

## Part C: Common Quality

### I Introductory Rules

#### 1 Contents of part C

Part C establishes the standards and other arrangements relating to **common quality**.

In particular the rules in part C concern the **principal performance objectives** of the **system operator**, the performance obligations of **asset owners**, arrangements concerning **ancillary services**, and **technical codes**.

#### 2 Application of part C

**Generators, retailers, grid owners, distributors** and **voting customers** are members of part C which for the avoidance of doubt includes the **technical codes**.

For the purposes of Part C (except for the purposes of calculating voting rights and for allocating fees) **distributors** include **direct consumers** who have a **point of connection** to the **grid**.

Subject to rule 3, the rules in sections I, II, III, and IV of part C and the **technical codes** can be changed by a **resolution** of **generators, retailers, grid owners, distributors** and **voting customers** voting in accordance with the process set out in rule 2 of section IV of part A and the voting rights contained in schedule A6, or by the **Board** under rule 1.9 of section IV of part A.

#### 3 Fees for part C

The proportion of total fees of part C allocated to each **member** of part C will be equal to the **member's** share of votes allocated under rule 1.2 of schedule A6 as at dates specified under rule 5 of schedule A7.

#### 4 Changing the introductory rules

The contents of this section I may be changed only in accordance with the process set out in rule 4 of section I of part A.

## II The performance objectives of the system operator (PPOs)

### 1 Purpose of section II

The purpose of section II is to:

- Set out the high level, output focussed performance objectives expected of the **system operator** in relation to the real time delivery of **common quality** and dispatch; and
- Describe the process by which the **system operator** is able to agree with the **Board** in the **policy statement** how it intends to meet these objectives.

### 2 Performance objectives expected from the system operator

The **principal performance objectives** of the **system operator** are to use reasonable endeavours to:

#### 2.1 Avoid cascade failure

**Dispatch assets** made available in a manner which avoids the cascade failure of **assets** resulting in the loss of demand and arising from:

##### 2.1.1 *Frequency or voltage*

Frequency or voltage excursions; or

##### 2.1.2 *Imbalances*

Supply and demand imbalances

#### 2.2 Frequency

With regard to the frequency of **electricity**:

##### 2.2.1 *Maintain frequency in the normal band*

Subject to rules 2.2.2 to 2.2.4, maintain frequency in the **normal band**;

##### 2.2.2 *Manage frequency during momentary fluctuation*

Ensure that during **momentary fluctuations** frequency stays between 45 Hertz and 55 Hertz (both inclusive);

### 2.2.3 *Limit rate of occurrences of momentary fluctuations*

Ensure that the rate of occurrence of **momentary fluctuations** experienced in both the North and South Islands of New Zealand does not exceed the statistical equivalent of the following levels:

Frequency Band (Hertz) (where "x" is the frequency during a momentary fluctuation)	Maximum number of occurrences by period (commencing on and from the [date of the rules])
55 x > 53.75	1 in any 60 month period
53.75 x > 52.5	2 in any 12 month period
52.5 x > 51.25	5 in any 12 month period
51.25 x > 50.5	50 in any 12 month period
50.5 x 50.2	to be set in 12 months time
49.8 x 49.5	to be set in 12 months time
49.5 > x 48.75	60 in any 12 month period
48.75 > x 47.5	6 in any 12 month period
47.5 > x 46.25	1 in any 60 month period
46.25 > x 45	1 in any 60 month period

For the avoidance of doubt when reporting on its performance in respect of the above table, rates of occurrence will be measured by the **system operator** in both the North and the South Islands of New Zealand and the results will be aggregated together.

### 2.2.4 *Recover quickly from a fluctuation*

Ensure when a fluctuation in frequency occurs that frequency is restored to the **normal band** as soon as reasonably practicable having regard to all the circumstances surrounding the fluctuation;

### 2.2.5 *Manage time error*

Ensure **frequency time error** is at all times not greater than five seconds of **New Zealand standard time**; and

### 2.2.6 *Eliminate time error once a day*

Ensure that at least once every **day** the **frequency time error** is eliminated.

## 2.3 Maintain other standards

### 2.3.1 *Take reasonable action to maintain other standards*

Where reasonably requested by any person, identify the cause of the problem where the following standards are not being met at any **point of connection** to the **grid** and take any action available to it under the **rules** as reasonably requested of it by any person, and practicable given the **assets** made available to it to resolve the problem:

#### 2.3.1.1 Harmonic levels

The New Zealand Electrical Code of Practice (NZECP 36.1993) for harmonic levels as amended from time to time;

#### 2.3.1.2 Voltage flicker levels

The Australian Standard (AS2279.4 1991) for voltage flicker levels as amended from time to time; and

#### 2.3.1.3 Voltage imbalance of less than 1%

The requirement to use reasonable endeavours to maintain **negative sequence voltage** at less than 1% and to ensure that **negative sequence voltage** will temporarily be no more than 2% in any part of the **grid**.

## 2.4 Costs of maintaining other standards

In the event that the **system operator** is able to establish who is causing any departure from the standards referred to in rule 2.4.1, the **system operator** will endeavour to recover its reasonable identification and testing costs from that person. Where the causer is a **member**, that **member** must pay those costs to the **system operator**. Where the **system operator** is unable to recover its reasonable identification and testing costs or the causer is not able to be identified then those costs will form part of the **system operator's identification costs**.

## 2.5 The system operator may rely on information provided

For the purposes of the rules in part C, the **system operator** may rely on the **assets** and information about such **assets** made available to the **system operator** by **asset owners** and may also assume that **asset owners** are complying with the **asset owner performance obligations** and the **technical codes**, or complying with a valid **dispensation** or **equivalent arrangement**.

### **3 Restoration**

In any event which disrupts the **system operator's** ability to meet the **principal performance objectives**, the **system operator** will, given the capability of generation and **ancillary services** and the configuration and capacity of the **grid** and the information made available by **asset owners**, re-establish normal operations of the power system as soon as possible having regard to the following priorities:

#### **3.1 Safety of persons**

Firstly, to the safety of natural persons;

#### **3.2 Safety of assets**

Secondly, the avoidance of damage to **assets**;

#### **3.3 Restoration of disconnected demand**

Thirdly, to the restoration of **offtake**;

#### **3.4 Restoration of PPO compliance**

Fourthly, to conformance with the **principal performance objectives**; and

#### **3.5 Restoration of economic dispatch**

Fifthly, to full conformance with the **dispatch objective**.

### **4 System operator may contract for higher levels of common quality**

Subject to any transitional provisions in part I, nothing in the **rules** will prevent the **system operator** from entering into contracts or arrangements whereby levels of quality more stringent than those specified in the **principal performance objectives** are agreed, provided that the **system operator** can identify the incremental costs of those more stringent levels and will ensure that those incremental costs are met by the persons wishing to enter into that contract or arrangement with the **system operator**.

### **5 System operator will not contract contrary to this arrangement**

Subject to rule 4, and to any transitional provisions described in part I, the **system operator** will not enter into contracts with other persons that are inconsistent with its obligations under the **rules** and the **technical codes**.

## 6 System operator and Board to agree annual policy statement

### 6.1 Policy statement agreed every 12 months

At least once in every 12 month period from the date that the **rules** take effect, the **Board** and the **system operator** will endeavour to agree a **policy statement** in accordance with the process described in these **rules**.

### 6.2 Timing of annual submission

Prior to the expiry of the term to which any current **policy statement** applies, the **system operator** will submit a **draft policy statement** to the **Board**. At any time prior to the **Board** making its draft **determination** on the **draft policy statement**, the **system operator** may, by written notice to the **Board** amend the **draft policy statement**.

## 7 Contents of Policy Statement

The **draft policy statement** will:

### 7.1.1 *Policies and means of achievement for PPOs*

Specify the policy and means by which the **system operator** intends to achieve the **principal performance objectives** in the 12 months following agreement of the **policy statement**, including but not limited to describing the policies and means by which scheduling and dispatch are adjusted to meet the **dispatch objective** and including the provision of a dispatch process statement. The dispatch process statement will contain the details of the processes which will enable the **system operator** to meet the **dispatch objective**, including without limitation:

#### 7.1.1.1 Planning process

The methodology to be used by the **system operator** for planning to meet its **dispatch objective** during the period leading up to real time; and

#### 7.1.1.2 Real time process

The methodology to be used by the **system operator** for meeting its **dispatch objective** in real time.

### 7.1.2 *Specify arrangements with transmission asset owner*

Specify the policies and means by which the **system operator** intends to address any conflict of interest which arises in the performance of its obligations under the **rules**.

### **7.1.3 *Reasons for adopting policies and means***

State the reasons for adopting these policies and the means to implement these policies; and

### **7.1.4 *A plan for the future***

Contain a statement of how policy might be formulated and implemented in the future.

## **8 Process for agreeing Policy Statement**

### **8.1 Board will consider the draft policy statement**

Within 10 **business days** of receiving the **draft policy statement**, the **Board** will consider the **draft policy statement**, and make a draft **determination** to either accept or reject the **draft policy statement**. In making this draft **determination** the **Board** will consider the extent to which:

#### **8.1.1 *Consistent with the guiding principles***

Implementation of the **draft policy statement** would be consistent with the **Guiding Principles**;

#### **8.1.2 *Achieves purposes***

The **draft policy statement** is consistent with the **system operator** achieving its **principle performance objectives** and the **dispatch objective**; and

#### **8.1.3 *Consistent with purposes of sections II and III***

The implementation of the **draft policy statement** would be consistent with the purposes of sections II and III:

### **8.2 Draft determinations to be recorded**

The draft **determination** of the **Board** will be set out in writing together with the reasons for that **determination** including how the **draft policy statement** satisfies or fails to satisfy each of the factors set out in rule 8.1. A copy of this draft **determination** of the **Board** will be given to the **system operator**.

### **8.3 Process if Board rejects the draft policy statement**

If the **Board's** draft **determination** is to reject the **draft policy statement** the **Board** will request the **system operator** to submit another **draft policy statement**, and the process set out in rules 8.1 and 8.2 will be repeated until the **Board** makes a draft **determination** to accept a **draft policy statement**.

#### 8.4 Process if Board accepts the draft policy statement

If the **Board** makes a draft **determination** to accept the **draft policy statement** it will **publish** that draft **determination** together with the **draft policy statement** within 5 **business days** of making the draft **determination**.

#### 8.5 Board invites submissions on draft decision

At the time the **Board publishes** the draft **determination** under rule 8.4, the **Board** will notify **members** of the date by which submissions on the draft **determination** are to be received by the **Board**. This date will be no earlier than 10 **business days** from the date of **publication** of the draft **determination**.

#### 8.6 Submissions process

##### 8.6.1 *Submissions to be in writing*

Every submission on the draft **determination** and the **draft policy statement** must be made in writing to the **Board** and received on or before the **submission expiry date**. The **Board** will provide a copy of each submission received to the **system operator** at the close of business on the **submission expiry date** and will also **publish** these submissions.

##### 8.6.2 *System operator to be involved in submission process*

The **system operator** shall have the right to make its own submission within five **business days** after the **submission expiry date** on both the draft **determination** and the submissions received in relation to it. The **Board** will **publish** the **system operator's** submission when it is received.

#### 8.7 Board to consider submissions and make final determination within 20 business days

Within 20 **business days** of the **submission expiry date**, the **Board** will complete its consideration of all submissions it receives on the draft **determination** in accordance with rule 8.65 and make a final **determination** on the **draft policy statement**. In making this determination the **Board** will consider the extent to which the criteria in rule 8.1 are met and take into account the submissions received. This final **determination** will be:

##### 8.7.1 *Accept the draft policy statement without any changes*

To accept the **draft policy statement**; or

##### 8.7.2 *Accept the draft policy statement with changes*

To accept the **draft policy statement** subject to seeking the **system operator's** consent to specified changes; or



### **8.7.3 *Reject the draft policy statement***

To reject the **draft policy statement**.

## **8.8 The Board must obtain the system operator's consent to any changes to the draft policy statement**

### **8.8.1 *Acceptance subject to consent***

If the **Board** accepts the **draft policy statement** subject to seeking the **system operator's** consent to specified changes in accordance with rule 8.7.2, the **Board** will then seek the **system operator's** written consent to those changes, and:

### **8.8.2 *System operator consents to the changes***

The **system operator** may give its written consent subject to conditions specified by the **system operator**. If the **Board** accepts such conditions the **system operator** will be deemed to have consented to the changes (subject to those conditions). If the **Board** does not accept those conditions the **system operator** will be deemed to have not consented to those changes.

### **8.8.3 *System operator does not consent to the changes***

If the **system operator** does not consent to the changes, the process set out in rules 8.7 and 8.8 will be repeated until either the **system operator** consents to the specified changes or the **Board** accepts or rejects the **draft policy statement** under rules 8.7.1 or 8.7.3.

## **8.9 System operator to present further draft policy statement if rejected**

Within 5 **working days** of rejecting a **draft policy statement** under rule 8.7.3, the **Board** will:

### **8.9.1 *Notify members***

Notify members;

### **8.9.2 *Request the system operator to submit another draft***

Request the **system operator** to submit another **draft policy statement** in accordance with rule 6.2 (to which the provisions of this rule 8 will apply); and

### **8.9.3 *Provide the reasons to the system operator in writing***

Provide the **system operator** in writing the reasons why the **draft policy statement** fails to satisfy each of the factors set out in rule 8.1.

## **8.10 Board to notify members of acceptance**

Within 5 **working days** of accepting a **draft policy statement** under rule 8.7.1 or the **system operator** notifying the **Board** that the **system operator** has given its written consent in accordance with rule 8.8.1, the **Board's** final **determination** will be:

### **8.10.1 Final decision set out in writing together with reasons**

Set out in writing together with the reasons for that decision including how the **draft policy statement** satisfies each of the factors set out in rule 8.1;

### **8.10.2 Board to publish determination and policy statement**

**Published** to members by the **Board** together with the accepted **draft policy statement**.

## **8.11 Draft becomes a policy statement once published**

Except in the case of the initial **draft policy statement** which will be deemed a "**policy statement**" on the date that these **rules** take effect, the **draft policy statement** will, on the day it is **published** pursuant to rule 8.10.2, become known as a "**policy statement**".

## **8.12 Policy statement rolled over until replaced**

If by the expiry date of the current **policy statement** a new **policy statement** has not been **published** pursuant to this chapter, the current **policy statement** will continue to apply until such time as it is replaced by the **publication** of a new **policy statement**.

# **9 Rule Changes and Variations**

## **9.1 Board will consult with system operator about impact of rule changes on policy statement**

Where the **system operator** or a **member** has notified the **Board** of a **proposal** to change the **rules** or the **technical codes**, the **Board** will consult with the **system operator** with regard to whether or not it will be necessary to revise the **policy statement** as a result of the proposed change. If the **system operator** considers that a **policy statement** revision is required then the **system operator** will initiate a revision following the process set out in this rule 9.

## 9.2 Variations to a policy statement

### 9.2.1 *Right to submit a request for variation*

At any time during the term of a current policy statement the **system operator** may submit a request for, or the **Board** may on its own account request, a variation to the current **policy statement**. Any **member** may make a submission to the **Board** at any time that the **Board** or the **system operator** requests a variation to a **policy statement**.

### 9.2.2 *Process for considering variations*

Upon receiving or making a request for a variation to a **policy statement**, the **Board** will:

#### 9.2.2.1 Dismiss

dismiss vexatious requests; and

#### 9.2.2.2 Hold over

hold over trivial requests until the next policy statement cycle; and

#### 9.2.2.3 Accept

immediately accept the request for a variation where such variation is required as a result of a **rule change**; or

#### 9.2.2.4 Follow the process in rule 8

follow the process set out in rule 8 until the **Board** makes a draft determination to accept or reject these requests for variation.

