CHAPTER (4A)

BASS STRAIT ISLANDS CHAPTER (SYSTEM OPERATIONS AND NETWORK SERVICE PROVISIONS)
# CHAPTER 4A BASS STRAIT ISLANDS (SYSTEM OPERATIONS AND NETWORK SERVICE PROVISIONS)

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CHAPTER 4A  BASS STRAIT ISLANDS (SYSTEM OPERATIONS AND NETWORK SERVICE PROVISIONS)

4A.1  GENERAL

4A.1.1  BSI Chapter objectives and purpose

(a) This Chapter reflects current Bass Strait Islands (BSI) operating standards, procedures and practices. This is consistent with the original development of the Code for the electricity supply industry on mainland Tasmania. The Code was modelled on the former National Electricity Code (now National Electricity Rules), to reflect existing operating standards, procedures, and technical capacity.

(b) There is no intention for the BSI to become part of the National Electricity Market, therefore many of the standards and procedures appropriate to a large integrated power system in which participants trade through a centralised market, are not appropriate to the BSI.

(c) This Chapter will:

(1) provide for the technical regulation of generation, BSI power system operations, and distribution on the BSI. Chapter 9 (Retail) and Chapter 8A (Distribution Powerline Vegetation Management) of the Code have applied to the BSI since 1998 and 2002 respectively and will continue to apply;

(2) specify the requirements for BSI power system participants that are not specified in licences;

(3) recognise existing power quality standards including frequency control and performance targets but provide for review;

(4) make provision for connection to the BSI power system through commercial agreements; and

(5) recognise the responsibility of the BSI System Controller for BSI power system operations, system control on the BSI, and obligations and responsibilities arising from government policies including those obligations and responsibilities included in the relevant Ministerial Charter as amended from time to time.

(d) Italicised expressions in this Chapter are defined in the Glossary of the Code.

4A.1.2  To whom and how this Chapter 4A applies

(a) This Chapter applies to the BSI System Controller, BSI power system participants, and Customers taking supply from the BSI power systems.
(b) To the extent that this Chapter may affect Customer operations it is the obligation of the BSI System Controller to ensure that any connection is consistent with the responsibilities and obligations of the BSI System Controller to maintain a safe, secure and reliable BSI power system operating within the technical envelope provided by this Chapter.

(c) To the extent that the provisions of any other Chapter in the Code except Chapter 1, 8A, 9, or 12, conflict with this Chapter, this Chapter will prevail.

### 4A.1.3 Other sources of rights and obligations

(a) This Chapter does not set out comprehensively all rights and obligations of Customers and connection applicants in matters relating to:

1. the supply of electricity to or from the Network Service Provider’s distribution systems; and
2. the way in which Customers’ electrical installations and embedded generating units affect the distribution system to which they are connected.

(b) This Chapter is neither intended to, nor is it to be read or construed as having the effect of:

1. altering any of the terms of any existing contract or connection agreement; or
2. altering the contractual rights or obligations of any of the parties under the contract or connection agreement as between those parties; or
3. relieving the parties under any such contract or connection agreement of their contractual obligations under such an agreement.

(c) Notwithstanding the above, if any obligation imposed or right conferred on a BSI power system participant by this Chapter is inconsistent with the terms of a contract or connection agreement to which this Chapter applies and the application of the inconsistent terms of the contract or connection agreement would adversely affect the quality or security of network service to other BSI Network Users, the parties to the contract or connection agreement must observe the provisions of this Chapter as if they prevail over the contract or connection agreement to the extent of the inconsistency.

(d) Under the Energy Ombudsman Act 1998, a person may make a complaint to the Ombudsman if the person has a grievance ‘concerning any service of, or relating to the sale and supply of gas or electricity by, an energy entity’.
4A.2 SYSTEM OPERATIONS

4A.2.1 System Control

Under subsection 19B(3) of the ESI Act, it is a licence condition that the relevant licensed Network Service Provider (referred to as the BSI System Controller in this Chapter) must:

(a) continuously monitor the operation of the Bass Strait Islands power system; and

(b) control the input of electricity and the loads placed on the Bass Strait Islands power system to ensure that –

(i) the integrity of the Bass Strait Islands power system is maintained; and

(ii) the Bass Strait Islands power system operates efficiently, reliably and safely.

Subsection 19B(3) of the ESI Act also requires the BSI System Controller to perform the functions assigned to it in relation to the BSI under the relevant regulations and the Code. Within the overarching requirements of subsections 19B(3)(a) and (b) of the ESI Act, this clause 4A.2 sets out the objectives and obligations of the BSI System Controller in relation to the system operations on the BSI.

4A.2.1.1 Objectives of the BSI System Controller

The objectives of the BSI System Controller are:

(a) to fulfil the requirements of subsections 19B(3)(a) and (b) of the ESI Act;

(b) to facilitate and operate the dispatch process efficiently in accordance with this Chapter;

(c) to achieve and maintain a secure BSI power system; and

(d) to conduct BSI power system planning.

4A.2.1.2 Obligations of the BSI System Controller

(a) The BSI System Controller may appoint a manager (or managers) of operations on the BSI, but retains the rights and obligations associated with the role.

(b) Without limitation to any of the BSI System Controller’s obligations under this Chapter and the ESI Act, the BSI System Controller must, in accordance with the provisions of this Chapter and the ESI Act:

(1) facilitate and operate the dispatch of generating units in accordance with the provisions of this Chapter;
(2) use its reasonable endeavours to achieve power system security on BSI in accordance with the provisions of this Chapter; and

(3) conduct BSI power system planning in accordance with the provisions of this Chapter.

