



Electricity

Code



Electricity Transmission Code

TC/09.2

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1 Preliminary

1.1 Definitions

- 1.1.1 Words and phrases appearing in bold like **this** are defined in clause 1.6. A number of words have the same meaning as defined in Chapter 10 of the **National Electricity Rules**, which can be accessed at <https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current>
- 1.1.2 References to **Australian Standards** are references to standards existing from time to time, or where they are superseded, their replacements.

1.2 Authority

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

1.3 Application

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

1.4 Best endeavours

- 1.4.1 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:
- (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.

1.5 Interpretation

1.5.1 In this industry code, unless the context otherwise requires:

- (a) headings, footnotes and examples are for convenience or information only and do not affect the operation or interpretation of this industry code or of any term or condition set out in this industry code;
- (b) unless the context otherwise requires, words importing the singular include the plural and vice versa;
- (c) an expression importing a natural person includes any company, partnership, trust, joint venture, association, corporation or other body corporate and any governmental agency and vice versa;
- (d) a reference to a clause or appendix is to a clause or appendix of this industry code;
- (e) a reference to any statute includes all statutes varying, consolidating, re-enacting, extending or replacing them and a reference to a statute includes all regulations, proclamations, ordinances, by-laws and determinations issued under that statute;
- (f) a reference to a document or a provision of a document includes an amendment or supplement to, or replacement of or novation of, that document or that provision of that document;
- (g) a reference to a person includes that person's executors, administrators, successors, substitutes (including, without limitation, persons taking by novation) and permitted assigns; and
- (h) other parts of speech and grammatical forms of a word or phrase defined in this industry code have a corresponding meaning.

1.6 Definitions

Act	means the Electricity Act 1996 (SA).
AEMO	means the Australian Energy Market Operator Pty Ltd (ACN 072 101 327).
Adelaide Central	means that area of Adelaide which is located east of West Terrace, north of South Terrace, west of East Terrace and south of the River Torrens.
agreed maximum demand	means for a connection point or a group of connection points , the maximum demand specified as such in the connection agreement between ElectraNet and the relevant transmission customer or a distributor .

applicable laws	means the Act , the National Electricity Rules , any industry code made by the Commission under the ESC Act , the licences issued under the Act and any other legislation, rules, regulations, code or conditions which are binding on an electricity entity .
Australian Standard or AS	means a standard published by the Standards Association of Australia.
best endeavours	means to act in good faith and use all reasonable efforts, skill and resources.
business day	means a day that banks are open for general banking business in Adelaide, other than a Saturday or a Sunday.
Commission	means the Essential Services Commission established under the ESC Act .
connection agreement	means an agreement between a transmission entity and a transmission customer, generator or distributor relating to the connection to the transmission entity's transmission network and the provision of transmission services .
connection asset	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
connection point	means an agreed point of supply between a transmission entity's transmission network and a transmission customer, generator or distributor .
customer	has the same meaning given to that term in the Act .
distributor	means a holder of a licence issued under the Act authorising the operation of a distribution system .
distribution network	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
distribution system	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
ElectraNet	means ElectraNet Pty Ltd (ACN 094 482 416) and includes any entity which replaces or assumes rights and/or obligations of that company by way of succession, assignment, novation, Ministerial direction or otherwise.
electricity entity	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 .
emergency	means the actual or imminent occurrence of an event which in any way endangers or threatens to endanger the safety or health of any person, or the maintenance of power system security , in the state of South

