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## **Procurement Plan**

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## Introduction and content

### INTRODUCTION

1. This is the eighth **procurement plan** under the **rules** and the Code. It commences on 1 December 2011 and applies for 12 months or until amended or replaced in accordance with the Code. It sets out the process the **system operator** will follow in procuring **ancillary services** during the term of this **procurement plan**.
2. Terms used in this **procurement plan** which are defined terms under the Code have the same meaning as contained in Part 1 of the Code. Some other terms are defined in Appendix B of this **procurement plan**.
- 2A. Unless the context requires otherwise, references in this **procurement plan**:
  - 2A.1 to clauses, Parts, subparts and Schedules are to clauses Parts, subparts and Schedules of the Code; and
  - 2A.2 to paragraphs and Appendices are to paragraphs and Appendices of this **procurement plan**.

### CONTENT

3. The content and structure of this **procurement plan** is consistent with the content and structure set out in clause 8.43(3) and includes:
  - 3.1 *[Revoked]*
  - 3.2 the principles the **system operator** will apply in making a **net purchase quantity assessment** (clause 8.43(3)(a));
  - 3.3 the processes the **system operator** will apply in making a **net purchase quantity assessment** (clause 8.43(3)(b)) including:
    - 3.3.1 determining the requirements for complying with its **principal performance obligations** (clause 8.43(3)(b)(i)); and
    - 3.3.2 determining the requirements for achieving the **dispatch objective** (clause 8.43(3)(b)(ii)); and
    - 3.3.3 assessing the contribution that compliance by **asset owners** with the **asset owner performance obligations** will make towards the **system operator's** compliance with its **principal performance obligations** (clause 8.43(3)(b)(iii)); and
    - 3.3.4 assessing the impact that **dispensations** and **alternative ancillary service arrangements** held by **asset owners** will have on the quantity of **ancillary services** required to enable the **system operator** to comply with its **principal performance obligations**(clause 8.43(3)(b)(iv));
  - 3.4 an assessment of the net purchase quantities required for the 12-month term provided by this **procurement plan** (clause 8.43(3)(c));

- 3.5 the proposed procurement process which the **system operator** will use to procure that **ancillary service**, taking into account the matters provided for in clause 8.43(3)(d);
- 3.6 financial information relating to the **administrative costs** for each **ancillary service** proposed in this **procurement plan** (clause 8.43(3)(e));
- 3.7 the technical requirements and key contract terms to support this **procurement plan** (clause 8.43(3)(f));
- 3.8 the rights and obligations of the **system operator** in relation to the procurement of any **ancillary service** in circumstances not anticipated by this **procurement plan** and in circumstances where the assumptions made by the **system operator** in this **procurement plan** cannot be met (clause 8.43(3)(g));
- 3.9 an assessment by the **system operator** of the competitive cost pressures and the degree of innovation it believes are involved in the procurement process it is proposing for that **ancillary service** (clause 8.43(3)(h)); and
- 3.10 an outline of how the **system operator** will report to the **Authority** on progress in implementing this **procurement plan** (clause 8.43(3)(i)).

#### **SERVICES TO PURCHASE**

- 3A. The **system operator** will purchase the following **ancillary services** from **ancillary service agents**:
  - 3A.1 **frequency keeping**;
  - 3A.2 **instantaneous reserve**;
  - 3A.3 **over frequency reserve**;
  - 3A.4 **voltage support**; and
  - 3A.5 **black start**.

## Conditions for implementation

4. The **system operator** will use reasonable endeavours to implement this **procurement plan** by entering into **ancillary service** procurement contracts with **ancillary service agents** to provide each **ancillary service** contemplated by this **procurement plan** in accordance with the terms and processes contained in this **procurement plan**. The obligations of the **system operator** and the **ancillary service agent** under any **ancillary service** procurement contract entered into in relation to the provision of **ancillary services** will be consistent with the obligations imposed by the Code as at the commencement date of this **procurement plan**. (*Refer to clause 8.45*)
5. The **system operator** may depart from the processes and arrangements set out in this **procurement plan** if the **system operator** reasonably considers that it is necessary to do so to comply with its **PPOs**. (*Refer to clause 8.47*)
6. The **system operator** will provide a report to the **Authority** in respect of any departure by the **system operator** from this **procurement plan** as referred to in paragraph 5. This report will contain the features outlined in clause 8.47(2).
7. Implementation of this **procurement plan** is subject to the **ancillary services** actually being made available to the **system operator** on—
  - 7.1 the terms contained in this **procurement plan**; or
  - 7.2 terms that, in the **system operator's** reasonable opinion, do not differ materially from those contained in this **procurement plan**.
8. *[Revoked]*
9. *[Revoked]*

