft Decision took into account all of the submissions made to the Issues Paper and outlined and sought comment on the Commission's draft positions in relation to amendments to the Code.

The Commission received one submission in relation to the Draft Decision, from ElectraNet. This report sets out the Commission's final decision in relation to the Code, and includes consideration of the issues raised by ElectraNet in its submission.

The amended Code will commence on and from 1 July 2018, which coincides with the commencement of the next regulatory period for ElectraNet. A copy of the Code, as amended, is attached to this report at **Appendix 1**.

³ Refer: <http://bit.ly/ESCOSA-ElectricityTransmissionCode-IssuesPaper>.

⁴ Refer: <http://bit.ly/ESCOSA-ElectricityTransmissionCode-DraftDecision>.

3 Decisions that do not result in amendments to the Code

The Commission sought AEMO's advice in relation to whether or not any exit points should be re-categorised (to a higher or lower reliability category) prior to the end of the 2018 to 2023 regulatory period.

AEMO analysed the costs and benefits associated with re-categorising exit points, using updated assumptions and methodologies, including:

- ▶ the application of specific VCR values to each individual exit point rather than a uniform VCR across all exit points, to better reflect the mix of customers and different values those customers place on reliability in different regions
- ▶ the recognition that outages caused by a transformer failure are more likely to occur randomly than at times of peak demand (as previously assumed)
- ▶ the utilisation of updated operating expenditure assumptions associated with the investment in new capital equipment
- ▶ the recognition of more recent electricity demand forecasts, which are lower than those previously utilised

The Commission published AEMO's recommendations in the Issues Paper. The recommendations, relevant submissions, and the Commission's final decisions are described in the following sections.

3.1 No proposed upgrades to exit point categories

The Commission's final decision is that no exit points will be upgraded to a higher reliability category within the Code as a result of this review.

In the Issues Paper, the Commission proposed that no exit point should be upgraded from its current reliability standard, as the cost that would arise as a result of that upgrade would exceed the benefit to customers. The proposal was based on AEMO's exit point analysis.

3.1.1 Submissions

No submissions opposed the Commission's proposal.

3.1.2 Discussion

Having considered AEMO's analysis, and prevailing demand forecasts, the Commission will not upgrade the reliability categories for any exit point.

3.2 Ardrossan West and Yadnarie exit points

The Commission's final decision is that the existing reliability categories of the Ardrossan West and Yadnarie exit points will be maintained at the current Code standard.

AEMO recommended that the Ardrossan West and Yadnarie exit point classifications should be reviewed at the time a transformer replacement is required (end of life or due to failure) at either of these exit points, to determine if the cost of maintaining the current Category 2 reliability standard would exceed the benefits to consumers. If so, AEMO noted that these exit points may then need to be re-categorised as Category 1. That is, any decision to re-categorise these exit points should be based on analysis that is undertaken as and when asset replacement is considered. Section 4.3 of this report sets out a new clause 2.3.2 in the Code, that will require ElectraNet to provide the Commission with its analysis at such a time.

3.2.1 Submissions

ElectraNet's submissions to the Issues Paper and the Draft Decision supported this position.

However, in its submission to the Draft Decision, ElectraNet stated that the proposed clause 2.3.2 (which would be used to re-examine these exit points) did not address the issue of emergency transformer replacement in the event of a single transformer failure at these locations. Further, it submitted that the best endeavours obligation in clause 2.6.1 to maintain N-1 equivalent transformer capacity would include conducting an assessment of replacing a failed transformer at these exit points.

3.2.2 Discussion

The Commission will not amend the reliability standards of either the Ardrossan West or the Yadnarie exit points at this time. In the event that a transformer replacement is required, the Commission will review these exit point classifications using the mechanism outlined in section 4.3 of this report.

However, taking ElectraNet's submission into account, the Commission agrees that the draft wording of clause 2.3.2 as proposed in the Draft Decision would have resulted in requiring an economic assessment to be submitted in the case of replacing a failed transformer. This issue, and the resultant amendments to the proposed wording of clause 2.3.2, is also addressed in section 4.3.

4 Decisions that result in amendments to the Code

4.1 Port Lincoln network support

The Commission's final decision is that the availability standard of 95 percent that applies to network support arrangements under clause 2.12.1 of the Code will be maintained. The Commission will, however, amend the wording of clause 2.12.1 of the Code to clarify the 95 percent availability standard.

The Port Lincoln exit point is a Category 3 exit point that currently utilises a third party network support arrangement (three 21 megawatt (**MW**) gas turbines). The turbines are provided under contractual arrangements between ElectraNet and Engie (formerly GDF Suez). This generation support is the least cost option to provide security of supply to Port Lincoln. The alternative option, augmentation of the transmission network, is comparatively uneconomic.

Clause 2.12.1 of the Code sets out certain requirements for the availability of network support, not only in relation to Port Lincoln, but to all exit points that are serviced using network support arrangements. Where the contracted agreed maximum demand is less than 120 percent of the installed transformer or transmission line capacity (as is the case for Port Lincoln), the network support arrangement must have at least 95 percent availability for each year.

Based on information provided by ElectraNet, AEMO estimated that the additional cost associated with the provision of the third generator exceeds the value of the additional reliability that the third generator provides. Test data, provided by ElectraNet, indicated that the network support arrangement could be maintained at greater than 90 percent availability with only two generating units being made available all year. AEMO estimated that the additional cost associated with the provision of the third generator would outweigh the associated benefits to consumers of the small increase in availability. Accordingly, AEMO proposed that the availability requirements for network support arrangements at Port Lincoln could be relaxed from 'at least 95 percent' to 'at least 90 percent', thereby creating an exception to clause 2.12.1 in respect of Port Lincoln only.

As noted at the outset of this final decision, the Code does not mandate the particular form of network support (eg generation). The Commission's consideration of whether or not to change the availability standard at the Port Lincoln exit point therefore relies on an assessment of the efficient cost of meeting that changed standard and the associated benefits to consumers.

A critical aspect of engaging in commercial contracts is managing the risk associated with the enterprise. Where the startup performance has satisfactorily met the Code requirements (better than 95 percent), ElectraNet may assess the risk associated with contracting an amount of generation support and make the appropriately informed decision. The services should be negotiated to provide the best outcome for both parties (and consumers). ElectraNet, in its submission to the Issues Paper, suggested that, if the 95 percent standard was reduced for Port Lincoln, it may not result in a reduction in network support charges. The potential savings of reduction in support may therefore not necessarily be passed on to customers, as the cost of the network support is negotiated between ElectraNet and Engie.

In its submission to the Draft Decision, ElectraNet noted that the proposed flexibility provision (discussed in section 4.3) would allow for the opportunity to revisit this standard in the event that an economic assessment found that an alternative standard provided greater net benefit to consumers. The Commission agrees that the proposed clause 2.3.2 will provide an opportunity for clause 2.12.1 to be reviewed if and when any capital works are required in order to satisfy it.

At this time, the Commission has not been provided with sufficient evidence to support the claim that the reduction in the availability of network support arrangements at Port Lincoln will result in a net benefit to consumers. Consequently the Commission will not amend the Code to reduce the availability standard at Port Lincoln.

In its consideration of this issue, Commission noted that the current wording of the availability standard is ambiguous, in that it does not define the term 'availability'.

Consequently in the Draft Decision, the Commission proposed to replace the existing clause 2.12.1(a) of the Code as follows:

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 **on the occasions it is called upon** for the 12 months to 30 June each year; and

In its submission to the Draft Decision, ElectraNet expressed its view that the support arrangements are not called upon sufficiently over a typical 12 month period to provide a statistically significant measurement. It suggests alternative wording that replaced the 12 month period with an average 'over time'.

The Commission acknowledges ElectraNet's view but also considers that the measurement must remain current and should not be skewed by historical results (whether they be positive or negative). Taking the concerns around measurability into account, the Commission will increase the assessment period from 12 months to 24 months and will make it clear in the Code that the measurability of performance will be taken into account in assessing compliance against this obligation. Furthermore, the Commission will incorporate additional wording to ensure that any test starts performed are included in the data set ElectraNet uses in analysing whether or not it has met the requirements of clause 2.12.1(a).

Accordingly, the Commission will replace the existing clause 2.12.1(a) of the Code with:

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 **on the occasions it is called upon (including for regular operational testing)** for the **24** months to 30 June each year **having regard to the measurability of availability performance**; and

4.2 Changes to reliability category definitions

The Commission's final decision is that the amendments proposed by AEMO and ElectraNet, to include economic network or network support arrangements in the definitions of Categories 1 and 2, will not be made. Rather, clause 2.3.1 of the Code will be amended, to clarify that the reliability standards expressed in the Code are minimum reliability standards (as opposed to fixed standards).

The restoration requirements in Category 5 of the Code will be amended to reflect the actual network support capacity of 176MW (rather than 65 percent of contracted agreed maximum demand). Additional changes will be made to reflect that these restoration requirements are 'best endeavours' requirements.

In addition to reviewing the reliability standards of all exit points, the Commission sought AEMO's advice on the reliability standards for each category within the Code.

AEMO recommended changes to the definitions of Categories 1, 2 and 5 in the Code, while retaining the existing Category 3 and 4 reliability and restoration standard requirements.

In the Issues Paper, the Commission sought comment on whether or not the changes recommended by AEMO should be adopted. The Commission received one submission (from ElectraNet) in relation to this specific issue. While ElectraNet supported the recommended changes, it suggested further amendments to each of these definitions, as set out below.

4.2.1 Categories 1 and 2 exit points

Category 1 exit points are required to supply 'N' reliability through one transmission line, one or more transformers, and/or network support arrangements.

Category 2 exit points are required to supply 'N' equivalent transmission line capacity and 'N-1' equivalent transformer capacity. This category was introduced in 2006, when the Commission recognised that, while transformers rarely fail, they can take several days to replace and therefore can have a significant impact on the customers at that exit point.

AEMO proposed an amendment that places greater responsibility on ElectraNet to consider a full range of cost effective network support arrangements to improve reliability. AEMO noted that this is of particular relevance with the decreasing cost of non-network options (eg battery storage).

AEMO recommended amending the definition of Categories 1 and 2 to read:

Category 1 - N equivalent line (and transformer) capacity plus economic network support arrangements (which must be justified through a RIT-T or regulatory investment test – distribution (RIT-D) process).

Category 2 – N equivalent line capacity (and N-1 equivalent transformer capacity) plus economic network support arrangements (which must be justified through a RIT-T or regulatory investment test – distribution (RIT-D) process), and N-1 equivalent transformer capacity.

ElectraNet's submission to the Issues Paper supported the intent of amending the definition, however, it suggested that AEMO's wording would limit the reliability option to being delivered strictly via network support arrangements. ElectraNet put the view that this is inconsistent with the RIT-T and RIT-D processes, which seek the lowest cost option irrespective of whether it uses network or non-network solutions.