### 9.2.3 *New draft policy statement if accepted*

If accepted the request for variation will be treated as a new **draft policy statement** and the process set out in this rule 9 will be followed with the intent that any such **draft policy statement** which is accepted will replace the existing **policy statement** on the date it is **published** in the manner contemplated by rule 8.10.2.

## 10 Policy statement not legally binding

For the avoidance of doubt, the **policy statement** is a relational document between the **Board** and the **system operator** which sets out how the **system operator** proposes to meet its **principal performance objectives**. The **policy statement** is not legally binding on either the **Board** or the **system operator** and is intended to allow the **system operator** to use its discretion in operational matters.

## 11 Departure from a policy statement

### 11.1 Emergency changes to a policy statement

Notwithstanding anything in rule 9, the **system operator** may depart from the policies set out in a **policy statement** with immediate effect in the event that a **system security situation** arises in relation to the **policy statement**.

### 11.2 Report required

When the **system operator** makes any departure under rule 11.1 because of a **system security situation**, the **system operator** will provide a report to the **Board** setting out the circumstances of the **system security situation** and the actions taken to deal with it. The **Board** will ensure this report is **published** within a reasonable time of its receipt.

### 11.3 Time limit on departure

Any departure from the agreed policies under rule 11.1 will cease at the expiry of the relevant **system security situation** unless it is approved in accordance with the processes set out in rule 9.2.

## 12 A Review of performance by the System Operator

At the same time as the **policy statement** is **published** pursuant to rule 8.10.2, the **system operator** will also **publish** a review and assessment of its performance during the period under the previous **policy statement**. This self-review will contain such information as is necessary to enable the **Board** to review the **system operator's** performance in carrying out its functions during this period. The **Board's** review and assessment of the **system operator** will also be **published** within ten days after the meeting of the **Board** at which the review was considered.

## 13 System Operator to prepare an annual security forecast

The **system operator** will prepare an annual security forecast which will include a ten year forward view of the capability of the grid security system based on information known to, and able to be disclosed by, the **system operator**. The **system operator** will agree the timing of the preparation of this forecast with the Board. The **system operator** is to prepare the forecast on a good faith basis and will not be held responsible for the accuracy or completeness of the information contained in the forecast.

## III Asset owner performance obligations (AOPOs) and technical standards

### 1 Content and purpose of section III

The purpose of section III is to establish performance obligations and technical standards for **asset owners** to assist the **system operator** in planning to achieve, and achieving the **PPOs**, to provide for **asset owners** to obtain an assessment of their **assets** from the **system operator**; and to provide for a process for the **system operator** to approve applications for **equivalence arrangements** and **dispensations** (where necessary).

### 2 Asset owner performance obligations and technical standards concerning frequency

#### 2.1 Contribution by injections to overall frequency management

Each **generator** (while **synchronised**) and the **HVDC owner**, will at all times ensure that their **assets** other than any **generating units** within an **exempt generating station**, make the maximum **injection** contribution to maintain frequency within the **normal band** (and to restore frequency to the **normal band**). Any such contribution will be assessed against the **technical codes**.

#### 2.2 Contributions by purchasers to overall frequency management

**Purchasers** must limit the magnitude of any instantaneous changes in **offtake of electricity** and net rates of change in **offtake for electricity** to the levels the **system operator** reasonably requires. In setting these requirements, the **system operator** will have regard to the impact of the **offtake** on the **system operator's** ability to meet the **principal performance objectives** concerning frequency (as set out in part C, section I, rule 2.2) and the **dispatch objective**.

#### 2.3 Contributions to frequency support in the case of under frequency events

##### 2.3.1 Generators

Each **generator** will at all times ensure that while connected, its **assets** other than an **exempt generating station** contribute to supporting frequency by:

2.3.1.1 Remaining synchronised when frequency above 47.5 Hertz

Remaining **synchronised**, ensuring each of its **generating units** can and does at a minimum sustain pre-event output at all times when the frequency is 47.5 Hertz and above; and

2.3.1.2 Remaining synchronised when frequency below 47.5 Hertz for 60 seconds

Subject to rule 2.3.2, remaining **synchronised**, ensuring each of its **generating units** can and does at a minimum sustain pre-event output, for 60 seconds if frequency falls below 47.5 Hertz but not below 45 Hertz.

**2.3.2 Exception for certain assets from rule 2.3.1.2**

If, due to the **inherent characteristics** of an **asset**, it is not possible for a **generator** to comply with rule 2.3.1.2, the **generator** must ensure that each of its **generating units** is capable of increasing and does increase output within one second by a rated five second overload capacity at least 10 percent of rated maximum output and which can be sustained for at least five seconds. When the **generating unit** is no longer capable of providing the overload, the **generator** must ensure that the **generating unit** is able to provide at least 80 percent of rated maximum output for 30 seconds while the frequency is below or equal to 47.5 Hertz provided that if the frequency falls during this period below 46 Hertz then each **generator** will ensure its **generating unit** is able to provide at least 80 per cent of its rated maximum output:

2.3.2.1 Above 45.5 Hertz and below 46 Hertz

For twenty seconds for any time within that period the frequency is below 46 Hertz and above 45.5 Hertz; and

2.3.2.2 Above 45 Hertz and below or equal to 45.5 Hertz

For ten seconds for any time within that period the frequency is below or equal to 45.5 Hertz and above 45 Hertz.

**2.3.3 HVDC owner**

The **HVDC owner** will at all times ensure that while connected, in full or in part, its **assets** contribute to supporting frequency during an **under frequency event** in either Island by:

2.3.3.1 Remaining connected when frequency above 48 Hertz

Remaining connected to those **assets** making up the **grid** in the North and South Islands while the frequency in both Islands remains above 48 Hertz; and

2.3.3.2 Remaining connected when frequency below 48 Hertz and above 47 Hertz

Remaining connected to those **assets** making up the **grid** in the North and South Islands while the frequency in both Islands remains below 48 Hertz and above 47 Hertz for 90 seconds;

2.3.3.3 Remaining connected when frequency above 45 Hertz

Remaining connected to those **assets** making up the **grid** in the North and South Islands while the frequency in both islands remains above 45 Hertz for 35 seconds, unless the frequency in either Island is less than 46.5 Hertz and the frequency is falling at a rate of 7 Hertz per second or greater; and

2.3.3.4 Modifying level of transfer

Subject to the level of transfer and the **HVDC link** configuration at the beginning of the **under-frequency event**, if the **HVDC link** itself is not the cause of the **under-frequency event**, modifying the instantaneous transfer on the **HVDC link** by up to 250MW with the objective of limiting the difference between the North and South Island frequencies to no greater than 0.2 Hertz.

### 2.3.4 *Distributors and grid owners*

**Distributors** and **grid owners** will ensure that they have established and maintained **automatic under frequency load shedding** in block sizes and with relay settings in accordance with the requirements of the **technical codes**.

## 2.4 Contributions by grid owners to frequency support

Each **grid owner** will ensure that its **assets** are capable of being operated and will operate within the frequency targets set out in rule 2.2.2 of section II.

## 2.5 Exempt Generating Stations

For the purposes of rule 2.1 and 2.3 of section III and the provisions in the Technical Code A an **exempt generating station** will mean any generating station which exports to a **local network** or the **grid** less than 30 MW unless the **Board** has issued a directive pursuant to rule 10.1 that such generating station must comply with rule 2.1 and 2.3 of section III and the provisions in the **technical codes**.

### 3 Asset owner performance obligations and technical standards concerning voltage

The **asset owner performance obligations** as they primarily affect voltage are as follows:

#### 3.1 Voltage Range AOPOs

##### 3.1.1 Grid Owner

Each **grid owner** will ensure that its **assets** at and in between:

- the **high voltage terminals** of the **grid owner's** transformers at each **grid injection point** and **grid exit point**; or
- where no transformer exists, the relevant **grid injection point** or **grid exit point**;

are capable of being operated within the following range of voltages.

Nominal grid voltage (kV)	Voltage Limits			
	Minimum (kV)		Maximum (kV)	
220	198	-10.0%	242	10.0%
110	99	-10.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%
33	31.35	-5.0%	34.65	5.0%
22	21.45	-2.5%	22.55	2.5%
11	10.725	-2.5%	11.275	2.5%

##### 3.1.2 Generators

Each **grid connected generator** will at all times ensure that its **assets** are capable of being operated, and do operate, when the **grid** is operated within the range of voltages set out in rule 3.1.1 of this section.

##### 3.1.3 Distributors

Each **distributor** will ensure that its **local network** is capable of being operated and do operate when the **grid** is operated over the range of voltages set out in rule 3.1.1 of this section.

#### 3.2 Voltage Support AOPOs

##### 3.2.1 Generators

Each **grid connected generator** will at all times ensure its **assets**:



### 3.2.1.1 Exporting net reactive power at full load

Must, when the voltage at its **grid injection point** is within the applicable range of nominal voltage, be capable of exporting (over excited) when **synchronised** and making available for dispatch by the **system operator**, a minimum net reactive power which is 50% of the maximum continuous megawatt (MW) output power as measured at the **generating unit** terminals.

Nominal grid voltage (kV)	Voltage range for which reactive power is required			
	Minimum (kV)		Maximum (kV)	
220	198	-10.0%	242	10.0%
110	99	-10.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%
33	31.35	-5.0%	34.65	5.0%
22	21.45	-2.5%	22.55	2.5%
11	10.725	-2.5%	11.275	2.5%

### 3.2.1.2 Importing net reactive power at full load

Must, when the voltage at its **grid injection point** is within the applicable range of nominal voltage, be capable of importing (under excited) when synchronised and making available for dispatch by the **system operator**, a minimum net reactive power which is 33% of the maximum continuous megawatt (MW) output power as measured at the **generating unit** terminals;

Nominal grid voltage (kV)	Voltage range for which reactive power is required			
	Minimum (kV)		Maximum (kV)	
220	209	-5.0%	242	10.0%
110	104.5	-5.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%

### 3.2.1.3 Support voltage in order to prevent system collapse

When **synchronised**, continuously operate in a manner that supports voltage and voltage stability on the **grid** in compliance with the **technical codes**.

## 3.3 Load shedding obligations to support voltage

### 3.3.1 Grid owners to shed load

Where it is not possible for **distributors** to comply with rule 3.3.2, the **grid owner** will, if possible, establish load shedding in block sizes and at voltage levels (and, where automatic systems are established, with relay settings) set

out in the **technical codes** or otherwise as the **system operator** reasonably requires.

### 3.3.2 *Distributors to shed load*

In order to prevent the collapse of the **network** voltage, **distributors** will ensure that where possible they have established load shedding in block sizes and at voltage levels (and, where automatic systems are established, with relay settings) in accordance with the **technical codes** or otherwise as the **system operator** reasonably requires.

## 4 Other asset owner performance obligations and technical standards

Other **asset owner performance obligations** are as follows:

### 4.1 Grid owner configuration performance obligation

Each **grid owner** will ensure that the design and configuration of its **assets** (including its connections to other persons) and associated protection arrangements, are consistent with the **technical codes** and, in the reasonable opinion of the **system operator**, with maintaining the **system operator's** ability to meet the **principal performance objectives**. In reaching this opinion, the **system operator** will have regard to the potential impact of the design or configuration of those **assets** or associated protection arrangements on its achievement of the **principal performance objectives** and the **dispatch objective**.

### 4.2 Grid owner's and distributor's obligations relating to connected persons

Each **grid owner** and each **distributor** will use reasonable endeavours to:

#### 4.2.1 *Provide information*

Ensure that any **generator** which is:

- (a) connected to their **grid** or their **local network** as the case may be; and
- (b) which has a **generating set** with a rated net maximum capacity equal to or greater than one **MW**; and
- (c) which is not a member of this rulebook

will provide the **system operator** with written advice of the existence of such **generating set** together with such other information relating to that **generating set** as the **system operator** reasonably requires; and

#### **4.2.2 Comply with Board directives**

Comply with any directive of the **Board** pursuant to rule 10.3.2.

#### **4.3 Communication facilities to be provided**

All **asset owners** and **purchasers** will provide communications facilities which comply with the **technical codes** or otherwise as the **system operator** reasonably requires which will assist the **system operator** in planning to achieve, and achieving, its **principal performance objectives** and the **dispatch objective**.

#### **4.4 Information to be provided**

All **asset owners** and **purchasers** will provide information which complies with the **technical codes** or otherwise which the **system operator** reasonably requests, to assist the **system operator** to plan to achieve, and achieve its **principal performance objectives** and the **dispatch objective**.

#### **4.5 Asset owners to cooperate**

All **asset owners** and **purchasers** will cooperate with the **system operator** as may reasonably be required by the **system operator** in carrying out its functions.

### **5 System operator to monitor compliance**

#### **5.1 Ongoing compliance to be monitored**

To the extent possible given the information made available by **asset owners**, the **system operator** will monitor, in the manner set out in the **policy statement**, the ongoing compliance of **asset owners** with the **asset owner performance obligations** and the **technical codes**.

#### **5.2 Right not to dispatch**

The **system operator** has the discretion, while acting reasonably, not to dispatch any **asset** or configuration of **assets** unless it is satisfied that the **assets** or configuration of **assets** comply with the relevant, **asset owner performance obligation** and/or a provision of the **technical codes** or that the **asset owner** has and complies with a valid equivalence arrangement or **dispensation** from the relevant **asset owner performance obligation** and/or a provision of the **technical codes**.

#### **5.3 Asset Owners to be notified**

Where the **system operator** has reasonable grounds for believing that non compliance with an **asset owner performance obligation**, **equivalence**

**arrangement** or **dispensation** exists, and that the **asset owner** has no valid equivalence arrangement or **dispensation** from the relevant **asset owner performance obligation** or provision of the **technical code**, or does not comply with a valid equivalence arrangement or **dispensation** from the relevant **asset owner performance obligation** and/or a provision of the **technical codes**, then the **system operator** will immediately notify the **asset owner**.

## 6 Responsibility for compliance

### 6.1 Nature of compliance obligation

All **asset owners** will comply with the **asset owner performance obligations** and **technical codes** at all times and in addition will satisfy the **system operator**, whenever requested by the **system operator** acting reasonably, that each of their **assets** or configuration of **assets** comply with the **asset owner performance obligations** and **technical codes** that apply to that **asset** or configuration of **assets**.

### 6.2 Obligation to restore compliance

In the event that an **asset owner** receives notification pursuant to rule 5.3 it will co-operate with the **system operator** and use reasonable endeavours to restore compliance as soon as practical.

## 7 Equivalence arrangements and dispensations

### 7.1 Right to apply for approval of equivalence arrangement or grant of dispensation

If an **asset owner** cannot comply with an **AOPO** or a **technical code** obligation in respect of a particular **asset** or configuration of **assets**, being an existing, new or proposed **asset**, the **asset owner** may apply for an **equivalence arrangement** to be approved or **dispensation** to be granted in accordance with the process set out in schedule C1.

### 7.2 Approval of equivalence arrangements

The **system operator** will approve an **equivalence arrangement** where it has received satisfactory evidence that the **asset owner** will put in place on the agreed date technical and/or commercial arrangements which will, in the reasonable opinion of the **system operator**, achieve compliance with the **AOPO** or **technical code** for which the **equivalence arrangement** is sought, even though the **asset** or configuration of **assets** are not themselves strictly compliant.