## Principles applied in making net purchase quantity assessment (clause 8.43(3)(a))

10. In determining the quantity of **ancillary services** to be procured and in assessing the cost effectiveness of such **ancillary services**, the **system operator** will apply the following principles:
  - 10.1 **Ancillary services** will be procured on a fixed quantity and fixed price basis where the **system operator** assesses there is a requirement for a fixed quantity or a high availability (irrespective of **dispatch**) of the **ancillary service**. This type of procurement will be referred to as *Firm Quantity Procurement*.
  - 10.2 In all other cases, **ancillary services** will be procured through a half-hour clearing market process whereby, for each **ancillary service**, **ancillary service agents** submit offers to the **system operator**. The market for that service is reconciled, priced and settled on a half-hour basis for such quantities as the **system operator** assesses to be practicable and cost-effective to procure. Before an offer can be submitted the **ancillary service agent** must enter into an **ancillary service** procurement contract for the particular **ancillary service**. The **ancillary service** procurement contract will set out the offer, pricing and settlement mechanisms for the particular **ancillary service** without stipulating specific offer quantities or prices. This type of procurement will be referred to as *Half-hour Clearing Market Procurement*.
  - 10.3 The **system operator** will apply one or a combination of the following pricing components in respect of each **ancillary service** procured by the **system operator**, as reasonably determined by the **system operator** to result in the most cost-effective outcome:
    - 10.3.1 *Utilisation or Offer Price* is the price for the quantity of the service, expressed in \$ or \$ per unit capacity of the **ancillary service** over the period for which the quantity used is measured and reconciled;
    - 10.3.2 *Availability Price* is the price for making the service available, irrespective of **dispatch**, measured in \$ per period of time for which the service is made available; and
    - 10.3.3 *Event Price* is the price for calling on the **ancillary service** capacity for a particular event, expressed in \$ per event.
  - 10.4 The **system operator** will consider the following in achieving the appropriate balance between cost and quality for each **ancillary service** purchased:
    - 10.4.1 the technical specification of the plant being offered, including any measuring equipment required;
    - 10.4.2 the minimum acceptable service standard;
    - 10.4.3 the number of suppliers offering the service and reasons for any limitations;

- 10.4.4 the actual cost of providing the service over the **ancillary service** procurement contract term; and
- 10.4.5 the liability for providing the service and the potential cost of failure.

## Process for making a net purchase quantity assessment (clause 8.43(3)(b))

### THE REQUIREMENTS FOR COMPLYING WITH THE PRINCIPAL PERFORMANCE OBLIGATIONS (PPOS) (CLAUSE 8.43(3)(b)(i))

11. The **system operator** will procure **ancillary services** to assist it to achieve the following objectives:

Ancillary service	Objectives
<b>Frequency keeping</b>	Compliance with clause 7.2(1)(b) Compliance with the <b>policy statement</b>
<b>Instantaneous reserve</b>	Compliance with clause 7.2(1)(a), 7.2(1)(b), and 7.2(2)(a) Prevent the frequency from going outside defined limits for specified contingencies Compliance with the <b>policy statement</b>
<b>Over frequency reserve</b>	Compliance with clause 7.2(1)(a), 7.2(1)(b), and 7.2(2)(b) Compliance with the <b>policy statement</b>
<b>Voltage support</b>	Compliance with clause 7.2(1)(a) Compliance with the <b>policy statement</b>
<b>Black start</b>	Compliance with clause 8.5 Compliance with the <b>policy statement</b>

### THE REQUIREMENTS FOR ACHIEVING THE DISPATCH OBJECTIVE (CLAUSE 8.43(3)(b)(ii))

12. The **system operator** will use reasonable endeavours to dispatch assets in a manner consistent with the **dispatch objective**. This will include the **dispatch** of **ancillary services**.
13. It is recognised within the Code that the meeting of the **dispatch objective** is subject to the availability and capability of generation and **ancillary services**. Accordingly, the **system operator** will **dispatch ancillary services** according to the **dispatch objective** provided there is sufficient availability of **ancillary services**.
14. The **policy statement** sets out the policies used by the **system operator** in scheduling and **dispatching ancillary services** to assist it in planning to comply and complying with its **dispatch objective**.

### **ASSET OWNER CONTRIBUTION (CLAUSE 8.43(3)(b)(iii))**

15. The **system operator** will assess the net purchase quantity of **ancillary services** required to achieve compliance with its **PPOs**, taking into account its assessment of the contribution that **asset owners** provide in achieving the **PPOs** through compliance with the **asset owner performance obligations** and **technical codes**.
16. The **system operator's** assessment of the contribution provided by **asset owners** will rely on the following:
  - 16.1 that **asset owners** will at all times comply with the **asset owner performance obligations** including any **dispensation** or **equivalence arrangement** in respect of these obligations that has been granted by the **system operator** pursuant to the Code;
  - 16.2 that information contained in the **asset capability statements** provided by **asset owners** is correct;
  - 16.3 the contribution provided by **asset owners** in meeting the relevant **asset owner performance obligations** will be provided at no additional procurement cost when dispatched for energy;
  - 16.4 the existence of any contracts of the type and nature set out in clause 8.6.
  - 16.5 *[Revoked]*