ElectraNet proposed the inclusion of the wording below (in underlined red font) to the definition of 'N' for Categories 1 and 2, to address these concerns:

'X' equivalent line and 'Y' transformer capacity, plus economic network or network support arrangements (which must be justified by a RIT-T or regulatory investment test for distribution (RIT-D) process).

In its Draft Decision, the Commission supported ElectraNet's proposal to include economic network arrangements in the interests of enabling the full suite of options to be considered to arrive at the most cost efficient solution to meet reliability standards. The Commission was however, concerned that the use of the word 'plus', as proposed by AEMO, would place a positive obligation on ElectraNet to pursue higher standards of reliability than those set out in the Code. It therefore replaced the word 'plus' with 'by means of', explicitly recognising that such arrangement, where economic, could be used in place of traditional line and transformer based solutions.

ElectraNet made two observations in relation to this issue, in its submission to the Draft Decision:

First, ElectraNet noted that currently a RIT-T is not currently required for replacement expenditure, and the requirement that the arrangement satisfy a RIT-T should therefore only apply where applicable. The Commission accepts that argument and has addressed it in its final decision set out below.

Second, ElectraNet expressed that the original intent of amending these category definitions was overlooked in the Draft Decision. The purpose of AEMO's proposed changes was to provide for additional reliability to be secured over and above the minimum N and N-1 standards of Category 1 and Category 2, where economic to do so. For this reason, ElectraNet re-stated its proposed wording as set out above.

In considering this issue, the Commission recognises that, while the wording proposed in the Draft Decision promotes outcomes-based reliability standards as set out in section 4.3 of this report, it does not explicitly recognise that reliability performance can exceed the standards set out in the Code, as proposed by AEMO and ElectraNet. However, the Commission is of the view that the reliability standards set out in the Code are **minimum** standards. Where an alternative solution is proposed that results in a higher net economic benefit to consumers (but that exceeds the relevant reliability standard), the Commission believes that this solution should be pursued, even if it has a higher cost to implement than an alternative solution that exactly meets that standard. This is consistent with the intent of AEMO's and ElectraNet's proposals.

To clarify this position, the Commission will amend clause 2.3.1 of the Code as follows:

- 2.3.1 A transmission entity must plan and develop its transmission system such that each *exit point* or group of *exit points* allocated to a category is in accordance with clause 2.4 meets the relevant minimum reliability standards for applicable to that category as set out in pursuant to clauses 2.5 to 2.9.

The amendment to clause 2.3.1 recognises the position put by AEMO and ElectraNet, that the Code should not prevent TNSPs from pursuing better outcomes than the reliability standards. It does not, however, mandate TNSPs to pursue those better outcomes. Under the NER, the AER's role is to assess any expenditure proposals designed to meet or exceed reliability standards set out in the Code. The Commission's role is limited to specifying what those minimum reliability standards should be.

The proposed amendments to the definitions of Category 1 and Category 2 (as set out in section 4.2.1 of the Draft Decision) are addressed through alternative amendments in section 4.4 of this report, and will therefore not be made.

4.2.2 Category 5 exit points

Category 5 exit points are required to provide 'N-1' equivalent line and transformer capacity for 100 percent of the agreed maximum demand on a continuous basis. Adelaide Central is the only exit point that falls within this category, and it is supplied by two independent and diverse substations to achieve this end. The Category 5 reliability standard also incorporates a restoration requirement to restore at least 65 percent of the equivalent line/transformer capacity (being 100 percent of contracted agreed maximum demand) within four hours of the commencement of any interruption.

In the event of a loss of supply from either or both of the substations, ElectraNet currently meets the partial restoration requirement through an arrangement with SA Power Networks, in accordance with clause 2.12.2 of the Code, to provide a limited supply to Adelaide Central via the distribution network with minimal interruption.

SA Power Networks' distribution network support capability to Adelaide Central is limited to 176MW. While this capability is currently sufficient to meet the 65 percent requirement under the Code, AEMO

modelling⁵ suggests that, in the future, the measure of 65 percent of the (equivalent line/transformer) capacity may exceed the network support capacity of 176MW, resulting in the inability of ElectraNet to meet the Category 5 reliability requirements.

Accordingly, AEMO recommended that the Category 5 definition be amended to reflect the upper limit of 176MW. This affects clauses 2.9.1 (a)(ii)(A) and 2.9.1 (b)(ii)(A) of the Code.

ElectraNet agreed with this proposal; however it submitted that the network support arrangement with SA Power Networks should be limited to a best endeavours commitment as it relies on a third party (being the distributor, in this case). Therefore, it put the view that clauses 2.9.1 (a)(ii)(A) and 2.9.1 (b)(ii)(A) should be further amended to reflect this best endeavours arrangement.

No other submissions were made in relation to this issue.

The Commission agrees that amending the Code to incorporate a finite level of network support would more appropriately reflect the reality that the level of network support is fixed, and does not fluctuate with demand. As the distribution network configuration may increase or decrease capacity in the future, SA Power Networks should advise accordingly where it affects ElectraNet's ability to comply with Code requirements. Any such changes would require a review by the Commission.

ElectraNet's proposal to amend sub-clauses (a)(ii) and (b)(ii) of clause 2.9.1 to incorporate a best endeavours restoration standard, is reasonable and consistent with the restoration standards under the Code generally. It acknowledges that, notwithstanding there are contractual arrangements in place, ElectraNet is dependent on SA Power Networks' ability to effect the network support in a timely manner.

Accordingly, the Commission will amend the Code to reflect these changes. The combined effect of the amendments as proposed by AEMO and ElectraNet, on clause 2.9.1 of the Code, is as follows:

⁵ AEMO, *2014 AEMO Transmission Connection Point Forecasting Report for South Australia*.

2.9.1 In respect of Category 5 connection points, a transmission entity must, by means of independent and diverse transmission substations:

(a) provide "N-1" equivalent line capacity into Adelaide Central for at least 100% of contracted agreed maximum demand and:

(i) in the event of a failure of any installed transmission line or network support arrangement, use its best endeavours to restore "N-1" equivalent line capacity as soon as practicable;

(ii) in the event of an interruption arising from the failure of the installed transmission lines or network support arrangements *use its best endeavours to:*

(A) restore at least ~~65%~~ 176 MW of "~~N~~" *equivalent line capacity* required by this clause within 4 hours of the commencement of the interruption; and

(B) ~~use its best endeavours to~~ restore "*N-1*" *equivalent line capacity* as soon as practicable after the commencement of the interruption.

(b) provide "N-1" equivalent transformer capacity into Adelaide Central for at least 100% of contracted agreed maximum demand and:

(i) in the event of a failure of any installed *transformer* or *network support arrangement*, use its *best endeavours* to restore the *equivalent transformer capacity* required by this clause as soon as practicable;

(ii) in the event of an interruption arising from the failure of the installed transformers or network support arrangements *use its best endeavours to:*

(A) restore at least ~~65%~~ 176 MW of "~~N~~" *equivalent transformer capacity* required by this clause within 4 hours of the commencement of the interruption; and

(B) ~~use its best endeavours to~~ restore "*N-1*" *equivalent transformer capacity* as soon as practicable after the commencement of the interruption.

4.3 Reliability standard flexibility

The Commission's final decision is to include an additional clause in the Code that obliges ElectraNet to submit a revised cost benefit analysis to the Commission, prior to committing to proposed material capital investment projects that are required in order to meet reliability standards above 'N' equivalent (or Category 1).

Under the current regulatory framework, the AER determines the revenue allowances for the TNSP for a five year regulatory period. The jurisdictional service standards are subject to a review well ahead of the commencement of that five year period. Unforeseen issues may arise between the time the review is undertaken and the end of the associated regulatory period, introducing a risk that inefficient capital investments may be proposed. A relevant case in point is the Baroota exit point, whereby (until recently), the reliability standard was set to increase in the future, but was found to be no longer economically justified. The Commission recently completed a separate review⁶ in order to resolve this matter, which resulted in the re-categorisation of the Baroota exit point.

Accordingly, the Commission requested additional advice from AEMO on options to enhance the existing arrangements in order to provide greater flexibility for changing reliability standards where appropriate.

AEMO provided a report⁷ to the Commission that suggested seven 'off ramp' alternatives that provide mechanisms for a reliability upgrade project to be deferred or cancelled should the assumptions on which it was based, such as demand forecasts and economic factors, significantly change prior to the project proceeding:

1. relying on the existing incentive framework for small projects (including the capital expenditure sharing scheme)
2. relying on the existing incentive framework for large projects (negative cost pass through)
3. providing for contingent projects
4. providing for contingent projects with economically expressed standards
5. providing for inverse contingent projects
6. implementing an ex post adjustment, and
7. implementing an automatic adjustment mechanism.

The first two of these alternatives are provided for within the current framework. Alternatives 3 and 4 can be implemented with no changes to the NER or any other legislation. The remaining alternatives (5, 6 and 7) would be more onerous to implement, as they all require changes to the NER.

Each of the above alternatives was described in the Issues Paper, and feedback was sought in relation to whether such flexibility should be introduced into the Code and, if so, the form it should take.

⁶ Essential Services Commission, Variation to clause 2.4.1 of the Electricity Transmission Code – Final Decision, October 2015, available at http://www.escosa.sa.gov.au/library/20151029-Electricity-VariationtoClause2_4_1TransmissionCode-FinalDecision.pdf.

⁷ Australian Energy Market Operator, Review of South Australian Electricity Transmission Reliability Standards, July 2015, available at <http://www.escosa.sa.gov.au/library/20150924-Elec-ReviewSATransmissionCodeReliabilityStandards-AEMO-Report.pdf>.

4.3.1 Submissions to the Issues Paper

4.3.1.1 ElectraNet

In considering the options presented in the Issues Paper, ElectraNet submitted that the Commission's process for the Baroota exit point achieved an efficient outcome, but that it introduced additional complexity and lacked flexibility. ElectraNet supported amendments to the Code that introduce a more flexible and streamlined approach to such events, based on the reassessment of the benefits and costs of the proposed compliance obligation at the point of investment decision.

ElectraNet suggested adding a new clause to the Code to achieve this, as follows:

Where a transmission entity is required to proceed with an investment to comply with the [Code] the assumptions used to justify the investment must be reviewed as part of the applicable regulatory investment test to verify that they have not materially changed resulting in the investment no longer having the anticipated benefit. Where the benefit no longer justifies the investment the transmission entity may apply to [the Commission] to review the investment trigger. On acceptance of the application [the Commission] may amend the applicable standard accordingly.

ElectraNet put the view that this approach, when combined with the existing arrangements under the NER, provides an appropriate balance between flexibility and transparency, and preserve the intent of the established incentive arrangements in the long-term interests of consumers. It further stated that there is no apparent need, nor additional benefit, in considering wider ranging options, including those that would require changes to the NER.

