



2018 review of the Electricity Transmission Code

FINAL Decision

August 2018

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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
prescribed transmission service	has the same meaning as set out in Chapter 10 of the NER
TNSP	Transmission Network Service Provider

1 Executive summary

The Essential Services Commission (**Commission**) has reviewed and publicly consulted on proposed amendments to the Electricity Transmission Code (**Code**). The review has been undertaken to clarify existing provisions of the Code and make consequential changes to reflect legislative amendments. The Commission is now releasing its final decision in relation to this review.

The Commission's final decision on the amendments to be made to the Code has taken into account the need to address interpretation issues that have been identified through previous compliance reviews. They 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 which has led the Commission to undertake a targeted review of the Code. Specifically, the review aimed 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 (i.e. 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.
- ▶ Clarification of the expression of the restoration standards that apply to transmission exit points which have an N level of redundancy for equivalent line capacity (category 1 and 2).
- ▶ 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 will clarify the category 3 exit point 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.

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 current version of 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 the unavailability of network support).

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 has determined to remove the 95 percent availability obligation for network support and will clarify that the one-hour restoration standard is subject to ElectraNet using its best endeavours (as is the case for other reliability standards in the Code).

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

The Commission will insert a new clause in the Code to clarify that the reliability standards in the Code apply only to those exit points that receive “prescribed transmission services” (as that term is defined in 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 for those customers that pay regulated transmission use of system charges; customers paying negotiated charges are subject to negotiated service levels (as governed by the negotiation framework 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 current version of the Code does not 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 in the case of a declared emergency). The absence of such provisions is inconsistent with the intent of the Code, which is to impose obligations only where ElectraNet can reasonably and safely meet them. Accordingly, the Commission will insert a clause in the Code which addresses how the reliability standards will be assessed when there is an unplanned interruption outside of the control of ElectraNet and it is not possible or safe to restore transmission services for a period of time.

1.5 Restoration standards for category 1 and 2 exit points

The current drafting of the restoration standards applying to category 1 and 2 exit points can be difficult to interpret in practice. It has an apparent contradiction, in that it requires best endeavours to restore a line interruption as soon as practicable and, in any event, use best endeavours to restore that interruption in two days.

The two-day obligation has been a historical obligation and it has generally been the experience that any interruption to transmission services at these exit points has been restored within two days. To remove the ambiguity in these restoration standards, the Commission will remove the reference to restore “as soon as practicable” within the clauses, which clarifies that ElectraNet must use best endeavours to restore line interruptions within a maximum of two days.

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

Recent changes to the Electricity Act 1996 (**Electricity Act**) and Electricity (General) Regulations 2012 (**Electricity 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 has determined to remove obligations regarding switching manuals from the Code. Requirements in relation to switching manuals are now administered and enforced by the Technical Regulator.

1.7 Further clarifications

The Commission has determined to make 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.

1.8 Next steps

The new Code will take effect on the date of notification of the amendments in the South Australian Government Gazette.

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 (generally distributors and large customers) with clarity 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.

The Code 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, which sets reliability standards for distribution services.³

As a condition of its transmission 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 requirements under 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 reliability standards relating to exit points under the Code only apply 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 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, system control services), those functions are regulated outside of the scope of the transmission licence and the Code.

2.2 Scope of the review

The Commission has undertaken this review following events that occurred after the last major Code review, which was completed in August 2016. In particular:

- ▶ The Commission reviewed the compliance of ElectraNet against requirements of the Code following the September 2016 state-wide outage and found that there was a need to clarify the expression of the category 3 exit point reliability standard (specifically as it relates to the network support arrangement at Port Lincoln) and the use of the Code's emergency provisions.

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 raised concerns about the application of the Code's reliability standards to transmission services provided to grid-scale batteries, such as the ElectraNet/AGL 30MW battery at Dalrymple. Given the growth in battery technology and likely future connections, the Commission accepted there was a need to clarify the application of the Code for 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, there was a need to remove Code provisions dealing with switching manuals (the relevant provisions are now reflected in the Electricity (General) Regulations 2012).

Further to addressing the matters above, the Commission will make minor editorial and drafting amendments to the Code, to improve clarity and readability (while maintaining the intent and application of any revised provisions). In addition, it has taken the opportunity to examine and provide further guidance on its interpretation of the requirement for a transmission entity to use its best endeavours to satisfy Code provisions. This is discussed in detail in section 2.3 below.

In summary, the review is targeted to the matters described above and was 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 prior to the AER determining ElectraNet's regulated revenue to apply from 1 July 2023.

2.3 Clarifying the approach around demonstrating best endeavours

As noted above, in undertaking this review, the Commission saw an opportunity to examine and provide guidance to stakeholders on what 'best endeavours' means in the context of the requirements set out in the Code. As it is a fundamental part of the requirements relating to the reliability and restoration standards set out in the Code, there is a need for clarity around this term.

For the most part, transmission service standards require a transmission entity to use its best endeavours to meet a particular requirement. The term best endeavours is defined in the Code to mean 'to act in good faith and use all reasonable efforts, skills and resources'. A best endeavours obligation is different to an absolute or mandated obligation (for example, an obligation that requires something 'must' be done). It requires a person to do everything that is reasonable and prudent to achieve the obligation but it does not require effort that goes beyond the bounds of reason.