(c) The BSI System Controller will not be taken to have breached its obligations under the Code where it uses its reasonable endeavours to arrange or control as required by the ESI Act or the Code, any act, matter, or thing, or the acts of any other person.

(d) Notwithstanding any other provision of this Chapter, in the event that the BSI System Controller, in its reasonable opinion for reasons of public safety or for power system security on BSI, needs to interrupt or disconnect supply to any Customer, the BSI System Controller may effect that interruption or disconnection.

(e) The BSI System Controller will liaise with the relevant BSI power system participants to assist in the management of any declared emergency supply situation.

4A.2.1.3 Bound to comply with the Code

The BSI System Controller is bound to comply with and perform any duties and obligations imposed by the Code.

4A.2.1.4 Direction power of the BSI System Controller generally

(a) In performing its functions under this Chapter 4A or the ESI Act, the BSI System Controller may issue a direction in connection with the performance of its functions under this Chapter 4A or the ESI Act.

(b) A BSI power system participant or a Customer taking supply from the BSI power system must comply with a direction issued by the BSI System Controller.

4A.2.2 Dispatch

4A.2.2.1 Dispatch principles

(a) The responsibilities of the BSI System Controller with regard to power system security on BSI are:

(1) to arrange the dispatch of generating units (including dispatch by remote control actions or specific directions) in accordance with this Chapter;

(2) to determine any potential constraint on the dispatch of generating units and the assessment of the effect of this constraint on the maintenance of power system security on BSI; and

(3) to establish a merit order for dispatch having regard to the provisions of connection agreements.
(b) The *BSI System Controller* will make, publish on its website, and update as needed a *BSI Dispatch Guideline* which outlines how the *BSI power system* manages merit order *dispatch* and any generation *constraints*.

### 4A.2.2.2 Reserve margins

(a) The *reserve margin* shall be maintained at a minimum of 10 per cent of the capacity (kW) of each generating unit(s) running. Should the *reserve* drop below 10 per cent for more than 30 seconds, another *generating unit* is to be started.

(b) A generating unit is to be stopped when the *load* is falling and the *load* has dropped to below a nominal 10 per cent of the capacity of the machine running, less one machine, and remains below for 10 minutes. With the proviso that there must be always be sufficient running capacity to meet the *load*.

(c) The *BSI System Controller* will make reasonable endeavours to maintain sufficient generating capacity or sufficient alternative recourse to meet peak demand, including an allowance for a *reserve margin*.

### 4A.2.2.3 Generating unit dispatch information

Generators connected to the *BSI networks* who are *self-dispatched* must specify and advise the *BSI System Controller* of the likely output profile, including peaks, and if the output is seasonally affected, expected daily generating profiles for each *month* of the year. The *BSI System Controller* may waive this obligation.

### 4A.2.3 Notification of constraints

The impact of *constraints* will be dealt with in the individual contracts or *connection agreements* with the affected parties.

### 4A.2.3.1 Dispatch related limitations

*Dispatch* related limitations will be included in *connection agreements* with *Embedded Generators*.

### 4A.2.4 Power System Security

#### 4A.2.4.1 Introduction

This clause 4A.2.4 applies to and defines the obligations for *BSI power system participants*, and

(a) provides the framework for achieving and maintaining a secure *BSI power system*;

(b) provides the conditions under which the *BSI System Controller* can issue directions to *BSI power system participants* so as to maintain or re-establish a secure *BSI power system*; and

(c) has the following aims:
(1) to detail the principles and guidelines for achieving and maintaining power system security on BSI;

(2) to establish responsibility for the availability and adequacy of BSI power system reserves; and

(3) to establish processes and arrangements to enable the BSI System Controller to plan and conduct operations within the BSI power system to achieve and maintain power system security on BSI.

(d) The BSI System Controller has responsibility for power system security on BSI, including the priority of load shedding. The BSI System Controller will make arrangements concerning the use of emergency powers over the BSI power system having regard to any principles for load shedding as advised by the Minister.

4A.2.4.2 Satisfactory operating state

The BSI power system is defined as being in a satisfactory operating state when:

(a) the frequency at all energised points of the BSI power system is within the normal operating frequency band except for brief excursions within the normal operating frequency excursion band as specified in clause 4A.2.4.8;

(b) the voltage magnitudes at all energised points of the BSI power system are within the relevant limits provided for at clause 4A.2.4.9.1;

(c) the current flows on all feeders of the BSI power system are within the ratings (accounting for time dependency in the case of emergency ratings) as defined by the relevant design and rating tables;

(d) all other plant forming part of or impacting on the BSI power system is being operated within the relevant operating ratings;

(e) the configuration of the BSI power system is such that the severity of any potential fault is within the capability of circuit breakers to disconnect the faulted circuit or equipment; and

(f) the conditions of the BSI power system are stable in accordance with the requirements of relevant standards.

4A.2.4.3 Abnormal conditions

(a) Abnormal conditions are conditions posing added risks to the BSI power system including, without limitation, severe weather conditions, lightning storms, and bush fires.

(b) During such abnormal conditions, the BSI System Controller may, in its reasonable opinion, determine an abnormal state. The BSI System Controller should notify all potentially affected BSI power system participants of such a reclassification as soon as practicable.
4A.2.4.4 Managing electricity shortfall events

(a) If the BSI System Controller identifies:
   (1) an inability to meet the system demand; or
   (2) an inability to meet the reserve margin,

the BSI System Controller may contact the major Customers, directing them to shut down in accordance with the BSI load shedding principles, or where relevant, may request that a Customer start their own generating unit.

