

# ELECTRICITY TRANSMISSION CODE

*TC/07 (Version 2)*

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The Essential Services Commission of South Australia is the independent economic regulator of the electricity, gas, ports, rail and water industries in South Australia. The Commission's primary objective is the *protection of the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services*. For more information, please visit [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au).

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### *Amendment Record*

ISSUE NO.	COMMENCEMENT DATE	PAGES
TC/01	11/10/99	-
TC/02	23/12/99	-
TC/03	01/07/01	-
TC/04	01/07/03	-
TC/05	01/07/08	-
TC/05 (Version 2)	01/07/08	-
TC/06	01/07/11	34
TC/07	01/07/13	30
TC/07 (Version 2)	01/07/13	29



# TABLE OF CONTENTS

<b>1</b>	<b>Preliminary</b>	<b>1</b>
1.1	Definitions	1
1.2	Authority	1
1.3	Application	1
1.4	Interpretation	1
1.5	Definitions	2
1.6	Obtaining a copy of this Industry Code	5
1.7	Other Acts, Industry Codes and Regulations	5
1.8	Scope	5
<b>2</b>	<b>Service Standards</b>	<b>5</b>
2.1	Quality of supply and system reliability	5
2.2	Transmission network standards	6
2.3	Specific reliability standards	6
2.4	Allocation of exit points to categories	6
2.5	Category 1 exit points	7
2.6	Category 2 exit points	8
2.7	Category 3 exit points	8
2.8	Category 4 exit points	9
2.9	Category 5 exit points	10
2.10	Obligation to restore capacity	11
2.11	Obligation to provide sufficient capacity following changes in forecast agreed maximum demand	11
2.12	Contracted agreed maximum demand and network support arrangement requirements	12
2.13	New connection points	13
2.14	Rating of transmission lines and transformers	13
2.15	Spare transformers	13
2.16	Emergency Transformer Replacement Plan	13
2.17	Reports to the Commission	13
2.18	Country lines	14
<b>3</b>	<b>Interruptions</b>	<b>14</b>
3.1	Interruptions or restrictions to transmission services	14
3.2	Outage planning	15
3.3	Minimisation of interruptions	15
3.4	Obligation to provide information	15
<b>4</b>	<b>Design Requirements</b>	<b>15</b>
4.1	Protection	15
4.2	Communications	16
4.3	Protection and control	16
4.4	Testing of third party equipment at connections	16

4.5	Network maintenance	16
4.6	Network modification	16
4.7	Network equipment performance	17
4.8	Network equipment inspections and tests	17
<b>5</b>	<b>Technical Requirements</b>	<b>17</b>
5.1	Good electricity industry practice	17
5.2	General requirements	17
5.3	System compatibility	17
5.4	Design standards	18
<b>6</b>	<b>General Requirements</b>	<b>18</b>
6.1	Power system incident reporting	18
6.2	Switching manual	19
6.3	Planning approvals and easement acquisition	19
6.4	Network options and security	19
<b>7</b>	<b>Access to Sites</b>	<b>20</b>
7.1	Rights of site entry for electricity entities	20
7.2	Disputes	21
<b>8</b>	<b>Telecommunications Access</b>	<b>21</b>
8.1	Access to the network	21
8.2	Terms of access	22
8.3	Arbitration	22
<b>9</b>	<b>Emergencies</b>	<b>22</b>
9.1	Emergency disconnection	22
9.2	Emergency provisions of other Acts	23
9.3	Health and safety	23

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# 1 PRELIMINARY

## 1.1 Definitions

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

## 1.2 Authority

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

## 1.3 Application

- 1.3.1 This industry code sets obligations that a **transmission entity** must comply with in relation to the provision of **transmission services** to:
  - (a) a **transmission customer**;
  - (b) a **distributor**;
  - (c) a **generator**,in South Australia.
- 1.3.2 This industry code also imposes obligations on the **system controller, distributors** and **generators**.