2.3.1 Current approach

Currently, ElectraNet reports in its annual performance report to the Commission on whether it has used its best endeavours to meet reliability and restoration standards set by the Code, and if not, why not. It is expected that explanations provided to demonstrate best endeavours are sufficient to enable the Commission to form a view about whether best endeavours were employed in the relevant circumstances.

Explanations might include, for example, what action was taken to restore supply, when that action was taken, preparations prior to events (as detailed in internal procedures and protocols established for handling interruption events), the level of planning and the ability to call on additional resources when required.

The Commission will then undertake a best endeavours assessment. Such an assessment takes into account:

- ▶ reasons for failing to meet the target

- ▶ the magnitude by which the target was missed (noting that an assessment is still performed, even if the target is narrowly missed)
- ▶ if the circumstances were reasonably foreseeable or beyond ElectraNet's control
- ▶ remedial action undertaken in response to the missed target
- ▶ improvements in performance throughout the year
- ▶ long-term trends in performance
- ▶ the extent to which ElectraNet has engaged with Commission staff, and
- ▶ the quality of information provided.

2.3.2 Clarifying the approach

The Commission considers the use of best endeavours standards (and the current process to assess best endeavours) is acceptable and should be retained. However, the Commission considers it should clarify its expectations in relation to the overall approach taken by ElectraNet to demonstrate best endeavours.

Best endeavours assessments often occur after a significant interruption and rely on information generated after the event. The Commission considers a more proactive approach could improve transparency around ElectraNet's pre-emptive strategies and procedures for achieving best endeavours under the Code (including how it minimises the duration and likelihood of interruptions) and how it will report its performance against the service standards.

The Commission considers this approach will also increase the accountability on ElectraNet to explain its performance to its customers and other stakeholders, particularly in cases when a standard is not met.

Following this review, the Commission will undertake consultation on what this proactive approach will involve. Further detail on this concept and approach is set out in section 4.2 of the final decision.

3 Code amendments

The amendments the Commission will make to the Code relate to clarifying the application of existing obligations to ElectraNet as well as the Commission's expectations on how achievement of those obligations is demonstrated. Specifically, the amendments 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
- ▶ the intent of the standards relating to the restoration of equivalent line capacity at category 1 and 2 exit points
- ▶ redundant Code obligations (resulting from recent legislative changes), and
- ▶ other minor clarifications, to improve readability of the Code.

As noted above, the amendments do not impact or change the existing operation of the Code – they are for clarity and simplification only.

The Commission received one submission in response to the draft decision. This submission was from ElectraNet. ElectraNet supported the majority of the proposed amendments. In particular, it:

- ▶ supported the clarification of the best endeavours restoration requirement for category 3 exit points;
- ▶ supported the proposed suspension of restoration targets when a transmission entity is prevented from restoring supply by events or circumstances beyond its control or due to health or safety concerns;
- ▶ supported the proposed treatment of grid scale battery loads pending appropriate treatment in the National Electricity Rules; and
- ▶ broadly supported the other miscellaneous corrections, clarifications and reporting requirements.

However, ElectraNet stated it did not support the Commission's draft proposal to address ambiguity around category 1 and 2 exit point restoration standards. It submitted that the draft proposal changed the intent of the restoration standard, which was outside the scope of this review. This matter is discussed further in section 3.4.

ElectraNet also suggested some additional drafting amendments to further clarify some of the definitions and clauses in the Code. These are discussed further in section 3.6.

3.1 Reliability standards at Port Lincoln and Snuggery Rural

The Commission will 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 Rural exit points,

operates on a best endeavours basis. Accordingly, the Commission will amend clause 2.7.1 of the Code as follows:⁵

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

- (a) provide **"N-1" equivalent line capacity** for at least 100% **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 will remove clause 2.11.1 of the Code, which specifies requirements in relation to agreed maximum demand and the required availability of network support arrangements if called into service at Port Lincoln and Snuggery Rural. As discussed in section 3.1.1.2 below, the obligations contained within this clause of the Code can give rise to interpretation issues in the context of compliance assessments.

3.1.1 Reasons for amendments

The Commission aims to set reliability standards that strike an appropriate balance between reliability and cost, to ensure that customers pay the lowest sustainable and efficient prices for transmission services. Each category of exit point in the Code provides different levels of reliability that take into account different levels of costs and benefits.

3.1.1.1 Category 3 exit points restoration standard

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 these exit points.

The category 3 exit point restoration standard required ElectraNet to restore transmission services within one hour of the commencement of an interruption to those services. The one-hour standard was 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).

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.

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.

The one-hour restoration standard for category 3 exit points does not specifically refer to the application of a best endeavours test. However, the standard must be read in conjunction with a separate Code obligation, which requires a network support arrangement to have 95 percent availability (see clause 2.12.1 of Transmission Code version 09 (TC09)). In reading those two requirements together it was clear that there were times when ElectraNet would be unable to meet the one-hour restoration of transmission services target, that is, when the network support was unavailable.

The Commission has determined 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 could not be met. This was achieved through the operation of the 95 percent availability standard for network support. In such circumstances, ElectraNet was still considered compliant with the Code.

However, experience had demonstrated that the interaction between the restoration standard and the 95 percent availability standard for network support arrangements led to confusion.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). The Code does not specify which test to use.