4.3.1.2 Energy Supply Association of Australia (ESAA)

The (former) ESAA supported the Commission's approach in seeking greater flexibility in reliability standards and planning process where the economic justification underpinning a standard may change within a regulatory period.

The ESAA argued that greater use could be made of the contingent projects mechanism to achieve more flexibility in reliability standards, and that this could be incorporated into the existing regulatory framework with no NER changes required. The use of the RIT-T to assess the economic benefit of a contingent project, would provide transparency and ensure the preferred option was fit for purpose and the most technically and commercially feasible option.

However, the ESAA also recognised that the contingent project mechanism would increase the regulatory burden for the regulated entity, and suggested a process of establishing a threshold to limit the number of projects assessed throughout a regulatory period.

4.3.1.3 Department of State Development (DSD) – Energy Markets and Programs Division

The DSD supported the notion of incorporating flexibility in the setting of reliability service standards. However, it suggested that there should be a focus, where possible, on mechanisms that do not require any NER rule changes, as this process is time consuming and will inhibit the timeliness of decision making and outcomes.

4.3.2 Discussion

From the submissions received, it is evident that there is support for introducing greater flexibility to amend reliability standards in the Code.

Of the off-ramp alternatives suggested by AEMO, the Commission has discounted those that will require NER changes (options 5, 6 and 7) on the basis that the objective of greater flexibility can be achieved without relying on rule changes that can often be protracted in nature. This approach is consistent with the DSD submission.

The Commission has also discounted the off-ramp alternatives that require greater use of the contingent project mechanism (options 3 and 4). These options result in a departure from the certainty and stability afforded by the traditional ex ante approach to regulation and could unnecessarily increase regulatory burden, both on the regulator and the regulated entity, resulting in increased costs to consumers.

The Commission acknowledges that the outcome in relation to the recent (out of cycle) Code review for the Baroota exit point was achieved without modification to the existing regulatory framework. Both the terms of the ESC Act and the interests of regulatory transparency require a formal Code review in the event that a change to a reliability standard becomes warranted; however, the content and terms of such a review will vary with the nature, scope and scale of the issue under consideration.

The Commission notes that there is currently no established mechanism in place that will provide it with notice that any reliability standard is no longer appropriate, nearer to the time the final investment decision is made in order for ElectraNet to comply with the Code. Such an assessment could be made by requiring ElectraNet to submit to the Commission a review of the costs and benefits of any relevant replacement or augmentation project at a time significantly closer to the time the investment is proposed.

Relevant projects would include all replacement or augmentation capital projects that exceed the RIT-T cost threshold as set by the AER (currently \$6 million) and that are required in order to meet or exceed one or more reliability standards above a Category 1 reliability ('N' equivalent line and transformer capacity).

The Commission could then test whether or not the economic analysis underpinning the reliability standard as set remains valid. If, as a result of its assessment, the Commission forms the view that the exit point should be reclassified, it will undertake a Code amendment process, prior to ElectraNet making its final commitment to the project.

On this basis, the Draft Decision proposed a new clause 2.3.2 of the Code, as follows:

2.3.2 A *transmission entity* must submit to the *Commission*, a review of the underpinning economic analysis, using the latest available data, no later than 12 months prior to a final investment decision being made in respect of all capital projects (whether replacement or augmentation) that exceed the *regulatory investment test for transmission* cost thresholds, and that are proposed to satisfy one or more reliability standards.

In its submission to the Draft Decision, ElectraNet supported the proposed clause, however, it suggested it conflicted with clause 2.11 of the Code, which requires ElectraNet to undertake investment on the basis of increases in forecast agreed maximum demand within 12 months of the identified future breach date. ElectraNet recommended amending clause 2.11 so that it no longer conflicts with proposed clause 2.3.2.

The Commission acknowledges that there was a typographical error in the Draft Decision, and the wording of the proposed clause 2.3.2 should have referred to 'no **earlier**' rather than 'no later' than 12 months prior to a final investment decision being made. The corrected wording removes this potential conflict with clause 2.11. Further, the Commission recognises that in times of fluctuating demand forecasts, clause 2.11 may inhibit flexibility due to the three year lead time it currently imposes. This is not anticipated to be an issue over the foreseeable future, but the Commission will consider this issue as part of the next cyclical review of the Code.

In the same submission, ElectraNet indirectly raised the possibility that the new clause 2.3.2, as proposed in the Draft Decision, might impede its ability to meet the more immediate restoration requirements set out in the Code (simply to restore power, irrespective of the level of redundancy required). Such an implication was not intended, and is avoided by modifying the wording of clause 2.3.2 such that it only applies to capital expenditure that is required to meet (or exceed) any requirement other than the minimum requirement of 'N' lines and transformers.

Under this approach there is no additional burden placed on ElectraNet during the immediate period following an interruption, when its efforts are, and should be, focused on restoring the connection point to an 'N' equivalent (or Category 1) standard. The additional Commission review is only required when the permanent solution to restore the connection point to its former reliability category is assessed by ElectraNet, which is the point at which that categorisation should be reviewed in order to ensure it remains appropriate within the current environment.

The Commission also acknowledges that clause 2.3.2, as proposed in the Draft Decision, places a requirement on ElectraNet to provide up to date economic analysis, but is silent on the Commission's responsibilities. To meet its statutory objective (to protect the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services), the Commission will review the updated information, and if it is satisfied that the exit point reliability standard is no longer appropriate, it will inform ElectraNet and commence an out of cycle Code review to give effect to a change in the reliability standard as soon as practicable.

The Commission's final decision in relation to reliability standard flexibility is to add a new clause to the Code as follows:

- 2.3.2 A *transmission entity* must submit to the *Commission* a review of the underpinning economic analysis, using the latest available data, no earlier than 12 months prior to a final investment decision being made in respect of all capital projects (whether replacement or augmentation), where:
- (a) the proposed investment cost exceeds the *Regulatory Investment Test for Transmission* cost threshold, and
 - (b) the relevant project is proposed to satisfy one or more reliability standards under this clause 2, where anything other than "**N**" *equivalent capacity* is required.

The above decision will require the term Regulatory Investment Test for Transmission to be defined in clause 1.5 of the Code. Clause 1.5 will therefore be amended to incorporate the following:

Regulatory Investment Test for Transmission has the same meaning as defined in Chapter 10 of the *National Electricity Rules*.

4.4 Explicit outcomes-based standards

The Commission's final decision is that the reliability category definitions in clauses 2.5 to 2.9 of the Code will be amended to confirm that alternative solutions can be utilised to meet exit point reliability standards, provided that they result in the same or better outcomes currently provided through the use of transmission lines and transformers.

Further, and as a consequence of the above, clause 2.12 of the Code will be amended to remove infrastructure specific references.

During the 2013 to 2018 regulatory period, the electricity industry has experienced change in the form of new and emerging (disruptive) technologies. The industry is at the point where it should consider the influence of these technologies both operationally and economically.

The Commission has reviewed the Code to ensure that the reliability standards and other obligations are as outcome focussed as possible. If the standards were to preclude new and potentially more cost efficient technologies from being considered as alternatives to existing technologies, then it might encourage inefficient investment.

The Issues Paper sought views as to whether the Code should continue and confirm outcome based standards and, if so, the form that such standards should take.

4.4.1 Submissions to the Issues Paper

The Commission received four submissions on that matter, as set out below.

4.4.1.1 ElectraNet

ElectraNet's submission did not support moving from input standards to outcome-based standards. It considered the existing input standards of the Code are already supplemented and supported effectively by the service target performance incentive scheme (STPIS) administered by the AER. ElectraNet suggested that any change to replace or supplement the existing Code requirements with outcomes-based standards would provide little additional benefit, with the added expense of additional regulatory burden.

In subsequent discussions, ElectraNet agreed that the 2006 amendments to the Code were designed, in part, to facilitate equivalent outcomes where economic, and welcomed any new amendments that would promote the pursuit of this objective.

4.4.1.2 ESAA

The ESAA noted that the Code is one component of the regulatory regime, with the AER as the economic regulator applying a strong incentive based regulatory regime to ensure expenditure is efficient and timely. The incentive scheme works such that rewards and penalties are applied against output measures via the STPIS.

The ESAA supported the Commission's review in acknowledging the AEMC's national framework for transmission reliability and its key recommendations. It endorsed the use of a probabilistic approach to undertaking an economic assessment in determining reliability standards. The ESAA highlighted that the reliability standard at each exit point should include the required level of capability and restoration rates. In addition, an outcomes-based measure needs to be consistent with consumer preferences so that the standard is maintained to its current level. Further the ESAA reinforced a comment made by AEMO during the AEMC review that the scheme should have a low transaction cost.

4.4.1.3 DSD

The DSD endorsed the national framework for transmission reliability principles as a high level guide to setting reliability standards. Its submission referred to DSD's original reply to the AEMC report, in which it endorsed the following relevant requirements for setting reliability standards:

Where transmission planning is the responsibility of the transmission business, the transmission reliability standards should:

- ▶ be expressed in the form of input planning standards that are specified on terms of network redundancy (N-x) and informed by an economic assessment process
- ▶ be specified in a way that has clear and measurable application at the connection point level
- ▶ include, as a minimum, a level of network redundancy and a requirement relating to when supply would need to be restored following an outage
- ▶ be set on the basis of having flexibility to include additional parameters, including output performance targets (ie limits), in order to make the standards more consistent with customer preferences, and
- ▶ be determined by a body independent of the transmission business.

The DSD suggested that such an approach would permit individual jurisdictions the flexibility to introduce additional parameters (including outcomes-based measures) that are able to complement the N-x standard with the aim of providing greater granularity and flexibility, resulting in more economically efficient outcomes.

4.4.1.4 AEMO

AEMO supported the consideration of outcome based measures for service standards and preferred standards based on expected energy not served (**EENS**). This approach uses the value of customer reliability (**VCR**) combined with data on the probability of an outage to determine EENS. It is capable of measuring low probability, high impact events.

Due to the rarity of loss of supply events, measured outcomes of unserved energy tend to be volatile and it is therefore difficult to measure conformance to an EENS standard over a single year. This could result in under (or over)investment for many years before an impact on reliability performance is observed. To address that issue, AEMO noted that the EENS should assess the probability of a loss of supply event, taking into account forward looking indicators of future reliability performance such as:

- ▶ unplanned circuit outage events
- ▶ failure of protection systems
- ▶ material failure of the supervisory control and data acquisition system, or
- ▶ incorrect operational isolation of primary or secondary equipment.

Finally, AEMO noted that ElectraNet already reports on these measures in order to comply with the AER's performance scheme.

4.4.2 Discussion

This review examined different methods of setting reliability and security standards and whether or not an alternative or supplement to the standards would be beneficial to both the regulated entity and to consumers. The current Code provides investment certainty to both consumers and the TNSP; however, it could also limit investment in disruptive technologies, regardless of their potential to improve relevant outcomes.

