



2018 review of the Electricity Transmission Code

DRAFT Decision

April 2018

Request for submissions

The Essential Services Commission (**Commission**) invites written submissions on this paper by **2 June 2018**.

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

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Glossary of terms

Commission	Essential Services Commission, established under the Essential Services Commission Act 2002
Code	Electricity Transmission Code
ElectraNet	ElectraNet Pty Ltd
Electricity Act	Electricity Act 1996 (SA)
Regulations	Electricity (General) Regulations 2012 (SA)
ESC Act	Essential Services Commission Act 2002 (SA)
NER	National Electricity Rules
TNSP	Transmission Network Service Provider

1 Executive summary

The Essential Services Commission (**Commission**) is reviewing and publicly consulting on proposed amendments to the Electricity Transmission Code (**Code**). The review will clarify the existing provisions of the Code and make consequential changes to reflect legislative amendments.

The proposals, the need for which has been identified through practical experience and separate reviews by the Commission, do not impact or change the existing operation of the Code – they are for clarity and simplification only.

1.1 Background

The Code applies primarily to ElectraNet Pty Ltd (**ElectraNet**),¹ South Australia's major electricity transmission network business. The Commission last reviewed the Code in 2016 and set the transmission network planning and reliability standards to apply from 1 July 2018, the start of the next five-year regulatory period for ElectraNet.

However, matters have arisen since that previous review that have led the Commission to commence a targeted review of the Code. Specifically, the review aims to address the following issues:

- ▶ Clarification of the expression of the reliability standards (but no practical change to the operation of those standards) that apply to transmission exit points where there are two supply sources and the back-up source is non-firm (the 'category 3' exit points at Port Lincoln and Snuggery Rural).²
- ▶ Application of reliability standards to customers that receive negotiated transmission services, such as grid-scale batteries.
- ▶ Suspension of the restoration targets during times where it is unsafe for employees or contractors of ElectraNet to restore transmission services, or where it is otherwise not possible to restore transmission services due to circumstances outside ElectraNet's control.
- ▶ The removal of Code obligations that are now redundant, given recent legislative changes.
- ▶ Other minor clarifications, to improve readability.

1.2 Restoration standards and network availability at Port Lincoln and Snuggery Rural

The Commission proposes to clarify the category 3 reliability standards in relation to the obligation for ElectraNet to restore transmission services in the event of an interruption to the transmission line at Port Lincoln or Snuggery Rural.

The Code imposes an obligation for the back-up supply to operate within one hour of a transmission line failure. It also requires ElectraNet to provide 95 percent availability for its back-up supply. These two obligations are intended to operate together, to recognise that there will be occasions when one-hour restoration of transmission services is not possible (due to unavailability of network support).

¹ The Code also applies to the Murraylink Transmission Company. However, the exit point reliability standards under the Code apply only to ElectraNet.

² "Non-firm" means there is a time lag between a failure of a transmission line or transformer at an exit point and the commencement of operation of the redundant asset (such as a back-up generator). That time lag leads to the loss of transmission services for customers connected to the exit point, until such time as the back-up supply is operational.

The Commission has found that expressing the obligation in that manner creates practical difficulties. For example, there are practical challenges in measuring 95 percent availability of a back-up source of supply that is on stand-by.

To clarify this matter, the Commission proposes to remove the 95 percent availability obligation for network support and clarify that the one-hour restoration standard is subject to ElectraNet using its best endeavours (as is the case for all other reliability obligations in the Code).

The proposals arose from the Commission's findings in its investigation into ElectraNet's compliance with the Code during the September 2016 state-wide outage.

Given the proposed clarification will adopt the best endeavours standard applied throughout the Code, and to promote increased public accountability from ElectraNet as to its operational practices, the Commission also proposes to require ElectraNet to report on how it will use its best endeavours to meet the reliability standards under the Code (including the amended category 3 one-hour restoration standard).

The purpose of the report is to demonstrate that ElectraNet is planning, maintaining and operating its transmission assets in accordance with good industry practice and has a plan to use all reasonable efforts to restore transmission services as quickly as possible in the event of an outage.

1.3 Application of the reliability standards to entities receiving negotiated services, such as grid-scale batteries

The Commission proposes to insert a new clause into the Code to clarify that the reliability standards in the Code apply only to those exit points that receive prescribed transmission services, as defined under the National Electricity Rules. In practice, this clarifies that any connection point that receives a negotiated transmission service, such as a grid-scale battery, is not subject to the reliability standards. This is consistent with the intent of the Code, which sets reliability standards only for those customers that pay regulated transmission use of system charges; customers paying negotiated charges are subject to negotiated service levels (within the negotiation framework arising under the National Electricity Rules).

1.4 Suspension of restoration targets where it is unsafe or not possible to restore transmission services due to circumstances outside ElectraNet's control

The Code does not currently address situations when unplanned interruptions to transmission services outside of ElectraNet's control occur and it is not possible or safe to restore those services – other than the situation of declared emergencies. The absence of such a provision is inconsistent with the intent of the Code, which is to impose consumer protection obligations only where ElectraNet can reasonably and safely meet them.

1.5 Updating the Code to reflect recent amendments to the Electricity Act 1996 and Electricity (General) Regulations 2012

Recent changes to the Electricity Act and Regulations have resulted in the transfer of regulatory responsibilities relating to high voltage switching manuals from the Commission to the Technical Regulator. Accordingly, the Commission proposes to remove obligations regarding switching manuals from the Code. Requirements in relation to switching manuals will be administered and enforced by the Technical Regulator.

1.6 Further Clarifications

The Commission also proposes other minor modifications to the Code, to improve the readability of the document, provide clearer language and align definitions with the National Electricity Rules where applicable.

1.7 Next Steps

The Commission invites written submissions on this draft decision by 2 June 2018. To facilitate the provision of submissions or address any queries, the Commission would be pleased to meet with stakeholders for a briefing upon request.

It is preferred submissions are sent electronically to: escosa@escosa.sa.gov.au

Alternatively, submissions can be sent to:

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2 The review

2.1 Purpose of the Code

The Electricity Transmission Code (**Code**) sets the planning and restoration standards for the provision of electricity transmission services in South Australia. It provides transmission customers with certainty about the level of reliability of supply that must be provided through transmission networks, recognising that the benefits of highly reliable transmission services must be traded off against the costs of providing them.

It does not regulate the reliability of other electricity infrastructure needed to supply electricity to customers, which is addressed through other regulatory instruments, such as the Electricity Distribution Code.³

As a condition of its licence, ElectraNet Pty Ltd (**ElectraNet**) is required to comply with the Code, which is an industry code made by the Essential Services Commission (**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,⁴ 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 industry (for example, a system control role in this State), those functions are regulated outside of the scope of the transmission licence and the Code.

2.2 Scope of the review

The review has arisen from practical experience in administration of the Code as well as events subsequent to the last major Code review, completed in August 2016. In particular:

- ▶ The Commission undertook a review of compliance by ElectraNet with the Code, following the September 2016 state-wide outage, and found that there is a need to clarify the expression of the category 3 exit point reliability standard (specifically as it relates to the generators at Port Lincoln).

³ The Electricity Distribution Code is available on the Commission's website at <http://www.escosa.sa.gov.au/ArticleDocuments/1198/20180116-Electricity-DistributionCode-EDC-12.1.pdf.aspx?Embed=Y>.

⁴ Murraylink Transmission Company is 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.

- ▶ ElectraNet and AGL are progressing the connection of a grid-scale battery at Dalrymple and ElectraNet has queried the application of the reliability standards in the Code in respect of the transmission services to be provided to the battery. Given the growth in battery technology and likely future connections, the Commission proposes to clarify generally the operation of the Code in to such operations.
- ▶ The Electricity Act 1996 and Electricity (General) Regulations 2012 were amended in 2017, transferring regulatory responsibilities in relation to switching manuals from the Commission to the Technical Regulator. Accordingly, the Code provisions dealing with switching manuals need to be removed (the relevant provisions are now reflected in the regulations and can be removed from the Code).

In addition to addressing the matters above, the Commission is proposing minor editorial and drafting amendments to the Code, to improve clarity and readability (while maintaining the intent and application of any revised provisions).

This review is targeted to the matters described above and is not a review at large: its primary purpose is to clarify existing obligations. A broader review of the Code, which would extend to its substantive provisions, will commence in 2020 (with a view to any revisions taking effect from 1 July 2023).

3 Proposed Code amendments

The proposed drafting amendments to the Code are intended to clarify existing obligations that ElectraNet must meet. They relate to:

- ▶ the reliability standards that apply to transmission exit points where there are two supply sources and the back-up source is non-firm (the 'category 3' exit points at Port Lincoln and Snuggery Rural)
- ▶ application of the reliability standards in the Code to customers that receive negotiated transmission services, such as grid-scale batteries
- ▶ suspension of the restoration targets during times that it is unsafe to restore transmission services, or where the interruption is due to circumstances outside ElectraNet's control
- ▶ Code obligations that are now redundant, given recent legislative changes, and
- ▶ other minor clarifications, to improve readability of the Code.