If the availability standard was 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 services. It is unclear how the one hour restoration standard and 18 day availability standard work together to deliver an appropriate restoration outcome.

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

Having regard to those practical difficulties, it is difficult to ascertain the availability of an asset that does not operate unless called upon. Accordingly, the Commission has determined to remove the 95 percent availability standard in favour of an alternative expression of the category 3 exit point restoration standard, as explained below.

3.1.1.2 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

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

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

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.

There are some standards that are not subject to a best endeavours requirement and have mandatory obligations, 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.

The category 3 exit point reliability standard is not intended to be expressed on a ‘mandatory’ basis, as the cost of such a higher standard would exceed the benefits.

Of note, all of the other equivalent line restoration standards within the Code are expressed in a non-mandatory manner – they require a ‘best endeavours’ approach to the restoration of transmission services.⁹ The category 3 standard is subject to a separate availability 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 previous ‘one-hour restoration of transmission services’ element of the standard was expressed in a mandatory sense, it was to be read together with the 95 percent availability standard, which provides for circumstances in which it was unreasonable to expect restoration of transmission services within an hour. This means that the overall restoration standard for category 3 exit points was not, in practical effect, mandatory – it was subject to the less prescriptive 95 percent availability requirement as explained above.

To express the standard in a 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 earlier, 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.

However, by removing the 95 percent availability requirement, the category 3 exit point restoration standard needed to be modified in some way to account for the times where ElectraNet is unable to restore transmission services within one hour. Changing the current one-hour requirement to a best endeavours obligation – as is the case for the other relevant reliability standards in the Code – achieves that intent, and is consistent with the operation of the reliability standards generally.

It should be noted that some 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 relate to restoration of a transformer and 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 transformer restoration). The Commission does not propose to introduce a maximum timeframe for category 3 and instead has amended clause 1.4.1 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.

⁹ Noting that there transformer replacement standards where mandatory timeframes are set.

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 exit point restoration standard is not a lessening of the current standard. Rather, it addresses the ambiguity of the existing standard, provides clarity on the obligation that applies to ElectraNet and assists the Commission in its monitoring and compliance assessments. ElectraNet supported the reasoning presented in the draft decision.¹⁰

In addition and to provide stakeholders with assurance that the drafting changes to the standard should not lead to a worsening of the service, the Commission will require ElectraNet to report on performance regarding its network support arrangements for the Port Lincoln exit point. It will utilise data already provided by ElectraNet to AEMO for that purpose, minimising additional reporting. This is discussed further in section 4.1.

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

The Commission will introduce a new Code provision (clause 2.4.2) to clarify that the reliability standards in the Code only apply to transmission customers that receive a prescribed transmission service. Further, clause 2.12 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 amendments

In its 2016 review of the Code, the Commission clarified that the reliability standards that applied to direct-connect customers¹¹ only applied to the extent that the customer receives a prescribed transmission service as defined under the National Electricity Rules (NER).¹²

Since the 2016 Code review, grid-scale batteries have been connected to the transmission network. These batteries are functionally a generating system with no firm access rights under the NER.

The application of the reliability standards under the Code to grid-scale batteries was 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 rights¹³ 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 pay the costs of it doing through transmission service charges.

Although there is a note in the table contained in clause 2.4.1 of the current Code that indicated which exit points the transmission service reliability standards apply to, the Commission has determined that the Code would be made clearer on the application of those standards to various types of exit points,

¹⁰ ElectraNet, *2018 Review of the Electricity Transmission Code – Draft Decision*, June 2018, p 2

¹¹ A direct-connect customer is someone that is not a distributor but imports electricity from the transmission network

¹² Essential Services Commission, *Electricity Transmission Code Review: Final Decision*, September 2016, p 26 (available at <http://www.escosa.sa.gov.au/ArticleDocuments/1020/20160922-Electricity-TransmissionCodeReview-FinalDecision.pdf.aspx?Embed=Y>)

¹³ This is the guaranteed capacity the TNSP can provide to the customer seeking access

including battery connection points. To address this issue, the Commission will remove the current note and add a new clause (clause 2.4.2), to make it explicit that the reliability standards are for exit points that receive a prescribed transmission service, as defined under the NER. In its submission, ElectraNet agreed that this was a suitable approach to address the application of the Code to grid size batteries (which received a negotiated transmission service when charging).¹⁴

In addition to clarifying the application of the reliability standards to any new grid scale batteries, the Commission will amend clause 2.12 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. For the reasons stated above, any new battery that receives negotiated transmission services¹⁵ are not 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 requirements relating to the restoration of transmission services, the Commission will insert new clauses (9.2.1 and 9.2.2) in 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 (or would likely be) compromised.

The new clauses are as follows:

9.2.1 Notwithstanding clauses 2.5 to 2.9 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, for the avoidance of doubt, does not include events or circumstances that arise from a breach of this industry 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, 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 2.5 to 2.9 of this industry code.

9.2.2 The **transmission entity** must give prompt notice of the events or circumstances to affected **customers**, the **distributor** 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

¹⁴ ElectraNet, *2018 Review of the Electricity Transmission Code – Draft Decision*, June 2018 pages 6 and 7 show support of the reasoning for the Commissions approach

¹⁵ As this term is defined in the rules

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 amendments

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 impact upon the application of the restoration standards specified in clause 2. 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.