The Commission has assessed the merits of replacing or supplementing the existing standards with explicit outcomes-based standards, having regard to the existing Code provisions, such as the reliability of supply (level of redundancy and availability of infrastructure), and the restoration of supply (efficient post contingent action). The Commission also considers that the Code must be accessible and simple, and should not result in an increased regulatory burden.

In making its assessment, the Commission analysed the Review of the national framework for transmission reliability as published by the AEMC.⁸ As discussed above, the DSD and the ESAA both advocated the use of the principles discussed in the AEMC report. However, neither of these organisations expressed any preference as to the types of indicators that should apply with a change in standards.

AEMO, as discussed above, suggested using EENS as a measure for setting outcomes-based standards. However, as stated by AEMO, the EENS is a complex and volatile mechanism and additional parameters may be required to offset the volatility. ElectraNet argued that the use of EENS standards to supplement the existing standards, will lead to duplicated regulation, as these measures already form part of STPIS.

The fundamental goal in relation to outcome based standards is to be less prescriptive in regard to traditional asset based solutions (lines and transformers), and to encourage economically efficient solutions by integrating emerging technologies where these technologies achieve equal or better outcomes to those provided by lines and transformers, at lower costs. The existing Code promotes that outcome by allowing for technologies that are 'equivalent' to transmission lines and transformers. For example, the Category 3 requirement for 'N-1 equivalent line capacity for at least 100 percent of agreed maximum demand' would provide for any form of technology that could deliver the same capacity as an N-1 transmission line solution, even those that may have different levels of redundancy.

The current reliability category definitions (contained in clauses 2.5 to 2.9 of the Code) act to specify different levels of availability of lines and transformers to provide 100 percent of contracted agreed maximum demand (a term also defined in the Code), through combinations of redundancy and restoration times. Redundancy is a mechanism whereby the probability of loss of supply due to equipment failure (ie the failure rate) is reduced. It therefore follows that the key outcomes that each of the reliability category definitions currently seeks, are:

- ▶ to achieve or better a failure rate, in terms of the equipment at the exit point
- ▶ to achieve or better a restoration time, in the event of an equipment failure at the exit point, and
- ▶ to provide at least 100 percent of contracted agreed maximum demand for that exit point.

To make the outcomes focussed and technology neutral approach under the Code even clearer, the Commission proposes to add an extra clause to each exit point standard under clauses 2.5 to 2.9 of the Code, to state that the exit point standards can be met through alternative inputs that can be demonstrated to produce equal or better outcomes than those produced by the existing (line and transformer) input requirements. A mix of traditional assets, generation and new technologies could be utilised, as appropriate. This proposal is consistent with that submitted by the DSD.

⁸ AEMC, *Review of the national framework for transmission reliability*, November 2013.

In its submission to the Draft Decision, ElectraNet stated that the proposed decision focuses on a technically better outcome rather than a solution that provides an economic benefit equivalent to or greater than the traditional mix of lines and transformers. ElectraNet suggests this could be addressed by amending the proposed clauses to read:

provide an alternative solution that **economically** meets or exceeds the outcomes in terms of each of the failure rate, the restoration time and the capacity, that would otherwise have been provided by equipment that satisfies the criteria set out in section 2.5.1.

The Commission accepts that the wording of the clause focuses on technical outcomes; however that is intentional. By doing so, it provides the grounds to pursue alternative methods that are not currently captured in delivering the outcomes of the Code. The process by which an economically efficient solution prevails is overseen by the AER when it assesses the prudence and efficiency of proposed expenditure in its revenue allowance determinations under the NER.

The Commission's final decision in relation to outcomes-based standards is to amend each of clauses 2.5 to 2.9, as illustrated below with respect to clause 2.5:

Category 1 exit points (clause 2.5)

- 2.5.1 In respect of Category 1 *exit points*, a *transmission entity* must, **subject to clause 2.5.2**:
- (a) provide "*N*" *equivalent line capacity* for at least 100% of contracted *agreed maximum demand* and, in the event of an interruption use its *best endeavours* to:
 - (i) restore "*N*" *equivalent line capacity* as soon as practicable; and
 - (ii) **in any event**, restore "*N*" *equivalent line capacity* within 2 days of the commencement of the interruption; **and**
 - (b) provide "*N*" *equivalent transformer capacity* for at least 100% of contracted *agreed maximum demand* and, in the event of an interruption:
 - (i) use its *best endeavours* to restore "*N*" *equivalent transformer capacity* as soon as practicable; and
 - (ii) in any event, restore "*N*" *equivalent transformer capacity* within 8 days of the commencement of the interruption.
- 2.5.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.5.1, to deliver the same or better outcomes in terms of each of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.5.1.

As a consequence of these changes, the Commission will also remove the specific infrastructure context that is currently incorporated into clause 2.12 of the Code, as follows:

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~~ capacity at the *exit point*, 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~~ capacity at the *exit point*, the *network support arrangement* must have a level of availability at least equal to the availability delivered by the ~~standard applicable to the relevant transformer or transmission line~~ elements applicable to the *exit point* pursuant to clauses 2.5 to 2.9.

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 at the *exit point*, 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 ~~transformer or transmission line~~ capacity at the *exit point*; and
- (b) rely on a *network support arrangement* to meet the required ~~transformer or transmission line~~ capacity at the *exit point* unless the *network support arrangement* is provided by the *transmission entity*.

4.5 Other issues

4.5.1 Demand management incentive opportunities

The Commission's final decision is that an additional clause will be added to the Code which makes it clear that the Code does not inhibit innovation.

In order to meet the standards set in the Code, a TNSP may use demand management initiatives to reduce, defer or remove the need for network investment by reducing the maximum demand at exit points.

While the current incentive framework is effective within the current regulatory period, there is no incentive for TNSPs to actively pursue research and development of demand management and other innovative solutions that may only provide benefits over terms longer than the next regulatory period.

ElectraNet submitted that there has been limited take up of innovative solutions in South Australia and has suggested that a new clause should be added to the Code that, would reinforce a long-term obligation to pursue demand management innovation, worded as follows:

In planning and developing its transmission system in accordance with clause 2.3.1 the transmission entity shall have regard to the identification of future demand management opportunities and use its best endeavours to identify and develop innovative network and non-network solutions which would be in the long-term interest of consumers.

The Commission supports innovation and a long-term approach to demand management (as good electricity industry practice); however, such initiatives, and the funding thereof is appropriately within the purview of the AER under the regulatory funding application/reset model.

The Code provides, with consumers' best interests in mind, a mechanism that guarantees a reliable, safe and secure electricity supply at an efficient cost. Although a Code can have a direct influence on asset investment, it is not designed, nor intended to incentivise a TNSP to conduct research and development projects.

Taking the above into account, the Commission was not persuaded in its Draft Decision to include a clause in the Code in regard to demand management initiatives, as suggested by ElectraNet.

In its submission to the Draft Decision, ElectraNet requested that the Commission reconsider its position in relation to this issue, and stated there is a need for ongoing efforts to better understand the role for demand management and new and emerging technologies in meeting supply needs into the future.

The Commission agrees that there is increasing recognition in the Code of potential new technologies and solutions (as outlined in section 4.3 of this report) and supports a proactive and long-term approach to demand management (as good electricity industry practice). The Commission however, remains of the view that such initiatives, and the funding thereof is appropriately within the purview of the AER under the regulatory funding application/reset model.

Taking the above into account, the Commission will add a new clause 1.3.3 to clarify that the Code does not inhibit innovation, as follows:

1.3.3 Nothing in this industry code should be interpreted as requiring specific technological solutions. The requirements of this code, including any standards or procedures to which it refers, can be met by any combination of transmission, distribution, generation, load management or alternative technology solutions where such solutions can be demonstrated to be prudent and efficient, taking into account the long-term benefit to consumers.

4.5.2 Connections to non-distributors

The Commission's final decision is to amend clause 2.4 of the Code to clarify the limit of ElectraNet's responsibility to infrastructure providing prescribed transmission services.

ElectraNet provides services to exit points for customers directly connected to the transmission network, for example, non-distribution customers. Clause 2.4.1 denotes those exit points as Category 1 exit points, and the customers' connections are identified with an asterisk to signify they are not distributors.

ElectraNet submitted that some direct-connect customers have questioned the obligations of the TNSP with respect to the replacement of transformers that have been provided as part of a negotiated or unregulated connection service. Consequently, ElectraNet has asked the Commission to clarify the restoration obligations applicable to those exit points.

The service standards set out in Chapter 2 of the Code relate to reliability and restoration at the physical point of connection where the customer connects its own assets (including, in some cases, transformers). At those points of connection, ElectraNet must fulfil its obligations. The customer is responsible for assets downstream of the point of connection. However, a separate contractual agreement may be established with the TNSP (or a third party) to manage those assets on the customer's behalf.

Further, while clause 2.16 of the Code requires ElectraNet to implement and comply with an Emergency Transformer Replacement Plan to ensure compliance with clause 2 of the Code, the plan does not anticipate the provision of spare transformers for individual customers. Again, ElectraNet may offer to do so under separate arrangements with the customer.

The Commission agrees that the limit of ElectraNet's responsibility at exit points involving direct-connect customers (that are not distributors) could be clarified within the Code, and proposed an amendment to the meaning of the note to clause 2.4 of the Code in the Draft Decision, as follows:

* denotes a customer but does not include a distributor. Restoration standards set out in clauses 2.5 to 2.9 do not apply to equipment beneficially owned by the non-distributor customer.

In response to the Draft Decision, ElectraNet submitted that the proposed wording still did not address its underlying concern. It proposed that, rather than to rely on beneficial ownership of the assets, the clause should instead rely on the purpose to which the asset is used: the restoration requirement could then apply only to equipment providing a prescribed transmission service, as defined in the NER.

The Commission agrees with ElectraNet's proposal, and has made the final decision to amend the meaning of the asterisk in clause 2.4 of the Code as follows:

* denotes a customer but does not include a distributor. *Restoration standards set out in clause 2.5 only apply to equipment providing a prescribed transmission service*

The above decision will require the term prescribed transmission service to be defined in clause 1.5 of the Code. Clause 1.5 will therefore be amended to incorporate the following:

prescribed transmission service has the same meaning as defined in Chapter 10 of the National Electricity Rules

4.5.3 Cessation of country connection points

The Commission's final decision is that clause 2.18 of the Code will be amended so that any proposal to decommission country (transmission) connection points will require the approval of the Commission, rather than the AER.

Under clause 2.18 of the Code, a TNSP is required to obtain approval from the AER, in order to cease to operate, maintain or service those parts of its transmission system located in country areas.

ElectraNet does not support the requirement to obtain approval from the AER. It put the view that the Commission, as the jurisdictional regulator, is best placed to make a decision should any such approval be required. ElectraNet has also suggested that the provision of clause 2.18 is amended, to refer to connection points rather than to 'parts of its transmission system'.