(b) A shortfall in idle reserve margin (i.e. the inability to cope with the failure of a running machine) is always present when system load commits all but one machine and the remaining machine is out for maintenance and shall not be taken to constitute an electricity shortfall event.

(c) If, at any time, there are insufficient generation or supply options available to securely supply total load (“major supply shortfall”), then the BSI System Controller may undertake all or any of the following:
   (1) attempt to increase the generation or supply capability such as requesting available, but not committed, generating units to start-up; or
   (2) disconnect one or more points of load connection in accordance with the BSI load shedding principles.

(d) The BSI System Controller must liaise with the Minister if the rotation of load shedding carried out in accordance with the BSI load shedding principles is envisaged to last for more than 24 hours.

4A.2.4.5 Technical envelope

(a) The BSI System Controller must determine and revise the technical envelope (as may be necessary from time to time) by taking into account the prevailing BSI power system and plant conditions.

(b) The technical envelope determination must take into account matters such as:
   (1) the BSI System Controller forecast total BSI power system load;
   (2) the provision of the applicable BSI power system reserves;
   (3) operation within all plant capabilities and constraints on the BSI power system;
   (4) generation minimum load constraints;
   (5) frequency control requirements;
   (6) reactive power support and ancillary services requirements; and
   (7) the existence of proposals for any major equipment or plant testing.
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4A.2.4.6  General principles for maintaining power system security

The principles for power system security on BSI are as follows:

(a) To the extent practicable, the BSI power system should be operated such that it is and will remain in a satisfactory operating state.

(b) Following an event or a significant change in BSI power system conditions, it is possible that the BSI power system may no longer be in a satisfactory operating state. Where the BSI power system is not in a satisfactory operating state, the BSI System Controller should take all reasonable actions to adjust, wherever possible, the operating conditions with a view to returning the BSI power system to a satisfactory operating state as soon as it is practicable.

(c) There should be adequate protection systems, initiated automatically, to prevent consequential damage to Customer equipment, and BSI power system infrastructure and to minimise the extent of the interruption to supply when the frequency is outside of the limits provided by clause 4A.2.4.8.

(d) BSI power system participants should be required, either under their connection agreements or as directed by the BSI System Controller, to provide and maintain all required facilities consistent with good electricity industry practice, and operate their equipment in a manner:

(1) to assist in preventing or controlling instability within the BSI power system; and

(2) to assist in the maintenance of, or restoration to, a satisfactory operating state of the BSI power system.

4A.2.4.7  Time for undertaking action

Actions are to be undertaken on any day as required irrespective of a normal business day or non-business day.

4A.2.4.7.1  Responsibility of the BSI System Controller for power system security

The BSI System Controller’s responsibilities for power system security on BSI are:

(a) to maintain the BSI power system in a satisfactory operating state;

(b) to monitor the operating status of the BSI power system;

(c) to co-ordinate the BSI power system participants in undertaking their certain activities and operations and monitoring activities of the BSI power system;

(d) to take reasonable steps to ensure that high voltage switching procedures and arrangements are utilised to provide adequate protection of the BSI power system;

(e) to assess potential infringement of the technical envelope or BSI power system operating procedures which could affect the security of the BSI power system;
(f) to operate the *BSI power system* within the limits of the *technical envelope*;

(g) to operate all *plant* and equipment under its control or co-ordination within the appropriate operational or emergency limits which are advised to the *BSI System Controller*;

(h) to assess the impacts of technical and any operational *constraints* on the operation of the *BSI power system*;

(i) to determine any potential *constraint* on the *dispatch* of generating units and the assessment of the effect of this *constraint* on the maintenance of *power system security on BSI*;

(j) to assess the availability and adequacy, of *BSI power system reserves* in accordance with the *BSI power system security and reliability standards*. The *BSI power system security and reliability standards* shall be to maintain sufficient *reserve* capacity to ensure that the system stays within the *technical envelope* as set out in clause 4A.2.4.8.1 of this chapter;

(k) to take reasonable steps to ensure that appropriate levels of idle *reserves* and *reactive power reserves* are available to ensure the *BSI power system* is, and is maintained, in a *satisfactory operating state*;

(l) to refer to *BSI power system participants*, as appropriate, information of which the *BSI System Controller* becomes aware in relation to significant risks to the *BSI power system* where actions to achieve a resolution of those risks are outside the responsibility or control of the *BSI System Controller*;

(m) to direct (as necessary) any *BSI power system participants* to take action necessary to ensure, maintain, or restore the *BSI power system* to a *satisfactory operating state*;

(n) to co-ordinate and direct any rotation of widespread interruption of *demand* in the event of a major *supply shortfall* or disruption; and

(o) to investigate and *review* all major *BSI power system* operational incidents and to initiate action plans to manage any abnormal situations or significant deficiencies which could reasonably threaten *power system security on BSI*. Such situations or deficiencies include without limitation:

1. *BSI power system frequencies* outside those specified in the definition of *satisfactory operating state*;

2. *BSI power system voltages* outside those specified in the definition of *satisfactory operating state*;

3. actual or potential *BSI power system instability*; and

4. unplanned/unexpected operation of major *BSI power system* equipment.
4A.2.4.8  Power system frequency

4A.2.4.8.1  Power system frequency control

The normal frequency range is 49.5Hz to 50.5Hz.

The frequency control points are summarised in Figure 4A.1 below.