	Australia or which destroys or damages, or threatens to destroy or damage, any property in the state of South Australia.
equivalent capacity	means either or both of equivalent line capacity and equivalent transformer capacity , as the context requires.
equivalent line capacity	means the capacity to transmit energy to meet agreed maximum demand using any means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements.
equivalent transformer capacity	means the capacity to transform energy to meet agreed maximum demand using any means including, but not limited to: <ul style="list-style-type: none"> (a) transmission system capability; (b) network support arrangements
ESC Act	means the Essential Services Commission Act 2002 (SA).
exit point	means a connection point through which a transmission customer or distributor imports electricity from the transmission network .
forecast agreed maximum demand	means the agreed maximum demand forecast for a given year that is agreed with the transmission customer or the distributor (whichever is applicable) three years prior to the date upon which the agreed maximum demand is to commence to apply under the relevant connection agreement .
generating system and generating unit	have the same meaning as defined in Chapter 10 of the National Electricity Rules .
generator	means a holder of a licence issued under the the Act authorising the person to generate electricity.
good electricity industry practice	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
group of exit points	means a group of two or more exit points interconnected by a distribution network .
maximum demand	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
“N”	means that the transmission system is able to supply the agreed maximum demand connected to the transmission system provided that all the transmission elements are in service (i.e. the loss of a single transmission element could cause a supply interruption to some transmission customers or distributor).
“N-1”	means the ability of the transmission system to continue to supply the agreed maximum demand connected to the transmission system without interruption should any one transmission element fail.

National Electricity Rules	has the meaning given to that term in the National Electricity Law.
network support agreement	means a written agreement setting out commercial and operational arrangements between a transmission entity and an independent network support provider in relation the provision of a network support arrangement .
network support arrangement	means: <ul style="list-style-type: none"> (a) distribution system capability; (b) generating unit capability; (c) load interruptibility; or (d) any combination of those services.
planned outage	means an interruption of, or restriction to, transmission services , other than due to an emergency .
power system incident	means an unplanned event which affects the provision of transmission services to a generator , transmission customer or distributor to the level agreed in the relevant connection agreement and occurs when protection equipment is activated.
power system security	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
prescribed transmission service	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
Regulatory Investment Test for Transmission	has the same meaning as defined in Chapter 10 of the National Electricity Rules .
SA Power Networks	means the partnership comprising: Spark Infrastructure SA (No.1) Pty Ltd ABN 54 091 142 380, Spark Infrastructure SA (No.2) Pty Ltd ABN 19 091 143 038, Spark Infrastructure SA (No.3) Pty Ltd ABN 50 091 142 362 each incorporated in Australia, CKI Utilities Development Limited (ABN 65 090 718 880), HEI Utilities Development Limited (ABN 82 090 718 951), each incorporated in The Bahamas.
site occupier	means an electricity entity that is required by its licence to provide access to its transmission system , distribution system or generating system 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 (as the case may be).
system controller	means a person holding a licence under Part 3 of the Act to exercise the function of system control over a power system.
transformer	means a plant or device forming part of the transmission network that reduces or increases the voltage of alternating current and includes the associated primary plant and connected secondary systems to the

extent that those items are needed in order to comply with the relevant reliability standard in clause 2.

transmission customer	means a customer that has a connection point with a transmission network and receives transmission services and, where the context requires, includes a distributor and/or a generator .
transmission entity	means a holder of a licence issued under the Act authorising the operation of a transmission system .
transmission line	means an electric line forming part of the transmission network and includes the associated primary plant and connected secondary systems to the extent that those items are needed in order to comply with the relevant reliability standard in clause 2.
transmission network	means a system of electric lines (generally at nominal voltages of 66kV or above) and other apparatus, equipment, plant and buildings used to convey electricity, but excluding connection assets .
transmission services	has the same meaning as defined in Chapter 10 of the National Electricity Rules and, for the avoidance of doubt, includes prescribed transmission services .
transmission system	means a transmission network together with connection assets .

1.7 Obtaining a copy of this industry code

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

1.8 Other Acts, industry codes and regulations

- 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:
- (a) Acts of Parliament and regulations made under those Acts of Parliament (in particular the **Act** and associated regulations, and the **ESC Act**);
 - (b) licence conditions;
 - (c) the **National Electricity Rules**;
 - (d) any guidelines, industry codes or rules made by the **Commission** from time to time; and
 - (e) the terms of any **connection agreements**.