## 1.4 Interpretation

- 1.4.1 In this industry code, unless the context otherwise requires:
  - (a) headings, footnotes and examples are for convenience or information only and do not affect the operation or interpretation of this industry code or of any term or condition set out in this industry code;
  - (b) unless the context otherwise requires, words importing the singular include the plural and vice versa;
  - (c) an expression importing a natural person includes any company, partnership, trust, joint venture, association, corporation or other body corporate and any governmental agency and vice versa;
  - (d) a reference to a clause or appendix is to a clause or appendix of this industry code;
  - (e) a reference to any statute includes all statutes varying, consolidating, re-enacting, extending or replacing them and a reference to a statute includes all regulations, proclamations, ordinances, by-laws and determinations issued under that statute;

- (f) a reference to a document or a provision of a document includes an amendment or supplement to, or replacement of or novation of, that document or that provision of that document;
- (g) a reference to a person includes that person's executors, administrators, successors, substitutes (including, without limitation, persons taking by novation) and permitted assigns;
- (h) other parts of speech and grammatical forms of a word or phrase defined in this industry code have a corresponding meaning.

## 1.5 Definitions

<b>Act</b>	means the Electricity Act 1996 (SA).
<b>AEMO</b>	means the Australian Energy Market Operator Pty Ltd (ACN 072 101 327).
<b>Adelaide Central</b>	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.
<b>agreed maximum demand</b>	for a <b>connection point</b> or a group of <b>connection points</b> is the demand specified as such in the <b>connection agreement</b> between <b>ElectraNet</b> and the relevant <b>transmission customers</b> or <b>SA Power Networks</b> .
<b>applicable laws</b>	means the <b>Act</b> , the <b>National Electricity Rules</b> , any industry code made by the <b>Commission</b> under the <b>ESC Act</b> , the licences issued under the <b>Act</b> and any other legislation, rules, regulations, code or conditions which are binding on the <b>transmission entity</b> .
<b>Australian Standard or AS</b>	means a standard published by the Standards Association of Australia.
<b>best endeavours</b>	means to act in good faith and use all reasonable efforts, skill and resources.
<b>business day</b>	means a day that banks are open for general banking business in Adelaide, other than a Saturday or a Sunday.
<b>Commission</b>	means the Essential Services Commission established under the <b>ESC Act</b> .
<b>connection agreement</b>	means an agreement between a <b>transmission entity</b> and a <b>transmission customer, generator</b> or <b>distributor</b> relating to the connection to the <b>transmission entity's transmission network</b> and the provision of <b>transmission services</b> .
<b>connection point</b>	means an agreed point of supply between a <b>transmission entity's transmission network</b> and a <b>transmission customer, generator, or distributor</b> .
<b>customer</b>	has the meaning given to that term in the <b>Act</b> .
<b>distributor</b>	means a holder of a licence issued under the <b>Act</b> authorising the operation of a <b>distribution system</b> .
<b>distribution system</b>	means a <b>distribution network</b> , together with connection assets.
<b>ElectraNet</b>	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.