ElectraNet also suggested, as an alternative, the deletion of clause 2.18 and the expansion of clause 2.13 (which currently sets out a requirement for new exit point standards to be approved by the Commission), to incorporate the cessation of services at a connection point.

Notwithstanding the provisions contained in section 6A.2.3 of the NER, which account for the economic provisions regarding the removal of assets from the regulatory asset base, the Commission's statutory objective of protecting the long-term interests of South Australian consumers is its primary consideration. ElectraNet's view that the Commission is best placed to make such decisions in light of its statutory objective as the jurisdictional regulator and administrator of the Code is supported by the Commission.

Under the amendment proposed, ElectraNet would first seek the approval of the Commission if it considered it prudent to remove a country service. Any requirements under the NER, and consultation with stakeholders and the community, would subsequently follow in considering such a request.

Where it is more cost efficient to use an alternative supply solution rather than to rebuild a transmission line to a radial exit point, a proposal to decommission a line should not necessarily be precluded. If the Commission were to agree to the cessation of a country line, alternative arrangements (such as separate licensing and codes) would need to be established for any affected exit points, which would cease to be covered under the Code.

Finally, the Commission also agrees with ElectraNet's suggestion that the heading of clause 2.18 be amended to reflect that it refers to country connection points, rather than specifically to country lines. This places the focus of the requirement on the outcomes of those parts of the transmission system located in country areas and is therefore commensurate with the outcomes-based approach of the Code.

For the reasons above, the Commission has made the final decision to amend clause 2.18 to read:

2.18 Country ~~lines~~ connection points

2.18.1A *transmission entity* must not discontinue or cease to operate, maintain or service ~~these parts of its transmission system connection points~~ in country areas without the approval of the ~~Australian Energy Regulator~~ *Commission*.

4.5.4 Energy cap planning reliability standards

The Commission's final decision is that energy cap planning will not be incorporated into the Code.

The ESAA's submission suggested incorporating energy cap planning into reliability standards. This approach enables targets to be applied to a level of load that can be placed at risk in terms of MW and MWh that consumers would be willing to accept. The ESAA submitted that this approach would enhance flexibility by relaxing the reliability standard. This would allow augmentations to be deferred to maximise the net economic benefit of the investment, and the range of network or network support solutions that address an identified need.

However, the Commission has not been provided with any further evidence to suggest that the incorporation of energy cap planning into the reliability standards within the Code would benefit consumers. Consequently the Commission's final decision is not to incorporate energy cap planning into the Code at this time.

4.5.5 Other miscellaneous Code amendments

The Commission's final decision is:

- ▶ to replace the reference in the Code that is made to the ESAA with a more general reference to industry bodies, and
- ▶ to replace a legacy transitional demand forecasting arrangement with an ongoing demand forecasting arrangement.

4.5.5.1 Removal of references to ESAA

In January 2016 the ESAA ceased operating and the Energy Networks Association (**ENA**) absorbed responsibility for ESAA's former network members and for Grid Australia's activities on behalf of the electricity transmission sector. The Code currently refers specifically to the ESAA as the body responsible for the industry guidelines with which the TNSP must comply.

In order for the Code to allow for future organisational changes such as this, clause 5.3.1 (f) of the Code (which specifically refers to ESAA guidelines) will be deleted, and clause 5.3.1 (b) will be updated as follows:

- (b) relevant *Australian Standards* and industry guidelines

4.5.5.2 Replacement of historical transitional arrangements with an ongoing requirement

The Commission notes that clause 2.11.3 of the Code was originally provided for transitional forecasting arrangements up to 2015-16 and has no relevance to the upcoming regulatory period.

Accordingly, clause 2.11.3 will be replaced with:

2.11.3 *ElectraNet* will negotiate in good faith with *SA Power Networks* to determine:

- (a) the *forecast agreed maximum demand* to be applied at an *exit point* or group of *exit points* to meet the standards applicable to each *exit point* or group of *exit points* pursuant to clause 2; and
- (b) any change in *forecast agreed maximum demand* to be applied at an *exit point* or group of *exit points* for the purposes of clause 2.11.

5 Next steps

The publication of this decision marks the conclusion of the Commission's review of the Electricity Transmission Code ahead of the revenue submission that will be made by ElectraNet to the AER for the regulatory period from 1 July 2018 to 30 June 2023.

The Electricity Transmission Code, as amended for this final decision and attached to this report as **Appendix 1**, will be effective from 1 July 2018.

APPENDIX 1: Electricity Transmission Code (as amended) effective 1 July 2018



Electricity

Code



Electricity Transmission Code

TC/09

1 July 2018

Enquiries concerning the currency of this code should be addressed to:

Essential Services Commission
GPO Box 2605
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Telephone: (08) 8463 4444
Freecall: 1800 633 592 (SA and mobiles only)
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Amendment record

Issue number	Commencement date	Pages
TC/01	11/10/99	-
TC/02	23/12/99	-
TC/03	01/07/01	-
TC/04	01/07/03	-
TC/05	01/07/08	-
TC/05 (Version 2)	01/07/08	-
TC/06	01/07/11	34
TC/07	01/07/13	30
TC/07 (Version 2)	01/07/13	29
TC/08	29/10/15	29
TC/09	01/07/18	30

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1 Preliminary

1.1 Definitions

- 1.1.1 Words and phrases appearing in bold like **this** are defined in Section 1.5.
- 1.1.2 References to **Australian Standards** are references to standards existing from time to time, or where they are superseded, their replacements.

1.2 Authority

- 1.2.1 This industry code is made by the **Commission** pursuant to section 28 of the **ESC Act**.

1.3 Application

- 1.3.1 This industry code sets obligations that a **transmission entity** must comply with in relation to the provision of **transmission services** to:
 - (a) a **transmission customer**;
 - (b) a **distributor**;
 - (c) a **generator**,
in South Australia.
- 1.3.2 This industry code also imposes obligations on the **system controller, distributors and generators**.
- 1.3.3 Nothing in this industry code should be interpreted as requiring specific technological solutions. The requirements of this code, including any standards or procedures to which it refers, can be met by any combination of transmission, distribution, generation, load management or alternative technology solutions where such solutions can be demonstrated to be prudent and efficient, taking into account the long term benefit to consumers.

1.4 Interpretation

- 1.4.1 In this industry code, unless the context otherwise requires:
 - (a) headings, footnotes and examples are for convenience or information only and do not affect the operation or interpretation of this industry code or of any term or condition set out in this industry code;
 - (b) unless the context otherwise requires, words importing the singular include the plural and vice versa;
 - (c) an expression importing a natural person includes any company, partnership, trust, joint venture, association, corporation or other body corporate and any governmental agency and vice versa;
 - (d) a reference to a clause or appendix is to a clause or appendix of this industry code;

- (e) a reference to any statute includes all statutes varying, consolidating, re-enacting, extending or replacing them and a reference to a statute includes all regulations, proclamations, ordinances, by-laws and determinations issued under that statute;
- (f) a reference to a document or a provision of a document includes an amendment or supplement to, or replacement of or novation of, that document or that provision of that document;
- (g) a reference to a person includes that person's executors, administrators, successors, substitutes (including, without limitation, persons taking by novation) and permitted assigns;
- (h) other parts of speech and grammatical forms of a word or phrase defined in this industry code have a corresponding meaning.

1.5 Definitions

Act	means the Electricity Act 1996 (SA).
AEMO	means the Australian Energy Market Operator Pty Ltd (ACN 072 101 327).
Adelaide Central	means that area of Adelaide which is located east of West Terrace, north of South Terrace, west of East Terrace and south of the River Torrens.
agreed maximum demand	for a connection point or a group of connection points is the demand specified as such in the connection agreement between ElectraNet and the relevant transmission customers or SA Power Networks .
applicable laws	means the Act , the National Electricity Rules , any industry code made by the Commission under the ESC Act , the licences issued under the Act and any other legislation, rules, regulations, code or conditions which are binding on the transmission entity .
Australian Standard or AS	means a standard published by the Standards Association of Australia.
best endeavours	means to act in good faith and use all reasonable efforts, skill and resources.
business day	means a day that banks are open for general banking business in Adelaide, other than a Saturday or a Sunday.

Commission	means the Essential Services Commission established under the ESC Act .
connection agreement	means an agreement between a transmission entity and a transmission customer, generator or distributor relating to the connection to the transmission entity's transmission network and the provision of transmission services .
connection point	means an agreed point of supply between a transmission entity's transmission network and a transmission customer, generator, or distributor .
customer	has the same meaning given to that term in the Act .
distributor	means a holder of a licence issued under the Act authorising the operation of a distribution system .
distribution network	has the same meaning given to that term in the Act
distribution system	means a distribution network , together with connection assets.
ElectraNet	means ElectraNet Pty Ltd (ACN 094 482 416) and includes any entity which replaces or assumes rights and/or obligations of that company by way of succession, assignment, novation, Ministerial direction or otherwise.
electricity entity	for the purposes of clause 7 of this industry code means a generator, distributor and a transmission entity referred to in a site occupier's licence as having the benefit of the access to a site occupier's transmission system, distribution system or generating assets.
emergency	means an emergency due to the actual or imminent occurrence of an event which in any way endangers or threatens to endanger the safety or health of any person, or the maintenance of power system security , in the state of South Australia or which destroys or damages, or threatens to destroy or damage, any property in the state of South Australia.
equivalent capacity	means either or both of equivalent line capacity and equivalent transformer capacity , as the context requires.
equivalent line capacity	means the capacity to transmit energy to meet demand using means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements.
equivalent transformer capacity	means the capacity to transform energy to meet demand using means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements

ESC Act	means the Essential Services Commission Act 2002 (SA).
exit point	means a connection point through which a transmission customer imports electricity from the transmission network .
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 contracted.
generator	means a holder of a licence issued under the the Act authorising the person to generate electricity.
good electricity industry practice	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
group of exit points	means a group of exit points interconnected by a distribution network .
“N”	means that the transmission system is able to supply the contracted amount of agreed maximum demand connected to the transmission system provided that all the network elements are in service (such that the loss of a single transmission element could cause supply interruption to some customers).
“N-1”	means the ability of the transmission system to continue to supply the contracted amount of agreed maximum demand connected to the transmission system without interruption should any one element fail.
National Electricity Rules	has the meaning given to that term in the National Electricity Law.
network support agreement	means a written agreement setting out commercial and operational arrangements between a transmission entity and a independent network support provider in relation the provision of a network support arrangement .
network support arrangement	means: <ul style="list-style-type: none"> (a) distribution system capability; (b) generating unit capability; (c) load interruptibility; or (d) any combination of those services.
planned outage	means an interruption of, or restriction to, transmission services , other than due to an emergency .