**Figure 4A.1: Bass Strait Islands Frequency Control**

- 53.0Hz machine over-speed trip
- 50.5Hz
- 50.0Hz NORMAL RANGE
- 49.5Hz
- 47.0Hz all feeders trip after 10 seconds
- 46.0Hz machine under speed trip

4A.2.4.8.2  Over-frequency Control

Over-frequency is effected by the generating unit over-speed at 53.0Hz.

4A.2.4.8.3  Under frequency

(a) Under-frequency control is complex and dependent on the configuration at the time of the system incident.

(b) At 46Hz all feeders are instantaneously tripped on machine under-speed.

(c) If the frequency drops and stays at 47Hz for 10 seconds all feeders are tripped.

4A.2.4.8.4  Automatic load shedding

If there is only one generating unit running, and that reaches 115 per cent of its capacity, all but the priority feeder, as established under clause 4A.2.4.8.5(b), shall be tripped.

4A.2.4.8.5  Load shedding principles and priority

(a) The Minister may provide the BSI System Controller with policies, updated as required by the Minister, to enable the BSI System Controller to determine the priority of load shedding for all loads.

(b) For the purposes of undertaking any load shedding, the BSI System Controller must develop the BSI load shedding principles and a priority load shedding schedule for all load, having regard to any policies of the Minister.
(c) After developing the *BSI load shedding principles* under clause 4A.2.4.8.5(b), the *BSI System Controller* must submit the *BSI load shedding principles* for the approval of the *Jurisdictional System Security Co-ordinator*.

### 4A.2.4.9 Voltage control

#### 4A.2.4.9.1 Voltage control range

The feeder *voltage* on the *BSI* is maintained in the range of 10.94kV to 11.10kV.

#### 4A.2.4.9.2 Power system voltage control

(a) The *BSI System Controller* must assess and determine the limits of the operation of the *BSI power system* in relation to voltage failure or collapse.

(b) The limits of operation of the *BSI power system* must be translated by the *BSI System Controller* into operational voltage settings or limits, feeder capacity limits, *reactive power* production (or absorption) capacity or other appropriate limits to enable their use by the *BSI System Controller* in the maintenance of power system security on *BSI*.

(c) The *BSI System Controller* must use its reasonable endeavours to maintain *voltage* conditions throughout the *BSI power system* in accordance with the technical requirements.

(d) The *BSI System Controller* must use its reasonable endeavours to arrange the provision of *reactive power* facilities and *BSI power system voltage* stabilising facilities including through *connection agreements*.

#### 4A.2.4.9.3 Reactive power reserve requirements

(a) The *BSI System Controller* must use reasonable endeavours to ensure that sufficient *reactive power reserve* is available at all times to maintain or restore the *BSI power system* to a *satisfactory operating state* after an event.

(b) If *voltages* are outside acceptable limits the *BSI System Controller* must take all reasonable actions including to direct changes to *demand* (through selective *load shedding* from the *BSI power system*), additional *generation* operation, or reduction in the distribution feeder flows, but only to the extent necessary to restore the *voltages* to within the relevant limits. A *BSI power system participant* must comply with any such direction.

(c) The *BSI System Controller* shall ensure that such testing, as may be appropriate and required, is undertaken to assess the availability and adequacy of the provision of *reactive power* to control and maintain *BSI power system voltages* consistent with the *BSI power system* being maintained in a *satisfactory operating state*. 
4A.2.4.10 Power system security

4A.2.4.10.1 Power system fault levels

The BSI System Controller must ensure that there are processes that will allow the determination of fault levels for normal operation of the BSI power system and in anticipation of all types of faults (refer also to clause 4A.3.7.7).

4A.2.4.10.2 BSI power system participant to advise

A BSI power system participant must promptly advise the BSI System Controller if it becomes aware of any circumstance which could be expected to adversely affect the secure operation of the BSI power system.

4A.2.4.10.3 Protection or control system abnormality

(a) If a BSI power system participant becomes aware that any relevant protection system or control system is defective or unavailable for service, that BSI power system participant must advise the BSI System Controller. If the BSI System Controller considers it to be a threat to power system security on BSI, the BSI System Controller may direct that the equipment protected or operated by the relevant protection system or control system be taken out of operation or operated as the BSI System Controller directs.

(b) A BSI power system participant must comply with a direction given by the BSI System Controller.

4A.2.4.10.4 Directions by the BSI System Controller affecting power system security

(a) If the BSI System Controller is satisfied that it is necessary to do so for reasons of public safety or the security of the BSI power system, the BSI System Controller may issue directions requiring a BSI power system participant to do such things as may be necessary and appropriate to be done for reasons of public safety or the security of the BSI power system.

(b) The Regulator may undertake a review of and report on the use of the power of direction by the BSI System Controller and may make any recommendations in relation to the BSI System Controller’s future exercise of the power as the Regulator considers appropriate.

4A.2.4.10.5 Black start up facilities

(a) The BSI System Controller must use reasonable endeavours to ensure that sufficient facilities are available and operable to provide for:

1. the maintenance or restoration of power system security on BSI under emergency conditions; and

2. the restoration of all or any part of the BSI power system to a satisfactory operating state following a black system.
(b) Each Generator must, subject to its connection agreement, develop black system procedures and must submit those procedures for approval by the BSI System Controller.

4A.2.5 Power system operating procedures

4A.2.5.1 Power system instructions and guidelines

(a) The BSI System Controller may issue instructions or guidelines being BSI power system operating procedures.