However, the current version of the Code does not address a situation where an unplanned interruption to prescribed transmission services outside of ElectraNet's reasonable control occurs, and ElectraNet is prevented from restoring transmission services or attempted restoration 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.

These new provisions 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 clauses 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 preventable 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, 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 of the fire 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 is reinstated.

To provide transparency around ElectraNet's actions in these situations, the Commission will require ElectraNet to inform affected customers, the distributor 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.

It is also important to note that the inclusion of these provisions does not affect the overarching obligation on ElectraNet to use its best endeavours under the Code. During the period of time that the unforeseen or unsafe event is occurring, ElectraNet must still use its best endeavours to work towards the restoration of the interrupted transmission services (even though the time the relevant event is occurring will not be taken into account in assessing whether restoration standards were met).

ElectraNet supported the introduction of clauses 9.2.1 and 9.2.2. It stated the new clauses are:¹⁶

"appropriate and reflect the economic reality that a transmission entity using its best endeavours may still not be able to meet the restoration targets due to circumstances beyond its reasonable control."

3.4 Restoration targets for category 1 and 2 exit points

To clarify the best endeavours nature of the restoration targets and remove any ambiguity regarding the current drafting of clauses 2.5.1(b)(ii) and 2.6.1(b)(ii) in relation to category 1 and 2 exit points, the Commission will amend these clauses to read:¹⁷

2.5.1 In respect of Category 1 **exit points**, a **transmission entity** must, subject to clause 2.5.2:

- (a) provide **"N" equivalent line capacity** for at least 100 percent of the **contracted agreed maximum demand for the exit point**; and,
- (b) in the event of an interruption **to the provision of prescribed transmission services at the exit point** use its **best endeavours** to:
 - i. **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 a maximum of 2 days after 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
- (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 A **transmission entity** may implement an alternative solution or combination of solutions to those **described in required by** clause 2.5.1, to deliver the same or better outcomes in terms of

¹⁶ ElectraNet, *2018 Review of the Electricity Transmission Code – Draft Decision*, June 2018, p 5

¹⁷ Clauses 2.5.1 and 2.6.1 have equivalent wording. Clause 2.5.1 is replicated above

the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.5.1.

The Commission will retain the reference to two days in these clauses to reflect that, in the majority of past cases where there has been an interruption to transmission services at these exit points, restoration has occurred well within two days of the interruption. Therefore, subject to there being an emergency event, the restoration of transmission services should occur within two days. Further, the Commission considers that two days would be the upper bound in relation to what is a reasonable timeframe for restoration given the historical performance of ElectraNet.

The removal of the first limb of these clauses, which references a requirement for ElectraNet to restore N equivalent line capacity “as soon as practicable”, should not impact upon the current level of service at these exit points given the underlying requirement for ElectraNet to use its best endeavours. Clause 1.4 of the Code will clarify that to meet best endeavours, ElectraNet must minimise the likelihood of an interruption and, if an interruption occurs, minimise the duration of the interruption.

To ensure that the current service level is maintained, the Commission will continue to monitor the reliability outcomes reported by ElectraNet through the annual performance reporting regime.

3.4.1 Reasons for amendments

In the draft decision, the Commission stated that the current drafting of restoration standards for category 1 and 2 exit points can be difficult to interpret in practice. The Commission proposed to make 2.5.1(b)(i) a best endeavours standard and make 2.5.1(b)(ii) an absolute standard.¹⁸ This proposal set a mandatory upper limit to the duration of an interruption at these exit points. ElectraNet stated that this drafting amendment was going beyond the scope of the review and changed the intent of the restoration standards at these exit points.

3.4.1.1 Previous versions of the Code

In versions of the Code prior to 2013, clauses 2.5.1(b)(i) and 2.5.1(b)(ii) set a best endeavours restoration standard which was supplemented with a mandatory two day restoration standard. However, during a limited review (**2013 review**), prior to the start of the 2013-18 regulatory period, the drafting of these clauses was changed such that the best endeavours requirement overarched both of the restoration standard timeframes.

At the time of this review, ElectraNet requested that the restoration standards applying to category 1 and 2 (and 4) exit points be subject to a best endeavours requirement. ElectraNet stated that it was not possible to comply with the restoration standard under all circumstances within a two day timeframe.¹⁹

ElectraNet stated a best endeavours requirement would be more appropriate, and would recognise that fault restoration obligations are intended to be an operational standard, not a planning standard that would drive additional investment.²⁰

ElectraNet contended that it would not be possible to comply with the fault restoration standards through operational means under all foreseeable circumstances, and extreme and exceptional situations will still arise when full compliance will not be possible.²¹

At the time, the Commission agreed with this line of reasoning and changed the restoration standards in relation to category 1 and 2 exit points so they included an overarching best endeavours requirement.

¹⁸ It proposed equivalent drafting changes to 2.6.1(b)(i) and (ii)

¹⁹ ESCOSA, ElectraNet's Proposed Amendments to the Electricity Transmission Code – Final Decision, 2013, p 16-17

²⁰ ESCOSA, ElectraNet's Proposed Amendments to the Electricity Transmission Code – Final Decision, 2013, p 16

²¹ ESCOSA, ElectraNet's Proposed Amendments to the Electricity Transmission Code – Final Decision, 2013, p 17

However, this drafting causes an apparent contradiction, in that it requires best endeavours to restore a line interruption as soon as practicable and, in any event use best endeavours to restore that interruption in two days. In practice, this leads to difficulty in assessing whether ElectraNet is satisfying the category 1 and 2 exit point restoration standards.