power system incident	means an unplanned event which affects the provision of transmission services to a generator , transmission customer or distributor to the level agreed in the relevant connection agreement and occurs when protection equipment is activated.
power system security	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
prescribed transmission service	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
Regulatory Investment Test for Transmission	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
SA Power Networks	means the partnership comprising: Spark Infrastructure SA (No.1) Pty Ltd ABN 54 091 142 380, Spark Infrastructure SA (No.2) Pty Ltd ABN 19 091 143 038, Spark Infrastructure SA (No.3) Pty Ltd ABN 50 091 142 362 each incorporated in Australia, CKI Utilities Development Limited (ABN 65 090 718 880), HEI Utilities Development Limited (ABN 82 090 718 951), each incorporated in The Bahamas.
site occupier	means any transmission entity , distributor , or generator that is required by its licence to provide access to its transmission system , distribution system or generating assets to another electricity entity (referred to in the licence), to the extent that access is necessary for the purposes of the electricity entity to operate and maintain properly its transmission system , distribution system or generation assets (as the case may be).
system controller	means a person holding a licence under Part 3 of the Act to exercise the function of system control over a power system.
transformer	means a plant or device forming part of the transmission network that reduces or increases the voltage of alternating current and includes the associated primary plant and connected secondary systems to the extent that those items must be capable of supplying the appropriate reliability standard in clause 2.
transmission customer	means a customer having a connection point with a transmission network .
transmission entity	means a holder of a licence issued under the Act authorising the operation of a transmission system .
transmission line	means an electric line forming part of the transmission network and includes the associated primary plant and connected secondary systems to the extent that those items must be capable of supplying the appropriate reliability standard in clause 2.
transmission network	means a system of electric lines (generally at nominal voltages of 66kV or above) and other apparatus, equipment, plant and buildings used to convey electricity, but excluding connection assets.

- transmission services** means:
- (a) in relation to a **transmission customer** and a **distributor**, transmission use of system services and exit services; and
 - (b) in relation to a **generator**, entry services (unless otherwise agreed between the **generator** and the **transmission entity**).
- transmission system** means a **transmission network** together with connection assets.

1.6 Obtaining a copy of this industry code

- 1.6.1 A **transmission entity** must, on request by a **transmission customer, distributor, generator** or a **system controller**, send to them a copy of this industry code free of charge.

1.7 Other Acts, industry codes and regulations

- 1.7.1 Not all aspects of a **transmission entity's** obligations are regulated by this industry code. The **transmission entity's** obligations and some aspects of the relationship between a **transmission customer, a distributor** or a **generator** and a **transmission entity** are also affected by:
- (a) Acts of Parliament and regulations made under those Acts of Parliament (in particular the **Act** and associated regulations, and the **ESC Act**);
 - (b) licence conditions;
 - (c) the **National Electricity Rules**;
 - (d) any guidelines or rules made by the **Commission** from time to time; and
 - (e) the terms of any **connection agreements**.

1.8 Scope

- 1.8.1 Any obligations imposed under this industry code are in addition to those imposed under the **National Electricity Rules** and the **Act** (and regulations).
- 1.8.2 If anything in this industry code is inconsistent with the **National Electricity Rules** or the **Act** (and regulations), the provisions of the **National Electricity Rules** or the **Act** (and regulations) will have priority to the extent of the inconsistency except where this industry code imposes an obligation on a person that is higher or more onerous than any corresponding obligation contained in the **National Electricity Rules** or the **Act** (and regulations).

2 Service standards

2.1 Quality of supply and system reliability

- 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 requirement 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 requirement to shed load under normal and reasonably foreseeable operating conditions.

2.2 Transmission network standards

- 2.2.1 At the written request of the **Commission**, the **transmission entity** must participate to the extent specified by the **Commission** in the development, issue and review of any standards and procedures specified by the **Commission**.
- 2.2.2 The **transmission entity** must in accordance with any guideline published for this purpose, or as directed by the **Commission**, report to the **Commission** on its performance against applicable standards and procedures.
- 2.2.3 The **Commission** may issue standards and procedures applicable to the **transmission entity** and with which the **transmission entity** must comply if the **Commission** considers that:
- (a) the **transmission entity** has failed to comply with clause 2.1; or
 - (b) standards and procedures applicable to the **transmission entity** have been shown to be insufficient to prevent transgressions by the **transmission entity**.
- 2.2.4 The **transmission entity** must act in accordance with any guideline published by the **Commission**, relevant to the **transmission entity**.

2.3 Specific reliability standards

- 2.3.1 A **transmission entity** must plan and develop its **transmission system** such that each **exit point** or **group of exit points** categorised in clause 2.4 meets the minimum reliability standards applicable to that category pursuant to clauses 2.5 to 2.9.
- 2.3.2 A **transmission entity** must submit to the **Commission** a review of the underpinning economic analysis, using the latest available data, no earlier than 12 months prior to a final investment decision being made in respect of all capital projects (whether replacement or augmentation), where:
- (a) the proposed investment cost exceeds the **Regulatory Investment Test for Transmission** cost threshold; and
 - (b) the relevant project is proposed to satisfy one or more reliability standards under this clause 2, where anything other than **"N" equivalent capacity** is required.

2.4 Allocation of exit points to categories

- 2.4.1 The allocation of **exit points** to categories is set out in the table below (**exit points** in square brackets refer to a **group of exit points**):

Category	Exit point [] = group of exit points	
Category 1	<ul style="list-style-type: none"> • Baroota • Back Callington * • Davenport * • Florieton SWER • Kanmantoo • Leigh Creek Coal * • Leigh Creek South Mannum/Adelaide 1 * • Mannum/Adelaide 2 * • Mannum/Adelaide 3 * • Middleback* • Millbrook * • Morgan/Whyalla 1 * • Morgan/Whyalla 2 * • Morgan/Whyalla 3 * • Morgan/Whyalla 4 * • Mt Gunson • Murray/Hahndorf 1 * 	<ul style="list-style-type: none"> • Murray/Hahndorf 1 * • Murray/Hahndorf 2 * • Murray/Hahndorf 3 * • Neuroodla • Pimba * • Roseworthy* • Stony Point (Whyalla Refiners) - distribution • Stony Point* • Whyalla Terminal LMF • Woomera* <p>* denotes a customer but does not include a distributor. Restoration standards set out in clause 2.5 only apply to equipment providing a prescribed transmission service.</p>
Category 2	<ul style="list-style-type: none"> • Ardrossan West • Dalrymple 	<ul style="list-style-type: none"> • Kadina East • Wudinna • Yadnarie
Category 3	<ul style="list-style-type: none"> • Port Lincoln 	<ul style="list-style-type: none"> • Snuggery Rural
Category 4	<ul style="list-style-type: none"> • Angas Creek • [Berri/Monash] • Blanche • Brinkworth • Clare North • Dorrien • Templers • Hummocks • Keith • Kincaig • Mannum • Mobilong • [Mt Barker, Mt Barker South] • Mt Gambier 	<ul style="list-style-type: none"> • North West Bend • Penola West • Davenport West • Snuggery Industrial • Tailem Bend • Waterloo • Whyalla Central – Main Bus • [Bungama and Pt Pirie] • [Dry Creek (West), Kilburn, LeFevre, New Osborne and Torrens Island 66kV] • [Happy Valley, Magill (South), Morphett Vale East and City West (South)] • [Para, Munno Para and Parafield Gardens West] • [Dry Creek (East), Magill (East) and Northfield]
Category 5	<ul style="list-style-type: none"> • Adelaide Central [East Tce, City West (ACR)] 	

2.5 Category 1 exit points

- 2.5.1 In respect of Category 1 **exit points**, a **transmission entity** must, subject to clause 2.5.2:
- (a) provide **"N" equivalent line capacity** for at least 100% of contracted **agreed maximum demand** and, in the event of an interruption use its **best endeavours** to:
 - i. restore **"N" equivalent line capacity** as soon as practicable; and
 - ii. in any event, restore **"N" equivalent line capacity** within 2 days of the commencement of the interruption; and
 - (b) provide **"N" equivalent transformer capacity** for at least 100% of contracted **agreed maximum demand** and, in the event of an interruption:
 - i. use its **best endeavours** to restore **"N" equivalent transformer capacity** as soon as practicable; and
 - ii. in any event, restore **"N" equivalent transformer capacity** within 8 days of the commencement of the interruption.
- 2.5.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.5.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.5.1.

2.6 Category 2 exit points

- 2.6.1 In respect of Category 2 **exit points**, a **transmission entity** must, subject to clause 2.6.2:
- (a) provide **"N" equivalent line capacity** for at least 100% of contracted **agreed maximum demand** and, in the event of an interruption use its **best endeavours** to:
 - i. restore **"N" equivalent line capacity** as soon as practicable; and
 - ii. in any event, restore **"N" equivalent line capacity** within 2 days of the interruption; and
 - (b) provide **"N-1" equivalent transformer capacity** for at least 100% of contracted **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**:

- (A) restore at least **"N" equivalent transformer capacity** within 8 days of the commencement of the interruption; and
- (B) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable after the commencement of the interruption.

2.6.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.6.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.6.1.

2.7 Category 3 exit points

2.7.1 In respect of Category 3 **exit points**, a **transmission entity** must, subject to clause 2.7.2:

- (a) provide **"N-1" equivalent line capacity** for at least 100% of contracted **agreed maximum demand** (including through the use of post-contingent operation) and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent line capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transmission lines** or **network support arrangements**:
 - (A) restore at least **"N" equivalent line capacity** within 1 hour of the commencement of the interruption; and
 - (B) use its **best endeavours** to restore **"N-1" equivalent line capacity** as soon as practicable after the commencement of the interruption; and
- (b) provide **"N-1" equivalent transformer capacity** for at least 100% of contracted **agreed maximum demand** (including through the use of post-contingent operation) and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**:
 - (A) restore at least **"N" equivalent transformer capacity** within 1 hour of the commencement of the interruption; and
 - (B) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable after the commencement of the interruption.

2.7.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.7.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.7.1.

2.8 Category 4 exit points

- 2.8.1 In respect of Category 4 **exit points**, a **transmission entity** must, subject to clause 2.8.2:
- (a) provide **"N-1" equivalent line capacity** for at least 100% of contracted **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent line capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transmission lines** or **network support arrangements**:
 - (A) for the **group of exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **"N" equivalent line capacity** within 4 hours of the commencement of the interruption;
 - (B) for all other **exit points**, use its **best endeavours** to restore at least **"N" equivalent line capacity** within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore **"N-1" equivalent line capacity** as soon as practicable after the commencement of the interruption; and
 - (b) provide **"N-1" equivalent transformer capacity** for at least 100% of contracted **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**:
 - (A) for the **group of exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **"N" equivalent transformer capacity** within 4 hours of the commencement of the interruption;
 - (B) for all other **exit points**, use its **best endeavours** to restore at least **"N" equivalent transformer capacity** within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable after the commencement of the interruption.
- 2.8.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.8.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.8.1.