### 7.3 Grant of dispensations

The **system operator** will grant a **dispensation** to an **asset owner** who has or will have **assets** or a configuration of **assets** which are not compliant with either an **AOPO** or **technical code** where the **system operator** has a reasonable expectation that it can continue to operate the existing system and meet its **PPOs** and where the **system operator** can readily quantify the costs on other persons of that **dispensation**, notwithstanding the particular non compliance of those **assets** provided that:

#### 7.3.1 *Costs to be paid*

Where the approval of a **dispensation** could impose readily identifiable and quantifiable costs on other persons, then a condition of the **dispensation** shall be that the **asset owner** is liable to pay for those costs arising due to the coming into effect of that **dispensation** in respect of the **AOPOs** or **technical codes** current at that time; and

#### 7.3.2 *Acknowledgement regarding dispatch*

The **asset owner** acknowledges that the granting of a **dispensation** does not guarantee that the **system operator** will dispatch that **asset** for which the **dispensation** was granted, as dispatch will only occur in accordance with the **dispatch objective**.

### 7.4 Other conditions can be imposed

The **system operator** may also impose other reasonable conditions on the grant of a **dispensation** pursuant to rule 7.3, including conditions as to duration of the **dispensation**.

## 8 Liability of asset owner pending decision

Pending determination of the **asset owner's** application for a **dispensation** or **equivalence arrangement**, if the **asset** is not complying with the **AOPOs** or the **technical codes**, the **asset owner** is liable for its non compliance and is responsible for any additional costs to the **system operator** or **asset owners** incurred as a result of the non-compliance (for example, the additional costs for additional **ancillary services** to be procured).

### 8.1 Modification of an equivalence arrangement or a dispensation

An **asset owner** may apply to the **system operator** for a modification to a **equivalence arrangement** or **dispensation** and the process set out in this rule 8 and schedule C1 will apply.

## 8.2 Cancellation of an equivalence arrangement or a dispensation

An **asset owner** may at any time give written notice to the **system operator** for the **equivalence arrangement** or **dispensation** to be cancelled on the grounds that the **asset** or configuration of **assets** subject to the **equivalence arrangement** or **dispensation** now complies with **AOPOs** or **technical codes**. The cancellation will take effect when the **system operator** gives written notice of acceptance of cancellation. The **system operator** shall record such cancellation in the **register** within five days of such notice.

## 8.3 Revocation of equivalence arrangement and revocation or variation of dispensation

### 8.3.1 *Right to revoke*

The **system operator** may revoke approval of an **equivalence arrangement** or revoke or vary the grant of the **dispensation** as the **system operator** reasonably considers appropriate if, at any time after the **system operator** has approved an **equivalence arrangement** or granted a **dispensation**, the **system operator** is satisfied that one or more of the following factors apply:

#### 8.3.1.1 False or misleading information

The **dispensation** or **equivalence arrangement** was approved on information that was false or materially misleading; or

#### 8.3.1.2 Change in circumstance

A prerequisite of the **dispensation** or **equivalence arrangement** has changed; or

#### 8.3.1.3 Condition not complied with

A condition upon which the **dispensation** or **equivalence arrangement** was approved has not been complied with; or

#### 8.3.1.4 Term of dispensation

Such withdrawal is provided for under the terms of any **dispensation** granted; or

#### 8.3.1.5 Rule change

A **rule change** has occurred in accordance with Part A which affects the **dispensations** or **equivalence arrangements**.

#### 8.3.1.6 Ruling Panel direction

After reconsideration of any decision carried out at the direction of the **Rulings Panel** under rule 8.4.1.5.

### 8.3.2 *Restriction on right to revoke*

The **system operator** shall not revoke or amend a **dispensation** and/or grant a further **dispensation** or revoke its approval of an **equivalence arrangement** pursuant to rule 8.3.1 above unless the **asset owner** to whom the **dispensation** was granted, or an **equivalence arrangement** was approved, and any other person who in the opinion of the **system operator** is likely to have an interest in the matter, is given reasonable notice of the **system operator's** intentions and a reasonable opportunity to make submissions to the **system operator** on the issue, and the **system operator** has regard to those submissions.

## 8.4 Appeal against decisions

### 8.4.1 *Right of appeal*

#### 8.4.1.1 Applicant

Any applicant can appeal any decision of the **system operator** in relation to any **equivalence arrangement** or a **dispensation**;

#### 8.4.1.2 Member

Any **member** can appeal any decision of the **system operator** in relation to an **equivalence arrangement** or a **dispensation** or appeal against any decision of an **asset owner** in relation to the confidentiality of information in an application for **dispensation** or **equivalence arrangements**;

#### 8.4.1.3 Notice of appeal

Every such appeal shall be made to the **Rulings Panel** by giving written notice to the **Board**, specifying the grounds of appeal. Every such notice must be given within 10 **business days** of publication of the decision in the register under rule 1.8 of schedule C1. If the applicant is not a **participant** it must first agree to be bound by the **rules** and by the decision of the **Rulings Panel**;

#### 8.4.1.4 Grounds of appeal

For the purpose of rule 8.4.1.3 an appeal may be made on the grounds that:

- the **asset owner** was wrong in its decision on the confidentiality of information in an application for an **equivalence arrangement** or a **dispensation**; or
- the **system operator** made an error of fact or failed to take properly into account all relevant information or took into account irrelevant information and in either case such consideration was material to the outcome.

#### 8.4.1.5 Decision of the Ruling Panel

The **Rulings Panel** in determining any appeal shall either approve the decision of the **system operator** or direct the **system operator** to reconsider the decision in full, or by reference to specified matters, and/or in conjunction with the **Board**.

#### 8.4.2 *Status of decisions pending any appeal*

Pending the outcome of any appeal pursuant to rule 8.8.1 the decision of the **system operator** in relation to the grant of a **dispensation** or approval of an **equivalence arrangement** will be valid and can be acted upon by the relevant **asset owner**.

## 9 Other provisions relating to equivalence arrangements and dispensations

### 9.1 Warranty from asset owner for equivalence arrangement

An **asset owner** who obtains approval for an **equivalence arrangement** covenants and warrants to the **system operator** that it will put in place and perform its obligations under that arrangement.

### 9.2 No precedent

**Equivalence arrangements** and **dispensations** are specific to **asset owners** and no approval of an **equivalence arrangement** or granting of a **dispensation** shall be construed as creating a precedent for the approval of other **equivalence arrangements** or **dispensations**.

### 9.3 Asset owner to notify system operator of potential non compliance

The owner or operator of an **asset** or configuration of **assets** will notify the **system operator** if it believes that it is in breach of any condition of its **dispensation**, or is in breach of any condition of its **equivalence arrangement**, or that such **asset** or configuration of **assets**, including any **equivalence arrangement**, does not, or is likely not to, comply with **asset owner performance obligations** and the **technical codes**.



#### **9.4 Failure of an equivalence arrangement or dispensation**

If an **asset owner** fails to put in place, maintain and meet all requirements of an approved **equivalence arrangement** or **dispensation**, the **asset owner** will be in breach of the **rules**.

### **10 Board may require exempt generating stations to comply with certain rules**

#### **10.1 System operator may apply to Board to extend compliance**

Notwithstanding anything in rules 2.1 and 2.3, the **system operator**, at any time may apply to the **Board** for it to issue a directive that certain **exempt generating station assets** must comply with rules 2.1 and 2.3 and the provisions of **technical codes** (or parts thereof).

#### **10.2 Criteria for Board decision**

The **Board** will issue the directive referred to in rule 10.1 if it is satisfied that there is **net public benefit** in obtaining that compliance.

#### **10.3 Implementation of directive**

In the event that a directive is issued pursuant to rule 10.2:

##### **10.3.1 Assets of a member**

In relation to **assets** of a **member** of the rulebook, that **member** will ensure that it complies with the directive with effect from the date specified in the directive; or

##### **10.3.2 Assets of a non member**

In relation to **assets** of a person who is not a **member** of the rulebook, the relevant **grid owner** or **distributor** to whom those **assets** are connected will use reasonable endeavours to ensure compliance by that person with the directive in accordance with rule 4.2.

## IV Arrangements concerning ancillary services

### 1 Content and purpose of section IV

The rules in this section:

- Describe the process by which the **system operator** is able to agree with the **Board**, in the procurement plan, how it will plan for and procure **ancillary services**;
- Outline how persons can enter authorised **alternative ancillary service arrangements** as an alternative to contributing to the allocable costs of **system operator** procured **ancillary services**;
- Establish how each **ancillary service** is to be priced and measured;
- Identify the allocable costs for **ancillary services** and outline the regime by which those costs are allocated to affected parties.

### 2 Process for procuring ancillary services

#### 2.1 Annual draft procurement plan

Each year, at the same time as the draft **policy statement** is submitted by the **system operator** to the **Board**, the **system operator** will also submit a draft **procurement plan** to the **Board**. At any time prior to the **Board** making its draft determination on the draft **procurement plan** the **system operator** may by written notice to the **Board** amend the draft **procurement plan**.

#### 2.2 Contents of procurement plan

The **draft procurement plan** will, for each **ancillary service**:

##### **2.2.1 Principles to be applied in making net purchaser quantity assessment**

Specify the principles that the **system operator** will apply in making a **net purchase quantity assessment**;

##### **2.2.2 Process for making a net purchase quantity assessment**

Outline the process which the **system operator** will apply in making a **net purchase quantity assessment**, which will include:

2.2.2.1 Whether requirements achieve objective;  
Determining the requirements of achieving the **principal performance objectives**;

2.2.2.2 Determining the requirements of the **dispatch objective**;  
Determining the requirements of the **dispatch objective**;

2.2.2.3 Contribution of asset owner compliance  
Assessing the contribution that compliance by **asset owners** with the **asset owner performance obligations** will make towards achieving the **principal performance objectives**;

2.2.2.4 Impact of dispensations and equivalence  
Assessing the impact that **dispensations** and **alternative ancillary services arrangements** held by **asset owners** will have on the quantity of **ancillary services** required to enable the **system operator** to achieve the **principal performance objectives**,

### **2.2.3 A net purchase quantity assessment**

Contain a net purchase quantity assessment for the 12 months following the expiry of the current term;

### **2.2.4 The system operator's proposed procurement processes**

Outline the process which the **system operator** will use to procure that **ancillary service** taking into account the following:

2.2.4.1 Market Mechanisms preferred

The **system operator** will use market mechanisms to procure **ancillary services** wherever technology and transaction costs make this practicable and efficient; and

2.2.4.2 Transparent Processes where no market mechanisms

Until such time as markets are developed, the **system operator** will use transparent processes which encourage all potential providers to compete to supply **ancillary services** required to meet common quality standards at the best economic cost.

### **2.2.5 Financial information concerning ancillary services**

Specify the **administrative costs** associated with the implementation of the procurement of that **ancillary service** as proposed in the **draft procurement plan**;

### **2.2.6 *Technical and contracting principles***

Outline the **system operator's** technical requirements and key contract terms to support the **draft procurement plan**;

### **2.2.7 *Matters relating to unanticipated procurement***

Outline the rights and obligations of the **system operator** in relation to procurement of that **ancillary service** in circumstances not anticipated by the **draft procurement plan**; and in circumstances when the assumptions made by the **system operator** in the **procurement plan** cannot be met;

### **2.2.8 *Commentary on competitive cost pressures and degree of innovation involved***

Include an assessment by the **system operator** of competitive cost pressures and the degree of innovation it believes are involved in the procurement process it is proposing for that **ancillary service**; and

### **2.2.9 *The system operator's reporting obligations***

Outline how the **system operator** will report on progress with implementing the **procurement plan**.

## **2.3 The Board to make a draft determination on the draft procurement plan**

Within 10 **business days** of receiving a **draft procurement plan**, the **Board** will consider the **draft procurement plan**, and make a draft **determination** to either accept or reject the **draft procurement plan**. In making this draft **determination** the **Board** will consider the extent to which:

### **2.3.1 *Consistent with the guiding principles***

Implementation of the **draft procurement plan** would be consistent with the **guiding principles**.

### **2.3.2 *Achieves purposes***

The **draft procurement plan** is consistent with the **system operator** achieving its **principal performance objectives** and the **dispatch objective** and the **asset owners** complying with the **asset owner performance obligations** and **technical codes**; and

### **2.3.3 *Consistent with the purpose of this section***

The implementation of the **draft procurement plan** would be consistent with the purpose of this section as set out in rule 1.

## 2.4 Draft determination to be recorded

The draft **determination** of the **Board** will set out in writing together with the reasons for that **determination** including how the **draft procurement plan** satisfies or fails to satisfy each of the factors set out in rule 2.3. A copy of this draft **determination** of the **Board** will be given to the **system operator**.

## 2.5 Process if the Board rejects the draft procurement plan

If the **Board's** draft decision is to reject the **draft procurement plan** the **Board** will request the **system operator** to submit another **draft procurement plan**, and the process set out in rule 2.3 will be repeated until the **Board** makes a draft **determination** to accept a **draft procurement plan**.

## 2.6 Process if the Board accepts the draft procurement plan

Within 5 **business days** of making any **determination** to accept a **draft procurement plan**, the **Board** will publish that draft **determination** together with the **draft procurement plan**.

## 2.7 The Board invites submissions on draft determination

At the time the **Board publishes** any draft **determination** and **draft procurement plan** in accordance with rule 2.5 the **Board** will notify the **members** of the date by which submissions on the draft **determination** and the **draft procurement plan** are to be received by the **Board**. This date will be no earlier than 10 **business days** from the date of **publication** of the draft **determination**.

## 2.8 Submission process

### 2.8.1 *Submissions to be made in writing*

Every submission on the draft **determination** and the **draft procurement plan** must be made in writing to the **Board** and received on or before the **submission expiry date**. The **Board** will provide a copy of each submission received to the **system operator** at the close of business on the **submission expiry date** and will also **publish** these submissions.

### 2.8.2 *System operator to be involved in submission process.*

The **system operator** shall have the right to make its own submission within five **business days** after the **submission expiry date** on both the draft **determination** and the submissions received in relation to it. The **Board** will **publish** the **system operator's** submission when it is received.

## **2.9 The Board to consider submissions and make final determination within 20 business days**

Within 20 **business days** of the **submission expiry date**, the **Board** will complete its consideration of all submissions it receives on the draft **determination** in accordance with rule 2.8 and make a final **determination** on the **draft procurement plan**. In making this determination the **Board** will consider the extent to which the criteria in rule 2.3 are met and taken into account the submissions received. This **determination** will be:

### **2.9.1 *Accept the draft procurement plan without any changes***

To accept the **draft procurement plan** without making any changes; or

### **2.9.2 *Accept the draft procurement plan with changes***

To accept the **draft procurement plan** subject to seeking the **system operator's** consent to specified changes; or

### **2.9.3 *Reject the draft procurement plan***

To reject the **draft procurement plan**.

## **2.10 The Board must obtain the system operator's consent to any changes to the draft procurement plan**

### **2.10.1 *If the Board accepts the draft procurement plan***

If the **Board** accepts the **draft procurement plan** subject to seeking the **system operator's** consent to specified changes in accordance with rule 2.9.2, the **Board** will then seek the **system operator's** written consent to those changes; and

### **2.10.2 *The system operator may give its consent***

The **system operator** may give its consent subject to conditions specified by the **system operator**. If the **Board** accepts such conditions the **system operator** will be deemed to have consented to the changes (subject to those conditions). If the **Board** does not accept those conditions the **system operator** will be deemed not to have consented to the changes. If the **system operator** does not consent to the changes, the process set out in rule 2.10.1 and this rule 2.10.2 will be repeated until either the **system operator** consents to the specified changes in accordance with this rule 2.10.2 or the **Board** accepts the **draft procurement plan** under clause 2.9.1 or the **Board** rejects the **draft procurement plan** under clause 2.9.3.