3.1 Reliability standards at Port Lincoln and Snuggery

The Commission proposes to clarify that the existing obligation for ElectraNet to restore transmission services within one hour in the event of an interruption at the Port Lincoln or Snuggery exit points, operates on a best endeavours basis. The Commission proposes to amend clause 2.8.1 of the Code as follows⁵:

In respect of Category 3 **exit points**, a **transmission entity** must, subject to clause 2.8.2:

- (a) provide **"N-1" equivalent line capacity** for at least 100% **percent** 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 for the exit point**, use its **best endeavours** to restore **"N-1" equivalent line capacity at the exit point** as soon as practicable;
 - ii. in the event of an interruption **to the provision of prescribed transmission services at the exit point** arising from the failure of the installed **transmission lines** or **network support arrangements at the exit point**, use **best endeavours to restore**:
 - (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

In addition, the Commission proposes to remove clause 2.12.1 of the Code, which sets requirements in relation to agreed maximum demand and the availability of network support arrangements when called into service, such as those in place at Port Lincoln and Snuggery Rural. As discussed in section 3.1.1.2 below, those requirements do not add to the planning and restoration targets already set by the Code and, in the context of a compliance assessment, give rise to some ambiguity.

3.1.1 Reasons for proposals

The Commission aims to set reliability standards that strike an appropriate balance between reliability and cost, to ensure that customers pay low and justifiable prices for transmission services. Each

⁵ Words and phrases appearing in bold like **this** throughout this draft decision are terms that are defined in clause 1.5 of the Code.

category in the Code provides different levels of reliability that take into account different levels of costs and benefits.

3.1.1.1 Category 3 restoration standard current approach

Category 3 is designed to provide N-1 redundancy but through a non-continuous (or non-firm) network support arrangement.⁶ The value of customer reliability at a Category 3 exit point is high enough to justify a reliability level higher than a Category 2 standard but it is not cost effective to receive a Category 4 level of redundancy (continuous N-1 supply). Therefore, a non-continuous N-1 standard is the most economically efficient outcome for those exit points.

The Category 3 restoration standard requires ElectraNet to restore transmission services within one hour of the commencement of an interruption to those services. The one-hour standard is designed to allow sufficient time for the back-up support to be operational (for example, for the network support generators at Port Lincoln to start).

The one-hour restoration of transmission services standard must be read in conjunction with a separate Code obligation, requiring 95 percent availability of network support (see clause 2.12.1 of TC09). Reading those two requirements together makes it clear that there will be times when ElectraNet is unable to meet the one-hour restoration of transmission services target, that is, when the network support is unavailable.

The Commission is of the view that the expression of the clauses could be made clearer in the following respects:

- ▶ What are the obligations if a line fails and the backup is not operating within one hour? What is the obligation thereafter?
- ▶ How does the one-hour restoration target operate alongside the 95 percent availability standard?
- ▶ How is the 95 percent availability standard calculated – is it time based or calculated only on the times it is called upon (number of starts)?

The Commission has always expected that the back-up transmission services support will operate within an hour in the normal course of events (not immediately, on the basis that the network support is non-firm as explained above).

However, that intent has also accommodated instances that are outside of normal network operations, where a one-hour standard cannot be met. This is achieved through the operation of the 95 percent availability standard for network support. In such circumstances, ElectraNet is still considered compliant with the Code.

However, experience has demonstrated that the interaction between the restoration standard and the 95 percent availability standard for network support leads to confusion as to the intent to restore transmission services.⁷ Further, there are two methods of measuring availability – a time based standard, or by the number of successful uses (starts in the case of generators) – neither of which is currently specified as the appropriate test.

If the availability standard is based on time rather than number of start-ups, ElectraNet would have up to 18 days to bring the network support into operation in the event of an interruption to transmission

⁶ “Non-firm” means there is a time lag between a failure of a transmission line or transformer at an exit point and the commencement of operation of the redundant asset (such as a back-up generator). That time lag leads to the loss of supply for customers connected to the exit point, until such time as the back-up supply is operational.

⁷ Essential Services Commission, Transmission Licence Compliance Review - ElectraNet Pty Ltd: 28 September 2016 state-wide power system outage, chapter 6 – Restoration of Port Lincoln, June 2017

services. Given the one hour restoration of transmission services standard, this is excessive and not in the consumers' interests.

If the availability standard is measured by the number of start-ups, its application in practice is impractical, as there are very few start-ups of the Port Lincoln generators on an annual basis.⁸

In general, it is difficult to ascertain the availability of an asset that is not operating unless called upon. ElectraNet cannot guarantee that the network support is capable of meeting demand unless it is operating.

Having regard to those practical difficulties, the Commission proposes to remove the 95 percent availability standard in favour of an alternative expression of the category 3 standard as explained below.

3.1.1.2 Proposed amendment to Category 3 restoration standard

Returning to the intent of the reliability standards under the Code, there is an overarching expectation that ElectraNet plans, maintains and operates its transmission assets in accordance with good industry practice and provides all reasonable efforts to restore transmission services as quickly as possible in the event of an interruption to those services.

This intent is reflected through the application of the 'best endeavours' standards that generally apply throughout the Code. 'Best endeavours' is a high legal standard, which requires ElectraNet to act in good faith and use all reasonable efforts, skills and resources to satisfy the standards.

While there are some standards that are not subject to best endeavours and are mandated, for example, transformer replacement standards, the additional costs of meeting those standards (relative to a best endeavours standard) were explicitly considered against the reliability outcomes those standards achieve at the time they were set.

For example, the category 3 reliability standard is not expressed on a 'mandatory' basis, as the cost of such a higher standard would exceed the benefits.

Of note, all of the other reliability standards within the Code are expressed in a non-mandatory manner – they have 'best endeavours' restoration of transmission services requirements. Category 3 only has the 'blended' standard in order to recognise the actual network support arrangements in place (the generators); for other exit points the Code makes no assumptions about the nature or presence of any particular form of network support.

As explained previously, while the current 'one-hour restoration of transmission services' element of the standard is expressed in a mandatory sense, it must be read together with the 95 percent availability standard, which provides for circumstances in which it is unreasonable to expect restoration of prescribed transmission services within an hour. This means that the overall standard for category 3 is not in practical effect mandatory – it is subject to the less prescriptive (and arguably vague) 95 percent availability requirements as explained above.

To express the standard in an entirely mandatory way would make this standard different to all others in the Code and would require ElectraNet to meet the standard at all times – regardless of the cost. As explained at the outset, there is no current economic justification for such a standard at this time, as it would result in consumers paying more than they ought to having regard to the value of supply.

Were the 95 percent availability requirement to be removed, the category 3 restoration standard needs to be modified in some way to account for the times where ElectraNet is unable to restore prescribed transmission services within one hour. Changing the current one-hour requirement to a best

⁸ Essential Services Commission, Electricity Transmission Code review, September 2016, page 11

endeavours obligation – as is the case for the other relevant reliability standards in the Code – would achieve that intent, and would be consistent with the operation of the reliability standards generally.

It should be noted that reliability standards for other categories impose not just a best endeavours restoration target but also an additional (longer) target to restore transmission services ‘in any event.’ Those standards provide a maximum timeframe for restorations that must be achieved, regardless of the circumstances. That is, an upper limit for ‘best endeavours’ is set (for example, Category 1 equivalent line restoration). The Commission does not propose to introduce a maximum timeframe for category 3 and instead will amend clause 2.1.1 of the Code to clarify that the reliability standards:

...include, without limitation, a requirement that the transmission entity must have regard to...the need to minimise the duration of any interruption to the provision of prescribed transmission services at the relevant exit point arising from that failure.

This approach overcomes the practical difficulty in defining a maximum timeframe for the operation of the current generation network support arrangements, while still placing a positive obligation on ElectraNet to restore transmission services as quickly as possible, even if it has not met the one-hour target due to reasons outside of its control.

The change in the category 3 standard is not a changing or lessening of consumer protection. Rather, it addresses the ambiguity of the existing standard and provides clearer obligations to ElectraNet and a clearer framework for monitoring and enforcing compliance.

However, to provide stakeholders confidence that the change in the standard does not lead to a worsening of service, the Commission proposes to require ElectraNet to make available a report, publicly and to the Commission, explaining how it will use its best endeavours to meet the reliability standards under the Code, including the category 3 one-hour restoration standard.

It will be required to demonstrate that it is planning, maintaining and operating its transmission assets in accordance with good industry practice and has a plan to use all reasonable efforts to restore transmission services as quickly as possible, in the event of an outage.