(b) BSI power system participants are obliged to comply with such instructions or guidelines. These instructions or guidelines are:

   (1) any instructions which may be issued by the BSI System Controller from time to time relating to the operation of the BSI power system;

   (2) any guidelines issued from time to time by the BSI System Controller in relation to power system security on BSI; and

   (3) any BSI power system operating procedures, instructions, or guidelines covering the operational activities and associated responsibilities of the relevant BSI power system participants and advised to BSI power system participants as being BSI power system operating procedures from time to time.

4A.2.5.2 Inspection of facilities by the BSI System Controller

The BSI System Controller may as often as in its reasonable opinion is required, inspect a facility of a BSI power system participant to ensure compliance with BSI power system operating procedures.

4A.2.5.3 Remote control and monitoring devices

All remote control, operational metering and monitoring devices, and local circuits deemed necessary by the BSI System Controller must be installed and maintained by a BSI power system participant in accordance with the standards and protocols determined and advised by the BSI System Controller.

4A.2.5.4 Nominated contact person

(a) BSI power system participants must advise the BSI System Controller of each nominated person for the purposes of giving or receiving operational communications in relation to its facilities. The persons so nominated must be those responsible for undertaking the operation of the relevant equipment.

(b) The information required shall be as advised by the BSI System Controller.
4A.2.6 Connection Approval

The BSI System Controller shall not approve any connection agreement, as referred to in clause 4A.3.1.4, which may in its reasonable judgement compromise its ability to fulfil any obligation it may have under the Code and the ESI Act.

4A.2.7 Planning Review

(a) The BSI System Controller shall, every three years, conduct a planning review which must incorporate forecast loads and a review of the adequacy of existing connection points and planning proposals for future connection points.

(b) The planning review is to comprise a planning period of 5 years for both generation and network service provision.

(c) The BSI System Controller will provide the planning review to the Regulator, BSI power system participants, and interested parties by 31 December in that year. However, the BSI System Controller is not required to provide any commercially sensitive information to BSI power system participants or interested parties.

4A.2.8 Ancillary services

(a) The BSI System Controller has an obligation to ensure the supply of ancillary services such that the BSI power systems operate within a technical envelope where the limits of the envelope are pre-set and the operation is undertaken by automatic means including:

1. black start capability to allow restoration of BSI power system operation after a complete failure of the BSI power system or part of the BSI power system;

2. ensuring sufficient reserve margin to maintain BSI power system frequency;

3. frequency control including load shedding; and

4. ensuring sufficient reactive support to guard against BSI power system failure through voltage collapse.

(b) The BSI System Controller shall not approve any connection agreement which is inconsistent with these obligations of the BSI System Controller.

(c) When justifiable in terms of power system security on BSI, the BSI System Controller may direct any BSI power system participant to provide an ancillary service where the BSI power system participant’s plant is capable of doing so.

(d) A BSI power system participant must not unreasonably refuse to provide ancillary services when directed to do so by the BSI System Controller.
4A.3 NETWORK SERVICE PROVISION

4A.3.1 Network service provision operations

4A.3.1.1 Purposes of this clause 4A.3

The purpose of this clause 4A.3 is to manage in a safe, efficient, and reliable manner:

(a) the supply of electricity to or from the Network Service Provider’s distribution system; and

(b) the way in which Customers' electrical installations and embedded generating units affect the distribution system to which they are connected.

4A.3.1.2 To whom and how this clause 4A.3 applies

(a) An electricity entity undertaking distribution operations on the BSI must comply with this clause 4A.3.

(b) An electricity entity undertaking retailing operations on the BSI and having contracts for sale with Customers must require the relevant Customer to comply with those provisions of this clause 4A.3 which are expressed to impose obligations on Customers.

(c) An electricity entity undertaking generation operations on the BSI must comply with this clause 4A.3.

4A.3.1.3 Compliance with legislation

A Network Service Provider must, in respect of electrical infrastructure installed into its distribution system or any replacement or modification of existing electrical infrastructure, comply with all applicable legislation.

4A.3.1.4 Obligation to connect

(a) The Network Service Provider has an obligation to permit access to the network, in doing so it must consult with and have regard to the obligations of the BSI System Controller to ensure power system security on BSI. The Network Service Provider shall not connect a person without the approval of the relevant connection agreement by the BSI System Controller in accordance with clause 4A.2.6 other than:

(1) a Customer with a load of not more than 20kW; or

(2) a Generator operating a generating unit with a capacity of not more than 5 kW.

(b) Customers and Generators who have a connection agreement are required to have their connection capable of being interrupted by the Network Service Provider when instructed by the BSI System Controller.
4A.3.2 Distribution System requirements

4A.3.2.1 Maintenance standards

A Network Service Provider must, in relation to the maintenance of its electrical infrastructure, adopt good electricity industry practice.

4A.3.2.2 Assets register

A Network Service Provider must keep a register of all electrical infrastructure and other assets forming part of its distribution system, which must include:

(a) a physical description of each item of electrical infrastructure or other asset, including its location; and

(b) the value of each item of electrical infrastructure and other asset, calculated in accordance with accounting standards under the Corporations Law and, if not inconsistent with those accounting standards, generally accepted principles and practices applied from time to time in Australia in the electricity supply industry.

4A.3.2.3 Public lighting

A Network Service Provider must repair or replace an item of public lighting on BSI within 7 business days of being notified by any person that such repair or replacement is necessary.