## **2.11 System operator to present further draft procurement plan if rejected**

Within 5 **business days** of rejecting a **draft procurement plan** under rule 2.9.3, the **Board** will:

### **2.11.1 *Notify the members***

Notify the **members**;

### **2.11.2 *Request the system operator to submit another plan***

Request the **system operator** to submit another **draft procurement plan** in accordance with rule 2.1 (to which the provisions of rule 2.3 will apply); and

### **2.11.3 *Provide reasons for failure to satisfy factors***

Provide the **system operator** in writing the reasons why the **draft procurement plan** fails to satisfy each of the factors set out in rule 2.3.

## **2.12 The Board to notify members of acceptance**

Within 5 **business days** of accepting a **draft procurement plan** under rule 2.9.1 or the **system operator** notifying the **Board** that the **system operator** has given its written consent in accordance with rule 2.10.2, the **Board's** final **determination** will be:

### **2.12.1 *Final determination set out in writing together with reasons***

Set out in writing together with the reasons for that decision including how the **draft procurement plan** satisfies each of the factors set out in rule 2.3.

### **2.12.2 *Board to publish determination and draft procurement plan***

**Published** by the **Board** together with the **draft procurement plan** to the **members**.

## **2.13 Draft becomes a procurement plan once published**

Except in the case of the initial **draft procurement plan** which will be deemed a "**procurement plan**" on the date the rules in part C commence, the **draft procurement plan** will, on the day it is **published** pursuant to rule 2.12.2, become known as a "**procurement plan**".

## 2.14 Procurement plan implemented once agreed

The **system operator** will implement the **procurement plan** for each **ancillary service** by entering into contracts with the **ancillary service agents** in the manner specified in the **procurement plan**.

## 2.15 Procurement plan rolled over until replaced

If by the expiry of the current **procurement plan** a new **procurement plan** has not been **published** pursuant to this chapter, the **procurement plan** will continue to apply and be implemented by the **system operator** to the extent practicable until such time as it is replaced by the **publication** of a new **procurement plan**.

## 2.16 Board obligated to consult with system operator about impact of changes to rules and technical codes on procurement plan

Where the **system operator** or a **member** has notified the **Board** of a **proposal** to change the rules or the **technical codes**, the **Board** will consult with the **system operator** with regard to whether or not it will be necessary to revise the **procurement plan**. If the **system operator** considers a **procurement plan** revision is required then the **system operator** will initiate a revision following the process set out rule 2.17.

## 2.17 Variations to a procurement plan

At any time during the term of a current **procurement plan**, the **system operator** may submit a request for, or the **Board** may on its own account request, a variation to the current **procurement plan**. Any **member** may make a submission to the **Board** at any time that the **Board** or the **system operator**, as the case may be, request a variation to a **procurement plan**.

## 2.18 Process for considering variations

Upon receiving or making a request for a variation to a **procurement plan** under rule 2.17, the **Board** will:

### 2.18.1.1 Dismiss

dismiss any vexatious requests; and

### 2.18.1.2 Hold over

hold over any trivial requests until the next **procurement plan** cycle; and



#### 2.18.1.3 Accept

immediately accept the request for a variation where such variation is required as a result of a **rule** change; or

#### 2.18.1.4 Following the process in rule 2.3

follow the process set out in rule 2.3 until the **Board** makes a draft **determination** to accept or reject the request for variation.

### 2.18.2 New draft procurement plan if accepted

If accepted, every request for variation will be treated as a new **draft procurement plan** and the process set out in this rule will be followed with the intent that any such **draft procurement plan** which is accepted will replace the existing **procurement plan** on the date it is **published** in the manner contemplated by rule 2.12.2.

## 3 Emergency changes to procurement plan

### 3.1 Departure from the procurement plan

Notwithstanding anything in rule 2, the **system operator** may depart from the processes and arrangements set out in the **procurement plan** with immediate effect in the event that **system security situation** arises in relation to the application of the **procurement plan**.

### 3.2 Report required

When the **system operator** makes any departure under rule 3.1, the **system operator** will provide a report to the **Board** setting out the circumstances of the **undesirable situation** and the actions taken to deal with it. The **Board** will ensure this report is published within a reasonable time of its receipt.

### 3.3 Time limit on departure

Any departure under rule 3.1 from the processes and other arrangements set out in the **procurement plan** will cease at the expiry of such **system security situation** unless it is approved in accordance with the processes set out in rule 2.17.

## 4 Alternative ancillary services arrangements

### 4.1 Right to apply to system operator for authorisation of an alternative ancillary services arrangement

Where an **asset owner** wishes to have an **ancillary service arrangement** authorised by the **system operator**, that person (or, in the event that more than one person wishes to have an authorisation, those persons jointly) may apply to the **system operator** to have that arrangement authorised as an **alternative ancillary services arrangement** using the process set out in schedule C2 of part C.

### 4.2 Authorisation of an alternative ancillary service arrangement

The **system operator** will authorise the arrangement as an **alternative ancillary services arrangement** if:

#### 4.2.1 *Technical compliance with procurement plan*

The proposed arrangement complies with the technical requirements for that **ancillary service** as set out in the current **procurement plan**; and

#### 4.2.2 *Ancillary service made available for dispatch by the system operator*

The implementation of the proposed arrangement will make the **ancillary service** available for dispatch by the **system operator** in substantially the same manner as if that **ancillary service** had been procured pursuant to the **procurement plan**.

### 4.3 System operator may impose conditions

As a condition of authorising an **alternative ancillary services arrangement** under rule 4.2 the **system operator** may:

#### 4.3.1 *Arrangements with the system operator*

Require the applicant to enter into certain arrangements with the **system operator** to ensure that it can continue to meet the **principal performance objectives**;

#### 4.3.2 *Specify a commencement date*

Specify the date on which the **alternative ancillary service arrangement** will commence;

### **4.3.3 *Impose conditions***

Impose any other condition it reasonably believes is necessary, including conditions necessary for the **system operator** to meet its **principal performance objectives** and conditions necessary for the orderly reconciliation and settlement of **ancillary services**.

## **4.4 Suspension of alternative ancillary service arrangement**

### **4.4.1 *Asset owner may suspend***

An **asset owner** may at any time give written reasonable notice to the **system operator** of suspension of the **alternative ancillary service arrangement** for a period specified in the notice.

### **4.4.2 *System operator may suspend an alternative ancillary service arrangement***

The **system operator** may suspend an **alternative ancillary service arrangement** in an **undesirable situation**.

## **4.5 Modification of an alternative ancillary service arrangement**

An **asset owner** may apply to the **system operator** for a modification to an **alternative ancillary services arrangement** and the process set out in this rule 4 and schedule C2 will apply.

## **4.6 Cancellation of an alternative ancillary service arrangement**

An **asset owner** may at any time give written reasonable notice to the **system operator** of cancellation of the **alternative ancillary services arrangement** which shall come into effect on the date specified in the notice.

## **4.7 Revocation of alternative ancillary services arrangements**

### **4.7.1 *Right to revoke***

If at any time after the **system operator** has authorised an **alternative ancillary services arrangement**, the **system operator** is satisfied that one or more of the following factors apply:

#### **4.7.1.1 False or materially misleading information**

The **alternative ancillary services arrangement** was authorised on information that was false or materially misleading; or

4.7.1.2 Prerequisite changed

A prerequisite of the **alternative ancillary services arrangement** has changed; or

4.7.1.3 Condition not complied with

A condition upon which the authorisation was granted has not been complied with; or

4.7.1.4 Revocation is provided for

Such revocation is provided for under the terms of any authorisation,

the **system operator** may revoke authorisation of the **alternative ancillary services arrangement** as the **system operator** reasonably considers appropriate.

**4.7.2 Restriction on right to revoke**

Subject to rule 4.4.2 the **system operator** shall not revoke or amend an **alternative ancillary services arrangement** unless the person to whom the authorisation was granted and any other person who in the opinion of the **system operator** is likely to have an interest in the matter is given reasonable notice of the **system operator's** intentions and a reasonable opportunity to make submissions to the **system operator** and the **system operator** has had regard to those submissions.

**4.8 Appeal of system operator decisions**

**4.8.1 Applicant**

Any applicant can appeal any decision of the **system operator** in relation to any **alternative ancillary services arrangement**;

**4.8.2 Member**

Any **member** can appeal any decision of the **system operator** in relation to an **alternative ancillary services arrangement** or appeal against any decision of an **asset owner** in relation to the confidentiality of information in an application for an **alternative ancillary services arrangement**;

**4.8.3 Notice of appeal**

Every such appeal shall be made to the **Rulings Panel** by giving written notice to the **Board**, specifying the grounds of appeal. Every such notice must be given within 10 **business days** of publication of the decision in the register under rule 1.6 of schedule C2. If the applicant is not a **participant** it

must first agree to be bound by the **rules** and by the decision of the **Rulings Panel**;

#### **4.8.4 Grounds of appeal**

For the purpose of rule 4.8.3 an appeal may be made on the grounds that:

- the **asset owner** was wrong in its decision on the confidentiality of information in an application for an **equivalence arrangement** or a **dispensation**; or
- the **system operator** made an error of fact or failed to take properly into account all relevant information or took into account irrelevant information and in either case such consideration was material to the outcome.

#### **4.8.5 Decision of the Ruling Panel**

The **Rulings Panel** in determining any appeal shall either approve the decision of the **system operator** or direct the **system operator** to reconsider the decision in full, or by reference to specified matters, and/or in conjunction with the **Board**.

#### **4.8.6 Status of decision pending any appeal**

Pending the outcome of any appeal pursuant to this rule 4.8, the decision of the **system operator** in relation to the authorisation of an **alternative ancillary services arrangement** will be valid and can be acted upon by the relevant **asset owner**.

## **5 Other provisions relating to alternative ancillary service arrangements**

### **5.1 System operator to monitor ongoing compliance of alternative ancillary services arrangements**

The **system operator** will monitor in accordance with the **procurement plan** the performance of **alternative ancillary services arrangements**. Where the **system operator** has reasonable grounds for thinking that non-compliance with an **alternative ancillary services arrangement** exists then the **system operator** will immediately notify the **asset owner**.

### **5.2 Warranty from asset owner**

An **asset owner** who obtains an authorisation of an **alternative ancillary services arrangement** covenants and warrants to the **system operator** that it will perform its obligations under the arrangement. In the event that an **asset owner** receives

notification pursuant to rule 5.1, it will co-operate with the **system operator** and will immediately use reasonable endeavours to restore compliance as soon as possible.

### **5.3 Holder of an alternative ancillary services arrangement not subject to cost allocations.**

It is intended that any **asset owner** who holds an **alternative ancillary services arrangement** will be relieved of an obligation to pay costs for **ancillary services** in the manner provided for in rule 6 to the extent set out in the **alternative ancillary services arrangement**.

### **5.4 Failure of an authorised alternative ancillary services arrangement**

Where **ancillary services** are meant to be provided to the **system operator** pursuant to an **alternative ancillary services arrangement** and such **ancillary services** are not made available to the **system operator** in accordance with the **alternative ancillary services arrangement** or any failure of an **alternative ancillary services arrangement**, then the person who holds the authorisation in respect of that **alternative ancillary services arrangement** will be deemed to be in breach of the rules. From the date any deemed breach of an **alternative ancillary services arrangement** becomes known the holder of the **alternative ancillary services arrangement** shall be required to meet its share of the ancillary costs as if the **alternative ancillary services arrangement** has not been authorised.

## **6 Allocating ancillary services costs**

### **6.1 Identifying costs associated with each ancillary service**

The allocable costs for each **ancillary service**, will be:

#### **6.1.1 *Actual costs pursuant to procurement contracts***

The actual amounts that the **ancillary service agents** are entitled to receive for that **ancillary service** pursuant to contracts entered into by the **system operator** in implementing the **procurement plan**; plus

#### **6.1.2 *Administrative costs associated with that ancillary service***

The actual **administrative costs** of the **system operator** (as approved by the **Board**) incurred in administering the **procurement plan** in respect of that **ancillary service**; less

### 6.1.3 Contribution from dispensation

Any readily identifiable and quantifiable costs to be paid by **asset owners** as a condition of any **dispensations** stipulated in accordance with rule 6.3.1 of section III.

### 6.1.4 Identifiable costs

Any identifiable costs to be paid by any person as a condition of any agreement reached by the **system operator** in accordance with rule 4 of section II.

## 6.2 Black start costs allocated to grid owner

The **allocable cost** of **black start** will be paid by the **grid owners** to the **system operator** in accordance with the process described in clause 6.7. Where there are multiple **grid owners** these costs will be allocated between them in proportion to their respective ODV valuations [cross refer rule 3 schedule A 6].

## 6.3 Over frequency reserve costs allocated to HVDC owner

The **allocable cost** of **over frequency reserves** will be paid by the **HVDC owner** to the **system operator** in accordance with the process described in rule 6.7.

## 6.4 Frequency keeping costs are allocated to purchasers

The **allocable cost** of **frequency keeping** will be paid by **purchasers** to the **system operator** in accordance with the process in clause 6.7. These costs will be calculated in accordance with the following formula:

$$\text{Share}_{\text{PURx}} = \frac{F_c * \max(0, \sum_t (\text{Offtake}_{\text{PURxt}} - E_{\text{PURxt}}^{\text{FK}}))}{\sum_x \max(0, \sum_t (\text{Offtake}_{\text{PURxt}} - E_{\text{PURxt}}^{\text{FK}}))}$$

where:

$\text{Share}_{\text{PURx}}$  **purchaser x's share of allocable cost in relation to frequency keeping**

$F_c$  **allocable cost of frequency keeping services in the billing period**

$\text{Offtake}_{\text{PURxt}}$  **total reconciled quantity in kWh for purchaser x across all grid exit points in trading period t in the billing period**

$E_{PURxt}^{FK}$  the quantity of any **frequency keeping** provided pursuant to any alternative **ancillary services arrangement** for **frequency keeping** authorised by the **system operator** for **purchaser x** in **trading period t**

## 6.5 Instantaneous reserve costs are allocated in two parts – availability and event charges

The **allocable cost** of **instantaneous reserve** will be allocated in accordance with the following process:

### 6.5.1 Availability costs allocated to generators and HVDC owner

The **availability costs** in a **billing period** will be allocated separately to persons in the North Island and South Island in accordance with the following formula:

$$\text{Share}_t = \frac{Ac_t \times m_t}{M_t}$$

where:

$\text{Share}_t$  the **availability cost** allocated to a **generator** which owns “**generating unit x**” or to the **HVDC link**, for **trading period t** for the North Island or South Island as appropriate

$Ac_t$  the **availability cost** for the North Island or South Island as appropriate incurred in respect of **trading period t**

$m_t$   $\left\{ \begin{array}{l} \max(0, \text{INJ}_{\text{GENxt}} - (h \times \text{INJ}_D) - E_{\text{GENxt}}^{\text{IR}}) = m_{xt} \text{ for any } \mathbf{generating} \\ \mathbf{unit} \\ \max(0, \text{HVDC}_{\text{Riskt}} - (h \times \text{INJ}_D) - E_{\text{HVDCt}}^{\text{IR}}) = m_{ht} \text{ for the } \mathbf{HVDC link} \end{array} \right.$