1.9 Scope

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

2 Service standards

2.1 Quality of supply and system reliability

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

2.2 Transmission network standards and procedures

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

2.3 Specific reliability standards

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

- (b) the relevant project is proposed to satisfy one or more reliability standards under this clause 2, where anything other than “N” equivalent capacity is required.

2.4 Allocation of exit points to categories

2.4.1 The table below categorises **exit points** for the purposes of setting planning and reliability standards under this industry code (square brackets denote a **group of exit points**):

CATEGORY	EXIT POINT [] = GROUP OF EXIT POINTS	
Category 1	<ul style="list-style-type: none"> • Baroota • Back Callington * • Davenport * • Florieton SWER • Kanmantoo • Leigh Creek Coal * • Leigh Creek South • Mannum/Adelaide 1 * • Mannum/Adelaide 2 * • Mannum/Adelaide 3 * • Middleback* • Millbrook * • Morgan/Whyalla 1 * • Morgan/Whyalla 2 * • Morgan/Whyalla 3 * • Morgan/Whyalla 4 * 	<ul style="list-style-type: none"> • Mt Gunson • Mt Gunson South * • Murray/Hahndorf 1 * • Murray/Hahndorf 2 * • Murray/Hahndorf 3 * • Neuroodla • Pimba * • Roseworthy* • Stony Point (Whyalla Refiners) - distribution • Stony Point* • Whyalla Terminal LMF • Woomera*
Category 2	<ul style="list-style-type: none"> • Ardrossan West • Dalrymple 	<ul style="list-style-type: none"> • Kadina East • Wudinna • Yadnarie
Category 3	<ul style="list-style-type: none"> • Port Lincoln 	<ul style="list-style-type: none"> • Snuggery Rural
Category 4	<ul style="list-style-type: none"> • Angas Creek • [Berri/Monash] • Blanche • Brinkworth • Clare North • Dorrien • Templers • Hummocks • Keith • Kincaig • Mannum • Mobilong • [Mt Barker, Mt Barker South] • Mt Gambier 	<ul style="list-style-type: none"> • North West Bend • Penola West • Davenport West • Snuggery Industrial • Taillem Bend • Waterloo • Whyalla Central – Main Bus • [Bungama and Pt Pirie] • [Dry Creek (West), Kilburn, LeFevre, New Osborne and Torrens Island 66kV] • [Happy Valley, Magill (South), Morphett Vale East and City West (South)] • [Para, Munno Para and Parafield Gardens West] • [Dry Creek (East), Magill (East) and Northfield]
Category 5	<ul style="list-style-type: none"> • Adelaide Central [East Tce, City West (ACR)] 	

- 2.4.2 An asterisk denotes an **exit point** which is subject to the reliability standards only to the extent that the **exit point** is used to provide **prescribed transmission services** to a **transmission customer**.

2.5 Category 1 exit points

- 2.5.1 In respect of Category 1 **exit points**, a **transmission entity** must, subject to clause 2.5.2:
- (a) provide **"N" equivalent line capacity** for at least 100 percent of the **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 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 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 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.

2.6 Category 2 exit points

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

- ii. in the event of an interruption to **prescribed transmission services** arising from a failure of any installed **transformer** or **network support arrangement** for the **exit point**:
 - (A) restore at least **"N" equivalent transformer capacity** at the **exit point** within 8 days of the commencement of the interruption; and
 - (B) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** at the **exit point** as soon as practicable after the commencement of the interruption.
- 2.6.2 A **transmission entity** may implement an alternative solution or combination of solutions to those required by clause 2.6.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.6.1.