4A.3.3 Customer Charter

(a) A Network Service Provider must prepare a Customer Charter:

(1) approved by the Regulator, stating the services and the level and standard of such services that a Customer is entitled to receive from the Network Service Provider;

(2) describing how to make a complaint to the Ombudsman; and

(3) including a telephone number at which the Network Service Provider can be contacted, at any time, in an emergency.

(b) The Network Service Provider must send or give a copy of the Customer Charter to a Customer:

(1) within 10 days of the Customer being connected to the distribution system; and

(2) on request.

4A.3.4 Complaint Handling

(a) A Network Service Provider must handle a complaint by a Customer in accordance with the relevant Australian Standard on Complaints Handling. The
Network Service Provider must include information on its complaint handling processes in the Network Service Provider’s Customer Charter.

(b) When a Network Service Provider responds to a Customer's complaint, the Network Service Provider must inform the Customer that the Customer has a right to raise the complaint to a higher level within the Network Service Provider's management structure.

(c) If the complaint is raised to a higher level, the Network Service Provider must advise the Customer in writing that the Customer has a right to refer the complaint to the Ombudsman or other relevant external dispute resolution body.

(d) A Network Service Provider must ensure that any disconnection warning issued by the Network Service Provider includes notification that the Customer has a right to refer any complaint to the Ombudsman or other relevant external dispute resolution body.

4A.3.5 Customers’ electrical installations

4A.3.5.1 Customers’ general obligations

A Network Service Provider must ensure that a Customer must:

(a) at its own expense, maintain the Customer's electrical installation in a safe condition to the satisfaction of its Network Service Provider or other relevant authority;

(b) ensure that the Customer's electrical installation and any equipment within it (including protective equipment) are adequate, and effectively co-ordinated at all times with the electrical characteristics of its Network Service Provider's distribution system;

(c) at its own expense, maintain the safe clearances consistent with Chapter 8A, between vegetation on the Customer’s property and electrical infrastructure providing supply to the Customer’s electrical installation; and

(d) maintain the capability for the Network Service Provider to disconnect and reconnect the electrical installation using remote signals.

4A.3.5.2 Power factor

(a) A Network Service Provider must ensure that a Customer must, at all times, keep the power factor of its electrical installation within the relevant range set out in the Table 4A.1 below.
(b) If the power factor of an electrical installation falls outside the relevant range set out in Table 4A.1 above, the Network Service Provider must forward a notice to the Customer requiring it to restore the power factor of the electrical installation within the relevant range.

### 4A.3.5.3 Voltage

(a) Subject to a Customer fulfilling its obligations under the Code or an individual contract, and to clause 4A.3.5.3(b), the Network Service Provider must maintain a voltage level at the point of supply to the Customer's electrical installation at one of the following standard nominal voltages:

1. $230\text{V}$;
2. $400\text{V}$;
3. $11\text{kV}$; or
4. replacements of the above standard nominal voltages published by the Standards Association of Australia from time to time.

(b) Variations of the magnitude set out in the Table 4A.2 below around the relevant standard nominal voltage listed in clause 4A.3.5.3(a) are permissible, unless otherwise agreed with the Customer.

### Table 4A.1

<table>
<thead>
<tr>
<th>Supply voltage (kV)</th>
<th>Power factor range for Customer maximum demand and voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 kVA</td>
</tr>
<tr>
<td></td>
<td>Minimum lagging</td>
</tr>
<tr>
<td>&lt; 11</td>
<td>0.75</td>
</tr>
<tr>
<td>11</td>
<td>0.8</td>
</tr>
</tbody>
</table>

### Table 4A.2

<table>
<thead>
<tr>
<th>Voltage level (kV)</th>
<th>Voltage range for time periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Steady state (average over 5 minute period)</td>
</tr>
<tr>
<td>&lt; 1.0</td>
<td>$+10%$, $-6%$</td>
</tr>
<tr>
<td></td>
<td>$+10%$, $-100%$</td>
</tr>
<tr>
<td>11</td>
<td>($\pm 10%$ for long feeders)</td>
</tr>
</tbody>
</table>
(c) If the Network Service Provider fails to fulfill its obligations under clause 4A.3.5.3(a) in respect of a Customer's electrical installation it must, within 20 business days of that failure being established, notify the Customer of what steps are to be taken to remedy that failure.

(d) The Network Service Provider must use best endeavours to minimise the occurrence of voltage variations allowed under clause 4A.3.5.3 for periods of less than 1 minute.

(e) The Network Service Provider may send, in accordance with IEC 1000-2-2, signals for the following:
   (1) ripple control systems;
   (2) medium-frequency power-line carrier systems; or
   (3) radio-frequency power-line carrier systems.

4A.3.5.4 Harmonics

The Network Service Provider must ensure that the harmonic levels in the voltage at the point of common coupling nearest to a Customer's point of supply comply with the levels specified in AS/NZ 61000.3.6.

4A.3.5.5 Negative sequence voltage

The Network Service Provider must use reasonable endeavours to maintain the negative sequence voltage at the point of common coupling to a Customer's three phase electrical installation as specified in IEC 61000.4.30.

4A.3.5.6 Load balance

(a) The Network Service Provider must ensure in its contractual arrangement with a Customer that the current in each phase of a three phase electrical installation does not deviate from the average of the three phase currents.

(b) Despite clause 4A.3.5.6(a), deviations are permissible for periods of less than 2 minutes:
   (1) up to 10 per cent for a standard nominal voltage up to 1 kV; and
   (2) up to 4 per cent for a standard nominal voltage above 1 kV.