<b>SA Power Networks</b>	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;
<b>electricity entity</b>	for the purposes of clause 7 of this industry code means a <b>generator, distributor</b> and a <b>transmission entity</b> referred to in a <b>site occupier's</b> licence as having the benefit of the access to a <b>site occupier's transmission system, distribution system</b> or generating assets.
<b>emergency</b>	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 <b>power system security</b> , 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.
<b>equivalent capacity</b>	means either or both of <b>equivalent line capacity</b> and <b>equivalent transformer capacity</b> , as the context requires.
<b>equivalent line capacity</b>	means the capacity to transmit energy to meet demand using means including, but not limited to: <ul style="list-style-type: none"> <li>(a) <b>transmission system</b> capability;</li> <li>(b) <b>network support arrangements</b>.</li> </ul>
<b>equivalent transformer capacity</b>	means the capacity to transform energy to meet demand using means including, but not limited to: <ul style="list-style-type: none"> <li>(a) <b>transmission system</b> capability;</li> <li>(b) <b>network support arrangements</b></li> </ul>
<b>ESC Act</b>	means the Essential Services Commission Act 2002 (SA).
<b>exit point</b>	means a <b>connection point</b> through which a <b>transmission customer</b> imports electricity from the <b>transmission network</b> .
<b>ESAA</b>	means the Electricity Supply Association of Australia.
<b>forecast agreed maximum demand</b>	means the <b>agreed maximum demand</b> forecast for a given year that is agreed with the customer three years prior to when the <b>agreed maximum demand</b> is contracted.
<b>generator</b>	means a holder of a licence issued under the the <b>Act</b> authorising the person to generate electricity.
<b>good electricity industry practice</b>	has the meaning given to that term in the <b>National Electricity Rules</b> .
<b>"N"</b>	means that the <b>transmission system</b> is able to supply the contracted amount of <b>agreed maximum demand</b> connected to the <b>transmission system</b> provided that all the network elements are in service (such that the loss of a single transmission element could cause supply interruption to some customers).
<b>"N-1"</b>	means the ability of the <b>transmission system</b> to continue to supply the contracted amount of <b>agreed maximum demand</b> connected to the <b>transmission system</b> without interruption should any one element fail.
<b>National Electricity Rules</b>	has the meaning given to that term in the National Electricity Law.

<b>network support agreement</b>	means a written agreement setting out commercial and operational arrangements between a <b>transmission entity</b> and a independent network support provider in relation the provision of a <b>network support arrangement</b> .
<b>network support arrangement</b>	means: (a) <b>distribution system</b> capability; (b) generating unit capability; (c) load interruptibility; or (d) any combination of those services.
<b>planned outage</b>	means an interruption of, or restriction to, <b>transmission services</b> , other than due to an <b>emergency</b> .
<b>power system incident</b>	means an unplanned event which affects the provision of <b>transmission services</b> to a <b>generator</b> , <b>transmission customer</b> or <b>distributor</b> to the level agreed in the relevant <b>connection agreement</b> and occurs when protection equipment is activated.
<b>power system security</b>	has the meaning given to that term in the <b>National Electricity Rules</b> .
<b>site occupier</b>	means any <b>transmission entity</b> , <b>distributor</b> , or <b>generator</b> that is required by its licence to provide access to its <b>transmission system</b> , <b>distribution system</b> or generating assets to another <b>electricity entity</b> (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 <b>transmission system</b> , <b>distribution system</b> or generation assets (as the case may be).
<b>system controller</b>	means a person holding a licence under Part 3 of the <b>Act</b> to exercise the function of system control over a power system.
<b>transformer</b>	means a plant or device forming part of the <b>transmission network</b> that reduces or increases the voltage of alternating current and includes the associated primary plant and connected secondary systems to the extent that those items must be capable of supplying the appropriate reliability standard in clause 2.
<b>transmission customer</b>	means a <b>customer</b> having a <b>connection point</b> with a <b>transmission network</b> .
<b>transmission entity</b>	means a holder of a licence issued under the <b>Act</b> authorising the operation of a <b>transmission system</b> .
<b>transmission line</b>	means an electric line forming part of the <b>transmission network</b> and includes the associated primary plant and connected secondary systems to the extent that those items must be capable of supplying the appropriate reliability standard in clause 2.
<b>transmission network</b>	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.
<b>transmission services</b>	means: (a) in relation to a <b>transmission customer</b> and a <b>distributor</b> , transmission use of system services and exit services; and (b) in relation to a <b>generator</b> , entry services (unless otherwise agreed between the <b>generator</b> and the <b>transmission entity</b> ).
<b>transmission system</b>	means a <b>transmission network</b> together with connection assets.