The Commission will also require ElectraNet to report information about the operation of its network support to ensure that it is operating as expected under normal conditions when called upon. It will utilise data already provided by ElectraNet to AEMO for that purpose, minimising the reporting burden. This is discussed in section four of this decision paper.

3.2 Application of the service standards to entities receiving negotiated services or prescribed services

The Commission proposes to introduce a new Code provision (clause 2.5.2) to clarify that the reliability standards only apply to customers that receive a prescribed transmission service. Further, clause 2.13 will be clarified so that only new exit points which provide a prescribed transmission service need to be submitted to the Commission for the purpose of approving reliability standards for those exit points.

3.2.1 Reasons for proposals

In its 2016 review of the Code, the Commission clarified that the reliability standards that applied to direct-connect customers⁹ only applied to the extent that the customer receives a prescribed transmission service as defined under the National Electricity Rules.¹⁰

⁹ A direct-connect customer is someone that is not a distributor but imports electricity from the transmission network

¹⁰ Essential Services Commission, *Electricity Transmission Code Review: Final Decision*, September 2016, page 26 (available at <http://www.escosa.sa.gov.au/ArticleDocuments/1020/20160922-Electricity-TransmissionCodeReview-FinalDecision.pdf.aspx?Embed=Y>)

Since the 2016 Code review, a grid-scale battery at Dalrymple has been announced, which is to be connected to the transmission network. Batteries, which are functionally a generating system with no firm access rights under the NER, are now being installed within the network.

The application of the reliability standards under the Code to grid-scale batteries is unclear, particularly as there are times where the battery imports energy, similar to a customer. If the standards were to apply to batteries, ElectraNet would need to provide firm access rights¹¹ to the battery and any associated network augmentation costs would be passed on to all customers. This would be inconsistent with the national market rules, where batteries are intended to be operated as a centrally dispatched generator and have non-firm access rights (they can be constrained by the market operator). It is not the intention that ElectraNet should be required to meet the Code's reliability standards for battery connections nor that customers should face those costs through transmission service charges.

Although there is a note in the table under clause 2.5.1 of the Code that indicates which exit points the transmission service reliability standards apply to, the Code could be made clearer on the application of those standards to various types of exit points, including battery connection points. To address this issue, the Commission proposes to remove the current note and add a new clause (clause 2.5.2), to make it explicit that the reliability standards are for exit points that receive a prescribed transmission service, as defined under the NER.

In addition, to clarify the application of the reliability standards to any new grid scale batteries, the Commission proposes to amend clause 2.13 of the Code to clarify that ElectraNet only needs to submit reliability standards for a new exit point where that exit point receives prescribed transmission services. Any new battery that receives negotiated transmission services¹² will not be subject to the reliability standards, consistent with the application of the Code to other exit points.

3.3 Suspension of timeframes for restoring prescribed transmission services

To provide further clarification around restoration of transmission service requirements, the Commission proposes to insert new clauses (9.2.1 and 9.2.2) into the Code, to address circumstances where an interruption to prescribed transmission services cannot be restored within applicable timeframes for reasons outside ElectraNet's control or because safety is compromised.

The proposed new clauses are as follows:

- 9.2.1 Notwithstanding any other clause of this industry code:
- (a) If an interruption to the provision of **prescribed transmission services** at one or more **exit points** is caused by or arises from one or more events or circumstances that are outside of the reasonable control of a **transmission entity** (which does not include events or circumstances that arise from a breach of this code, or a negligent act, by the **transmission entity**); and
 - (b) the **transmission entity** is prevented from restoring that interruption by the events or circumstances that are outside of the reasonable control of the **transmission entity**; or

¹¹ This is the guaranteed capacity the TNSP can provide to the customer seeking access

¹² As this term is defined in the rules

- (c) if the **transmission entity** took steps to restore, or to seek to restore, that interruption during or following the events or circumstances, those steps would, or would be likely to, result in a serious risk to the health or safety of any person (including a serious risk to the health or safety of any employee or contractor of the **transmission entity**),

the period of time during which (as applicable) the **transmission entity** is so prevented or the serious risk to the health or safety of that person continues to exist (such time to be satisfactorily recorded by the **transmission entity**), will not be taken into account in determining whether the **transmission entity** has satisfied the reliability standards specified in clauses 2.6 to 2.10 of this industry code.

- 9.2.2 The **transmission entity** must give prompt notice of the events or circumstances to affected **customers** and the **Commission**, including details of the events or circumstances, an estimate of likely duration of the interruption to the provision of **prescribed transmission services** at one or more **connection points**, the extent to which its restoration obligations are or are likely to be affected and the steps taken to remove, overcome or minimise those effects.

3.3.1 Reasons for proposals

There are provisions in the Code (clauses 3.1.2, 9.1, 9.3 and 9.4) which may be invoked in certain circumstances and which result in the restoration standards specified in clause 2 ceasing to apply for a period of time. Those clauses relate to the operation of system protection systems, ElectraNet-imposed disconnections during emergencies and statutory powers to disconnect under other legislation or for health and safety reasons.

Notwithstanding the inclusion of these clauses in the Code, the Code does not currently address a situation where an unplanned interruption to prescribed transmission services occurs, which is outside of ElectraNet's reasonable control or mitigation, and following which, restoration or attempted restoration of transmission services could compromise the health and safety of a person.

The absence of such a provision is inconsistent with the intent of the Code (and how, in practice, it has been interpreted and implemented), which is to require the satisfaction of restoration standards where ElectraNet can reasonably achieve them and where it is appropriately safe for it to do so.

However, such a provision should not be utilised as a means to lessen the restoration standards that currently apply to ElectraNet without risk of regulatory consequence. Accordingly, the new provisions can only be invoked in limited situations.

The table below outlines the situations where the clause may be invoked, the impact that situation must have and the consequential effect on restoration times.

Situation	Impact	Restoration times
Event or circumstance occurs that is outside of ElectraNet's reasonable control. *	ElectraNet is unable to restore prescribed transmission services.	The period of time ElectraNet is unable to restore prescribed transmission services is not taken into account in determining whether ElectraNet has satisfied the restoration standard applicable to the relevant exit point.
Event or circumstance occurs that is outside of ElectraNet's reasonable control.	If steps were taken to restore prescribed transmission services there would be, or would likely be, a serious risk** to the health or safety of any person (including an employee or contractor of ElectraNet).	The period of time the serious risk to the health and safety of a person exists is not taken into account in determining whether ElectraNet has satisfied the restoration standard applicable to the relevant exit point.

* An event or circumstance outside of ElectraNet's reasonable control does not include one that arises from a breach of the Code or a negligent act by ElectraNet. Further, it cannot have been reasonably foreseeable or its consequences reasonably prevented.

** A serious risk to health and safety is considered to be one where there is a significant risk of a person obtaining a debilitating injury and, in the case of an employee or contractor of ElectraNet, one that is beyond a 'business as usual' risk for such personnel.

As an example, if an out-of-control fire destroys a transmission element on a line causing an interruption to prescribed transmission services, and it is therefore not safe for ElectraNet personnel to enter the area for 12 hours, the period for which it is unsafe for restoration work to commence (that is, 12 hours) will not be taken into account in determining whether ElectraNet has restored transmission services within the applicable timeframe. Once it is considered safe for personnel to enter the area and commence restoration work, the relevant timeframe for restoring transmission services recommences.

To provide transparency around ElectraNet's actions in these situations, the Commission will require ElectraNet to inform affected customers and the Commission of the situation, including details of the event, the circumstances preventing restoration, the estimated duration of any interruption and the steps to be taken to restore prescribed transmission services.

3.4 Adoption of definitions from the National Electricity Rules

In making industry codes, the Commission takes into account relevant national frameworks and legislation.¹³ In addition, clause 1.8.2 of the Code provides that, if there are any inconsistencies between the Electricity Act (and regulations), the NER and the Code, then the NER and Electricity Act take priority, unless (and to the extent) the Code imposes higher obligations on an entity.

As part of this review, the Commission has considered whether it should replace a number of the existing definitions in the Code (which have been taken from the Electricity Act or developed over time) with definitions from the NER. In principle, the Commission has determined there is benefit in utilising NER terms where appropriate, provided there is no lessening or material change to the consumer protections contained in the Code.

¹³ Section 6 (b)(vii) of the ESC Act requires the Commission to have regard to the need to promote consistency in regulation with other jurisdictions.

The consistency in definitions mitigates the risk of confusion around the interpretation and application of the Code for entities that operate under the national framework and across jurisdictions. This, in turn, should reduce compliance costs.