2.7 Category 3 exit points

- 2.7.1 In respect of Category 3 **exit points**, a **transmission entity** must, subject to clause 2.7.2:
- (a) provide **"N-1" equivalent line capacity** for at least 100 percent of the **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 any installed **transmission line** or **network support arrangement** for the **exit point**, use **best endeavours** to restore:
 - (A) at least **"N" equivalent line capacity** within 1 hour of the commencement of the interruption; and
 - (B) restore **"N-1" equivalent line capacity** as soon as practicable after the commencement of the interruption; and
 - (b) provide **"N-1" equivalent transformer capacity** for at least 100 percent of contracted **agreed maximum demand** (including through the use of post-contingent operation) and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement** for the **exit point**, use its **best endeavours** to restore **"N-1" equivalent transformer capacity** at the **exit point** as soon as practicable;
 - ii. in the event of an interruption to the provision of **prescribed transmission services** at the **exit point** arising from the failure of any installed **transformer** or **network support arrangement** for the **exit point**:

- (A) restore at least **"N" equivalent transformer capacity** within 1 hour of the commencement of the interruption; and
 - (B) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** as soon as practicable after the commencement of the interruption.
- 2.7.2 A **transmission entity** may implement an alternative solution or combination of solutions to those required by clause 2.7.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.7.1.

2.8 Category 4 exit points

- 2.8.1 In respect of Category 4 **exit points**, a **transmission entity** must, subject to clause 2.8.2:
- (a) provide **"N-1" equivalent line capacity** for at least 100 percent of the **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement** for the **exit point**, use its **best endeavours** to restore **"N-1" equivalent line capacity** at the **exit point** as soon as practicable;
 - ii. in the event of an interruption to the provision of **prescribed transmission services** at the **exit point**, arising from the failure of any installed **transmission line** or **network support arrangement**:
 - (A) for the **group of exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **"N" equivalent line capacity** for that **group of exit points** within 4 hours of the commencement of the interruption;
 - (B) for all other **exit points**, use its **best endeavours** to restore at least **"N" equivalent line capacity** at the **exit point** within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore **"N-1" equivalent line capacity** for the **exit point** as soon as practicable after the commencement of the interruption; and
 - (b) provide **"N-1" equivalent transformer capacity** for at least 100 percent of the **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement** for the **exit point**, use its **best endeavours** to restore **"N-1" equivalent transformer capacity** at the **exit point** as soon as practicable;
 - ii. in the event of an interruption to the provision of **prescribed transmission services** at the **exit point** arising from the failure of any installed **transformer** or **network support arrangement** for the **exit point**:

- (A) for the **group of exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **"N" equivalent transformer capacity** for that **group of exit points** within 4 hours of the commencement of the interruption;
 - (B) for all other **exit points**, use its **best endeavours** to restore at least **"N" equivalent transformer capacity** at the **exit point** within 12 hours of the commencement of the interruption; and
 - (C) use its **best endeavours** to restore **"N-1" equivalent transformer capacity** at the **exit point** as soon as practicable after the commencement of the interruption.
- 2.8.2 A **transmission entity** may implement an alternative solution or combination of solutions to those required by clause 2.8.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.8.1.

2.9 Category 5 exit points

- 2.9.1 Subject to clause 2.9.12, in respect of Category 5 **exit points**, a **transmission entity** must, by means of independent and diverse transmission substations:
- (a) provide **"N-1" equivalent line capacity** into **Adelaide Central** for at least 100 percent of the **agreed maximum demand** for the **exit points** and:
 - i. in the event of a failure of any installed **transmission line** or **network support arrangement** for the **exit points**, use its **best endeavours** to restore **"N-1" equivalent line capacity** at the **exit points** as soon as practicable;
 - ii. in the event of an interruption to the provision of **prescribed transmission services** arising from a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to:
 - (A) restore at least 176 MW of **equivalent line capacity** within 4 hours of the commencement of the interruption; and
 - (B) restore **"N-1" equivalent line capacity** as soon as practicable after the commencement of the interruption.
 - (b) provide **"N-1" equivalent transformer capacity** into **Adelaide Central** for at least 100 percent of the **agreed maximum demand** and:
 - i. in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore the **equivalent transformer capacity** as soon as practicable;
 - ii. in the event of an interruption to the provision of **prescribed transmission services** arising from a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to:

- (A) restore at least 176 MW of **equivalent transformer capacity** within 4 hours of the commencement of the interruption; and
 - (B) restore "**N-1**" **equivalent transformer capacity** as soon as practicable after the commencement of the interruption.
- 2.9.2 A **transmission entity** may implement an alternative solution or combination of solutions to those required by clause 2.9.1, to deliver the same or better outcomes in terms of the failure rate, the restoration time and the capacity, otherwise required to be achieved under clause 2.9.1.