2.9 Category 5 exit points

- 2.9.1 Subject to clause 2.9.2, in respect of Category 5 **exit points**, a **transmission entity** must, by means of independent and diverse transmission substations:
- (a) provide **"N-1" equivalent line capacity** into **Adelaide Central** for at least 100% of contracted **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to restore **"N-1" equivalent line capacity** as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transmission lines** or **network support arrangements**, use its **best endeavours** to:
 - (A) restore at least 176 MW of **equivalent line capacity** required by this clause within 4 hours of the commencement of the interruption; and
 - (B) restore **"N-1" equivalent line capacity** as soon as practicable after the commencement of the interruption.
 - (b) provide **"N-1" equivalent transformer capacity** into **Adelaide Central** for at least 100% of contracted **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore the **equivalent transformer capacity** required by this clause as soon as practicable;
 - ii. in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**, use its **best endeavours** to:
 - (A) restore at least 176 MW of **equivalent transformer capacity** required by this clause within 4 hours of the commencement of the interruption; and
 - (B) restore **"N-1" equivalent transformer capacity** as soon as practicable after the commencement of the interruption.
- 2.9.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in clause 2.9.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.9.1.

2.10 Obligation to restore capacity

- 2.10.1 The obligation to restore a failed **transmission line**, **transformer** or **network support arrangement** as soon as practicable so as to meet the standards specified in this clause 2 includes, without limitation, a requirement that the **transmission entity** must have regard to:
- (a) **good electricity industry practice**;
 - (b) the need to minimise the duration of any interruption arising from that failure; and

- (c) the need to minimise the likelihood of an interruption as a result of the failure of any other **transmission line, transformer** or **network support arrangement** utilised at that **exit point** or **group of exit points**.

2.11 Obligation to provide sufficient capacity following changes in forecast agreed maximum demand

- 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 exit 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 reasonably expected to occur 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 exit 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 exit points** is sufficient to meet the required standard within 3 years of the identified future breach date.
- 2.11.3 **ElectraNet** will negotiate in good faith with **SA Power Networks** to determine:
 - (a) the **forecast agreed maximum demand** to be applied at an **exit point** or **group of exit points** pursuant to clause 2; and
 - (b) any change in **forecast agreed maximum demand** to be applied at an **exit point** or **group of exit points** for the purposes of clause 2.11.

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, 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 capacity at the **exit point**, the **network support arrangement** must have at least 95% availability on the occasions it is called upon (including for regular operational testing) for the 24 months to 30 June each year, having regard to the measurability of availability performance; and
 - (b) if the level of contracted **agreed maximum demand** exceeds 120% of the installed capacity at the **exit point**, the **network support arrangement** must have a level of availability at least equal to the availability delivered by the **transmission line** and **transformer** elements applicable to the **exit point** pursuant to clauses 2.5 to 2.9.
- 2.12.2 Where a **transmission entity** relies on a **network support arrangement** provided by an independent network support provider to meet the required capacity at the **exit point**, 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 capacity at the **exit point**; and
 - (b) rely on a **network support arrangement** to meet the required capacity at the **exit point**, unless the **network support arrangement** is provided by the **transmission entity**.

2.13 New connection points

- 2.13.1 Where a new **connection point** is to be provided by a **transmission entity**, the **transmission entity** must submit the applicable standards for that **connection point** to the **Commission** for approval.
- 2.13.2 Any standards submitted under clause 2.13.1 must be developed having regard to:
- (a) any recommendations of **AEMO**;
 - (b) the size of the load;
 - (c) the value of lost load and types of **customers**;
 - (d) the number of **customers**;
 - (e) the cost of installation of transmission assets relevant to the **connection point**.

2.14 Rating of transmission lines and transformers

- 2.14.1 A **transmission entity** must, as required by the **Commission**, provide the **Commission** with the details of how the **transmission entity** determines the rated capacity of its **transmission lines** and **transformers**, including whenever the **transmission entity** changes its rating policy.

2.15 Spare transformers

- 2.15.1 A **transmission entity** must have available sufficient spares of each type of **transformer** such that the reliability standards specified in this clause 2 can be met in the event of a **transformer** failure.

2.16 Emergency transformer replacement plan

- 2.16.1 A **transmission entity** must prepare, implement and comply with an emergency transformer replacement plan setting out the **transmission entity's** strategy for ensuring that spare **transformers** are available to ensure that it meets the reliability standards specified in this clause 2.

2.17 Reports to the Commission

- 2.17.1 A **transmission entity** must report to the **Commission** by 31 August each year, concerning matters relating to the standards during the 12 month period ending on 30 June of that year.
- 2.17.2 In particular, the **transmission entity** must:
- (a) report on the actual performance with the standards set out in this clause 2;
 - (b) provide an explanation of the reason for any non-compliance;
 - (c) report on how the **transmission entity** will continue to meet, or improve its performance so as to meet, the standards set out in this clause 2;
 - (d) report on the **transmission entity's** compliance with the **emergency transformer** replacement plan prepared in accordance with clause 2.16 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance;
 - (e) report on the compliance of any **network support arrangements** with the requirements of clause 2.11 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance
- 2.17.3 A **transmission entity** must report to the **Commission** on the circumstances of each occasion where it has been required, as a result of a **transformer** failure, to repair a **transformer**, install a new **transformer**, or provide **equivalent transformer capacity**, in order to meet the reliability standards specified in this clause 2 within 2 months of that event.

2.18 Country connection points

- 2.18.1 A **transmission entity** must not discontinue or cease to operate, maintain or service **connection points** in country areas without the approval of the **Commission**.

3 Interruptions

3.1 Interruptions or restrictions to transmission services

- 3.1.1 A **transmission entity** may, subject to anything contrary in a **connection agreement** with a **transmission customer, distributor** or **generator**, interrupt or restrict **transmission services**:
- (a) for the purposes of:
 - i. carrying out testing, commissioning, maintenance or repair on a **connection point** or any part of the **transmission network** which can not reasonably be undertaken utilising live-line techniques;
 - ii. carrying out augmentation or extensions to the **transmission system** or to connect a new **transmission customer, distributor** or **generator**;
 - iii. complying with the directions or requirements of **AEMO**, the **system controller** or any other government authority; and
 - iv. maintaining **power system security** or responding to an **emergency** or for health or safety reasons (in accordance with clause 9.3); or

- (b) as otherwise agreed in writing with the **transmission customer, distributor or generator**.
- 3.1.2 Nothing in this clause 3.1 will prevent the interruption or restriction of **transmission services** caused by the normal operation of protection systems forming part of the **transmission network** or any **connection point**.

3.2 Outage planning

- 3.2.1 A **transmission entity** must use its **best endeavours** to coordinate any **planned outages** with all affected **transmission customers, distributors or generators**.
- 3.2.2 Where possible, **planned outages** should be coordinated to coincide with works planned by affected **transmission customers, distributors or generators**.

3.3 Minimisation of interruptions

- 3.3.1 The **transmission entity** must use its **best endeavours** to minimise the number and duration of any interruption or restriction to **transmission services**, as compared with the level agreed in **connection agreements**.

3.4 Obligation to provide information

- 3.4.1 The **transmission entity** must, on request by a **transmission customer, distributor or generator**, provide a written response within 10 **business days** explaining (to the extent that the available information at that time allows) any interruption or restriction to the provision of **transmission services** to the **transmission customer, distributor or generator**.

4 Design requirements

4.1 Protection

- 4.1.1 A **transmission entity** may require, as a term of a **connection agreement**, that a **transmission customer, distributor or generator** that wishes to:
 - (a) be connected to a **transmission network**; or
 - (b) modify an existing connection with the **transmission network**,
consult with the **transmission entity** concerning the design and equipment selection for all protection functions which are required to coordinate and grade with the **transmission network** in order to minimise interruption or restrictions to **transmission services** due to the operation of those protection functions.
- 4.1.2 The **transmission entity** may require as a term of a **connection agreement** that a **transmission customer, distributor or generator** installs duplicate protection, including batteries, as required by the **National Electricity Rules**.

4.2 Communications

- 4.2.1 A **transmission entity** may require as a term of a **connection agreement** that a **transmission customer, distributor or generator** provides both voice and data communications for the operation and supervision of the **connection point**.

4.3 Protection and control

- 4.3.1 A **transmission entity** may require as a term of a **connection agreement** with a **transmission customer, distributor** or **generator** that protection and control associated with their **connection points** must comply with:
- (a) applicable guidelines issued by the **transmission entity**;
 - (b) the proposed design agreed by the **transmission entity**; and
 - (c) **good electricity industry practice**.

4.4 Testing of third party equipment at connections

- 4.4.1 A **transmission entity** may require as a term of a **connection agreement** with a **transmission customer, distributor** or **generator** that all tests carried out on equipment associated with its **connection points** be undertaken jointly with or under the direction of, the **transmission entity** and, where applicable, in accordance with the **National Electricity Rules**.

4.5 Network maintenance

- 4.5.1 A **transmission entity** must ensure that, where maintenance is carried out in substations that form part of the **transmission system**, adequate precautions are taken in accordance with **good electricity industry practice** to:
- (a) ensure that the equipment to be maintained is correctly identified, isolated, earthed (where appropriate) and clearly marked; and
 - (b) reduce the possibility of incorrect operation of other plant and equipment which could result in interruptions to **transmission services**.
- 4.5.2 On the completion of maintenance the **transmission entity** must take the same precautions to ensure that the equipment is adequately tested prior to its return to service.

4.6 Network modification

- 4.6.1 A **transmission entity** may require, as a term of a **connection agreement**, that:
- (a) a **transmission customer, distributor** or **generator** does not modify any control or protection devices relating to a **connection point** without the prior agreement of the **transmission entity**;
 - (b) where such changes are made, the relevant entity records and documents the design changes and provides a copy to the **transmission entity**.

4.7 Network equipment performance

- 4.7.1 A **transmission entity** must not operate its **transmission system** beyond the design rating for that **transmission system**.

4.8 Network equipment inspections and tests

- 4.8.1 A **transmission entity** must inspect and test its **transmission system**:
- (a) in accordance with the manufacturer's requirements and **good electricity industry practice**; and
 - (b) to ensure that its **transmission system** is operating safely and within the requirements of the **National Electricity Rules** or as specified in any **connection agreement**.

5 Technical requirements

5.1 Good electricity industry practice

- 5.1.1 A **transmission entity** must observe **good electricity industry practice** for the planning, design, construction, maintenance and operation of its **transmission system**.

5.2 General requirements

- 5.2.1 In relation to the rating, design, erection, maintenance and operation of aerial lines, underground lines, substations and earthing systems, in addition to the requirements of the **Act** (and the regulations) and the **National Electricity Rules**, a **transmission entity** must ensure that the **transmission system** and all its components are designed, constructed, operated and maintained in accordance with:
- (a) standards set out in **connection agreements**, or agreed with or prescribed by the **Commission**; or
 - (b) where no standards have been agreed or prescribed under clause 5.2.1(a), all applicable and relevant industry guidelines, International Electrotechnical Commission standards, **Australian Standards** and telecommunication requirements.