$M_t$   $\Sigma_x m_{xt} + m_{ht}$

$h$  0.5 **MWh/MW**

$\text{INJ}_{\text{GENxt}}$  electricity injected (expressed in **MWh**) by **generating unit x** in **trading period t** into the North Island or South Island as appropriate

$E_{\text{GENxt}}^{\text{IR}}$  the quantity of any **instantaneous reserve** provided pursuant to any alternative **ancillary services** contract for **instantaneous reserve** authorised by the **system operator** for generating unit **x** in **trading period t**



$HVDC_{Riskt}$	the <b>at risk HVDC transfer</b> (expressed in <b>MWh</b> ) in <b>trading period t</b> into the North Island or South Island as appropriate
$E_{HVDCt}^{IR}$	the quantity of any instantaneous reserve provided pursuant to any alternative ancillary services contract for instantaneous reserve authorised by the system operator for at risk HVDC transfer in trading period t
$INJ_D$	60 <b>MW</b>

### 6.5.2 **Event costs allocated to event causers**

The event charge payable by the causer of an **under-frequency event** (referred to as “Event e” below) will be calculated in accordance with the following formula:

$$EC = ECR * (\sum_y (INT_{ye} \text{ for all } y) - INJ_D)$$

where:

EC	the <b>event charge</b> payable by the <b>causer</b>
ECR	$IR_{EST}/2(INT_{EST} - (INJ_D * EV_{EST}))$
$IR_{EST}$	the <b>system operator’s</b> bona fide estimate of the <b>availability cost</b> for all <b>trading periods</b> in the relevant 12 month period
$INT_{EST}$	the <b>system operator’s</b> bona fide estimate of electricity which will be lost by virtue of <b>under-frequency events</b> in the relevant 12 month period (being the aggregate of the net reductions in the injection of electricity (expressed in <b>MW</b> ) experienced at <b>points of connection</b> and at <b>HVDC injection points</b> by reason of the <b>under-frequency event</b> )
$INJ_D$	60 <b>MW</b>
$EV_{EST}$	the <b>system operator’s</b> bona fide estimate of the number of <b>under-frequency events</b> which will occur in the year
$INT_{ye}$	the electric power (expressed in <b>MW</b> ) lost at point y by reason of Event e (being the net reduction in the injection of electricity (expressed in <b>MW</b> ) experienced at point y by reason of Event e) excluding any loss at point y by reason of secondary Event e

y a **point of connection** or the **HVDC injection point** where the injection of electricity was interrupted or reduced by reason of Event e

### 6.5.3 *Rebates paid for under frequency events*

Any **event charge** that has been paid for an **under-frequency event** (referred to as “Event e”) pursuant to rule 6.5.2 will be rebated to **availability cost** payees, or any **causer** holding a **dispensation** including a rebate entitlement, in accordance with the following formula:

$$\text{Rebate}_{xe} = EC_e * Z_{xe}/Z_{tote}$$

where:

$\text{Rebate}_{xe}$  the rebate of the **event charge** paid for Event e to **availability cost** payee “x”

$EC_e$  the **event charge** paid for Event e

$Z_{xe}$  the sum of all **availability costs** paid by x during the **billing period** in which the Event e occurred and the two preceding **billing periods**.

$Z_{tote}$  the sum of all **availability costs** paid for all **trading periods** during the **billing period** in which the Event e occurred and the two preceding billing periods.

These costs will be paid by the relevant **member** to the **system operator** in accordance with the process in clause 6.7.

## 6.6 *Voltage support costs are allocated in three parts – nominated peak, monthly peak and residual charges*

**Distributors** and **generators** will pay the **allocable cost** of **voltage support** in each **zone** to the **system operator** in accordance with the process described in clause 6.7. These costs will be calculated in accordance with the following process:

### 6.6.1 *Calculating the Nominated Peak kVAr charge*

Each **distributor** will pay a nominated peak kVAr charge calculated in accordance with the following formula:

$$\text{NomPeakCharge}_{\text{LINESx}} = \sum_z \text{PeakRate}_z * (\sum_j \text{NomPeak}_{\text{LINESxjz}})$$

where:

NomPeakCharge <sub>LINESx</sub>	the total nominated peak charges for <b>distributor x</b>
Peak Rate <sub>z</sub>	Fixed \$/kVAr set annually in advance by <b>system operator</b> for zone z
Nom Peak <sub>LINESxj</sub>	Peak demand in kVAr nominated annually in advance by <b>distributor x</b> at its <b>grid exit point j</b> (in zone z)
$\Sigma_z$	means sum across all relevant zones z
$\Sigma_j$	means sum across all grid exit points j of <b>distributor x</b> in zone z

### 6.6.2 Calculating the monthly peak penalty charge

Each **distributor** will pay a monthly peak penalty charge calculated in accordance with the following formula:

$$\text{PeakPenaltyCharge}_{\text{LINESx}} = \Sigma_z (\text{PenaltyRate}_z * (\Sigma_j \text{PenaltyQuantity}_{\text{LINESxjz}}))$$

where:

PeakPenaltyCharge <sub>LINESx</sub>	the total peak penalty charges for <b>distributor x</b> across all <b>grid exit points</b> for <b>distributor x</b>
PenaltyRate <sub>z</sub>	the fixed \$/kVAr penalty charge for “kVAr above nominated kVAr” set annually in advance by <b>system operator</b>
PenaltyQuantity <sub>LINESxj</sub>	“kVAr above nominated kVAr” quantity for <b>distributor x</b> at <b>grid exit point j</b> in zone z

For the purpose of calculating “kVAr above nominated kVAr”, the kVAr taken by the **distributor** are:

- (a) the average of the six largest kVAr peaks for the customer in each month measured at that **distributor’s points of connection** within the zone z; and
- (b) includes only kVAr demands on weekdays (Monday to Friday but excluding national holidays) between the hours of 07:00 to 21:00 inclusive; and
- (c) includes no more than two kVAr peaks in any one day;

and “kVAR above nominated kVAR” shall be the difference between the kVAR taken by the **distributors** as determined in (a), (b) and (c) and nominated kVAR specified by the **distributor**.

$\Sigma_z$  means sum across all zones z

$\Sigma_j$  means sum across all grid exit points j of distributor x in zone z

### 6.6.3 Calculation of residual charge

Each **distributor**, or **generator** if required as a condition of a **dispensation**, will pay the **system operator** a residual charge or receive a residual payment calculated in accordance with the following formula:

$$\text{Resid}_{\text{LINESx}} = \Sigma_z (\text{Vcost}_z - \text{NominatedPeakCharge}_{\text{ALLz}} - \text{PeakPenalty Charge}_{\text{ALLz}}) * \text{BillingPeriodOfftake}_{\text{LINESxz}} / \text{BillingPeriodOfftake}_{\text{ALLz}}.$$

where:

$\text{Resid}_{\text{LINESx}}$  the residual relating to **distributor x**

$\text{Vcost}_z$  total allocable costs for voltage support in zone z in the billing period

$\text{NominatedPeakCharge}_{\text{ALLz}}$  the sum of all **distributors'**  $\text{NominatedPeakCharge}_{\text{LINESx}}$  for zone z

$\text{PeakPenaltyCharge}_{\text{ALLz}}$  the sum of all **distributors'**  $\text{PeakPenaltyCharge}_{\text{LINESx}}$  for zone z

$\text{BillingPeriodOfftake}_{\text{LINESxz}}$  the sum of **reconciled quantity** for **distributor x** across all **grid exit points** in zone z for the **billing period** for all **trading periods**

$\text{BillingPeriodOfftake}_{\text{ALLz}}$  the sum of **reconciled quantity** for all **distributors** across all **grid exit points** in zone z for the **billing period** for all **trading periods**

$\Sigma_z$  the sum across all zones z

## 6.7 Clearing manager to calculate amounts payable and receivable

### 6.7.1 *Amounts payable to system operator*

The **clearing manager** will calculate the amount payable to the **system operator** by each **grid owner, purchaser, generator and distributor** for **ancillary services** pursuant to clause 6.1 to 6.6 and will collect these amounts on behalf of the **system operator** by including any amounts payable in relation to **ancillary services** in the invoices issued pursuant to part H. The amounts collected under these invoices will be payable to the **system operator** on [insert date].

### 6.7.2 *System operator will provide information*

To enable the **clearing manager** to calculate these amounts the **system operator** will provide to the **clearing manager** the total allocable cost for each **ancillary service**, and any additional information required to carry out the calculations under rules 6.1 to 6.6 inclusive which is not otherwise provided by the **reconciliation manager** or the **pricing manager** pursuant to the rules in Part G.

## 6.8 System Operator pays ancillary service agents

The **system operator** will be responsible for paying all **ancillary service agents**. The **system operator** must use the **clearing manager** as its agent to make payments to **members**. The **system operator** may use the **clearing manager** as its agent to make payments to **non-members**. Where the **clearing manager** is to make any payment pursuant to this rule, the **Board** may prescribe the manner in which the payment is to be made. Before exercising its discretion under this rule the **Board** must be satisfied that the result will be a material increase in efficiency, taking into account both cost-effectiveness and transparency.

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## **Schedule C1 – Approval of equivalence arrangement or grant of dispensation**

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### **1 Contents of schedule C1**

This schedule sets out the process for all **asset owners** who wish to apply for approval of an **equivalence arrangement** or grant of a **dispensation**.

### **2 Application and supporting information**

Each application for an **equivalence arrangement** or a **dispensation** shall be in writing and shall:

#### **2.1 Specify the AOPO or technical code**

Specify the **AOPO** or **technical code** from which approval for an **equivalence arrangement** or the grant of **dispensation** is sought;

#### **2.2 Provide supporting information**

Provide supporting information for the application, including sufficient information about the actual capability of the **asset** or configuration of **assets**;

#### **2.3 Describe any remedial action planned**

Describe any remedial action planned to return the **asset** or configuration of **assets** to a compliant state;

#### **2.4 Specify required term**

Specify the required term of the **equivalence arrangement** or **dispensation**; and

#### **2.5 Information for which confidentiality is sought**

Indicate any information for which confidentiality is sought on the grounds that it would, if disclosed, unreasonably prejudice the commercial position of the person who supplied the information (or of the person who is the subject of that information) or would disclose a trade secret or on the ground that it is necessary to protect information which is itself subject to an obligation of confidence and the duration of the requirement for confidentiality.

### **3 System operator obligations on receipt of application**

Within 5 **business days** of receipt of the application, the **system operator** shall:

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### 3.1 Record the name of the asset owner

Record the name of the **asset owner** making the application, the date and the subject matter of the application in the **register**;

### 3.2 Notify the board

Notify the **Board** of the application;

### 3.3 Provide an estimate of time

Provide the **asset owner**, with an estimate of the likely time it will take to consider the application and the likely costs associated with processing the application based on the **system operator approved fee rates**;

## 4 Rights and obligations during the processing of applications

### 4.1 Reasonable endeavours

The **system operator** will use reasonable endeavours to process the application for approval of an **equivalence arrangement** or grant of a **dispensation** within the time frame and costs estimated in accordance with 3.3 of this schedule.

### 4.2 Amended estimates

In the event that the **system operator** cannot process the application within the timeframe and/or costs originally estimated, it will give notice of this fact and its amended estimates of timeframe and/or costs to the **asset owner** and the provisions of rule 5 of this schedule will apply in respect to those costs.

### 4.3 Additional information

The **system operator** may require the provision of additional information at any stage during the application process, and provided the **system operator's** requirements are reasonable, that information must be provided by the **asset owner** if the application is to be processed.

### 4.4 Withdrawal of application

The **asset owner** may withdraw an application at any time subject to the meeting of all costs incurred by the **system operator** as at the date of withdrawal of the application. Where costs have been paid in advance those monies outstanding to the credit of the **asset owner** will be immediately returned to the **asset owner**.

## 4.5 Amendment of application

An applicant may amend an application being considered by the **system operator** at any time. All amendments must be in writing and submitted to the **system operator** and will take effect from the date of receipt.

## 5 Obligation of asset owner to pay costs

The **system operator** and the **asset owner** must agree on the costs involved in processing any applications for approval of an **equivalence arrangement** or grant of a **dispensation** and the method for payment by the **asset owner** of those costs:

### 5.1 Before the system operator proceeds

Before the **system operator** proceeds with the application;

### 5.2 At any time during the process

At any time during the processing of the application when either:

#### 5.2.1 *Estimate of likely time will exceed the previous estimate*

The **system operator** notifies the **asset owner** that it considers the estimate of the likely time frame involved in processing the application will exceed the estimate given under 3.3 of this schedule or any revised estimate given under rule 4; or

#### 5.2.2 *Asset owner varies its application*

An **asset owner** varies its application and the **system operator** acting reasonably considers this variation will change the costs in processing the application.

The **system operator** is entitled not to proceed until agreement on costs is reached at any of these stages.

## 6 Special provisions relating to the grant of dispensations

### 6.1 Issue a draft decision

Before granting a **dispensation**, the **system operator** will issue a draft decision on the application. This draft decision will be published on the **register** and will include:

#### 6.1.1 *Assessment of technical issues*

An assessment by the **system operator** of the technical issues;



### **6.1.2 Advice on ancillary services changes**

Advice from the **system operator** about any changes required to **ancillary services** procurement as a result of the proposed **dispensation**; and

## **6.2 Board approval required**

Where changes are required to the **procurement plan** the draft decision will be conditional on the **Board** deciding to amend the **procurement plan**.

## **6.3 Right to make submissions**

Any **member** may make a submission to the **system operator** on the application that resulted in the publication of the draft decision within [10] working days of the draft decision being recorded on the **register**.

## **6.4 Right to be notified of outcome**

All submissions will be considered by the **system operator** and the **system operator** will notify any **member** who made a submission on the **system operator's** decision on the application.

## **7 Decision of the system operator**

The **system operator** will advise all applicants for approval of an **equivalence arrangement** or grant of a **dispensation** of its decision as soon as it is made in writing and will advise such applicants of the reason for that decision.

## **8 Decisions to be published**

Any approval of an **equivalence arrangement** or a grant of **dispensation** by the **system operator** will be **published** in the **register**. The approval will state the name of the **asset owner**, the date, duration and nature of the **equivalence arrangement** or **dispensation** including any conditions. On request and at the cost of the person making the request, the **system operator** will supply all background information in relation to its decision to that person other than that which was designated as commercially sensitive by the relevant **asset owner**.

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## **Schedule C2 - Approval of alternative ancillary services arrangement**

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### **1 Process for approval of alternative ancillary service arrangement**

#### **1.1 Applications and supporting information**

Each application for an **alternative ancillary service arrangement** shall be in writing and shall:

##### **1.1.1 *Specify the ancillary service***

Specify the **ancillary service** for which approval for an **alternative ancillary service arrangement** is sought;

##### **1.1.2 *Provide information***

Provide supporting information for the application including sufficient information about the actual capability of the **asset** or configuration of **assets**;

##### **1.1.3 *Describe remedial actions***

Describe any remedial action planned to return the **asset** or configuration of **assets** to a compliant state;

##### **1.1.4 *Specify term***

Specify the required term of the **alternative ancillary service arrangement**; and

##### **1.1.5 *Identify confidential information***

Indicate any information for which confidentiality is sought on the grounds that it would if disclosed unreasonably prejudice the commercial position of the person who supplied the information (or the person who is the subject of that information) or would disclose a trade secret or on the ground that it is necessary to protect information which is itself subject to an obligation of confidence.