The NER definitions that the Commission proposes to adopt, along with other ancillary amendments that have been made to improve the readability of particular defined terms, are set out in the table below:

Defined term	Proposed definition	Reasoning
agreed maximum demand	means for a connection point or a group of connection points , is the maximum demand specified as such in the connection agreement between ElectraNet and the relevant transmission customer or SA Power Networks a distributor	Amendment has been made to improve the readability of the defined term.
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 an the transmission electricity entity .	Amendment has been made to ensure consistency with the terms used in clause 7.1.2.
connection asset	has the same meaning as defined in Chapter 10 of the National Electricity Rules.	This definition has been added as this term was previously undefined. The NER definition is considered appropriate in the context of the Code and promotes consistency between the Code and the NER.
connection point	means an agreed point of supply between a transmission entity's transmission network and a transmission customer generator, or distributor .	Amendment has been made to simplify the defined term.
distribution network	has the same meaning as defined in Chapter 10 of the National Electricity Rules. given to that term in the Act	This definition from the NER has been adopted given it aligns with previous definition, does not lessen or impact upon any consumer protections and promotes consistency between the Code and the NER.
distribution system	has the same meaning as defined in Chapter 10 of the National Electricity Rules. given to that term in the Act	This definition from the NER has been adopted given it aligns with previous definition, does not lessen or impact upon any consumer protections and promotes consistency between the Code and the NER.

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 system.assets	Amendment has been made to improve the readability of the defined term.
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.	Amendment has been made to improve the readability of the defined term (by removing the circular wording).
equivalent line capacity	means the capacity to transmit energy to meet agreed maximum demand using any means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements. 	Amendment has been made to improve the readability of the defined term.
equivalent transformer capacity	means the capacity to transform energy to meet agreed maximum demand using any means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements. 	Amendment has been made to improve the readability of the defined term.
forecast agreed maximum demand	means the agreed maximum demand forecast for a given year that is agreed with the transmission customer three years prior to the date upon which when the agreed maximum demand is contracted to commence to apply under the relevant connection agreement .	Amendment has been made to improve the readability of the defined term.
generating system and generating unit	have the same meaning as defined in Chapter 10 of the National Electricity Rules.	These definitions from the NER have been adopted given they do not lessen or impact upon any consumer protections, reflect current industry terminology and promote consistency between the Code and the NER.
group of exit points	means a group of two or more exit points interconnected by a distribution network .	Amendment has been made to improve the readability of the defined term.
maximum demand	has the same meaning as defined in Chapter 10 of the National Electricity Rules.	This definition from the NER has been adopted as this was a previously undefined term and clarifies the definition of agreed maximum demand.

"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 transmission elements are in service (i.e. such that the loss of a single transmission element could cause a supply interruption to some transmission customers .)]	Amendment has been made to improve the readability of the defined term.
"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 transmission element.	Amendment has been made to improve the readability of the defined term.
site occupier	means any transmission entity, distributor, or generator electricity entity that is required by its licence to provide access to its transmission system, distribution system or generating system 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 generating system generation assets (as the case may be).	Amendment has been made to improve the readability of the defined term and pick up newly defined terms.
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 are needed in order to comply with must be capable of supplying the relevant appropriate reliability standard in clause 2.	Amendments made to improve the readability of the defined term.
transmission customer	means a customer that having a connection point with a transmission network that and receives transmission services .	Amendments made to improve the readability of defined term and align it with other NER definitions that have also been adopted.
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 are needed in order to comply with must be capable of supplying the relevant appropriate reliability standard in clause 2.	Amendments made to improve the readability of the defined term.

transmission services	<p>has the same meaning as defined in Chapter 10 of the National Electricity Rules and includes prescribed transmission services. means:</p> <p>in relation to a transmission customer and a distributor, transmission use of system services and exit services; and</p> <p>in relation to a generator, entry services (unless otherwise agreed between the generator and the transmission entity).</p>	<p>This definition from the NER has been adopted given it aligns with the previous definition and reflects current industry terminology. Further, it does not lessen or impact upon any consumer protections and promotes consistency between the Code and the NER.</p>
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3.5 Updates in response to legislative changes

Since the previous Code review in 2016, there have been amendments to the Electricity Act and Regulations. Of relevance to this review is the transfer of all regulatory responsibilities relating to the development, amendment and approval of high voltage switching manuals from the Commission to the Technical Regulator. Accordingly, the Commission proposes to remove obligations regarding switching manuals from the Code given it is no longer responsible for administering them. Requirements in relation to switching manuals will be administered and enforced by the Technical Regulator.

To reflect this transfer in responsibilities, the Commission will remove clause 6.2 from the Code which deals with requirements relating to switching manuals.

3.6 Further clarifications

As part of this review, the Commission has also taken the opportunity to clarify the language of certain provisions in the Code. The amendments have been made to improve readability and consistency throughout the Code and update any outdated references. They do not change the intent or application of any of the provisions of the Code. The additional amendments proposed are set out in the table below.

Clause	Proposed Drafting Amendment	Reasoning
1.1.1	<p>Words and phrases appearing in bold like this are defined in Section clause 1.5. A number of words have the same meaning as defined in Chapter 10 of the National Electricity Rules, which can be accessed at https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current.</p>	<p>Amendment has been made to ensure consistency throughout the code and provide readers with easy access to the glossary contained in the National Electricity Rules.</p>
1.3.3	<p>Nothing in this industry code should be interpreted as requiring specific technological solutions. The requirements of this industry 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 it can be demonstrated that such solutions are prudent and efficient, taking into account the long-term benefit to customers. can be demonstrated to be prudent and efficient, taking into account the long term benefit to consumers.</p>	<p>Amendment has been made to ensure consistency throughout the code and improve the readability of the clause.</p>

1.7.1	<p>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:</p> <p>....</p> <p>(d) any guidelines, industry codes or rules made by the Commission from time to time; and</p> <p>...</p>	Amendment has been made so that the code references other industry codes that may be applicable.
2.1.1	<p>Subject to the service reliability 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.</p>	Amendment made to clarify that the service standards apply to the provision of prescribed transmission services.
2.2.1	<p>The obligation to restore or use best endeavours to restore, a failed transmission line, transformer or network support arrangement, so as to meet the reliability standards specified in this clause 2 includes, without limitation, a requirement that the transmission entity must have regard to:</p> <p>(a) good electricity industry practice;</p> <p>(b) the need to minimise the duration of any interruption to the provision of prescribed transmission services at the relevant exit point arising from that failure; and</p> <p>(c) the need to minimise the likelihood of an interruption to the provision of prescribed transmission services at the exit point 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; and</p> <p>(d) the rights, obligations and processes set out in clause 9.</p>	This clause has been brought forward (from clause 2.9.1 of TC09) to the beginning of clause 2 to highlight the overarching and guiding requirements on a transmission entity in relation to reliability standards.
2.3 (heading)	Transmission network standards and procedures .	Amendment has been made to make the heading consistent with the requirements of the clause.
2.3.4	<p>The transmission entity must act in accordance comply with any applicable guideline published by the Commission, relevant to the transmission entity and with any plan developed by the transmission entity, as required under this industry code.</p>	Amendment has been made to improve readability of the clause and clarify that, for the purposes of the Code, other regulatory instruments may apply to ElectraNet.

2.5.1	The table below categorises allocation of exit points to categories is set out in the table below for the purposes of setting planning and reliability standards under this industry code (exit points in square brackets denote refer to a group of two or more exit points):	Amendment has been made to improve the readability of the clause.
2.5.2	An asterisk denotes an exit point , not being a distribution exit point , which is subject to the reliability standards only to the extent that the exit point is used to provide prescribed transmission services to a transmission customer .	This clause replaces the wording that was attached to the asterisk in the table in clause 2.4. It has been incorporated as a new clause 2.5.2 to improve readability.
2.6.1	<p>In respect of Category 1 exit points, a transmission entity must, subject to clause 2.6.2:</p> <p>(a) provide “N” equivalent line capacity for at least 100% percent of the contracted agreed maximum demand for the exit point; and,</p> <p>(a)(b) in the event of an interruption to the provision of prescribed transmission services at the exit point use its best endeavours to:</p> <p>i. use its best endeavours to restore “N” equivalent line capacity at the exit point as soon as practicable; and</p> <p>ii. in any event, restore “N” equivalent line capacity at the exit point within 2 days of the commencement of the interruption; and</p> <p>(c) provide “N” equivalent transformer capacity for at least 100% percent of contracted the agreed maximum demand for the exit point; and,</p> <p>(b)(d) in the event of an interruption to the provision of prescribed transmission services at the exit point:</p> <p>i. use its best endeavours to restore “N” equivalent transformer capacity at the exit point as soon as practicable; and</p> <p>ii. in any event, restore “N” equivalent transformer capacity at the exit point within 8 days of the commencement of the interruption.</p>	<p>The “best endeavours” wording has been moved, to clarify that the requirement to restore N equivalent line capacity is a best endeavours requirement to the extent that it is restored within 2 days. If it is not restored within 2 days, there will be a breach of clause 2.6.1(b)(ii).</p> <p>Other ancillary amendments have been made to improve readability and ensure consistency with the Code’s defined terms.</p>
2.6.2	A transmission entity may implement an alternative solution or combination of solutions to those described in required by 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.	This amendment has been made to improve readability.
2.7.1	<p>In respect of Category 2 exit points, a transmission entity must, subject to clause 2.7.2:</p> <p>(a) provide “N” equivalent line capacity for at least 100% percent of the contracted agreed maximum demand for the exit point; and,</p>	The “best endeavours” wording has been moved, to clarify that the requirement to restore N equivalent line capacity is a best endeavours requirement to the extent that it is restored within 2 days. If it is not restored within 2 days, there will be a breach of clause 2.7.1(b)(ii).