4A.3.5.7 Voltage fluctuations

(a) The Network Service Provider must maintain voltage fluctuations at the point of common coupling at a level no greater than the levels specified in AS/NZ 61000.3.5:1998 and AS/NZ 61000.3.7:2001 as appropriate.

(b) Subject to clause 4A.3.5.7(c), the Customers must ensure that the Customer's equipment does not cause voltage fluctuations at the point of common coupling
greater than the levels specified in AS/NZ 61000.3.5:1998 and AS/NZ 61000.3.7:2001 as appropriate.

(c) If two or more Customers’ electrical installations are connected at the same point of common coupling, the maximum permissible contribution to voltage fluctuations allowable from each Customer is to be determined in proportion to their respective maximum demand, unless otherwise agreed.

4A.3.5.8 Compliance with Requirements

If the Network Service Provider establishes that a Customer is not complying with the requirements of clause 4A.3.5.4 to clause 4A.3.5.7 and this adversely affects other Customers or causes damages to property or malfunction in electrical appliances, the Network Service Provider must notify the Customer that it must meet the above requirements and the Customer must comply with such a notice.

4A.3.5.9 Electromagnetic interference

(a) A Network Service Provider must ensure that a Customer complies with the requirement that the electromagnetic interference caused by a Customer's electrical installation or any appliances connected to that electrical installation is less than the limits set out in AS/NZS 2344 and any industry guidelines in respect of waveform distortion.

(b) A Network Service Provider must ensure that each embedded generating unit does not cause electromagnetic interference above the limits set out in AS/NZS 2344 and any industry guidelines in respect of waveform distortion.

(c) A Network Service Provider must ensure, consistent with good electricity industry practice, that electromagnetic interference caused by its distribution system is less than the limits set out in AS/NZS 2344 and any industry guidelines in respect of waveform distortion.

(d) A Network Service Provider must investigate the source of any electromagnetic interference in its distribution area above the limits set in AS/NZS 2344 and any industry guidelines in respect of waveform distortion when it becomes aware of such electromagnetic interference.

(e) If a Network Service Provider establishes that the source of electromagnetic interference above the relevant limits is in its distribution system, it must reduce the level of electromagnetic interference below those limits.

(f) If a Network Service Provider establishes that the source of electromagnetic interference above the relevant limits is in a Customer's electrical installation, and that electromagnetic interference adversely affects other Customers or causes damage to property or malfunction in electrical appliances, the Network Service Provider must notify the Customer that it must reduce the level of electromagnetic interference below those limits and the Customer must comply with the notice.
4A.3.6 Connection of embedded generating units

The BSI by virtue of being standalone power systems has dynamic limits on the generation mix and the need to ensure that power system security on BSI is maintained. Because of a need to maintain sufficient reserve margins and in particular system inertia, there is an obligation in both Customer’s and Generator’s connection agreements to make their electrical installation interruptible and to be disconnected and reconnected by the BSI System Controller in order to prevent system collapse.

4A.3.6.1 Capability

(a) A Network Service Provider must ensure that its distribution system is able to receive a supply of electricity from an embedded generating unit connected to its distribution system on the basis set out in the relevant contract with the Embedded Generator concerned.

(b) Generators operating a generating unit or generating units with a total capacity of not more than 5 kW are exempt from entering into a connection agreement with the Network Service Provider. All other Generators, as is outlined in clause 4A.3.6, must have a connection agreement or contract and are liable for studies on the security impacts of their connection to the BSI Power System.

4A.3.6.2 Delivery performance requirements of embedded generating units

Unless otherwise agreed with the Network Service Provider, an embedded generating unit must comply with the relevant operational requirements set out in clause 4A.2 of this Chapter and the connection requirements set out in clause 4A.3.7 of this Chapter.

4A.3.6.3 Co-ordination of embedded generating units

Embedded Generators must ensure that an embedded generating unit connected to a Network Service Provider's distribution system, and any equipment within it (including protective equipment), is adequate and effectively co-ordinated at all times with the electrical characteristics of the Network Service Provider's distribution system and generation system.

4A.3.6.4 Compliance with legislation

An Embedded Generator must, in respect of its embedded generating unit, comply with all applicable legislation.

4A.3.6.5 Generator protection requirements

(a) Generators are required to provide any necessary automatically initiated protective device or systems to protect their plant and associated facilities against abnormal voltage and extreme frequency excursions of the BSI power system.

(b) Settings for the protection devices will be set in accordance with the requirements of the Network Service Provider.
4A.3.7 Connection Process for embedded generating units

4A.3.7.1 Agreement to connect

(a) A Network Service Provider must not connect an Embedded Generator operating a generating unit with a capacity of more than 5 kW to its distribution system unless a legally binding and enforceable connection agreement is in place which requires the parties to abide and comply with the Code.

(b) The connection agreement must contain the specific conditions that have been agreed to for connection and access to the distribution network, including but not limited to:

1. details of the connection point including the distribution network coupling points where appropriate;
2. metering arrangements and adjustments for losses where the point of metering is significantly different to the connection point;
3. automated disconnection and reconnection capability for use by the Network Service Provider;
4. authorised demand which may be taken or supplied at the connection point (under specified conditions);
5. connection service charges;
6. payment conditions;
7. duration and termination of conditions of the connection agreement;
8. terms, conditions, and constraints that have been agreed to for connection to the network to protect the legitimated interest of the Network Service Provider including rights to disconnect the Embedded Generator for breach of commercial undertakings;
9. details of any agreed standards of reliability of distribution service at the connection points or within the network;
10. testing intervals for protection systems associated with the connection point;
11. agreed protocols for maintenance co-ordination; and
12. procedures for resolving disputes.