#### **1.2 System operator obligations on receipt of the application**

Within five **business days** of receiving any application under rule 1.1 the **system operator** shall:

### **1.2.1 Record the name**

Record the name of the **asset owner** making the application, the date and the subject matter of the application in the **register**;

### **1.2.2 Notify the Board**

Notify the **Board** of the application;

### **1.2.3 Provide an estimated time to consider**

Provide the **asset owner** with an estimate of the likely time it will take to consider the application and the likely costs associated with processing the application based on the rates specified in the **system operator approved fee rates**.

## **1.3 Obligation of asset owner to pay costs**

The **system operator** and the **asset owner** must agree on the costs involved in processing any applications for authorisation of an **alternative ancillary services arrangement** and the method for payment by the **asset owner** of those costs:

### **1.3.1 Before the system operator proceeds**

Before the **system operator** proceeds with the application;

### **1.3.2 At any time during the processing**

At any time during the processing of the application when either;

#### **1.3.2.1 Time estimate will exceed original estimate**

The **system operator** notifies the **asset owner** that it considers the estimate of the likely time frame and costs involved in processing the application will exceed the estimate given under rule 1.2.3; or

#### **1.3.2.2 Change of costs in processing the application**

An **asset owner** varies its application and the **system operator** acting reasonably considers this variation will change the costs in processing the application; and

The **system operator** is entitled not to proceed until agreement is reached.

## **1.4 Obligations in processing applications**

### **1.4.1 System operator to use reasonable endeavours**

The **system operator** will use reasonable endeavours to process the application for authorisation of an **alternative ancillary services arrangement** within the time frame and costs estimated in accordance with rule 1.2.3.

#### **1.4.2 System operator to give notice if original timeframe and costs not achievable**

In the event that the **system operator** cannot process the application within the timeframe and costs originally estimated it will give notice of this fact and its amended estimates of timeframe and costs to the **asset owner** and the provisions of rule 1.3 will apply in respect to those costs.

#### **1.4.3 System operator may require extra information**

The **system operator** may require the provision of additional information at any stage during the application process, and provided the **system operator's** requirements are reasonable, that information must be provided by the **asset owner** if the application is to be processed.

#### **1.4.4 Asset owner may withdraw an application at any time**

The **asset owner** may withdraw an application at any time subject to the meeting of all costs incurred by the **system operator** as at the date of withdrawal of the application. Where costs have been paid in advance those monies outstanding to the credit of the **asset owner** will be immediately returned to the **asset owner**.

#### **1.4.5 Applicant may amend an application at any time**

An applicant may amend an application being considered by the **system operator** at any time. All amendments must be in writing and submitted to the **system operator** and will take effect from the date of receipt.

### **1.5 Decision of system operator**

The **system operator** will advise all applicants for authorisation of an **alternative ancillary services arrangement** of its decision as soon as it is made in writing and will advise such applicants of the reason for that decision.

### **1.6 Decision to be published**

Any authorisation of an **alternative ancillary services arrangement** by the **system operator** will be published in the **register**. Subject to that which the **system operator** agreed was commercially sensitive, the authorisation will state the name of the **asset owner**, the date, duration and nature of the **alternative ancillary services arrangement** including any conditions. On request and at the applicant's cost, the **system operator** will supply all background information in relation to its decision to any applicants other than that which was designated as commercially sensitive by the relevant **asset owner**.

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## Schedule C3 - Technical codes

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### I Technical Code A – Assets

#### 1 Purpose

The purpose of this **technical code A** is to define obligations for **asset owners** and technical standards for **assets** that are supportive of, or more detailed than, those set out in section III, in order to enable the **system operator** to plan to achieve, and achieve the **principal performance objectives**.

#### 2 General requirements

##### 2.1 Operational performance of assets

Each **asset owner** will ensure that:

###### 2.1.1 *System number*

Its **assets** at **grid exit points** and at **grid injection points** and, in the case of **distributors**, the **assets** of any **embedded generator** connected to it, are identified and referred to by a **system number**;

###### 2.1.2 *Assets capable of operating within stated limits*

Its assets, both in the manner in which they are designed and operated, are capable of being operated, and operate, within the limits stated in the **asset capability statement** provided by the **asset owner** for that **asset**;

###### 2.1.3 *Meets any other reasonable requirements*

It meets any other reasonable requirements of the **system operator**, identified during planning studies, which are required for the **system operator** to plan to achieve, or to achieve its **principal performance objectives**.

##### 2.2 Assessment of assets to be connected to the grid

###### 2.2.1 *Requirements on asset owners for commissioning of assets*

All **asset owners** will provide the **system operator** with an **asset capability statement** and any other reasonable information required by the **system operator** to allow the **system operator** to assess compliance of its **asset** (or any configuration of **assets**) with the requirements of the **asset owner performance obligations** and **technical codes** at each of the following times:

#### 2.2.1.1 During the planning stage

Prior to the completion of planning for the construction of that **asset** (or configuration of **assets**); and

#### 2.2.1.2 Prior to the commissioning

At the completion of construction but prior to the commissioning of that **asset** (or configuration of **assets**) except that the **asset owner**, in accordance with the requirements of rule 2.6, will put in place a plan to minimise the impact of commissioning tests on the **system operator's** ability to achieve its **principal performance objectives** and will adhere to this plan during commissioning unless otherwise agreed to by the **system operator**.

### 2.2.2 *On completion of commissioning*

On completion of commissioning of any **asset** (or configuration of **assets**) the **asset owner** will obtain a final assessment in writing from the **system operator** that the **asset** (or configuration of **assets**) meets the requirements of the **asset owner performance obligations** and **technical codes**. This final assessment will be based on the information supplied by the **asset owner** and, where necessary, the result of **system tests** at commissioning.

## 2.3 System operator responsibilities

The **system operator** will give the assessment referred to in 2.2.2 within a reasonable time frame of the request and will supply **asset owner** with all information which supports its assessment. Any permission granted by the **system operator** to any **asset owner** to conduct commissioning of any **asset** (or configuration) shall permit connection of the **asset** (or configuration) solely for the purposes of commissioning.

## 2.4 Completion of commissioning

On completion of commissioning of any **asset** (or configuration) the owner of the **asset** (or configuration) will give the **system operator** such information as it reasonably requires to be satisfied that the **assets** or configuration of **assets** comply with the AOPOs and the **technical codes**. The **system operator** will complete its final assessment of compliance. This final assessment will be based on the information supplied and, where necessary, the result of **system tests** at commissioning.

## 2.5 Requirements for asset capability statement

Each **asset owner** will provide the **system operator** with an **asset capability statement** in the form from time to time published by the **system operator** for each **asset** that is proposed to be connected, or is connected to, or form part of the **grid**. The **asset capability statement** will:

**2.5.1 *Include all information requested by the system operator***

Include all information reasonably requested by the **system operator** so as to allow the **system operator** to determine the limitations in the operation of the **asset** that the **system operator** needs to know for the safe and efficient operation of the **grid**;

**2.5.2 *Include any modelling data***

Include any modelling data for the planning studies, as reasonably requested by the **system operator**;

**2.5.3 *Be updated and reissued to the system operator***

Be updated, and reissued to the **system operator**, as information and design development progresses through the study, design, manufacture, testing and commissioning phases;

**2.5.4 *Be complete and up to date before commissioning***

Be complete and up to date before the commissioning of the **asset**; and

**2.5.5 *Be complete and up to date at all times***

Be complete and up to date at all times while the **asset** is connected to, or forms part of, the **grid**.

**2.6 Requirements for commissioning of assets**

**2.6.1 *Asset owners must provide a commissioning plan***

**Asset owners** must provide a commissioning plan in accordance with rule 2.6.2:

2.6.1.1 Changes are made to assets

When changes are made to **assets** that alter any of the following at the **grid interface**:

- (a) The single-line diagram;
- (b) A protection system, other than a change to a protection system setting;
- (c) A **control system** including a change to a **control system** setting;  
or
- (d) Any rating of **assets**;

2.6.1.2 Assets are to be connected to the grid

When **assets** are to be connected to, or are to form part of, the **grid**; or

### 2.6.1.3 Assets to remain connected whilst being tested

Where it is necessary for an asset owner to perform a **system test**

and, where the commissioning or connection of these **assets** may affect the **system operator's** ability to plan to achieve, or to achieve, its **principal performance objectives**. Where an **asset owner** is unsure whether the commissioning or connection of an **asset** may impact on the **system operator's** ability to plan to achieve and achieve the **principal performance objectives** they should contact the **system operator** for advice.

## 2.6.2 *Requirements of a commissioning plan*

The commissioning plan prepared by **asset owners** in consultation with the **system operator** will:

### 2.6.2.1 Include a timetable

Include a timetable containing the sequence of events necessary to connect the **assets** to the **grid** and conduct any proposed **system test**;

### 2.6.2.2 Contain protection and control settings

Contain the protection and control settings to be applied before livening of the **assets**;

### 2.6.2.3 Contain procedures

Contain the procedures for commissioning the plant with minimum risk to personnel and plant and to the ability of the **system operator** to plan to achieve and achieve its **principal performance objectives**; and

## 2.7 Asset owner to follow commissioning plan

Once assessed by the **system operator** acting reasonably, the **asset owner** will follow the commissioning plan at all times unless otherwise agreed with the **system operator**, which agreement will not be unreasonably withheld where compliance with the commissioning plan is not practicable and non compliance would not impact on the **system operators** ability to meet its **principle performance objectives** and any impact on other **asset owners**.

## 3 Requirements for assets information

In accordance with section III, rule 4.4, the following information is required by the **system operator** to assist it to plan to achieve, and achieve its **principal performance objectives**.

### 3.1 Exchange of information

Sufficient information must be exchanged between the **system operator** and the **asset owner** to ensure that both fully understand the implications of the proposed connection of the relevant **assets** to the **grid** or to the **local network**. This information must be exchanged in accordance with a timetable agreed to by both the **system operator** and the **asset owner**.



### 3.2 For planning studies by the system operator

Where reasonably requested by the **system operator**, the **asset owner** will provide sufficient information to the **system operator** to demonstrate the compliance of its **assets** with the **asset owner performance obligations** and the **technical codes**.

### 3.3 Information about other asset owners

Information about any **asset**, **supply** or **demand** of other **asset owners** will only be disclosed by the **system operator**:

#### 3.3.1 *As provided for elsewhere in the rules*

As expressly provided for elsewhere in the **rules**;

#### 3.3.2 *Required in a grid emergency*

As reasonably required in a **grid emergency** or to ensure the security of the **grid**;

#### 3.3.3 *Required by law*

As required by law; or

#### 3.3.4 *Otherwise agreed with relevant asset owners*

Otherwise as may be agreed with the relevant **asset owners**.

### 3.4 For approval of the grid interface

Each **asset owner** will provide the **system operator** with:

- all information reasonably requested by the **system operator** so as to ensure compliance with rule 4.4 and to enable the **system operator** to assess the **grid interface**; and
- details of protection systems, including settings, to ensure the requirements of rule 4.4 are met.

### 3.5 Supporting information

Each **asset owner** must ensure that all supporting information for the operational control of **assets** is kept up to date.

## 4 Requirements for the grid and grid interface

### 4.1 Co-operation required between all parties at on protection systems

All **asset owners** and **grid owners** must co-operate with the **system operator** to ensure that protection systems on both sides of a **grid interface** which will include main and back up protection systems are co-ordinated so that a faulted **asset** is disconnected by the main protection system first and the other **assets** are not prematurely disconnected.

### 4.2 Agreement required before implementation

Any proposed **grid interface**, including the settings of any associated protection system, must be agreed between the relevant **asset owner** and the **system operator** before being implemented.

### 4.3 Grid interface switchgear to be provided

Each **asset owner** must ensure that sufficient **circuit-breakers** are provided for its **assets** so that each of its **assets** are able to be disconnected totally from the **grid** whenever a fault occurs within the **asset**.

### 4.4 Protection of assets and the grid

Each **asset owner** will ensure that it provides protection systems for its **assets** that are connected to or form part of the **grid**. Each **asset owner** must also ensure that:

#### 4.4.1 *Achieve the principal performance objectives*

Such protection systems will support the **system operator** in planning to achieve, and achieving the **principal performance objectives** and must be designed, commissioned, maintained, and settings applied, to achieve the following performance in a reliable manner:

##### 4.4.1.1 Disconnect any faulted asset

Disconnect any faulted **asset** in minimum time and with minimum disruption to the operation of the **grid** or other **assets**;

##### 4.4.1.2 Be selective when operating

Be selective when operating, so that the minimum amount of **assets** will be disconnected; and

##### 4.4.1.3 Preserve power system stability

As far as reasonably practicable, preserve power system stability.

#### **4.4.2 Duplicated main protection systems are provided**

Except for **circuit-breakers** and the primary circuits of instrument transformers, main protection systems for a connection of its **assets** to the **grid** operating at 220 **kV** are duplicated, and **circuit-breaker** failure protection systems are provided for each 220 **kV circuit-breaker**.

#### **4.4.3 Similar to existing design practice**

Protection system design for a connection of **assets** to the **grid** at lower voltages must be similar to existing design practice in adjacent connections of **assets** to ensure co-ordination of protection systems;

### **4.5 Synchronising facilities**

At a point of connection:

#### **4.5.1 Asset owners**

**Asset owners**, other than **grid owners**, must provide a means of checking **synchronism** before the switching of **assets** where it is possible that such switching may result in connection of parts of the New Zealand electric power system which are not **synchronised**; and

#### **4.5.2 Grid owners**

**Grid owners** must provide a means of checking synchronism before the switching of **assets** in locations agreed with the **system operator** so that it is not possible for such switching to result in connections of parts of the New Zealand electric power system which are not **synchronised**.

### **4.6 Auto-reclose facility**

Any auto-reclose facility at the **grid interface**, where power flow into the **grid** can occur, must include an appropriate **synchronising** check facility.

## **5 Specific requirements for generators**

### **5.1 Requirements for frequency response and control**

Each **generator** will ensure that:

#### **5.1.1 Generating sets and associated control systems**

Each of its **generating sets**, and its associated **control systems**;

5.1.1.1 Supports the system operator

Supports the **system operator** to plan to achieve, and achieve the **principal performance objectives**;

5.1.1.2 Is able to synchronise

Is able to **synchronise** at a stable frequency within the frequency range stated in the **asset capability statement** for that **asset**.

**5.1.2 Rate of change in output**

The rate of change in the output of any of its **generating sets** does not adversely affect the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**. The rate of change must be adjustable to allow for changes in **grid** conditions;

**5.1.3 Generating set has a speed governor**

Each of its **generating sets** has a speed governor which:

5.1.3.1 Provides stable performance

Provides stable performance with adequate damping;

5.1.3.2 Has adjustable droop

Has an adjustable droop over the range of zero percent to 7 percent; and

5.1.3.3 Is able to synchronise

Does not adversely affect the operation of the **grid** because of any of its non-linear characteristics;

**5.1.4 Appropriate speed governor settings**

Appropriate speed governor settings to be applied before commencing **system tests** for a **generating set** are agreed between the **system operator** and the **generator**. The performance of the **generating set** is then assessed by measurements from **system tests** and final settings are then applied to the **generating set**, before making it ready for service after those final settings are agreed between the **system operator** and the **generator**. **Asset owners** will not change speed governor settings without **system operator** approval.