## 1.6 Obtaining a copy of this Industry Code

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

## 1.7 Other Acts, Industry Codes and Regulations

1.7.1 Not all aspects of a **transmission entity's** obligations are regulated by this industry code. The **transmission entity's** obligations and some aspects of the relationship between a **transmission customer**, a **distributor** or a **generator** and a **transmission entity** are also affected by:

- (a) Acts of Parliament and regulations made under those Acts of Parliament (in particular the *Electricity Act 1996* (the **Act**) and associated regulations, and the **ESC Act**;
- (b) licence conditions;
- (c) the **National Electricity Rules**;
- (d) any guidelines or rules made by the **Commission** from time to time; and
- (e) the terms of any **connection agreements**.

## 1.8 Scope

1.8.1 Any obligations imposed under this industry code are in addition to those imposed under the **National Electricity Rules** and the **Act** (and regulations).

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

# 2 SERVICE STANDARDS

## 2.1 Quality of supply and system reliability

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

2.1.2 Subject to the service standards specified in this clause 2, a **transmission entity** must use its **best endeavours** to plan, develop and operate the **transmission system** so as to meet the standards imposed by the **National**

**Electricity Rules** in relation to **transmission network** reliability such that there will be minimal requirements to shed load under normal and reasonably foreseeable operating conditions.

## 2.2 *Transmission network standards*

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

## 2.3 *Specific reliability standards*

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

## 2.4 *Allocation of exit points to categories*

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

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

## 2.5 Category 1 exit points

2.5.1 In respect of Category 1 exit points, a **transmission entity** must:

- (a) provide **“N” equivalent line capacity** for at least 100% of contracted **agreed maximum demand** and, in the event of an interruption use its **best endeavours** to:
  - (i) restore **“N” equivalent line capacity** as soon as practicable; and

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

## 2.6 Category 2 exit points

2.6.1 In respect of Category 2 exit points, a **transmission entity** must:

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

## 2.7 Category 3 exit points

2.7.1 In respect of Category 3 exit points, a **transmission entity** must:

- (a) provide **“N-1” equivalent line capacity** for at least 100% of contracted **agreed maximum demand** (including through the use of post-contingent operation) and:

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

## 2.8 Category 4 exit points

2.8.1 In respect of Category 4 exit points, a **transmission entity** must:

- (a) provide **“N-1” equivalent line capacity** for at least 100% of contracted agreed maximum demand and:
  - (i) in the event of a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to restore **“N-1” equivalent line capacity** as soon as practicable;
  - (ii) in the event of an interruption arising from the failure of the installed **transmission lines** or **network support arrangements**:
    - (A) for the grouped **exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **“N” equivalent line capacity** within 4 hours of the commencement of the interruption;

- (B) for all other **exit points**, use its **best endeavours** to restore at least **“N” equivalent line capacity** within 12 hours of the commencement of the interruption; and
  - (C) use its **best endeavours** to restore **“N-1” equivalent line capacity** as soon as practicable after the commencement of the interruption.
- (b) provide “N-1” equivalent transformer capacity for at least 100% of contracted agreed maximum demand and:
- (i) in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore **“N-1” equivalent transformer capacity** as soon as practicable;
  - (ii) in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**:
    - (A) for the grouped **exit points** connected to the Category 5 **exit points**, use its **best endeavours** to restore at least **“N” equivalent transformer capacity** within 4 hours of the commencement of the interruption;
    - (B) for all other **exit points**, use its **best endeavours** to restore at least **“N” equivalent transformer capacity** within 12 hours of the commencement of the interruption; and
    - (C) use its **best endeavours** to restore **“N-1” equivalent transformer capacity** as soon as practicable after the commencement of the interruption.

## 2.9 Category 5 exit points

- 2.9.1 In respect of Category 5 exit points, a **transmission entity** must, by means of independent and diverse transmission substations:
- (a) provide “N-1” equivalent line capacity into Adelaide Central for at least 100% of contracted agreed maximum demand and:
    - (i) in the event of a failure of any installed **transmission line** or **network support arrangement**, use its **best endeavours** to restore **“N-1” equivalent line capacity** as soon as practicable;
    - (ii) in the event of an interruption arising from the failure of the installed **transmission lines** or **network support arrangements**:
      - (A) restore at least 65% of **“N” equivalent line capacity** within 4 hours of the commencement of the interruption; and
      - (B) use its **best endeavours** to restore **“N-1” equivalent line capacity** as soon as practicable after the commencement of the interruption.