	<p>(a)(b) in the event of an interruption to the provision of prescribed transmission services at the exit point use its best endeavours to:</p> <p>i. use its best endeavours to restore “N” equivalent line capacity at the exit point as soon as practicable; and</p> <p>ii. in any event, restore “N” equivalent line capacity at the exit point within 2 days of the commencement of the interruption; and</p> <p>(b)(c) provide “N-1” equivalent transformer capacity for the exit point for at least 100% percent of contracted the agreed maximum demand; and:</p> <p>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 at the exit point as soon as practicable;</p> <p>ii. in the event of an interruption to prescribed transmission services arising from a the failure of any the installed transformers or network support arrangements for the exit point:</p> <p>(A) restore at least “N” equivalent transformer capacity at the exit point within 8 days of the commencement of the interruption; and</p> <p>(B) use its best endeavours to restore “N-1” equivalent transformer capacity at the exit point as soon as practicable after the commencement of the interruption</p>	<p>Other ancillary amendments have been made to improve readability and ensure consistency with the Code’s defined terms.</p>
2.7.2	<p>A transmission entity may implement an alternative solution or combination of solutions to those described in required by 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</p>	<p>This amendment has been made to improve readability of clause.</p>
2.8.1	<p>In respect of Category 3 exit points, a transmission entity must, subject to clause 2.8.2:</p> <p>(a) provide “N-1” equivalent line capacity for at least 100% percent of the contracted agreed maximum demand (including through the use of post-contingent operation) and:</p> <p>i. in the event of a failure of any installed transmission line or network support arrangement for the exit point, use its best endeavours to restore “N-1” equivalent line capacity at the exit point as soon as practicable;</p> <p>ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of the any installed transmission lines or network support arrangements for the exit point, use best endeavours to restore:</p>	<p>This amendment has been made to reflect the draft decision in relation to category 3 exit points, as discussed in section 3.1.1.1.</p> <p>Other ancillary amendments have been made to improve readability and ensure consistency with the Code’s defined terms.</p>

	<p>(A) restore at least “N” equivalent line capacity within 1 hour of the commencement of the interruption; and</p> <p>(B) use its best endeavours to restore “N-1” equivalent line capacity as soon as practicable after the commencement of the interruption; and</p> <p>(b) provide “N-1” equivalent transformer capacity for at least 100% percent of contracted agreed maximum demand (including through the use of post-contingent operation) and:</p> <p>i. in the event of a failure of any installed transformer or network support arrangement for the exit point, use its best endeavours to restore “N-1” equivalent transformer capacity at the exit point as soon as practicable;</p> <p>ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of any the installed transformers or network support arrangements for the exit point:</p> <p>(A) restore at least “N” equivalent transformer capacity within 1 hour of the commencement of the interruption; and</p> <p>(B) use its best endeavours to restore “N-1” equivalent transformer capacity as soon as practicable after the commencement of the interruption.</p>	
2.8.2	A transmission entity may implement an alternative solution or combination of solutions to those described in required by 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	Amendment has been made to improve readability of the clause.
2.9.1	<p>(a) provide “N-1” equivalent line capacity for at least 100% percent of the contracted agreed maximum demand and:</p> <p>i. in the event of a failure of any installed transmission line or network support arrangement for the exit point, use its best endeavours to restore “N-1” equivalent line capacity at the exit point as soon as practicable;</p> <p>ii. in the event of an interruption to the provision of prescribed transmission services at the exit point, arising from the failure of any the installed transmission lines or network support arrangements:</p> <p>(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 for that group of exit points within 4 hours of the commencement of the interruption;</p> <p>(B) for all other exit points, use its best endeavours to restore at least “N” equivalent line capacity at the exit</p>	Amendments have been made to improve readability and ensure consistency with the Code’s defined terms.

	<p>point within 12 hours of the commencement of the interruption; and</p> <p>(C) use its best endeavours to restore “N-1” equivalent line capacity for the exit point as soon as practicable after the commencement of the interruption; and</p> <p>(b) provide “N-1” equivalent transformer capacity for at least 100% percent of the contracted agreed maximum demand and:</p> <p>i. in the event of a failure of any installed transformer or network support arrangement for the exit point, use its best endeavours to restore “N-1” equivalent transformer capacity at the exit point as soon as practicable;</p> <p>ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of any the installed transformers or network support arrangements for the exit point:</p> <p>(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 for that group of exit points within 4 hours of the commencement of the interruption;</p> <p>(B) for all other exit points, use its best endeavours to restore at least “N” equivalent transformer capacity at the exit point within 12 hours of the commencement of the interruption; and</p> <p>(C) use its best endeavours to restore “N-1” equivalent transformer capacity at the exit point as soon as practicable after the commencement of the interruption.</p>	
2.9.2	<p>A transmission entity may implement an alternative solution or combination of solutions to those described in required by 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.</p>	<p>Amendment has been made to improve readability of the clause.</p>
2.10.1	<p>Subject to clause 2.10.2, in respect of Category 5 exit points, a transmission entity must, by means of independent and diverse transmission substations:</p> <p>(a) provide “N-1” equivalent line capacity into Adelaide Central for at least 100% percent of the contracted agreed maximum demand for the exit points and:</p> <p>i. in the event of a failure of any installed transmission line or network support arrangement for the exit points, use its best endeavours to restore “N-1” equivalent line capacity at the exit points as soon as practicable;</p>	<p>Amendments have been made to improve readability and ensure consistency with the Code’s defined terms.</p>

	<p>ii. in the event of an interruption to the provision of prescribed transmission services arising from a the failure of any the installed transmission lines or network support arrangements, use its best endeavours to:</p> <p>(A) restore at least 176 MW of equivalent line capacity required by this clause within 4 hours of the commencement of the interruption; and</p> <p>(B) restore "N-1" equivalent line capacity as soon as practicable after the commencement of the interruption.</p> <p>(b) provide "N-1" equivalent transformer capacity into Adelaide Central for at least 100% percent of contracted the agreed maximum demand and:</p> <p>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;</p> <p>ii. in the event of an interruption to the provision of prescribed transmission services arising from a the failure of any the installed transformers or network support arrangements, use its best endeavours to:</p> <p>(A) restore at least 176 MW of equivalent transformer capacity required by this clause within 4 hours of the commencement of the interruption; and</p> <p>(B) restore "N-1" equivalent transformer capacity as soon as practicable after the commencement of the interruption.</p>	
2.10.2	A transmission entity may implement an alternative solution or combination of solutions to those described in required by clause 2.10.1, 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 2.10.1	Amendment has been made to improve readability of the clause.
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:	Amendment has been made to improve readability of the clause and reflect that the definition of forecast agreed maximum demand already captures the relevant time period.
2.11.3	ElectraNet will must 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	Amendments have been made to improve readability and clarify that clause 2.11.3 is a mandatory requirement.
2.12	Contracted agreed maximum demand and n-Network support arrangement requirements	The first part of the clause has been removed to reflect the draft decision in relation to category 3 service standards

	<p>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:</p> <p>(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</p> <p>(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.</p> <p>2.12.1 Where a transmission entity relies on a network support arrangement provided by an independent network support provider to meet a reliability standard under clause 2 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.</p>	<p>arrangements, as discussed in section 3.1.1.2.</p> <p>For clause 2.12.1, amendment has been made to clarify the clause relates to the reliability standards set out in clause 2.</p>
2.13	<p>New connection exit points</p> <p>2.13.1 Where a new connection exit point, which will provide prescribed transmission services, is to be owned and operated by a transmission entity, the transmission entity must submit the applicable reliability standards for that connection exit point to the Commission for approval.</p> <p>2.13.2 Any standards submitted under clause Error! Reference source not found. must be developed having regard to:</p> <p>...</p> <p>(d) the number of customers; and</p> <p>(e) the cost of installation of transmission assets relevant to the connection exit point.</p>	<p>Amendment has been made to clarify that a transmission entity is only required to submit a proposal in relation to applicable reliability standards when a new exit point is proposed (given that reliability standards relate to the provision of prescribed transmission services through exit points).</p> <p>Amendments have also been made to improve readability of the clause and that it also only relates to exit points</p>
2.17.1	<p>A transmission entity must report to the Commission by 31 August each year, concerning matters relating to the reliability standards during the 12 month period ending on 30 June of that year.</p> <p>(a) report on the actual performance with the reliability standards set out in this clause 2</p> <p>(b) provide an explanation of the reason for any non-compliance;</p>	<p>Amendment has been made to improve consistency throughout the Code.</p>