**5.2 Voltage response and control**

Each **grid-connected generator** shall:

### **5.2.1 Excitation and voltage control system**

Have an excitation and voltage control system with a voltage set point that is adjustable over the range of voltage set out in section III, rule 3.2 and will operate continuously in the voltage control mode when **synchronised**; and

### **5.2.2 Generating set requirements**

In order to meet the **asset owner performance obligations**, ensure that each of its **generating sets** is equipped with either:

#### **5.2.2.1 Taps**

A connection transformer with an appropriate range of taps on each transformer together with an on-load tap-changer; or

#### **5.2.2.2 Assets**

Assets to give a dynamic performance equivalent to rule 5.2.2.1.

## **5.3 Multi-generating set control**

Where the output of more than one **generating set** is controlled by a common **control system**, the **generator** must ensure that:

### **5.3.1 Achieve the principal performance objectives**

The common **control system** does not adversely affect the ability of the **system operator** to plan to achieve, and achieve the **principal performance objectives**;

### **5.3.2 Combined output**

The combined output from the **generating sets** performs as though it were from one **generating set**; and

### **5.3.3 Individual performances not degraded**

Such **control system** does not degrade the individual performance of any one **generating set**.

## **5.4 Unbalanced conditions**

Each **generator** and **grid owner** must ensure that each of its **assets** is capable of operating under the voltage imbalance conditions stated in section II, rule 2.3.1 (c) and, when operated within the limits stated in its **asset capability statement**, does not:

### **5.4.1 Contribute unbalanced phase currents**

Contribute unbalanced phase currents into the **grid**; or

#### **5.4.2 *Aggravate any current unbalances***

Aggravate any current unbalance that may occur on the **grid**.

### **5.5 Back up protection for grid faults**

At some **points of connection**, a **generator** must ensure that its **generating sets** have both main and back up protection systems for nearby faults on the **grid**, where the necessity for, and the method of providing such protection systems is agreed between the **system operator** and the **generator**.

## **6 Specific requirements for local networks**

### **6.1 Connection of local networks in parallel with the grid**

Each **distributor** must agree with the **system operator** any temporary or permanent connection of its **assets** when those assets become simultaneously connected to the **grid** at more than one **point of connection**.

## **7 Modifications and changes to assets**

### **7.1 Requirements for new connections to apply**

**Assets** that have been modified, or are proposed to be modified, will be deemed to be new **assets** for the purposes of the **rules** and this **technical code A** and will be subject to the requirements for connection to the **grid** and the requirements for commissioning **assets**. For the purposes of this section, the following are considered to be modifications to **assets**:

#### **7.1.1 *New connection to the grid***

A new connection of **assets** to the **grid** or a **local network**; or

#### **7.1.2 *New connection to form part of the grid***

A new connection of **assets** to form part of the **grid**; or

#### **7.1.3 *A new connection to local network***

A new connection of **assets** of an **embedded generator** to a **local network**; or

#### **7.1.4 *Alteration to assets already connected to the grid***

An alteration to **assets** already connected to the **grid** or in the case of **embedded generator** already connected to a **local network**;

and, the new connection or alteration may affect the capacity of the **assets** or where the new connection or alteration may affect **asset owner performance obligations** or **technical code** requirements.

## 7.2 Notification of decommissioned assets

The **asset owner** agrees to notify the **system operator** in a timely manner of any **assets** which have been decommissioned where those **assets** affect or can affect the **system operator's** ability to meet its **PPOs**.

# 8 Records, tests and inspections

## 8.1 Asset records to be kept

Each **asset owner** must arrange for, and retain, records for each of its **assets** to demonstrate that the **assets** comply with **asset owner performance obligations** and this **technical code A**.

## 8.2 Asset owners to conduct testing

The **system operator** will agree a routine testing plan including timeframes for **assets** with the **Board**. **Asset owners** will carry out testing of their **assets** in accordance with the agreed plan.

## 8.3 Tests requested by the system operator

Where the **system operator** advises an **asset owner** that it reasonably believes that an **asset** may not comply with an **asset owner performance obligation** or this **technical code A**, the **asset owner** will:

### 8.3.1 *Advise the system operator of its remedial or test plan*

As soon as practicable, but in a period no longer than 30 days of receiving a written request, advise the **system operator** of its remedial or test plan for the **assets**; and

### 8.3.2 *Undertake any remedial action or testing*

As soon as reasonably practicable, undertake any remedial action or testing of its **assets** in accordance with its plan advised to the **system operator** in rule 8.3.1. The **system operator** may require such testing or remedial action to be undertaken in the presence of a **system operator** representative.

## 8.4 Access to records or assets

Each **asset owner** must, at the request of the **system operator**, provide access to records of the performance or testing of any **asset**; and access to inspect any **asset**.

## 9 Status of system operator approval

Any review and approval by the **system operator** under the **rules** is not to be construed as confirming or endorsing the design nor of warranting the safety, durability or reliability of any **asset**. Such review or approval does not relieve the **asset owner** from its obligations to continue to meet the requirements of the **rules**. The **system operator** will not, by reason of any such review or lack of review, be held responsible for strength, adequacy of design, or capacity of any **asset**. In undertaking any review, the **system operator** will not be held responsible for any consequence of a failure of any **asset** due to inadequate design.



## II Technical Code B - Emergencies

### 1 Purpose and application

#### 1.1 Purpose

The purpose of this **technical code B** is to set out the basis on which the **system operator** and **members** will anticipate and respond to emergency events on the **grid** that affect the **system operator's** ability to plan to achieve, and to achieve its **principal performances objectives**.

#### 1.2 Application

This **technical code** applies to all **asset owners** except for exempt **generating stations**.

### 2 Obligations of all parties

The **system operator** and all **members** are to act quickly and safely during a **grid emergency** in accordance with this **technical code B** so that the actual and potential impacts of any **grid emergency** are minimised.

### 3 Obligations of the system operator

#### 3.1 Planning in anticipation of a grid emergency

The **system operator** will use reasonable endeavours to ensure that:

##### 3.1.1 *Each member advised of any independent action*

Where necessary, each **member** is advised of any independent action required of the **dispatch customer** if there is a **grid emergency**; and

##### 3.1.2 *Facilities are specified*

Facilities to be put in place by **grid owners** and/or other **asset owners** to manually disconnect **demand** at each **point of connection** are specified.

## 4 Formal notices and responses

### 4.1 Requirements for formal notices

The **system operator** will issue a notice to relevant **members** whenever, or as soon as practicable after, one of the following events has occurred:

#### 4.1.1 *Achievement of PPOs is at risk*

The ability of the **system operator** to plan to achieve, and achieve the **principal performance objectives** is at risk or is compromised (as set out in the **policy statement**);

#### 4.1.2 *Public safety is at risk*

Public safety is at risk;

#### 4.1.3 *Assets are at risk*

There is a risk of significant damage to **assets**; and/or

#### 4.1.4 *Independent action has been taken*

Independent action has been taken in accordance with this **technical code B** to restore the **system operator's principal performance objectives**.

### 4.2 Content of formal notice

The **system operator** will ensure that any **formal notice** issued in accordance with rule 4.1 will include the following:

#### 4.2.1 *Electrical or geographical region*

The electrical or geographical region affected by the notice;

#### 4.2.2 *Potential consequences*

The potential consequences of the situation;

#### 4.2.3 *Responses requested*

The responses requested of **members**; and

#### 4.2.4 *Trading periods*

The **trading periods** to which the notice applies.

### 4.3 Recording formal notices

The **system operator** will record the sending of a **formal notice** and **members** will record the receipt of a **formal notice**.

### 4.4 Members to modify proposals

Where the **system operator** issues a request in accordance with this **technical code B** to a **member** to alter its **dispatch proposal**, that **member** will use reasonable endeavours to modify its **dispatch proposal** in response to the request.

## 5 Actions to be taken by the system operator in a grid emergency

### 5.1 Insufficient generation and frequency regulating reserve gives rise to a grid emergency

In the event that insufficient generation and **frequency regulating reserve** gives rise to a **grid emergency**, the **system operator** may have regard to the priority below where practicable:

#### 5.1.1 *Generators to vary their offer*

Request any relevant **generator** to vary its **offer** and dispatch **generators** in accordance with that **offer**, to ensure there is sufficient **generation** and **frequency regulating reserves**;

#### 5.1.2 *Reduce demand*

Request any relevant **purchaser**, where practicable, or any relevant **distributor** to reduce **demand**;

#### 5.1.3 *Disconnection of demand*

Require the disconnection of **demand** in accordance with rule 6.5;

#### 5.1.4 *Any other reasonable action*

Take any other reasonable action to alleviate the **grid emergency**;

regardless of whether a **formal notice** has been issued.

### 5.2 Insufficient transmission capacity that gives rise to a grid emergency

In the event that insufficient transmission capacity gives rise to a **grid emergency**, the **system operator** may have regard to the priority below where practicable:

### **5.2.1 Generators to vary their offer**

Request **generators** to vary their **offer** and dispatch the **generator** in accordance with that **offer**, to ensure that the available transmission capacity within the **grid** is sufficient to transmit the remaining level of **demand**;

### **5.2.2 Asset owners to restore their assets**

Request any **asset owner** to restore their **assets** that are not in service;

### **5.2.3 Reduce demand**

Request any **purchaser**, where practical, or **distributor** to reduce **demand**;

### **5.2.4 Disconnection of demand**

Require the disconnection of **demand** in accordance with rule 6.5; and

### **5.2.5 Any other reasonable action**

Take any other reasonable action to alleviate the **grid emergency**;

regardless of whether a **formal notice** has been issued.

## **5.3 Frequency outside normal band**

When frequency is outside the **normal band** and all available **injection** has been dispatched, the **system operator** may require the disconnection of **demand** in accordance with rule 6.5 in appropriate block sizes until frequency is restored to the **normal band**.

## **5.4 Minimum voltage limit**

When any **grid** voltage reaches the minimum voltage limit set out in Table 1 of this **technical code**, and is sustained at or below that limit, the **system operator** may require the disconnection of **demand** in accordance with rule 6.5 in appropriate block sizes until the voltage is restored to above the minimum voltage limit.

## **5.5 Unexpected event gives rise to a grid emergency**

The **system operator** may, where an unexpected event occurs giving rise to a **grid emergency**, take any reasonable action to alleviate the **grid emergency** situation.

## 6 Load shedding systems

### 6.1 Requirement to establish and maintain automatic under frequency load shedding systems

#### 6.1.1 *Distributor*

Every **distributor** will ensure that an **automatic under frequency load shedding** system is installed and maintained in accordance with rule 6.2 for each **point of connection** to which its **local network** is connected where, as at 10 May 2001, the relevant **distributor** has such an **automatic under frequency load shedding** system installed within its **local network** for that **point of connection**.

#### 6.1.2 *Grid owner*

Each **grid owner** will ensure that an **automatic under frequency load shedding** system is installed and maintained in accordance with rule 6.2 for each **point of connection** where, as at 10 May 2001, the **grid owner** has such an **automatic under frequency load shedding** system installed within its network for that **point of connection**.

#### 6.1.3 *System operator*

The **system operator** may reasonably request **distributors** to install and maintain, or arrange for, additional **automatic under frequency load shedding** systems in accordance with rule 6.2, in order for the **system operator** to plan to achieve and achieve its **principal performance objectives**.

#### 6.1.4 *Additional automatic under frequency load shedding*

Where additional **automatic under frequency load shedding** systems are not provided by **distributors** in accordance with rule 6.1.3, the **system operator** may reasonably require **grid owners** to install and maintain additional **automatic under frequency load shedding** systems in accordance with rule 6.2, in order for the **system operator** to plan to achieve and achieve its **principal performance objectives**.

### 6.2 Requirements of an automatic under frequency load shedding system

Any **automatic under frequency load shedding** system required to be provided in accordance with rule 6.1, must:

### **6.2.1 Enable automatic disconnection**

Enable automatic disconnection of 2 blocks of **demand** (each block being a minimum of 20% of the total **demand** at that **point of connection**) with block 1 operating 0.2 seconds after the frequency reduces to 47.5 Hz and block 2 operating:

- 15 seconds after the frequency reduces to 47.5 Hz; or
- 0.2 seconds after the frequency reduces to 45.5 Hz; and

### **6.2.2 Be maintained at all times**

Be operational at all times.

## **6.3 Action to be taken following automatic under frequency load shedding**

Upon operation of an **automatic under frequency load shedding** system, the **distributor** or **grid owner**:

### **6.3.1 Distributor or grid owner to advise system operator**

Must, as soon as practicable, advise the **system operator** of the operation of the **automatic under frequency load shedding** system and, where reasonably required by the **system operator** to plan to achieve or to achieve its **principal performance objectives**, a reasonable estimate of the amount of **demand** that has been disconnected;

### **6.3.2 May restore demand**

May restore **demand** only when permitted to do so by the **system operator**;

### **6.3.3 Ensure demand restored**

Must ensure **demand** restored (in accordance with rule 6.4.2) remains subject to the requirements of rule 6.3;

### **6.3.4 Report to the system operator if demand is moved**

Must report to the **system operator** if **demand** is moved between **points of connection**;

### **6.3.5 Request permission to restore demand**

May request permission to restore **demand** from the **system operator** where no instruction to restore **demand** has been received from the **system operator** within 15 minutes of the frequency returning to the **normal band**; and

### 6.3.6 **Loss of communication**

May cautiously and gradually restore the **demand** disconnected through the **automatic under frequency load shedding** system if there is a loss of communication, after 15 minutes of the loss of communication occurring. This restoration must be done only while the frequency is within the **normal band** and the voltage is within the required range. Each **distributor** or **grid owner** must immediately cease the restoration of **demand** and, to the extent necessary, disconnect **demand** if the frequency drops below the **normal band** or the voltage moves outside the required range. As soon as practicable after communications are restored, each **distributor** or **grid owner** must report to the **system operator** on the status of load restoration and the status of rearming the automatic under frequency relays.

## 6.4 **Priorities for manual load shedding**

Each **distributor** must assign a priority order for the disconnection of **demand** for **points of connection** which will include the party who will effect the disconnection of **demand**. The **distributor** must obtain agreement to the priority order from **grid owners**, such agreement will not be unreasonably withheld. Each **distributor** must advise the **system operator** of the agreed priority order, in addition to any changes to a priority order previously advised.

## 6.5 **Requirements for manual load shedding**

Where the **system operator** requires the disconnection of **demand** in accordance with this **technical code B**, the **system operator** will instruct **distributors** and the **grid owner** as the case may be (in accordance with the agreed priority order in rule 6.4) to disconnect **demand** for the relevant **point of connection**. Where a **distributor** and a **grid owner** have not agreed on a priority order for a **point of connection**, the **system operator** will instruct **grid owners** to disconnect **demand** directly at the relevant **point of connection**. To the extent practicable, the **system operator** will use reasonable endeavours when instructing for the disconnection of **demand** to ensure equity between **distributors**.

## 6.6 **Distributor and grid owner to act as instructed by system operator**

Each **distributor** or **grid owner** will act as instructed to by the **system operator** operating in accordance with rules 5 and 6.

# 7 **Obligations of grid owners**

## 7.1 **Planning for switching of grid feeders during a grid emergency**

A **grid owner** must use reasonable endeavours to ensure that appropriate **assets** are installed for the manual disconnection of **demand** at **points of connection**.

## 7.2 **Independent action to be taken at minimum voltage limit**

A **grid owner** will take independent action as may be required by the **system operator** in accordance with rule 5.4 to disconnect **demand** at **points of connection** when the voltage at

any **point of connection** reaches the minimum voltage limit set out in Table 1 and is sustained at or below that level. A **grid owner** will continue to disconnect **demand** at **points of connection** while the voltage remains below the minimum voltage limit set out in Table 1, being guided by any arrangements with **distributors** as advised by the **system operator**.