3.4.1.2 Commission’s draft decision

Because of the interpretation issues caused by the current drafting of these clauses, the Commission proposed to change the clauses to reflect the restoration standards as they applied prior to the 2013 review.

Accordingly, this confirmed that the restoration standards would require transmission services to be restored as soon as practicable but take no longer than two days. The Commission considered this appropriate as the main reasoning for the 2013 review change would be addressed with the introduction of clause 9.2.1 and 9.2.2.

The inclusion of clause 9.2.1 and 9.2.2 clarifies that interruptions caused by circumstances outside of ElectraNet’s reasonable control will be taken into account when assessing whether ElectraNet has met its restoration standards.

Further, by examining major historical line interruptions for category 1 and 2 exit points, the Commission concluded that each of these instances would have been covered by the current clause 9.2.1 and 9.2.2.²² Consequently, ElectraNet would not have breached the restoration standards at any time since the 2013 review.

3.4.1.3 ElectraNet’s submission to draft decision

In its submission to the draft decision regarding the current Code review, ElectraNet stated that it cannot guarantee that an absolute two day restoration standard can be achieved under all conceivable circumstances, even if it acts in good faith and uses all reasonable efforts.²³

Further, ElectraNet stated that the cost of compliance with an absolute standard would be material. ElectraNet stated the reason for likely cost increases is because the current “N” level of redundancy for the lines coming into the category 1 and 2 exit points would need to be augmented to a “N-1” level of redundancy.²⁴ This would be required to guarantee that all interruptions to transmission services would be restored within two days. It further stated it has not had sufficient time to cost the implication of this Code change and submitted that if “N-1” redundancy solutions are to be contemplated for these exit points in the future, it would be best considered as part of the broader five-year review of the Code.^{25 26}

ElectraNet also stated that it considers best endeavours to be a high legal standard that ensures it delivers transmission services and restores interruptions to transmission services to the best of its ability doing everything reasonable in the circumstances.

ElectraNet acknowledged that best endeavours assessments should be judged with reference to the requirements of the NER and, in particular, good electricity industry practice after taking into account external obligations and circumstances. ElectraNet also submitted that the best endeavours standard

²² For example, the system black event in September 2016, or the Leigh Creek event in November 2011. In both of these instances the interruptions were outside of ElectraNet’s reasonable control.

²³ ElectraNet, Submission to 2018 Review of the Transmission Code – Draft Decision, 2018, p 5

²⁴ ElectraNet, Submission to 2018 Review of the Transmission Code – Draft Decision, 2018, p 6

²⁵ ElectraNet, Submission to 2018 Review of the Transmission Code – Draft Decision, 2018, p 6

²⁶ The Commission will undertake a wholesale review of the Electricity Transmission Code, including all elements of the service standards in 2020

recognises that the benefits that accrue from increased reliability should outweigh the costs. Absolute standards do not take this trade-off into account as much as best endeavours standards do.

3.4.1.4 Final decision

The Commission will amend the drafting of clauses 2.5.1(b) and 2.6.1(b) so that the associated restoration standards will be best endeavour standards (with no absolute standard requirement) but they will retain a reference to a two day time frame. The Commission considers that the retention of the two day time frame is appropriate as it reflects historical performance and provides an indication of the maximum length of an interruption under normal operations.

To date, ElectraNet has submitted approximately one line failure a year in its annual performance report (for all exit points). The majority of interruptions have been fixed within the two day time frame. The most common reason for a line interruption has been storm activity.

3.5 Updates in response to legislative changes

Since the previous Code review in 2016, there have been amendments to the Electricity Act and Electricity (General) Regulations 2012. 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 will remove obligations regarding switching manuals from the Code given it is no longer responsible for administering them. Requirements in relation to switching manuals are now 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 Adoption of definitions from the National Electricity Rules

In making industry codes, the Commission takes into account relevant national frameworks and legislation.²⁷ 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 precedence, unless (and to the extent) the Code imposes higher obligations on an entity.

As part of this review, the Commission 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. 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.

In its submission to the draft decision, ElectraNet suggested further minor amendments to some definitions for the Commission to consider. Those suggestions and the Commission's responses are set out in Appendix B.

NER definitions that the Commission has adopted, along with other ancillary amendments that have been made to improve the readability of particular defined terms, are set out in Appendix C.

²⁷ 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

3.7 Further clarifications

As part of this review, the Commission also took the opportunity to clarify the language of certain provisions in the Code. The amendments are being made to improve readability and consistency throughout the Code and update any outdated references.

In its submission, ElectraNet also suggested some further drafting amendments for the Commission to consider. These are set out in Appendix D, which also incorporate the Commissions' response to these suggestions.

A consolidated version of all amendments to be made to the Code is set out in Appendix E.

4 Amended reporting requirements

The Commission will amend Electricity Guideline No. 3 – Transmission and System Control to introduce new reporting requirements with regard to the Port Lincoln network support as outlined below. ElectraNet will commence reporting on the new performance indicators in August 2019 for the 2018-19 period.