5.3 System compatibility

- 5.3.1 A **transmission entity** must ensure that its **transmission system**, and any extensions to its **transmission system**, are designed to be compatible with the existing South Australian electricity network including but not limited to:
- (a) voltages and frequency;
 - (b) relevant **Australian Standards** and industry guidelines;
 - (c) **transformer** vector group connection;
 - (d) voltage phase displacements to allow parallel operation;
 - (e) protection coordination with the network to which it is connected;
 - (f) earthing systems;
 - (g) fault levels;
 - (h) power factors;

- (i) ground clearances; and
- (j) **National Electricity Rules** requirements.

5.4 Design standards

- 5.4.1 A **transmission entity** may refuse to connect, or energise a connection of, a **transmission customer, distributor, or generator** if that connection is not correctly protected or is not within the design rating of the **transmission system**.
- 5.4.2 A **transmission entity** may disconnect a **transmission customer, distributor, or generator** where that person fails to comply with:
 - (a) the design standards set out in the **transmission customer's, distributor's or generator's connection agreement**;
 - (b) where a **connection agreement** does not set out any design standards, recognised design standards of high voltage equipment in relation to design, installation clearances and provision of safe operating and maintenance procedures;
 - (c) the requirements of the **National Electricity Rules** in relation to those design standards.

6 General requirements

6.1 Power system incident reporting

- 6.1.1 A **transmission entity** must collect information and report on **power system incidents** relating to its **transmission system** in accordance with, and within the times required by the **Commission** from time to time.
- 6.1.2 A **transmission entity** must review each **power system incident** relating to its **transmission system** in accordance with guidelines published by the **Commission** with a view to determining the cause of the **power system incidents** and minimising similar future occurrences.

6.2 Switching manual

- 6.2.1 Each **transmission entity, system controller, generator and distributor** must, to the extent requested by the **Commission**, coordinate and assist with the development of, and amendments to, a switching manual for the safe operation of:
 - (a) the **transmission system and distribution system**, and any connection to or between those systems; and
 - (b) where applicable, equipment belonging to a **transmission customer or generator**.
- 6.2.2 The switching manual must be approved by the **Commission**.
- 6.2.3 The switching manual, and any amendments to the switching manual, come into force when approved by the **Commission**, and must be complied with by each of the entities referred to in clause 6.2.1.

- 6.2.4 Each entity must ensure that any person with whom it establishes a **connection agreement**, or an agreement to carry out work to which the switching manual relates, will be contractually bound to comply with that entity's internal switching manual.
- 6.2.5 An **electricity entity** must report quarterly to the **Commission**, 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**

6.3 Planning approvals and easement acquisition

- 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 agreed maximum demand** prior to changes in **forecast agreed maximum demand** causing a breach of the reliability standards specified in this industry code so as to ensure that the **transmission entity** is in a position to meet its obligations.

6.4 Network options and security

- 6.4.1 Where the most economically feasible option to meet the minimum reliability standards of clauses 2.5 to 2.9 relies on a combination of transmission, sub-transmission and distribution services, the **transmission entity** must ensure that the reliability standard required by that category is capable of being delivered to the **exit points** within that category, including for any contingency events that the category requires for that reliability category.
- 6.4.2 Where a **distributor** is required, in accordance with the **National Electricity Rules**, to extend or augment its **distribution system** associated with a **transmission entity's** obligations under clause 6.4.1, the **distributor** must undertake that work in a timeframe which will enable the **transmission entity** to achieve the required reliability standard at an **exit point**.
- 6.4.3 A **transmission entity** that provides **equivalent transmission line capacity** or **equivalent transformer capacity** for the purposes of clause 2 of this industry code must consider network plant failures in any National Electricity Market region, including **distribution systems**, where such plant failures might impact on the applicable level of redundancy or reliability.
- 6.4.4 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.

7 Access to sites

7.1 Rights of site entry for electricity entities

- 7.1.1 Each **site occupier** must enter into an agreement with an **electricity entity** (or include provisions in its **connection agreement** with that **electricity entity**) allowing the **electricity entity** access to the **site occupier's transmission system, distribution system** or generation assets (as the case may be) for purposes of the **electricity entity** to operate and maintain properly its **transmission system, distribution system** or generation assets (as the case may be).
- 7.1.2 The access must be on terms agreed between the parties or, failing agreement, on terms determined by the **Commission**, dealing with matters such as:
- (a) the times during which entry will be allowed (which must at least include normal working hours, with reasonable prior notice);
 - (b) rights of entry to be granted at any time in cases of **emergency**;
 - (c) requiring that the **electricity entity** complies with any **applicable laws** or reasonable rules of the **site occupier** relating to occupational health and safety;
 - (d) ensuring that the **electricity entity** complies with any reasonable rules or requirements of the **site occupier** relating to operating procedures and security;
 - (e) requiring that the **electricity entity** maintain its equipment or assets so that they operate safely;
 - (f) the liability of the **electricity entity** to the **site occupier** for any direct physical loss it suffers caused by the **electricity entity** (or its assets or equipment located on the site);
 - (g) the liability of the **site occupier** to the **electricity entity** for any direct physical loss it suffers in relation to its equipment or assets situated on the **site occupier's** site, that are caused by the **site occupier**; and
 - (h) the preconditions that must be satisfied by the **electricity entity** before it will be allowed access to the relevant site or electricity infrastructure.

7.2 Disputes

- 7.2.1 Any dispute relating to the granting of access contemplated by clause 7.1, or the terms of such access, shall be submitted to the dispute resolution procedures prescribed in industry codes issued by the **Commission** from time to time.

8 Telecommunications access

8.1 Access to the network

- 8.1.1 A **transmission entity** and **distributor** must make an offer to a person requesting rights to use or have access to its **transmission system** or **distribution system** (as the case may be) for telecommunications purposes, having regard to matters including:
- (a) the technical feasibility of the entity granting such access to its **transmission system** or **distribution system**; and
 - (b) the preservation of visual amenity, given the surroundings and environment in which the relevant part of the **transmission system** or **distribution system** is located;
 - (c) whether or not it would be uneconomical for the person requesting access to develop another facility to provide the telecommunications service requested;
 - (d) whether or not access can be provided without:
 - i. undue risk to human health or safety;
 - ii. undue risk to the safety of property;
 - iii. adversely affecting the safety or performance of the **transmission system** or **distribution system**;
 - iv. adversely affecting any **customers** or entities connected to those systems;
- 8.1.2 the matters set out in clause 8.2; and
- 8.1.3 the person requesting access agreeing in writing with the **transmission entity** or **distributor** that any dispute relating to the granting of such access be submitted to arbitration in accordance with clause 8.2(e) or such other arbitration procedures prescribed in industry codes issued by the **Commission** from time to time.

8.2 Terms of access

- (a) The offer by the **transmission entity** or **distributor** for the purposes of clause 8.1 must be on reasonable commercial terms, having regard to:
- (b) the significance of the request for access to **transmission system** or **distribution system**, given the nature and scope of the telecommunications purpose for which access is requested;
- (c) the capital and operational costs of the **transmission system** or **distribution system**;
- (d) the rate of return expected to be earned by the **transmission entity** or **distributor** (as the case may be) in relation to access for telecommunications purposes;
- (e) the **transmission entity's** or **distributor's** actual or anticipated use of its own system for telecommunications purposes.

8.3 Arbitration

- 8.3.1 If a dispute arises under or in connection with:
- (a) the granting of access contemplated by clause 8.1;
 - (b) the terms on which such access is offered,
- a party to the dispute may, by notice in writing to each of the other parties to the dispute, refer the matter to arbitration.
- 8.3.2 The parties must, within 20 **business days** after receipt of a notice under paragraph 8.3.1, agree on the nomination of an arbitrator. If the parties fail to agree on the nomination of an arbitrator within this time, a party to the dispute may, by notice in writing to the **Commission** and each other party to the dispute, request the **Commission** to nominate an arbitrator.
- 8.3.3 The arbitration will be conducted in accordance with the Commercial Arbitration Act 1996 and the Institute of Arbitrators, Australia Rules for the conduct of Commercial Arbitration.

9 Emergencies

9.1 Emergency disconnection

- 9.1.1 Notwithstanding any other clause in this industry code, a **transmission entity** may disconnect, interrupt or limit the provision of **transmission services** at one or more **connection points** in the case of an **emergency**.
- 9.1.2 Where a **transmission entity** exercises its rights under clause 9.1.1, the **transmission entity** must:
- (a) provide, by way of its 24 hour **emergency** service, information on the nature of the **emergency** and an estimate of the time when **transmission services** will be available; and
 - (b) use its **best endeavours** to restore **transmission services** to a **transmission customer, distributor or generator** once the **emergency** condition has passed.

9.2 Emergency provisions of other Acts

- 9.2.1 Nothing in this industry code prevents the **transmission entity** from exercising any power, or obligation to comply with any direction, order or requirement under the Emergency Powers Act 1941, Essential Services Act 1981, State Disaster Act 1980 or the State Emergency Services Act 1987 or other relevant legislation.

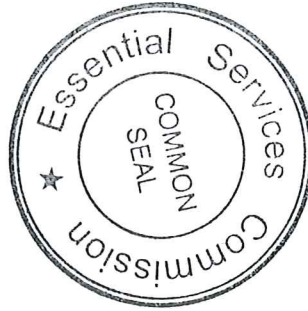
9.3 Health and safety

- 9.3.1 Notwithstanding any other clause of this industry code, a **transmission entity** may disconnect, interrupt or limit the provision of **transmission services** to a **connection point** for reasons of health or safety, provided it follows the procedures in clause 9.3.2.

- 9.3.2 Except in the case of an **emergency**, or where relevant regulations require it, a **transmission entity** must not disconnect a **connection point** for a health or safety reason unless the **transmission entity** has:
- (a) given the affected **transmission customer, distributor** or **generator** written notice of the reason; and
 - (b) where the threat to health or safety is due to:
 - i. a **transmission entity's transmission system**, given each affected **transmission customer, distributor** or **generator** 5 **business days'** prior notice;
 - ii. a **transmission customer, distributor** or **generator**, allowed the relevant person 5 **business days** to remove the threat to health or safety (the 5 **business days** shall be counted from the date of receipt of the notice).

This Industry Code was made by the Commission on 15 September 2016 pursuant to Part 4 of the Essential Services Commission Act 2002, to take effect from 1 July 2018.

The COMMON SEAL of)
the ESSENTIAL)
SERVICES COMMISSION)
of South Australia was)
hereunto affixed by)
authority of the)
ESSENTIAL SERVICES)
COMMISSION and in the)
presence of:



Brett Rowse

Commissioner

15 September 2016

Date



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