- (b) provide “N-1” equivalent transformer capacity into Adelaide Central for at least 100% of contracted agreed maximum demand and:
  - (i) in the event of a failure of any installed **transformer** or **network support arrangement**, use its **best endeavours** to restore the **equivalent transformer capacity** required by this clause as soon as practicable;
  - (ii) in the event of an interruption arising from the failure of the installed **transformers** or **network support arrangements**:
    - (A) restore at least 65% of “N” **equivalent transformer capacity** within 4 hours of the commencement of the interruption; and
    - (B) use its **best endeavours** to restore “N-1” **equivalent transformer capacity** as soon as practicable after the commencement of the interruption.

## 2.10 *Obligation to restore capacity*

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

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

- 2.11.1 Subject to clause 2.11.2, in the event that a change in **forecast agreed maximum demand** at an **exit point** or group of **exit points** will result in a future breach of a standard specified in this clause 2, a **transmission entity** must ensure that the **equivalent capacity** at the **exit point** or group of **exit points** is sufficient to meet the required standard within 12 months of the identified future breach date.
- 2.11.2 Where a change in **forecast agreed maximum demand** at an **exit point** or group of **exit points** under clause 2.11.1 was not reasonably expected to occur by the **transmission entity** in the **forecast agreed maximum demand** 3 years prior, a **transmission entity** must:

- (a) use its **best endeavours** to ensure that the **equivalent capacity** at the **exit point** or group of **exit points** is sufficient to meet the required standard within 12 months of the identified future breach date; and
  - (b) in any event, ensure that the **equivalent capacity** at the **exit point** or group of **exit points** is sufficient to meet the required standard within 3 years of the identified future breach date.
- 2.11.3 For the purpose of transitional arrangements, **ElectraNet** will negotiate in good faith with **SA Power Networks** to determine the **forecast agreed maximum demand** at an **exit point** or group of **exit points** that is to apply to this clause 2.11 for each regulatory year 2013/14, 2014/15 and 2015/16.

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

- 2.12.1 Where a transmission entity has a network support arrangement in place and delivers transformer or transmission line capacity by means of equivalent capacity, the transmission entity may contract for any amount of agreed maximum demand provided that:
- (a) if the level of contracted **agreed maximum demand** is less than 120% of the installed **transformer** or **transmission line capacity**, the **network support arrangement** must have at least 95% availability for the 12 months to 30 June each year; and
  - (b) if the level of contracted **agreed maximum demand** exceeds 120% of the installed **transformer** or **transmission line capacity**, the **network support arrangement** must have a level of availability at least equal to the availability standard applicable to the relevant **transformer** or **transmission line**.
- 2.12.2 Where a **transmission entity** relies on a **network support arrangement** provided by an independent network support provider to meet the required **transformer** or **transmission line** capacity, the **transmission entity** must enter into a **network support agreement** with that network support provider to ensure the capability and availability of the **network support arrangement**.
- 2.12.3 Where a transmission entity does not have a network support agreement in place, the transmission entity must not:
- (a) contract for an amount of **agreed maximum demand** which is greater than 100% of the installed **transmission line** and **transformer** capacity at the **exit point**; and
  - (b) rely on a network support arrangement to meet the required transformer or transmission line capacity unless the network support arrangement is provided by the transmission entity.