As discussed in section 2.3.2 of the final decision, the Commission considers there is benefit in there being more transparency around how ElectraNet will use its best endeavours to satisfy its Code requirements. Following this review, the Commission will commence consultation on the appropriate approach to achieve this. This is expected to be implemented by the next regulatory reporting period.

4.1 New Port Lincoln specific requirements

As a consequence of the 2016 outage review and this subsequent review of the Code, the Commission will amend the reporting requirements on ElectraNet.

Specifically, the Commission will require ElectraNet to report further information on the operation of network support arrangements, in particular, the generators at Port Lincoln. The Commission will require 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.

ElectraNet supports the integration of these additional reporting requirements into the annual performance reporting currently administered by the Commission. This means that information regarding the performance of the network support arrangements at Port Lincoln will be reported to the Commission annually for assessment purposes.

4.2 Demonstration of best endeavours

The Commission considers there should be more accountability on ElectraNet to demonstrate how it will use best endeavours to meet the various requirements of the Code. In particular, it should report the pre-emptive measures it will take to satisfy its obligations and minimise the likelihood and duration of interruptions to transmission services. In doing this, ElectraNet should be able to reference existing policies, procedures, systems and plans. These may include documents, such as annual Safety, Reliability, Maintenance and Technical Management Plans or emergency response procedures.

Following transmission service interruptions, ElectraNet should use these as a point of reference for its reporting on how it has applied best endeavours.

4.2.1 Reasons for approach

There are several reasons for this approach. First, continuation of the best endeavours standard reflects that there are benefits and costs associated with providing different levels of redundancy that

an absolute standard does not fully assess. In addition, best endeavours reflects that there are factors outside of ElectraNet's control that impacts network performance.

Second, placing responsibility to set out, ahead of time, what it means to apply best endeavours, will improve accountability of ElectraNet in providing transmission services.

Subsequent to any transmission network interruptions, ElectraNet will be responsible for providing an explanation of how best endeavours was used. The combination of an explanation from ElectraNet ahead of time and after an interruption will make ElectraNet's performance more transparent to stakeholders.

Following this review, the Commission will commence consulting on what is needed to implement this proactive approach.

5 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 Electricity Transmission Code (**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 stand-alone 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 simply 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 National Electricity Rules (**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 (**RIT-T**).

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 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:²⁸

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 ²⁹	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

²⁸ Sourced from AEMO, *Review of the South Australian Electricity Transmission Code reliability standards*, May 2015, p.9.

²⁹ '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 acknowledged to have an interruptible service). Further, when network elements fail, the standards require the restoration of those failed elements within specified timeframes.

5.2 Terminology

Terminology such as 'N', 'N-1' and 'N-2' is used in the Code (and throughout this final decision) 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.

5.2.1 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.

5.2.2 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.

5.2.3 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.

5.2.4 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).

5.3 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.

6 Appendix B: Commission’s response to submissions to the draft decision - definition changes

Defined term	Draft Decision	ElectraNet’s comment ³⁰	Commission response
Connection point	means an agreed point of supply between a transmission entity’s transmission network and a transmission customer generator, or distributor .	The words “generator or distributor” should not be deleted from the definition because the term connection point is clearly intended to extend to this persons under the ETC.	The Commission agrees with ElectraNet’s suggestion and will include “generator or distributor” in the final definition.
exit point	means a connection point through which a transmission customer imports electricity from the transmission network	The definition should include “transmission customer <u>or distributor</u> ” given that the definition of ‘transmission customer’ is limited to end use customers and most exit point obligations relation to connection points with the distribution network.	The Commission agrees with ElectraNet’s suggestion and will include “or distributor” in the final definition.
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 .	The definition should include “transmission customer <u>or the distributor (whichever is applicable)</u> ”.	The Commission agrees with ElectraNet and will include the suggested wording in the final definition.
“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 .)]	The definition should include “to some transmission customers <u>or a distributor</u> ”.	The Commission agrees with ElectraNet’s suggestion and will include “or a distributor” in the final definition.

³⁰ ElectraNet, 2018 Review of the Electricity Transmission Code – Draft Decision, June 2018, p 8

<p>Transmission customer</p>	<p>means a customer that has ving a connection point with a transmission network that and receives transmission services.</p>	<p>The use of the Act definition for 'customer' means that this term does not include distributors. It follows that every reference to 'transmission customer' in the ETC will need to be assessed to determine whether it should also refer to distributor.</p>	<p>The Commission accepts ElectraNet's position.</p>
<p>transmission services</p>	<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>The definition in the NER clearly includes prescribed transmission services. Suggest "...and includes, <u>for the avoidance of doubt</u>, prescribed transmission services".</p>	<p>The Commission agrees with ElectraNet's suggestion and will include "for the avoidance of doubt" in the final definition.</p>

7 Appendix C: Code definition amendments

Additional NER definitions that the Commission has adopted, 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	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.
exit Point	means a connection point through which a transmission customer or distributor imports electricity from the transmission network	Amendment has been made to improve the clarity 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 or the distributor (whichever is applicable) 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 or distributor).	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 fail.	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 has ing a connection point with a transmission network that and receives transmission services and, where the context requires includes a distributor and/or a generator .	Amendments made to improve the readability of defined term and align it with other NER definitions that have also been adopted.