## 8 Obligations of generators and ancillary service agents to take independent action

The following independent action is required of **generators** and **ancillary service agents** during the occurrence of extreme variations of frequency or voltage at the **points of connection** to which their **assets** are connected. Such extreme levels of frequency or voltage are deemed to constitute a **grid emergency** and require a fast and independent response from **members**.

### 8.1 To correct extreme under frequency

When the **under frequency limit** is reached and the frequency continues to fall, **generators** must use reasonable endeavours to take the following immediate independent action to assist in restoring frequency;

#### 8.1.1 *Increase the energy injection*

Increase the energy injection from **generating sets** where those **generating sets** are physically capable of increasing such **injection**;

#### 8.1.2 *Attempt to restore network frequency*

Attempt to restore **grid** frequency to the **normal band** by **synchronising**, connecting to the **grid** and loading those **generating sets** which are not connected, but are able to be connected and operated in this manner;

#### 8.1.3 *Re-synchronise*

**Re-synchronise**, re-connect to the **grid** and load any **generating sets** that have tripped and are able to be connected and operated in this manner; and

#### 8.1.4 *Report to the system operator*

Report to the **system operator** as soon as practicable after taking action in accordance with rules 8.1.1, 8.1.2, and 8.1.3.

### 8.2 To correct extreme over frequency

When the **over frequency limit** is reached and the frequency continues to rise, **generators** must use reasonable endeavours to take the following immediate independent action to assist in restoring frequency:



**8.2.1 Decrease the energy injection**

Decrease the energy injection from connected **generating sets** where **generators** are physically capable of decreasing such **injection**; and

**8.2.2 Report to the system operator**

Report to the **system operator** as soon as practicable after taking action in accordance with rule 8.2.1.

**8.3 To correct extreme voltage**

When either the minimum voltage limit or the maximum voltage limit set out in Table 1 is exceeded at any point of connection, **generators** and **ancillary service agents** must use reasonable endeavours to take immediate independent action to return the voltage to as close as practicable to within such limits. **Generators** must use reasonable endeavours to **synchronise**, connect to the **grid**, and, as necessary, load and adjust all available **generating sets** which can assist in restoring the voltage. **Ancillary service agents** must also use reasonable endeavours to connect to the **grid**, and, as necessary, load all available **reactive capability** resources, which can assist in restoring the voltage. As soon as practicable after taking such actions, **generators** and **ancillary service agents** must report to the **system operator** on the action taken to correct voltage.

**8.4 During a loss of communication with generators**

For a loss of communication with the **system operator** lasting at least five minutes, **generators** must use reasonable endeavours to:

**8.4.1 Take independent action**

For **synchronised generating sets**, take independent action to adjust supply to maintain frequency as close as possible to the **normal band**, and maintain voltage as close as possible either to that previously advised by the **system operator** or as can be best established by the **generator**;

**8.4.2 Synchronise and connect available generating sets**

**Synchronise** and connect available **generating sets** to the **grid** if the **generating sets** currently connected do not have the capacity to control the frequency and voltage as required by rule 8.5.1;

**8.4.3 Continue to attempt to maintain frequency and voltage**

Continue to attempt to maintain the frequency and voltage to the requirements of rule 8.5.1; and

**8.4.4 Report to the system operator**

As soon as practicable after communications are restored, report to the **system operator** on the action taken.

## 8.5 During a loss of communication with ancillary service agents

For a loss of communication with the **system operator** lasting at least five minutes, **ancillary service agents** must use reasonable endeavours to:

### 8.5.1 *Take independent action*

If on load, take independent action to adjust any real or reactive power resources to maintain frequency and voltage as close as possible either to that previously advised by the **system operator** or as can be best established by the **ancillary service agent**;

### 8.5.2 *Connect available reactive capability resources*

Connect available **reactive capability** resources to the **grid** if the currently connected reactive power resources do not have the capacity to control the voltage as required by table 1;

### 8.5.3 *Continue to attempt to maintain the voltage*

Continue to attempt to maintain the voltage to the requirements of rule table 1; and

### 8.5.4 *Report to the system operator*

As soon as practicable after communications are restored, report to the **system operator** on the action taken.

## 8.6 Major disruption to system operator communications and operational control centre facilities

In the event of a failure at the **system operator's** operational centre that disables the main dispatch or communication systems, the **system operator** may temporarily transfer its operational activities to an alternative operational centre, and the **system operator** will arrange for communication facilities to transfer to the new location and will notify **members** of these arrangements.

**Table 1: Extreme point of service voltage limits**

Nominal voltage (kV)	Extreme voltage limits	
	Maximum (kV)	Minimum (kV)
220	242	187
110	121	93.5
66	72.5	56.1
50	55	42.5

## III Technical Code C – Operational Communications

### 1 Purpose and application

#### 1.1 Purpose

The purpose of this **technical code C** is to state the minimum requirements for the communications, which are required in order to assist the **system operator** to plan to achieve, and achieve the **principal performance objectives**. Additional requirements may be set out in [*dispatch rules*]. This **technical code C** does not deal with the content of communications, which is dealt with in each **technical code** and in part G where relevant.

#### 1.2 Application

This **technical code** applies to the **system operator** and to all **asset owners** except **exempt generating stations**.

### 2 Performance requirements for operational communications

#### 2.1 Verbal and electronic communications

All verbal and electronic communications between the **system operator** and the **asset owner** must be logged by both the **system operator** and the **asset owner**. All verbal instructions must be repeated back and confirmed before being actioned.

#### 2.2 Document transmission

An acceptable form of document transmission will be facsimile transmission (fax). Any other form of document transmission must be agreed between the **system operator** and the **asset owner** concerned. Document transmission of formal notices or other documents from the **system operator** may be broadcast simultaneously to two or more **asset owners**.

#### 2.3 Operational communications

Each **asset owner** to provide the following methods of operational communications:

##### 2.3.1 *Speech*

Speech communications between the **system operator** and the **control room** of each **asset owner**;

### 2.3.2 **Document transmission**

Document transmission communications between the **system operator** and the **control room** of each **asset owner**; and

### 2.3.3 **Data transmission**

Where SCADA signals are required, data transmission communications between the **system operator** and the SCADA system of the **asset owner**.

## 2.4 **Points of contact**

The **system operator** and each **asset owner** will nominate and advise each other of the preferred points of contact and the alternative points of contact to be used by the **system operator** and the **asset owner**. Each **asset owner** shall also nominate and advise the **system operator** of the person to receive instructions and formal notices as set out in **technical code B – Emergencies**. The preferred points of contact will include those to be used when the **system operator** instructs the **asset owner**, when the **system operator** sends formal notices to the **asset owner** and when the **asset owner** contacts the **system operator**. The alternative points of contact will only be used if preferred points of contact are not available.

## 3 **Performance requirements for communications circuits**

### 3.1 **Availability of communications**

Each **asset owner** will use reasonable endeavours to comply with:

- the availability requirements set out in Appendix A1 for data transmission communications at each **grid** busbar to which the asset owner is connected; and
- the availability requirements set out in Appendix A2 for any operational communications required between the **system operator** and the **control room** of the **asset owner**.

### 3.2 **Requirements of the data network**

The data transmission communications will be designed so that that any point through which multiple communications are transferred complies with Appendix A1.

### 3.3 **Specific requirements for speech communications**

Each **asset owner** must ensure that speech communication circuits operate in real time and full duplex mode.

## **4 Performance requirements for indications and measurements**

### **4.1 Minimum required indications and measurements**

The relevant **asset owner** must provide the indications and measurements shown in Appendix B to the **system operator**. The **system operator** may require the **asset owner** to provide additional information where, in the reasonable opinion of the **system operator**, such information is required for the **system operator** to plan to achieve, and achieve its **principal performance objectives**.

### **4.2 Required accuracy of measurements**

The **asset owner** must ensure that the accuracy of the measurements comply with Appendix C unless the **system operator** reasonably determines that a lesser accuracy is required.

## **5 Communications between parties**

### **5.1 Loss of communication between an asset owner and the system operator**

When there is a loss of communication between an **asset owner** and the **system operator**, the **asset owner** and the **system operator** must use reasonable endeavours to re-gain communication. As far as is practicable during a loss of communication, all **asset owners** must assist in relaying messages to and from the **system operator**.

## Appendix A1: Availability requirements for data communications at grid busbars (rule 4.1)

Category Number	Category Description	Availability
1	A <b>grid</b> busbar with over 299 <b>MW</b> of injection offtake or power flow	99.99%
2	A <b>grid</b> busbar with 200-299 <b>MW</b> of injection offtake or power flow	99.95%
3	A <b>grid</b> busbar with 50-199 <b>MW</b> of injection offtake or power flow	99.8%
4	A <b>grid</b> busbar with up to 49 <b>MW</b> of injection offtake or power flow	98.6%

The category applicable to an **asset owner** at each **grid** busbar to which it is connected will be determined by the amount of injection, offtake, or power flow measured at the **grid** busbar at a time of maximum system load with an additional allowance for load growth. The additional allowance for load growth will be 5% per annum for the expected economic life of the communications service or 10 years if the service is to be leased.

The availability requirements are cumulative in any one-year period.

The following defines “power flow” as used in this Appendix A1:

- For a **grid** busbar, power flow is the sum of all positive **MW** inflows to the busbar.
- For a **grid** busbar which is a grid injection point, power flow is either the sum of the generator injection to the busbar, or the sum of the positive **MW** inflows to the busbar, whichever is the greater.

The availability requirements for category 2, 3 and 4 busbars must be applied on the basis of total, down stream **MW** power flows.

## Appendix A2: Availability requirements for control room communications (rule 4.1)

Category Number	Category Description	Availability
1	A <b>control room</b> which manages over 299 <b>MW</b> of injection, offtake or power flow	99.99%
2	A <b>control room</b> which manages between 200-299 <b>MW</b> of injection, offtake or power flow	99.95%
3	A <b>control room</b> which manages between 50-199 <b>MW</b> of injection, offtake or power flow	99.8%
4	A <b>control room</b> which manages less than 49 <b>MW</b> of injection, offtake or power flow	98.6%

The category applicable to an **asset owner** at each of its **control rooms** will be determined by the amount of injection, offtake, or power flow under **operational control** of the **control room** at a time of maximum system load with an additional allowance for load growth. The additional allowance for load growth will be 5% per annum for the expected economic life of the communications service or 10 years if the service is to be leased.

The availability requirements are cumulative in any one-year period

The following defines “power flow” as used in this Appendix A2:

- For a **control room** for a **distributor**, power flow is the sum of all positive **MW** offtakes from the **grid** for the **local networks** that come under the **operational control** of the **control room**.
- For a **control room** for a **generator**, power flow is the sum of all positive **MW** injections to the **grid** for the **generator sets** that come under the **operational control** of the **control room**
- For a **control room** for a **grid owner**, power flow is the sum of all positive **MW** power flows into **grid** busbars that come under the **operational control** of the **control room**.

The availability requirements for category 2, 3 and 4 busbars must be applied on the basis of total, down stream **MW** power flows.

## Appendix B: Indications and measurements (rule 4.1)

### From generating sets:

- The parameters shown in table B1 must be provided

**Table B1:**

Parameter	Values Required
Station nett MW	Import and export
<b>Generating set</b> gross MW (MCR* above 5 MW only)	Import and export, for each <b>generating set</b>
Station nett MVA <sub>r</sub>	Import and export
<b>Generating set</b> Gross MVA <sub>r</sub> (MCR* above 5 MW only)	Import and export, for each <b>generating set</b>
Pulses for MWh per bus	Import and export
Pulses for MVA <sub>r</sub> h per bus	Import and export
<b>Generating set circuit-breaker</b> status	Open/closed/in transition/indication error <sup>+</sup>
<b>Grid interface circuit-breaker</b> status	Open/closed/in transition/indication error <sup>+</sup>
<b>Grid interface</b> disconnecter status	Open/closed/in transition/indication error
<b>Generating set</b> operating mode	Generate/ <b>compensate</b> /shutdown

\* MCR = Maximum continuous rating of the **generating set**.

+ No intentional time delays should be included for **circuit-breaker** indications as these are time tagged by the **system operator** to less than 10 ms.

### From the grid and other grid interfaces:

**Grid owners** and/or **distributors** must provide the indications shown in table B2 in respect of **assets** connected to, or forming part of, the **grid**.



**Table B2:**

Parameter	Required indication
<b>Grid interface circuit-breaker</b> status	Open/closed/in transition/ indication error*
<b>Grid interface</b> disconnecter status	Open/closed/in transition/closed to earth/ indication error

\* No intentional time delays should be included for **circuit-breaker** indications as these are time tagged by the **system operator** to less than 10 ms.

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## **Appendix C: Accuracy of measurements (rule 5.2)**

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The accuracy of measurements must be equal to or better than those in table C.

The accuracy will be assessed by comparing the actual parameter with the indicated value.

**Table C:**

<b>Parameter</b>	<b>Accuracy Required</b>
MW	± 2 percent MCR*
MVA <sub>r</sub>	± 2 percent MCR*

\* MCR = Maximum continuous rating of the **asset**.

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## Technical Code D – Co-ordination of outages affecting common quality

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### 1 Purpose

The purpose of this **technical code D** is to set out the obligations of **asset owners** to notify planned outages of **assets** which affect common quality and to set out the obligations of the **system operator** in relation to **outage co-ordination** and the provision of timely advice to **asset owners** on the security implications of **notified planned outages**.

### 2 Notification of planned outages

An **asset owner** will, in relation to each of its **assets**, notify the **system operator** as soon as practicable of all planned outages of such **assets** where such outages may impact on the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**. Where the **asset owner** is unsure whether an outage of an **asset** may impact on the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**, they should contact the **system operator** for advice. **Asset owners** should notify the **system operator** up to 12 months ahead of planned outages and update the **system operator** of changes to the planned outages as and when the **asset owner** becomes aware of them.

### 3 Assessment of notified planned outages

The **system operator** will assess all **notified planned outages** and the extent to which they impact on the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**.

### 4 Assets may be requested to remain in service

The **system operator** may request that an **asset owner** of **assets** which are the subject of a **notified planned outage** keep those **assets** in service until a more suitable time if such outage would, in the reasonable opinion of the **system operator**, adversely affect the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**. The **system operator** may propose a suitable alternative time for the **notified planned outage**.

### 5 Asset owners to assist security

An **asset owner** should endeavour to programme its **notified planned outage** at a time when there will be no disruption to the **system operator's** ability to plan to achieve, and achieve the **principal performance objectives**. The **system operator** may advise an **asset owner** when an appropriate time would be. Where the **asset owner** is able to modify the **notified planned outage** period for an **asset** in the manner suggested by the **system operator** without material cost or disruption, the **asset owner** should endeavour to do so.

## 6 Asset outage programme

The **system operator** will regularly publish an **asset** outage programme containing the **notified planned outage** information provided by the **asset owners**. Where an **asset owner** wishes the **notified planned outage** to remain confidential, the information will not be included in the published outage programme. Where, however, a **formal notice** is issued in accordance with **technical code B – Emergencies** in respect of the **notified planned outage**, the **system operator** may publish sufficient information regarding the relevant **notified planned outage** to identify the condition that affects the ability of the **system operator** to plan to achieve, and to achieve the **principal performance objectives** and the **trading periods** to which the notice is expected to apply.

## 7 Assets may be requested to return to service

The **system operator** may request an **asset owner** to terminate a **notified planned outage** in progress within a pre-arranged period so that **assets** which are the subject of the **notified planned outage** can be returned to service to support the **system operator** in planning to achieve, and achieving the **principal performance objectives**.