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

- 2.10.1 Subject to clause 2.10.2, in the event that a change in **forecast agreed maximum demand** at an **exit point** or **group of exit points** will result in a future breach of a standard specified in this clause 2, a **transmission entity** must ensure that the **equivalent capacity** at the **exit point** or **group of exit points** is sufficient to meet the required standard within 12 months of the identified future breach date.
- 2.10.2 Where a change in **forecast agreed maximum demand** at an **exit point** or **group of exit points** under clause 2.10.1 was not reasonably expected to occur by the **transmission entity** in the **forecast agreed maximum demand**, a **transmission entity** must:
- (a) use its **best endeavours** to ensure that the **equivalent capacity** at the **exit point** or **group of exit points** is sufficient to meet the required standard within 12 months of the identified future breach date; and
 - (b) in any event, ensure that the **equivalent capacity** at the **exit point** or **group of exit points** is sufficient to meet the required standard within 3 years of the identified future breach date.
- 2.10.3 **ElectraNet** must negotiate in good faith with **SA Power Networks** to determine:
- (a) the **forecast agreed maximum demand** to be applied at an **exit point** or **group of exit points** to meet the reliability standards applicable to each **exit point** or **group of exit points** pursuant to clause 2; and
 - (b) any change in **forecast agreed maximum demand** to be applied at an **exit point** or **group of exit points** for the purposes of clause 2.10.

2.11 Network support arrangement requirements

- 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 **transmission entity** must enter into a **network support agreement** with that network support provider to ensure the capability and availability of the **network support arrangement**.
- 2.11.2 Where a **transmission entity** does not have a **network support agreement** in place, the **transmission entity** must not:
- (a) contract for an amount of **agreed maximum demand** which is greater than 100 percent of the **N equivalent capacity** at the **exit point**; and

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

2.12 New exit points

- 2.12.1 Where a new **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 **exit point** to the **Commission** for approval.
- 2.12.2 Any standards submitted under clause 2.12.1 must be developed having regard to:
 - (a) any recommendations of **AEMO**;
 - (b) the size of the load;
 - (c) the value of lost load and types of **customers**;
 - (d) the number of **customers**; and
 - (e) the cost of installation of transmission assets relevant to the **exit point**.

2.13 Rating of transmission lines and transformers

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

2.14 Spare transformers

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

2.15 Emergency transformer replacement plan

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

2.16 Reports to the Commission

- 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.
- 2.16.2 In particular, the **transmission entity** must:
 - (a) report on the actual performance with the reliability standards set out in this clause 2;
 - (b) provide an explanation of the reason for any non-compliance;

- (c) report on how the **transmission entity** will continue to meet, or improve its performance so as to meet, the reliability standards set out in this clause 2;
 - (d) report on the **transmission entity's** compliance with the **emergency transformer** replacement plan prepared in accordance with clause 2.15 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance;
 - (e) report on the compliance of any **network support arrangements** with the requirements of clause 2.11 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance.
- 2.16.3 A **transmission entity** must report to the **Commission** on the circumstances of each occasion where it has been required, as a result of a **transformer** failure, to repair a **transformer**, install a new **transformer**, or provide **equivalent transformer capacity**, in order to meet the reliability standards specified in this clause 2 within 2 months of that event.

