
CHAPTER ~~(4A)~~

BASS STRAIT ISLANDS CHAPTER (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 standards 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*:
 - (i) 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 systems* 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 4A2.4 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 re- classification 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) the balance of *firm capacity* requirements, available *controlled renewable generation* sources, and *uncontrolled embedded generation*;
 - (6) *frequency* and *voltage* control requirements;

- (7) *reactive power support and ancillary services* requirements; and
- (8) the existence of proposals for any major equipment or *plant* testing.

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) 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 *voltage* is outside the limits provided by clause 4A.2.4.9.
- (e) *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:
 - (l) *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.

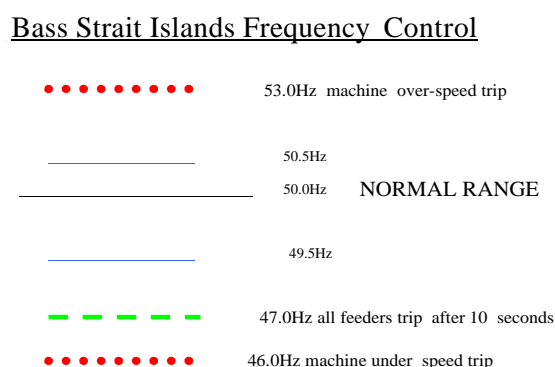
4A.2.4.8 Power system frequency

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



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

- Under-*frequency* control is complex and dependent on the configuration at the *time* of the system incident.
- At 46Hz all feeders are instantaneously tripped on machine under-speed.
- 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

- 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*.
- 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 a *Customer* with a *load* of not more than 20kW.
- (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.

Table 4A.1

Supply voltage (kV)	Power factor range for Customer maximum demand and voltage					
	Up to 100 kVA		Over 100 kVA - 2 MVA		Over 2 MVA	
	Minimum lagging	Minimum leading	Minimum lagging	Minimum leading	Minimum lagging	Minimum leading
< 11	0.75	0.8	0.8	0.8	0.85	0.85
11	0.8	0.8	0.85	0.85	0.9	0.9

- (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) 230V;
 - (2) 400V;
 - (3) 11 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.2

Voltage level (kV)	Voltage range for time periods		
	Steady state (average over 5 minute period)	Less than 1 minute	Less than 10 seconds
< 1.0	+10%,- 6 %	± 10 %	Phase to earth + 50 % - 100 % Phase to phase + 20 % - 100 %
11	(± 10 % for long feeders)	± 10 %	Phase to phase +20 % - 100 %

- (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) All new *Embedded Generators* must have a *Generator's connection agreement* consistent with the requirements of clause 4A.3.6 or contract and may be 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* 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.

- (e) 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

Bass Strait Islands		
Voltage level kV	System fault level MVA	Short circuit level kA
11	120	6.3