<p>transmission line</p>	<p>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.</p>	<p>Amendments made to improve the readability of the defined term.</p>
<p>transmission services</p>	<p>has the same meaning as defined in Chapter 10 of the National Electricity Rules and includes, for the avoidance of doubt, prescribed transmission services. means:</p> <p style="padding-left: 40px;">in relation to a transmission customer and a distributor, transmission use of system services and exit services; and</p> <p style="padding-left: 40px;">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>

8 Appendix D: Commission’s response to submissions to the draft decision – clause amendments

Clause	Draft Decision Amendment	ElectraNet Comment	Commissions response
2.5	<p>2.5.1 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>2.5.2 A transmission entity may implement an alternative solution or combination of solutions to those described in required by clause 2.5.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise</p>	<p>As noted in our submission above the strict 2 day line restoration target cannot be met in all reasonably foreseeable circumstances. The clause should be amended to read:</p> <p>“2.6.1 In respect of Category 1 exit points, a transmission entity must, subject to clause 2.6.2 and clause 9.2:”</p> <p>Further the best endeavours requirement should apply to both (b)(i) and (b)(ii). In addition clauses (b)(i) and (b)(ii) could be reordered for additional clarity as:</p> <p>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. restore “N” equivalent line capacity at the exit point within 2 days of the commencement of the interruption; and</p> <p>ii. in any event, restore “N” equivalent line capacity at the exit point as soon as practicable</p>	<p>The Commission has responded to this in section 3.4.</p> <p>Given the lead in to clause 9.2, the Commission does not consider a reference to “and clause 9.2” as suggested is necessary.</p> <p>The overarching requirement to use best endeavours (to be set out in clause 1.4 of the Code) is also not subject to clause 9.2.</p> <p>This applies for all category clauses.</p>

	required to be achieved under clause 2.5.1.		
2.6	<p>2.6.1 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> <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>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</p>	<p>As noted in our submission above the strict 2 day line restoration target cannot be met in all reasonably foreseeable circumstances. The clause should be amended to read:</p> <p>"2.7.1 In respect of Category 1 exit points, a transmission entity must, subject to clause 2.7.2 and clause 9.2:"</p> <p>Further the best endeavours requirement should apply to both (b)(i) and (b)(ii). In addition clauses (b)(i) and (b)(ii) could be reordered for additional clarity as:</p> <p>(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. restore "N" equivalent line capacity at the exit point within 2 days of the commencement of the interruption; ; and</p> <p>ii. in any event, restore "N" equivalent line capacity at the exit point as soon as practicable</p>	The Commission has responded to this in section 3.4.

	terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.6.1		
2.7-2.9		Similarly to 2.6 and 2.7 it would be appropriate to reference clause 9.2 in each clause.	See comment above in respect to clause 2.5
2.11	<p>Contracted agreed maximum demand and a Network support arrangement requirements</p> <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>2.11.1 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>As currently drafted it is unclear with respect to the network support provider's requirement to "ensure the capacity and availability of the network support arrangement".</p> <p>Further it is assumed that the "installed capacity" in 2.12.2 is the "N equivalent capacity".</p>	<p>There are no requirements on a network support provider in respect of this clause.</p> <p>In the context of this Code, the requirement to ensure that a network support provider can deliver the necessary capability and availability under an agreement is the responsibility of the transmission entity.</p> <p>The Commission agrees that "installed capacity" is more appropriately defined as "N equivalent capacity" in this clause.</p>
2.17	<p>Country connection points</p> <p>2.17.1 A transmission entity must not discontinue or cease to operate,</p>	Due to the requirement to reference "generator or distributor" in the definition of connection point we	The Commission considers the broader requirement of this clause necessitates a

	maintain or service connection points in country areas without the approval of the Commission .	believe this clause should be entitled "Country exit points" rather than 'connection points'.	reference to connection point.
9.2.1 (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	The subclause should be amended to read: "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 for the avoidance of doubt does not include events or circumstances that arise from a breach of this industry code, or a negligent act, by the transmission entity unless that breach of this industry code is caused by an event or circumstance that is outside of the reasonable control of a transmission entity);"	The Commission accepts the suggestion to include the words "for the avoidance of doubt" in this clause. However, the additional wording suggested in the brackets makes the clause somewhat circular. The interpretation of this clause is discussed in section 3.3 of the final decision which clarifies the circumstances under which this clause can be invoked. An event which resulted in a breach of the Code would not prohibit this clause from being invoked if it was outside of the reasonable control of a transmission entity.
9.2.1 (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	The reference to customers should include distributor	The Commission accepts the suggested amendment.
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: ...	This clause clearly refers to any connected party, which supports the need for the broader definition of connection point and the associated amendments.	The Commission accepts this position.

9 Appendix E: Code amendments, excluding definition changes

Clause	Amendment	Reasoning
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 .	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.
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 . can be demonstrated to be prudent and efficient, taking into account the long term benefit to consumers.	Amendment has been made to ensure consistency throughout the code and improve the readability of the clause.
1.4	The obligation to 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 or to satisfy any other obligation in this industry code, includes, without limitation, a requirement that the transmission entity must have regard to: <ul style="list-style-type: none"> (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) to the extent applicable, clause 9. 	This clause has been brought forward (from clause 2.9.1 of TC09) to highlight the overarching and guiding requirements on a transmission entity in relation to using best endeavours to meet obligations of the Code.
1.8.1	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: <p>....</p> <ul style="list-style-type: none"> (d) any guidelines, industry codes or rules made by the Commission from time to time; and 	Amendment has been made so that the code references other industry codes that may be applicable.