2.17 Country connection points

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

3 Interruptions

3.1 Interruptions or restrictions to transmission services

- 3.1.1 A **transmission entity** may, subject to anything contrary in a **connection agreement** with a **transmission customer, distributor or generator**, interrupt or restrict **transmission services**:
- (a) for the purposes of:
 - i. carrying out testing, commissioning, maintenance or repair of its **transmission system** which can not reasonably be undertaken utilising live-line techniques;
 - ii. carrying out augmentation or extensions to the **transmission system** or to connect a new **transmission customer, distributor or generator**;
 - iii. complying with the directions or requirements of **AEMO**, the **system controller** or any other government authority; and
 - iv. maintaining **power system security** or responding to an **emergency** or for health or safety reasons (in accordance with clause 9.4); or
 - (b) as otherwise agreed in writing with the **transmission customer, distributor or generator**.
- 3.1.2 Nothing in this clause 3.1 will prevent the interruption or restriction of **transmission services** caused by the normal operation of protection systems forming part of the **transmission system**.

3.2 Outage planning

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

3.3 Minimisation of interruptions

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

3.4 Obligation to provide information

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

4 Design requirements

4.1 Protection

4.1.1 A **transmission entity** may require, as a term of a **connection agreement**, that a **transmission customer, distributor or generator** that wishes to:

- (a) be connected to a **transmission network**; or
- (b) modify an existing connection with the **transmission network**,

consult with the **transmission entity** concerning the design and equipment selection for all protection functions which are required to coordinate and grade with the **transmission network** in order to minimise interruption or restrictions to **transmission services** due to the operation of those protection functions.

4.1.2 The **transmission entity** may require as a term of a **connection agreement** that a **transmission customer, distributor or generator** installs duplicate protection, including batteries, as required by the **National Electricity Rules**.

4.2 Communications

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

4.3 Protection and control

4.3.1 A **transmission entity** may require as a term of a **connection agreement** with a **transmission customer, distributor or generator** that protection and control associated with their **connection points** must comply with:

- (a) applicable guidelines issued by the **transmission entity**;
- (b) the proposed design agreed by the **transmission entity**; and
- (c) **good electricity industry practice**.

4.4 Testing of third party equipment at connections

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

4.5 Network maintenance

4.5.1 A **transmission entity** must ensure that, where maintenance is carried out in substations that form part of the **transmission system**, adequate precautions are taken in accordance with **good electricity industry practice** to:

- (a) ensure that the equipment to be maintained is correctly identified, isolated, earthed (where appropriate) and clearly marked; and

- (b) reduce the possibility of incorrect operation of other plant and equipment which could result in interruptions to **transmission services**.
- 4.5.2 On the completion of maintenance the **transmission entity** must take the same precautions to ensure that the equipment is adequately tested prior to its return to service.

4.6 Network modification

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

4.7 Network equipment performance

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

4.8 Network equipment inspections and tests

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

5 Technical requirements

5.1 Good electricity industry practice

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

5.2 General requirements

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

5.3 System compatibility

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

5.4 Design standards

- 5.4.1 A **transmission entity** may refuse to connect, or energise a connection of, a **transmission customer, distributor, or generator** if that connection is not correctly protected or is not within the design rating of the **transmission system**.

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

6 General requirements

6.1 Power system incident reporting

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

6.2 Planning approvals and land and easement acquisition

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

6.3 Network options and security

- 6.3.1 Where the most economically feasible option to meet the minimum reliability standards of clauses 2.5 to 2.9 relies on a combination of transmission, sub-transmission and distribution services, the **transmission entity** must ensure that the reliability standard required by that category is capable of being delivered to the **exit points** within that category, including for any contingency events that the category requires for that reliability category.
- 6.3.2 Where a **distributor** is required, in accordance with the **National Electricity Rules**, to extend or augment its **distribution system** associated with a **transmission entity's** obligations under clause 6.3.1, the **distributor** must undertake that work in a timeframe which will enable the **transmission entity** to achieve the required reliability standard at an **exit point**.
- 6.3.3 A **transmission entity** that provides **equivalent transmission line capacity** or **equivalent transformer capacity** for the purposes of clause 2 of this industry code must consider network plant failures in any National Electricity Market region, including **distribution systems**, where such plant failures might impact on the applicable level of redundancy or reliability.
- 6.3.4 For the purpose of assessing **connection point** reliability, the capability of the Murraylink interconnector should be calculated using the Murraylink transfer limit equation under peak Victorian demand conditions.