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

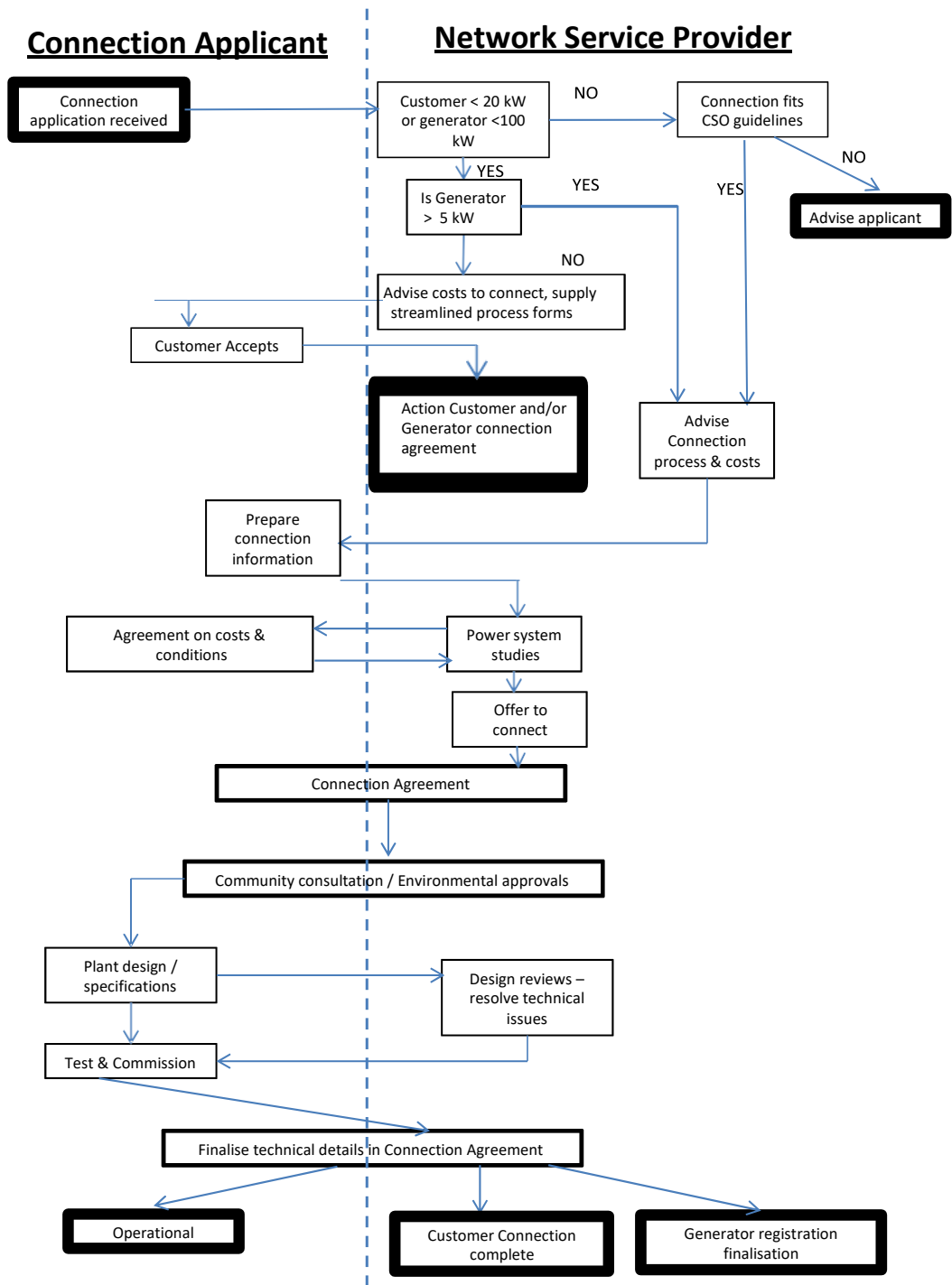
4A.3.8.1 Introduction

- (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



4A.4 Power System Performance Standards

4A.4.1 Network Performance Standards

- (a) Deleted
- (b) The standards for the lower bound of *reliability* on the BSI are set out in Table 4A.4.
- (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 number and duration of planned and unplanned interruptions per annum to the supply of electricity due to interruptions on the distribution system, calculated using the methodology outlined in Schedule 8.1, do not exceed the frequency and duration figures in Table 4A.4.

Table 4A.4: Reliability Standards on Flinders and King Islands

Supply reliability area	System Average Interruption Frequency Index (SAIFI)	System Average Interruption Duration Index (SAIDI)
Flinders Island	8	720 mins
King Island	8	720 mins

Table 4A.5: Deleted

4A.4.2 Generation Performance Standards

If required by its *licence* to comply with this clause 4A.4.2, a *Generator* must use reasonable endeavours to ensure that the incidence of planned and unplanned interruptions to the *Customers* attributable to *generation* performance does not exceed the prescribed standards as set out in Table 4A.6.

Table 4A.6: Generation Performance Standards

Supply area category	Annual number of system blacks	Average reliability	
		Average System Restoration Time	
		06:00 - 21:59	22:00 - 05:59
Flinders Island	20 5	12.50 30 mins	22.50 60 mins
King Island	8 5	13.75 30 mins	23.75 60 mins

4A.4.3 Review of Performance Standards

If the Regulator considers appropriate, it may review the performance standards as set out in clause 4A.4.1 and clause 4A4.2.