	<p>(c) report on how the transmission entity will continue to meet, or improve its performance so as to meet, the reliability standards set out in this clause 2</p> <p>...</p>	
3.1.1	<p>A transmission entity may, subject to anything contrary in a connection agreement with a transmission customer, distributor or generator, interrupt or restrict transmission services:</p> <p>(a) for the purposes of:</p> <p>i. carrying out testing, commissioning, maintenance or repair of its transmission system on a connection point or any part of the transmission network which can not reasonably be undertaken utilising live-line techniques;</p> <p>...</p>	Amendments have been made to improve consistency with the Code's defined terms.
3.1.2	<p>Nothing in 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 system, network or any connection point</p>	Amendments have been made to improve consistency with the Code's defined terms.
6.2	<p>Clause 6.2, regarding "switching manual" removed.</p>	This clause has been removed to reflect the draft decision regarding changes to the Electricity Act and Regulations in relation to switching manuals, as discussed in section 3.5.
6.2.1	<p>Prior to the date on which the forecast agreed maximum demand at an exit point becomes the agreed maximum demand, a transmission entity must use its best endeavours to:</p> <p>(a) complete all necessary design work,</p> <p>(b) obtain all necessary planning approvals and</p> <p>(c) acquire all necessary land, and</p> <p>(d) acquire all necessary easements.</p> <p>on the basis of the forecast agreed maximum demand for an exit point prior to the date on which that changes in forecast agreed maximum demand will become the agreed maximum demand for that exit point and causing a breach of the service reliability standards specified in this industry code for that exit point so as to ensure that the transmission entity is in a position to meet its obligations.</p>	Amendments have been made to improve readability of the clause and clarify this requirement is separate to requirements relating to reliability standards.
7.1.1	<p>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 generating system generation assets (as the case may be) for purposes of the electricity entity to operate and maintain properly its</p>	Amendments have been made to improve consistency with the Code's defined terms.

	<p>transmission system, distribution system or generating system. generation assets (as the case may be).</p>	
8.1.1 (f)	<p>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:</p> <p>....</p> <p>(f) 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 8.3 or such other arbitration procedures prescribed in industry codes issued by the Commission from time to time.</p>	<p>Amendments have been made to rectify a formatting and clause reference error.</p>
9.1.2	<p>Where a transmission entity exercises, or is exercising, its rights under clause 9.1.1, the transmission entity must:</p> <p>(a) provide, by way of its 24 hour emergency service, information on the nature of the emergency, the impact of the emergency on the provision of transmission services and an estimate of the time when transmission services will be available; and</p> <p>(b) use its best endeavours to fully restore transmission services to a transmission customer, distributor or generator once the emergency condition has passed.</p>	<p>Amendment has been made to clarify that a transmission entity may exercise its right under this clause on multiple occasions during an emergency.</p> <p>Amendment has been made to clarify the information requirements on a transmission entity in these circumstances.</p> <p>Amendment has been made to clarify that transmission services are to be fully restored after an emergency</p>
9.3.1	<p>Nothing in this industry code prevents the transmission entity from</p> <p>(a) exercising any power under, or</p> <p>(b) complying with any obligation to comply with any direction, order or requirement under</p> <p>the Emergency Powers Act 1941Emergency Management Act 2004, Essential Services Act 1981 State Disaster Act 1980 or the Fire and Emergency Services Act 2005State Emergency Services Act 1987 or other relevant legislation.</p>	<p>Amendments have been made to improve readability and update the references to applicable legislation.</p>
9.4.1	<p>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 9.4.2.</p>	<p>Amendments have been made to improve readability of the clause.</p>
9.4.2	<p>Except in the case of an emergency, an interruption arising under clause 9.2 or where relevant regulations require it, a transmission entity must not disconnect, interrupt or limit the provision of transmission services to a connection point for a health or safety reason unless the transmission entity has:</p> <p>...</p>	<p>Amendments have been made to clarify that this clause is subject to clause 9.2.</p>

9.4.2 (b)	<p>....</p> <p>where the threat to health or safety is due to:</p> <ul style="list-style-type: none"> i a transmission entity's transmission system, given each affected transmission customer, distributor or generator 5 business days' prior notice; or 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). 	Amendment made to clarify this clause requires an "or".
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All proposed drafting amendments have been marked up in version of the Code attached as Appendix B.

4 Amended reporting requirements

As a consequence of the 2016 outage review and this subsequent review of the Code, the Commission proposes to amend reporting requirements for ElectraNet.

Specifically, the Commission considers there is benefit in ElectraNet reporting further information on the operation of network support arrangements, in particular the generators at Port Lincoln. The Commission proposes that ElectraNet annually reports the following information to it:

- ▶ the number of instances the network support was successfully/unsuccessfully started for testing/supply
- ▶ the time taken for the network support to restore N transmission services, following a line interruption, and
- ▶ the time of operation of the network support, before N-1 capability was restored

The provision of this information will allow the Commission to monitor the level of reliability of the network support arrangements at Port Lincoln to ensure there is no reduction in current levels of performance.

In addition, the Commission proposes to require ElectraNet to periodically report its plan for achieving the reliability standards specified in the Code. In particular, the Commission will require ElectraNet to specify how it will plan for, and satisfy, the requirement under the Code to use its 'best endeavours' to meet the reliability standards for each exit point on an ongoing basis.

This plan may be linked to (or complement) ElectraNet's current plans or procedures, such as its existing Safety, Reliability and Maintenance Technical Management Plan.

The Commission will amend Electricity Guideline No. 3 – Transmission and System Control to introduce the new reporting requirements. ElectraNet will commence reporting on the new measures in August 2019 for the 2018-19 period.

5 Appendices

Appendix A: 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 making 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, first issued on 11 October 1999, sets out the obligations that apply to a Transmission Network Service Provider (**TNSP**) in relation to the provision of transmission services in South Australia. It 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), although the exit point reliability standards under the Code apply only to ElectraNet at this stage.

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, does include some end-use customers).

To the extent that a TNSP also provides other services in the electricity industry (for example, ElectraNet also performs a system control role in South Australia), those services are not captured by the scope of 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, then a different regulatory regime 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 regime for transmission services in the NEM. The regulation of the transmission system is important given 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 establishes technical standards, dealing with matters such as frequency, system stability, voltage and fault clearance. Jurisdictional standards, such as those set under the Code, set 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 NER requirement that any new assets constructed by ElectraNet, including those required to meet a reliability standard mandated under the Code, must satisfy a regulatory test referred to as a Regulatory Investment Test – Transmission.

The purpose of the RIT-T is to identify the most 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 this test, ElectraNet must demonstrate that the proposed new transmission asset is necessary so as to meet the minimum network performance requirements set out in the NER, any relevant legislation or regulations and any statutory instruments that apply to that entity (such as the Code).

5.1.1 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:

- ▶ reliability standards
- ▶ requirements relating to infrastructure failures
- ▶ design requirements
- ▶ technical 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 with which ElectraNet must comply.

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

Category 1 has the lowest reliability and 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, which are generally of a ‘best endeavours’ form, are summarised in the table below:¹⁴

Reliability category	Reliability (refer to 5.1.3 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 ¹⁵	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 176 MW within 4 hours	At least 176MW within 4 hours

In effect, the reliability 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

¹⁴ Sourced from AEMO, *Review of the South Australian Electricity Transmission Code reliability standards*, May 2015, p.9.

¹⁵ ‘Non-firm’ means the required level of supply can be met after post-contingent operation (that is, allows for interruption).

supply (the exception is Category 3 that is acknowledge to have an interruptible service). Further, when network elements fail, the standards require the restoration of those failed elements within specified timeframes.

5.1.2 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.

5.1.2.1 N reliability

A transmission system with **N** reliability means that it has the ability to convey the agreed maximum demand, provided that all of the network elements are in service. The loss of a single transmission element (a line, a transformer or other associated equipment) will interrupt transmission services to customers.

5.1.2.2 N-1 reliability

A level of **N-1** reliability provides a higher degree of reliability. A transmission system with **N-1** reliability means that there would be no interruption to transmission services with one transmission element out of service because there is a second level of redundancy that will take over at the time the failure occurs. It is also possible to define N-1 reliability in terms of a percentage of time or for a percentage of maximum demand.