## 2.13 New connection points

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

## 2.14 Rating of transmission lines and transformers

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

## 2.15 Spare transformers

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

## 2.16 Emergency Transformer Replacement Plan

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

## 2.17 Reports to the Commission

- 2.17.1 A **transmission entity** must report to the **Commission** by 31 August each year, concerning matters relating to the standards during the 12 month period ending on 30 June of that year.
- 2.17.2 In particular, the **transmission entity** must:
- (a) report on the actual performance with the standards set out in this clause 2;
  - (b) provide an explanation of the reason for any non-compliance;

- (c) report on how the **transmission entity** will continue to meet, or improve its performance so as to meet, the standards set out in this clause 2;
  - (d) report on the **transmission entity's** compliance with the Emergency Transformer Replacement Plan prepared in accordance with clause 2.16 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance;
  - (e) report on the compliance of any **network support arrangements** with the requirements of clause 2.11 and, in the event of any non-compliance, provide an explanation of the reasons for that non-compliance
- 2.17.3 A **transmission entity** must report to the **Commission** on the circumstances of each occasion where it has been required, as a result of a **transformer** failure, to repair a **transformer**, install a new **transformer**, or provide **equivalent transformer capacity**, in order to meet the reliability standards specified in this clause 2 within 2 months of that event.

## 2.18 Country lines

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

# 3 INTERRUPTIONS

## 3.1 Interruptions or restrictions to transmission services

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

(b) as otherwise agreed in writing with the **transmission customer, distributor or generator**.

3.1.2 Nothing in this clause 3.1 will prevent the interruption or restriction of **transmission services** caused by the normal operation of protection systems forming part of the **transmission network** or any **connection point**.

### 3.2 Outage planning

3.2.1 A transmission entity must use its best endeavours to coordinate any planned outages with all affected transmission customers, distributors or generators.

3.2.2 Where possible, **planned outages** should be coordinated to coincide with works planned by affected **transmission customers, distributors or generators**.

### 3.3 Minimisation of interruptions

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

### 3.4 Obligation to provide information

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

## 4 DESIGN REQUIREMENTS

### 4.1 Protection

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

(a) be connected to a **transmission network**; or

(b) modify an existing connection with the **transmission network**,

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

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

## 4.2 Communications

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

## 4.3 Protection and control

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

## 4.4 Testing of third party equipment at connections

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

## 4.5 Network maintenance

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

## 4.6 Network modification

- 4.6.1 A transmission entity may require, as a term of a connection agreement, that:
- (a) a **transmission customer, distributor** or **generator** does not modify any control or protection devices relating to a **connection point** without the prior agreement of the **transmission entity**;

- (b) where such changes are made, the relevant entity records and documents the design changes and provides a copy to the **transmission entity**.

#### 4.7 Network equipment performance

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

#### 4.8 Network equipment inspections and tests

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

## 5 TECHNICAL REQUIREMENTS

### 5.1 Good electricity industry practice

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

### 5.2 General requirements

- 5.2.1 In relation to the rating, design, erection, maintenance and operation of aerial lines, underground lines, substations and earthing systems, in addition to the requirements of the **Act** (and the regulations) and the **National Electricity Rules**, a **transmission entity** must ensure that the **transmission system** and all its components are designed, constructed, operated and maintained in accordance with:
  - (a) standards set out in **connection agreements**, or agreed with or prescribed by the **Commission**; or
  - (b) where no standards have been agreed or prescribed under clause 5.2.1(a), all applicable and relevant Electricity Supply Association of Australia (**ESAA**) guidelines, IEC 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**;
- (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) **ESAA** guidelines;
- (g) earthing systems;
- (h) fault levels;
- (i) power factors;
- (j) ground clearances; and
- (k) **National Electricity Rules** requirements.