(c) A Network Service Provider must ensure that its distribution system is capable to receive a supply of electricity from an embedded generating unit connected to the BSI power system prior to making an offer to connect.

(d) If such a connection agreement is sought by an Embedded Generator, the Network Service Provider and Embedded Generator must negotiate in good faith.
Despite clause 4A.3.7.1(c), if two or more embedded generating units are connected in parallel, their obligations under clause 4A.3.7.5 and clause 4A.3.7.6 of this Chapter apply to the point of common coupling and the maximum permissible contribution of each embedded generating unit is to be determined in proportion to their capacity, unless otherwise agreed.

4A.3.7.2 Supply frequency

A Network Service Provider must use best endeavours to ensure that, at the system frequency of 50 Hz and permitted variations set out in clause 4A.2.4.8, an embedded generating unit will remain in service.

4A.3.7.3 Co-ordination and compliance of embedded generating units

A Network Service Provider must ensure that:

(a) an Embedded Generator’s embedded generating unit, and any equipment within it that is connected to a distribution system:

   (1) complies with this Code; and

   (2) is maintained in a safe condition; and

(b) protection equipment is at all times effectively coordinated with the electrical characteristics of the BSI power system as advised by the Network Service Provider.

4A.3.7.4 Minimum requirements for embedded generating units (synchronous type)

A Network Service Provider must ensure that an embedded generating unit over 100 kW that is a synchronous generating unit has:

(a) an excitation control system including voltage regulator; and

(b) a governor system responsive to system frequency changes.

4A.3.7.5 Negative sequence voltage

A Network Service Provider must ensure that an embedded generating unit’s contribution to the negative sequence voltage at the point of connection between the embedded generating unit and the distribution system is less than 2 per cent, as measured in accordance with IEC 61000.4.30.

4A.3.7.6 Harmonics

A Network Service Provider must ensure that an embedded generating unit’s contribution to the harmonic distortion levels in the supply voltage at the point of connection between the embedded generating unit and the distribution system comply with the levels specified in AS/NZ 61000.3.6.
4A.3.7.7 Fault levels

Unless otherwise agreed in writing between an Embedded Generator and the Network Service Provider, an Embedded Generator must design and operate its embedded generating unit so that it does not cause fault levels in the BSI power system to exceed the levels set out in the Table 4A.3 below.

Table 4A.3: BSI Fault Levels

<table>
<thead>
<tr>
<th>Voltage level kV</th>
<th>System fault level MVA</th>
<th>Short circuit level kA</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>120</td>
<td>6.3</td>
</tr>
</tbody>
</table>

4A.3.7.8 Earthing

(a) Unless otherwise agreed with the Network Service Provider, an Embedded Generator must ensure that any metalwork of electrical apparatus and equipment forming part of its embedded generating unit is solidly earthed in a manner which, in the opinion of the Network Service Provider, is satisfactory.

(b) Unless otherwise agreed with the Network Service Provider, an Embedded Generator must ensure that all neutral earthing connections of each machine are capable of being solidly earthed.

4A.3.8 Establishing or modifying Customer or Generator connection

4A.3.8.1 Introduction

(a) The objective of this procedure is to outline the process for Customers and for Generators to connect to the BSI power system.

(b) New Customer connections are subject to any guidelines provided under the terms of the CSO.

(c) The procedure depicted in the diagram Figure 4A.2 represents the major steps required to establish a connection and may be varied to suit the circumstances of the application.

4A.3.8.2 Process and procedures

(a) The process and procedures to be followed by either a BSI power system participant or which may be followed by any other person wishing to establish or modify connection to a network is as shown in diagrammatic form under clause 4A3.8.3.

(b) Establishing connection includes modifying an existing connection.
4A.3.8.3 Connection Process Procedure

Figure 4A.2: Connection Process Flow Chart
4A.4  Power System Performance Targets

4A.4.1  Network Performance Targets

(a) Feeders on the BSI are classified as either low density rural or high density rural as shown in Table 4.A.4.

(b) The targets for the lower bound of reliability of all feeders are set out in Table 4A.5.

(c) If required by its licence to comply with this clause 4A.4.1, the Network Service Provider must use reasonable endeavours to ensure that the total number and duration of planned and unplanned interruptions to the feeders on the distribution system on the BSI meets the prescribed targets as set out in Table 4A.5.

<table>
<thead>
<tr>
<th>Table 4A.4: Classification of feeders on Flinders and King Islands</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density Rural</td>
</tr>
<tr>
<td>Flinders Island (Feeder Number)</td>
</tr>
<tr>
<td>75753</td>
</tr>
<tr>
<td>76764</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4A.5: Network Performance Targets on Flinders and King Islands by individual feeder</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density Rural</td>
</tr>
<tr>
<td>Annual number of supply interruptions</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

4A.4.2  Generation Performance Targets

If required by its licence to comply with this clause 4A.4.2, a Generator must use reasonable endeavours to ensure that the incidents of planned and unplanned interruptions to the Customers attributable to generation performance meets the prescribed targets as set out in Table 4A.6.

<table>
<thead>
<tr>
<th>Table 4A.6: Generation Performance Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply area category</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Flinders Island</td>
</tr>
<tr>
<td>King Island</td>
</tr>
</tbody>
</table>
4A.4.3  Review of Performance Targets

If the Regulator considers appropriate, it may review the performance targets as set out in clause 4A.4.1 and clause 4A.4.2.