5.1.2.3 N-2 reliability

N-2 reliability provides for an even higher degree of reliability as there is two levels redundancy in the transmission system. This means that there would be no interruption to transmission services even if two transmission elements failed. This high level of security is capital intensive in terms of expenditure. Accordingly, this level of reliability is generally only required in Central Business District areas, where a high level of reliability and security is deemed necessary.

5.1.2.4 Equivalence

The 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, 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 a regulated business (in this case, ElectraNet) to meet a 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 aims to facilitate 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).

5.1.3 Changes to, and new, exit points

Where demand growth increases over time, the Code requires ElectraNet to use its best endeavours to ensure it has the relevant planning approvals in place (e.g. land acquisition, easements) to augment an exit point and, where necessary, the transmission network, to meet that increasing forecast demand.

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, that is, the economic cost to customers of a supply failure
- ▶ the types and numbers of customers supplied through the exit point, and
- ▶ the location and cost of the installation of the assets relevant to the exit point.

Appendix B: Code with proposed drafting amendments



Electricity

Code



Electricity Transmission Code

TC/09.1

1 July 2018

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

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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
TC/09.1		

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1 Preliminary

1.1 Definitions

- 1.1.1 Words and phrases appearing in bold like **this** are defined in [Section-clause 1.5. A number of words have the same meaning as defined in Chapter 10 of the National Electricity Rules, which can be accessed at <https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current>](#)
- 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 [industry](#) 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 [it can be demonstrated that](#) such solutions [are prudent and efficient, taking into account the long-term benefit to customers](#).
- ~~(a) can be demonstrated to be [are 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; and
- (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	<u>means</u> for a connection point or a group of connection points , is the maximum demand specified as such in the connection agreement between ElectraNet and the relevant transmission customer or SA Power Networks a distributor .
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 <u>an the transmission</u> electricity 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 asset

has the same meaning as defined in Chapter 10 of the National Electricity Rules.

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 as defined in Chapter 10 of the National Electricity Rules given to that term in the **Act**.

distribution system

has the same meaning as defined in Chapter 10 of the National Electricity Rules 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 system 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 agreed maximum demand using <u>any</u> 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 agreed maximum demand using <u>any</u> 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 transmission customer three years prior to <u>the date upon which when the agreed maximum demand is contracted to commence to apply under the relevant connection agreement</u> .
<u>generating system and generating unit</u>	<u>has the same meaning as defined in Chapter 10 of given to that term under the National Electricity Rules.</u>
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 <u>two or more exit points</u> interconnected by a distribution network .
<u>maximum demand</u>	<u>has the same meaning as defined in Chapter 10 of the National Electricity Rules.</u>
"N"	means that the transmission system is able to supply the <u>contracted amount of</u> agreed maximum demand connected to the transmission system provided that all the <u>transmission</u> elements are in service (<u>i.e. such that</u> the loss of a single transmission element -could cause a supply interruption to some <u>transmission customers</u>).
"N-1"	means the ability of the transmission system to continue to supply the <u>contracted amount of</u> agreed maximum demand connected to the transmission system without interruption should any one <u>transmission</u> 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 an 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 electricity entity that is required by its licence to provide access to its transmission system, distribution system or generating system 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 generating system 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 are needed in order to comply with must be capable of supplying the relevant appropriate reliability standard in clause 2.

transmission customer	means a customer that has having a connection point with a transmission network <u>and receives transmission services</u> .
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 <u>are needed in order to comply with must be capable of supplying</u> the <u>relevant appropriate</u> 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	<u>has the same meaning as defined in Chapter 10 of the National Electricity Rules and includes prescribed transmission services.</u> means: in relation to a transmission customer and a distributor, transmission use of system services and exit services; and 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:
- Acts of Parliament and regulations made under those Acts of Parliament (in particular the **Act** and associated regulations, and the **ESC Act**);
 - licence conditions;
 - the **National Electricity Rules**;
 - any guidelines, industry codes or rules made by the **Commission** from time to time; and
 - the terms of any **connection agreements**.

1.1.1.1

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-reliability 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 Restorations

- 2.2.1 The obligation to restore, or use best endeavours to restore, a failed **transmission line, transformer or network support arrangement** so as to meet a reliability standard specified in 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 to the provision of prescribed transmission services at the relevant exit point arising from that failure;
 - (c) the need to minimise the likelihood of an interruption to the provision of prescribed transmission services at the exit point 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;- and
 - ~~(d)~~ the rights, obligations and processes set out in clause 9.

2.2.3 Transmission network standards and procedures

- 2.2.3.1 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**.
- 2.2.3.2 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.
- 2.2.3.3 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**.

~~2.2.42.3.4~~ The **transmission entity** must ~~act in accordance~~ comply with any applicable guideline published by the **Commission**, ~~relevant to the transmission entity and with any plan developed by the transmission entity~~, as required under this industry code

2.32.4 Specific reliability standards

~~2.3.12.4.1~~ A **transmission entity** must plan and develop its **transmission system** such that each **exit point** or **group of exit points** categorised in clause 2.5 meets the minimum reliability standards applicable to that category pursuant to clauses 2.6 to 2.10.

~~2.3.22.4.2~~ 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.

2.42.5 Allocation of exit points to categories

~~2.4.12.5.1~~ The ~~table below categorises allocation of exit points to categories is set out in the table below for the purposes of setting planning and reliability standards under this industry code~~ (exit points in square brackets ~~denote~~ refer to a group of **two or more** 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	Exit point [] = group of exit points
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 • Tailern 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)]

2.4.2.5.2 An asterisk denotes an **exit point, not being a distribution exit point, which is subject to the reliability standards only to the extent that the exit point is used to provide prescribed transmission services to a transmission customer.**

2.5.2.6 Category 1 exit points

2.5.1.2.6.1 In respect of Category 1 **exit points**, a **transmission entity** must, subject to clause 2.6.2:

- (a) provide “N” equivalent line capacity for at least 100 percent% of ~~the contracted~~ agreed maximum demand for the exit point; and,
- (a)(b) in the event of an interruption to the provision of prescribed transmission services at the exit point use its **best endeavours** to:
- i. use its best endeavours to restore “N” equivalent line capacity at the exit point as soon as practicable; and
 - ii. in any event, restore “N” equivalent line capacity at the exit point within 2 days of the commencement of the interruption; and
- (c) provide “N” equivalent transformer capacity for at least 100 percent% of ~~contracted the~~ agreed maximum demand for the exit point; and
- (b)(d) in the event of an interruption to the provision of prescribed transmission services at the exit point:
- i. use its **best endeavours** to restore “N” equivalent transformer capacity at the exit point as soon as practicable; and
 - ii. in any event, restore “N” equivalent transformer capacity at the exit point within 8 days of the commencement of the interruption.

~~2.5.2.6.2~~ A **transmission entity** may implement an alternative solution or combination of solutions to those ~~described in~~required by 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.

2.6.2.7 Category 2 exit points

~~2.6.1.2.7.1~~ In respect of Category 2 **exit points**, a **transmission entity** must, subject to clause 2.7.2:

- (a) provide **"N" equivalent line capacity** for at least 100 percent% of ~~the contracted~~ agreed maximum demand for the exit point; and
- (~~a~~)(b) in the event of an interruption to the provision of prescribed transmission services at the exit point, ~~use its~~ best endeavours to:
 - i. use its best endeavours to restore **"N" equivalent line capacity at the exit point** as soon as practicable; and
 - ii. in any event, restore **"N" equivalent line capacity at the exit point** within 2 days of the interruption; and
- (~~b~~)(c) provide **"N-1" equivalent transformer capacity** for at least 100 percent% of ~~contracted the~~ agreed maximum demand for the exit point; 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 at the exit point** as soon as practicable;
 - ii. in the event of an interruption to prescribed transmission services arising from a failure of any the installed **transformers or network support arrangements for the exit point**:
 - (A) restore at least **"N" equivalent transformer capacity at the exit point** within 8 days of the commencement of the interruption; and
 - (B) use its best endeavours to restore **"N-1" equivalent transformer capacity at the exit point** as soon as practicable after the commencement of the interruption.

~~2.6.2.7.2~~ A **transmission entity** may implement an alternative solution or combination of solutions to those ~~described in~~required by 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.

2.7.2.8 Category 3 exit points

~~2.7.1.2.8.1~~ In respect of Category 3 **exit points**, a **transmission entity** must, subject to clause 2.8.2:

- (a) provide **"N-1" equivalent line capacity** for at least 100 percent% of ~~the 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 for the exit point**, use its best endeavours to

- restore "N-1" equivalent line capacity at the exit point as soon as practicable;
 - ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of ~~the~~ installed **transmission lines** or **network support arrangements for the exit point**, use **best endeavours to restore**:
 - (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 percent% 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 for the exit point**, use its **best endeavours** to restore "N-1" equivalent transformer capacity at the exit point as soon as practicable;
 - ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of ~~any~~ the installed **transformers** or **network support arrangements for the exit point**:
 - (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.