7 Access to sites

7.1 Rights of site entry for electricity entities

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

7.2 Disputes

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

8 Telecommunications access

8.1 Access to the network

- 8.1.1 A **transmission entity** and **distributor** must make an offer to a person requesting rights to use or have access to its **transmission system** or **distribution system** (as the case may be) for telecommunications purposes, having regard to matters including:
- (a) the technical feasibility of the entity granting such access to its **transmission system** or **distribution system**; and
 - (b) the preservation of visual amenity, given the surroundings and environment in which the relevant part of the **transmission system** or **distribution system** is located;
 - (c) whether or not it would be uneconomical for the person requesting access to develop another facility to provide the telecommunications service requested;
 - (d) whether or not access can be provided without:
 - i. undue risk to human health or safety;
 - ii. undue risk to the safety of property;
 - iii. adversely affecting the safety or performance of the **transmission system** or **distribution system**;
 - iv. adversely affecting any **customers** or entities connected to those systems;
 - (e) the matters set out in clause 8.2; and
 - (f) the person requesting access agreeing in writing with the **transmission entity** or **distributor** that any dispute relating to the granting of such access be submitted to arbitration in accordance with clause 8.3 or such other arbitration procedures prescribed in industry codes issued by the **Commission** from time to time.

8.2 Terms of access

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

8.3 Arbitration

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

9 Emergencies

9.1 Emergency disconnection

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

9.2 Unplanned interruptions

- 9.2.1 Notwithstanding 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, the interruption during or following the events or circumstances, those steps would, or would be likely to, result in a serious risk to the health or safety of any person (including a serious risk to the health or safety of any employee or contractor of the **transmission entity**),
- the period of time during which (as applicable) the **transmission entity** is so prevented or the serious risk to the health or safety of that person continues to exist (such time to be satisfactorily recorded by the **transmission entity**), will not be taken into account in determining whether the **transmission entity** has satisfied the reliability standards specified in clauses 2.5 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 **exit points**, the extent to which its restoration obligations are or are likely to be affected and the steps taken to remove, overcome or minimise those effects.

9.3 Emergency provisions of other Acts

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

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

the Emergency Management Act 2004, Essential Services Act 1981 or the Fire and Emergency Services Act 2005 or other relevant legislation.

9.4 Health and safety

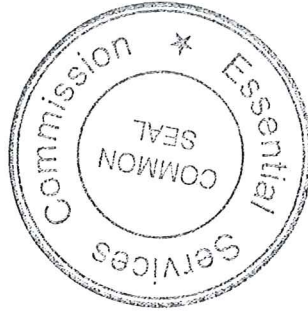
9.4.1 A **transmission entity** may disconnect, interrupt or limit the provision of **transmission services** to a **connection point** for reasons of health or safety, provided it follows the procedures in clause 9.4.2.

9.4.2 Except in the case of an **emergency**, an interruption arising under clause 9.2 or where relevant regulations require it, a **transmission entity** must not disconnect, interrupt or limit the provision of **transmission services** to a **connection point** for a health or safety reason unless the **transmission entity** has:

- (a) given the affected **transmission customer, distributor** or **generator** written notice of the reason; and
- (b) where the threat to health or safety is due to:
 - i. a **transmission entity's transmission system**, given each affected **transmission customer, distributor** or **generator** 5 **business days'** prior notice; or
 - ii. a **transmission customer, distributor** or **generator**, allowed the relevant person 5 **business days** to remove the threat to health or safety (the 5 **business days** shall be counted from the date of receipt of the notice).

This Industry Code was made by the Commission on 13 March 2019 pursuant to Part 4 of the Essential Services Commission Act 2002, to take effect from 13 March 2019.

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



Brett Rhoads

Commissioner

13 March 2019

Date



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