	...	
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.	Amendment made to clarify that the service standards apply to the provision of prescribed transmission services.
2.2 (heading)	Transmission network standards and procedures .	Amendment has been made to make the heading consistent with the requirements of the clause.
2.2.4	The transmission entity must act in accordance with 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 .	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.
2.4.1	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.
2.4.2	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 2.4.2 to improve readability.
2.5.1	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 restore "N" equivalent line capacity at the exit point within a maximum of 2 days after the commencement of the interruption; and 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,	The "best endeavours" wording has been moved, to clarify that the requirement to restore N equivalent line capacity is a best endeavours requirement to restore within a maximum of 2 days. Refer section 3.4 of the decision. Other ancillary amendments have been made to improve readability and ensure consistency with the Code's defined terms.

	<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>	
2.5.2	A transmission entity may implement an alternative solution or combination of solutions to those described in required by clause 2.5.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.5.1.	This amendment has been made to improve readability.
2.6.1	<p>In respect of Category 2 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 restore "N" equivalent line capacity at the exit point within a maximum of 2 days after the commencement of the interruption; and 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>The "best endeavours" wording has been moved, to clarify that the requirement to restore N equivalent line capacity is a best endeavours requirement to restore within a maximum of 2 days. Refer section 3.4 of the decision.</p> <p>Other ancillary amendments have been made to improve readability and ensure consistency with the Code's defined terms.</p>

2.6.2	<p>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</p>	<p>This amendment has been made to improve readability of clause.</p>
2.7.1	<p>In respect of Category 3 exit points, a transmission entity must, subject to clause 2.7.2:</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>(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>	<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>
2.7.2	<p>A transmission entity may implement an alternative solution or combination of solutions to those described in</p>	<p>Amendment has been made to improve readability of the clause.</p>

	<p>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>	
2.8.1	<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 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</p>	<p>Amendments have been made to improve readability and ensure consistency with the Code's defined terms.</p>

	<p>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>	
2.8.2	<p>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.</p>	<p>Amendment has been made to improve readability of the clause.</p>
2.9.1	<p>Subject to clause 2.9.2, in respect of Category 5 exit points, a transmission entity must, by means of independent and diverse transmission substations:</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>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>Amendments have been made to improve readability and ensure consistency with the Code’s defined terms.</p>

	(B) restore “N-1” equivalent transformer capacity as soon as practicable after the commencement of the interruption.	
2.9.2	A transmission entity may implement an alternative solution or combination of solutions to those described in 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	Amendment has been made to improve readability of the clause.
2.10.2	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.
2.10.3	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 2.10.3 is a mandatory requirement.
2.11.1	Contracted agreed maximum demand and n-Network support arrangement requirements 2.12.1 — Where a transmission entity has a network support arrangement in place, the transmission entity may contract for any amount of agreed maximum demand provided that: (a) — if the level of contracted agreed maximum demand is less than 120% of the installed capacity at the exit point, the network support arrangement must have at least 95% availability on the occasions it is called upon (including for regular operational testing) for the 24 months to 30 June each year, having regard to the measurability of availability performance; and (b) — if the level of contracted agreed maximum demand exceeds 120% of the installed capacity at the exit point, the network support arrangement must have a level of availability at least equal to the availability delivered by the transmission line and transformer elements applicable to the exit point pursuant to clauses 2.5 to 2.9. 2.11.1 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 .	The first part of the clause has been removed to reflect the draft decision in relation to category 3 service standards arrangements, as discussed in section 3.1.1.2. For clause 2.11.1, amendment has been made to clarify the clause relates to the reliability standards set out in clause 2.

2.11.2	<p>Where a transmission entity does not have a network support agreement in place, the transmission entity must not:</p> <p>(a) contract for an amount of agreed maximum demand which is greater than 100% percent of the N equivalent capacity at the exit point, and</p> <p>...</p>	
2.12	<p>New connection exit points</p> <p>2.12.1 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>2.12.2 Any standards submitted under clause 2.12.1 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>
2.16	<p>2.16.1 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.</p> <p>2.16.2 In particular, the transmission entity must:</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>(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>	<p>Amendment has been made to improve consistency throughout the Code.</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>	<p>Amendments have been made to improve consistency with the Code's defined terms.</p>

3.1.2	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	Amendments have been made to improve consistency with the Code's defined terms.
6.2	Clause 6.2, regarding "switching manual" removed.	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> <ul style="list-style-type: none"> (a) complete all necessary design work, (b) obtain all necessary planning approvals and (c) acquire all necessary land, and (d) acquire all necessary easements. <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	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).	Amendments have been made to improve consistency with the Code's defined terms.
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 8.2(e) 8.3 or such other arbitration procedures prescribed in industry codes issued by the Commission from time to time.</p>	Amendments have been made to rectify a formatting and clause reference error.

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). 	<p>Amendment made to clarify this clause requires an "or".</p>



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