2.7.22.8.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in ~~required by~~ 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.

2.8.2.9 **Category 4 exit points**

2.8.12.9.1 In respect of Category 4 **exit points**, a **transmission entity** must, subject to clause 2.9.2:

- (a) provide "N-1" equivalent line capacity for at least 100 percent% of ~~the~~ **contracted** agreed maximum demand and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement for the exit point**, use its **best endeavours** to restore "N-1" equivalent line capacity at the exit point as soon as practicable;
 - ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of ~~any~~ 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** for that group of exit points 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** at the exit point within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore “N-1” equivalent **line capacity** for the exit point as soon as practicable after the commencement of the interruption; and
- (b) provide “N-1” equivalent **transformer capacity** for at least 100 percent% of the contracted agreed maximum demand and:
- i. in the event of a failure of any installed **transformer** or **network support arrangement** for the exit point, use its **best endeavours** to restore “N-1” equivalent **transformer capacity** at the exit point as soon as practicable;
 - ii. in the event of an interruption to the provision of prescribed transmission services at the exit point arising from the failure of any the installed **transformers** or **network support arrangements** for the exit point:
- (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** for that group of exit points 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** at the exit point within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore “N-1” equivalent **transformer capacity** at the exit point as soon as practicable after the commencement of the interruption.

2.8.22.9.2 A **transmission entity** may implement an alternative solution or combination of solutions to those described in required by 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.

2.92.10 Category 5 exit points

2.9.12.10.1 Subject to clause 2.10.12, 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 percent% of the contracted agreed maximum demand for the exit points and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement** for the exit points, use its **best endeavours** to restore “N-1” equivalent **line capacity** at the exit points as soon as practicable;

- ii. in the event of an interruption to the provision of prescribed transmission services arising from ~~at the~~ failure of ~~any 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 percent% of ~~contracted the~~ 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 to the provision of prescribed transmission services arising from ~~at the~~ failure of ~~any 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.

2.9.22.10.2 A **transmission entity** may implement an alternative solution or combination of solutions to those ~~described in~~required by clause 2.10.1, 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 2.10.1.

~~2.9.3~~ 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~~
~~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**.~~

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

~~2.10.12.11.1~~ 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.

~~2.10.2.11.2~~ 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.

~~2.10.3.11.3~~ **ElectraNet** ~~will~~ **must** 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 reliability 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.

~~2.11.2.12~~ **Contracted agreed maximum demand and n**Network support arrangement requirements

~~2.11.1~~ 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:

- ~~(1)~~ 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
- ~~(2)~~ 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.

~~2.11.4.12.1~~ Where a **transmission entity** relies on a **network support arrangement** provided by an independent network support provider to meet a reliability standard under clause 2 ~~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**.

~~2.11.5.12.2~~ 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**.

2.122.13 **New ~~connection-exit~~ points**

~~2.12.12.13.1~~ Where a new ~~connection-exit point, which will provide prescribed transmission services~~, is to be ~~owned and operated~~ provided by a **transmission entity**, the **transmission entity** must submit the applicable **reliability** standards for that ~~connection-exit point~~ to the **Commission** for approval.

~~2.12.22.13.2~~ 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**; and
- (e) the cost of installation of transmission assets relevant to the ~~connection-exit point~~.

2.132.14 **Rating of transmission lines and transformers**

~~2.13.12.14.1~~ 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.

2.142.15 **Spare transformers**

~~2.14.12.15.1~~ 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.

2.152.16 **Emergency transformer replacement plan**

~~2.15.12.16.1~~ 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.

2.162.17 **Reports to the Commission**

~~2.16.12.17.1~~ A **transmission entity** must report to the **Commission** by 31 August each year, concerning matters relating to the **reliability** standards during the 12 month period ending on 30 June of that year.

~~2.16.22.17.2~~ In particular, the **transmission entity** must:

- (a) report on the actual performance with the **reliability** 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 **reliability** 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 2.12 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance.

~~2.16.3~~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.

2.17.2.18 Country connection points

~~2.17.1~~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 of its transmission system 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 9.4); 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 system, 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~~

- ~~6.3.0 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:~~
- ~~(-) the **transmission system and distribution system**, and any connection to or between those systems; and~~
 - ~~(-) where applicable, equipment belonging to a **transmission customer or generator**.~~
- ~~6.6.0 The switching manual must be approved by the **Commission**.~~
- ~~6.7.0 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.~~
- ~~6.8.0 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.~~
- ~~6.9.0 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**~~

~~6.106.2~~ Planning approvals and land and easement acquisition

- ~~6.2.1~~ Prior to the date on which the forecast agreed maximum demand at an exit point becomes the agreed maximum demand, A transmission entity must use its **best endeavours** to:
- (a) complete all necessary design work;
 - (b) obtain all necessary planning approvals ~~and~~
 - (c) acquire all necessary land, and
 - (d) acquire all necessary easements.

~~6.11.0 on the basis of the forecast agreed maximum demand at an exit point prior to the date on which that changes in forecast agreed maximum demand become the agreed maximum demand for that exit point and causing a breach of the service reliability standards specified in this industry code for that exit point so as to ensure that the transmission entity is in a position to meet its obligations.~~

6.126.3 Network options and security

~~6.12.16.3.1~~ Where the most economically feasible option to meet the minimum reliability standards of clauses 2.6 to 2.10 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.

~~6.12.26.3.2~~ 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 6.3.1, 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**.

~~6.12.36.3.3~~ 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.

~~6.12.46.3.4~~ 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 **generating system**~~generation assets~~ (as the case may be) for purposes of the **electricity entity** to operate and maintain properly its **transmission system, distribution system** or **generating system**~~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;
 - (e) the matters set out in clause 8.2; and
- ~~8.1.2(f)~~ 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)~~8.3 or such other arbitration procedures prescribed in industry codes issued by the **Commission** from time to time.

8.2 Terms of access

- ~~(a)~~8.2.1 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)~~(a) 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)~~(b) the capital and operational costs of the **transmission system** or **distribution system**;
 - ~~(d)~~(c) 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)~~(d) 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, or is exercising, 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, the impact of the emergency on the provision of transmission services and an estimate of the time when transmission services will be available; and
 - (b) use its **best endeavours** to fully restore **transmission services** to a **transmission customer, distributor or generator** once the **emergency** condition has passed.

9.2 Unplanned interruptions

9.2.1 Notwithstanding any other clause of this industry code:

- (a) If an interruption to the provision of prescribed transmission services at one or more exit points is caused by or arises from one or more events or circumstances that are outside of the reasonable control of a transmission entity (which does not include events or circumstances that arise from a breach of this code, or a negligent act, by the transmission entity); and
- (b) the transmission entity is prevented from restoring that interruption by the events or circumstances that are outside of the reasonable control of the transmission entity; or
- (c) if the transmission entity took steps to restore, or to seek to restore, the interruption during or following the events or circumstances, those steps would, or would be likely to, result in a serious risk to the health or safety of any person (including a serious risk to the health or safety of any employee or contractor of the transmission entity),

the period of time during which (as applicable) the transmission entity is so prevented or the serious risk to the health or safety of that person continues to exist (such time to be satisfactorily recorded by the transmission entity), will not be taken into account in determining whether the transmission entity has satisfied the reliability standards specified in clauses 2.6 to 2.10 of this industry code.

9.2.19.2.2 The transmission entity must give prompt notice of the events or circumstances to affected customers and the Commission, including details of the events or circumstances, an estimate of likely duration of the interruption to the provision of prescribed transmission services at one or more exit points, the extent to which its restoration obligations are or are likely to be affected and the steps taken to remove, overcome or minimise those effects.

9.3 Emergency provisions of other Acts

9.3.1 Nothing in this industry code prevents the **transmission entity** from:

- (a) ~~exercising any power under,~~ or
- (b) ~~complying with any~~ obligation to comply with any direction, order or requirement under.

~~9.3.1 the Emergency Powers Act 1941~~Emergency Management Act 2004, Essential Services Act 1981, ~~State Disaster Act 1980~~ or the Fire and Emergency Services Act 2005~~State Emergency Services Act 1987~~ or other relevant legislation.

9.4 Health and safety

9.4.1 ~~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 9.4.2.

9.4.2 Except in the case of an **emergency**, ~~an interruption arising under clause 9.2;~~ or where relevant regulations require it, a **transmission entity** must not disconnect, ~~interrupt or limit the provision of transmission services to~~ 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; ~~or~~
 - 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~~ [insert] 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:

.....
Commissioner

.....
Date



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