## 5.4 Design standards

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

# 6 GENERAL REQUIREMENTS

## 6.1 Power system incident reporting

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



## 6.2 Switching manual

- 6.2.1 Each **transmission entity, system controller, generator** and **distributor** must, to the extent requested by the **Commission**, coordinate and assist with the development of, and amendments to, a switching manual for the safe operation of:
- (a) the **transmission system** and **distribution system**, and any connection to or between those systems; and
  - (b) where applicable, equipment belonging to a **transmission customer** or **generator**.
- 6.2.2 The switching manual must be approved by the **Commission**.
- 6.2.3 The switching manual, and any amendments to the switching manual, come into force when approved by the **Commission**, and must be complied with by each of the entities referred to in clause 6.2.1.
- 6.2.4 Each **entity** must ensure that any person with whom it establishes a connection agreement, or an agreement to carry out work to which the switching manual relates, will be contractually bound to comply with that **entity's** internal switching manual.
- 6.2.5 An **electricity entity** must report quarterly to the **Commission**, all breaches of its internal switching manual, including breaches by a contractor or customer of which it has become aware. Any breach resulting in a fatality or serious injury, significant impact on **transmission system** availability or significant asset damage must be reported to the **Commission** within 20 **business days**

## 6.3 Planning approvals and easement acquisition

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

## 6.4 Network options and security

- 6.4.1 Where the most economically feasible option to meet the 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 **agreed maximum demand** points within that category, including for any contingency events that the category requires for that reliability category.

- 6.4.2 Where a **distributor** is required, in accordance with the **National Electricity Rules**, to extend or augment its **distribution system** associated with a **transmission entity's** obligations under clause 6.4.1, the **distributor** must undertake that work in a timeframe which will enable the **transmission entity** to achieve the required reliability standard at an **exit point**.
- 6.4.3 A **transmission entity** that provides **equivalent transmission line capacity** or **equivalent transformer capacity** for the purposes of clause 2 of this industry code must consider network plant failures in any NEM region, including distribution systems, where such plant failures might impact on the applicable level of redundancy or reliability.
- 6.4.4 For the purpose of assessing **connection point** reliability, the capability of the Murraylink interconnector should be calculated using the Murraylink transfer limit equation under peak Victorian demand conditions.

## 7 ACCESS TO SITES

### 7.1 Rights of site entry for electricity entities

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

- (g) the liability of the **site occupier** to the **electricity entity** for any direct physical loss it suffers in relation to its equipment or assets situated on the **site occupier's** site, that are caused by the **site occupier**; and
- (h) the preconditions that must be satisfied by the **electricity entity** before it will be allowed access to the relevant site or electricity infrastructure.

## 7.2 Disputes

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

# 8 TELECOMMUNICATIONS ACCESS

## 8.1 Access to the network

- 8.1.1 A **transmission entity** and **distributor** must make an offer to a person requesting rights to use or have access to its **transmission system** or **distribution system** (as the case may be) for telecommunications purposes, having regard to matters including:
  - (a) the technical feasibility of the entity granting such access to its **transmission system** or **distribution system**; and
  - (b) the preservation of visual amenity, given the surroundings and environment in which the relevant part of the **transmission system** or **distribution system** is located;
  - (c) whether or not it would be uneconomical for the person requesting access to develop another facility to provide the telecommunications service requested;
  - (d) whether or not access can be provided without:
    - (i) undue risk to human health or safety;
    - (ii) undue risk to the safety of property;
    - (iii) adversely affecting the safety or performance of the **transmission system** or **distribution system**;
    - (iv) adversely affecting any **customers** or entities connected to those systems;
- 8.1.2 the matters set out in clause 8.2; and
- 8.1.3 the person requesting access agreeing in writing with the **transmission entity** or **distributor** that any dispute relating to the granting of such access be submitted to arbitration in accordance with clause 8.3 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 its rights under clause 9.1.1, the transmission entity must:

- (a) provide, by way of its 24 hour emergency service, information on the nature of the **emergency** and an estimate of the time when **transmission services** will be available; and
- (b) use its **best endeavours** to restore **transmission services** to a **transmission customer, distributor** or **generator** once the emergency condition has passed.

## 9.2 Emergency provisions of other Acts

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

## 9.3 Health and safety

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

9.3.2 Except in the case of an **emergency**, or where relevant regulations require it, a **transmission entity** must not disconnect a **connection point** for a health or safety reason unless the **transmission entity** has:

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



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