### **IMPACT OF DISPENSATIONS AND ALTERNATIVE ANCILLARY SERVICE ARRANGEMENTS HELD BY ASSET OWNERS (CLAUSE 8.43(3)(b)(iv))**

#### **Dispensations**

17. The **system operator** will take into account all known **dispensations** from compliance with an **asset owner performance obligation** or **technical code** when determining the net quantity of procurement required for each **ancillary service**.
18. The costs of these **dispensations** will be paid for by the **asset owner** as a condition of the **dispensation**.
19. The **allocable cost** to be paid by **ancillary service payers** excludes the readily identifiable and quantifiable costs resulting from granting **dispensations**. Any **dispensations** awarded during this **procurement plan** period may affect the net quantity of procurement for each **ancillary service** but the cost to **ancillary service payers** will not be changed as the cost for the **dispensation** will be borne by the **asset owner** with the **dispensation**.

#### **Alternative Ancillary Service Arrangements**

20. At the time of the preparation of this **procurement plan**, no **alternative ancillary service arrangements** were in place.

## **IMPACT OF LOCAL QUALITY AGREEMENTS AND EXISTING LONG TERM CONTRACTS HELD BY ASSET OWNERS**

### **Local quality agreements**

21. In assessing the net quantities of procurement, the **system operator** will take account of:
  - 21.1 any existing contracts for higher levels of **common quality** that the **system operator** has entered into under clause 8.6. These are referred to as local quality agreements.
  - 21.2 *[Revoked]*

### **Existing long term contracts**

22. In assessing the net quantities of procurement, the **system operator** will take account of any **existing long term contracts**.

## Assessment of net quantities (clause 8.43(3)(c))

23. Set out below is a summary of the methodology used to make a **net purchase quantity assessment** for each **ancillary service** to be procured by the **system operator**.

### ASSESSMENT METHODOLOGY FOR INSTANTANEOUS RESERVE

24. All parties that can offer **instantaneous reserve** compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **instantaneous reserve** on a half-hour clearing market procurement basis will be contracted by the **system operator** for provision of **instantaneous reserve** on that basis. Each such **ancillary service** procurement contract will be a contract to provide **reserve offers** for the purposes of clause 13.37 and a contract to provide **instantaneous reserve** for the purposes of clause 13.82(g)(i).
25. The **system operator** will assess the net purchase quantity of **instantaneous reserve** for each **trading period** in accordance with the processes set out in paragraphs 11 to 22 and Schedule 13.3.

### ASSESSMENT METHODOLOGY FOR FREQUENCY KEEPING

26. Subject to paragraph 26A, all parties that can offer **frequency keeping** compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **frequency keeping** on a half-hour clearing market procurement basis ("**half hour frequency keeping**") will be contracted by the **system operator** for provision of **half hour frequency keeping**. Each such **ancillary service** procurement contract will be a contract to provide **frequency keeping** for the purposes of clause 13.82(g)(i).
- 26A. Parties that can offer **frequency keeping** compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **frequency keeping** on a firm **trading period** and **MW band** quantity procurement basis ("**fixed price/quantity frequency keeping**") may be contracted by the **system operator** to provide **fixed price/quantity frequency keeping** instead of or as well as **half hour frequency keeping**. Each such **ancillary service** procurement contract will be a contract to provide **frequency keeping** for the purposes of clause 13.82(g)(i).
27. The **system operator** will assess the net purchase quantity of **frequency keeping** for each **trading period** in accordance with the processes set out in paragraphs 11 to 22.

### **ASSESSMENT METHODOLOGY FOR OVER FREQUENCY RESERVE**

28. The **system operator** will procure **over frequency reserves** from parties that can offer **over frequency reserves** compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **over frequency reserves** on a firm quantity procurement basis. Each such **ancillary service** procurement contract will be a contract to provide **over frequency reserves** for the purposes of clause 13.82(g)(i).
29. The **system operator** will assess the net purchase quantity of **over frequency reserves** during the term of this **procurement plan** and for each **trading period** in accordance with the processes set out in paragraphs 11 to 22.

### **ASSESSMENT METHODOLOGY FOR VOLTAGE SUPPORT**

30. The **system operator** will procure **voltage support** from parties that can offer **voltage support** compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **voltage support** on a firm quantity procurement basis. Each such **ancillary service** procurement contract will be a contract to provide **voltage support** for the purposes of clause 13.82(g)(i).
31. The **system operator** will assess the net purchase quantity of **voltage support** in each **zone** during the term of this **procurement plan** and for each **trading period** in accordance with the processes set out in paragraphs 11 to 22.

### **ASSESSMENT METHODOLOGY FOR BLACK START SERVICES**

32. The **system operator** will procure **black start** services from parties that can offer **black start** services compliant with the **system operator's** technical requirements and the Code and who are prepared to enter into an **ancillary service** procurement contract with the **system operator** to provide **black start** services on a firm quantity procurement basis.
33. The **system operator** will assess the net purchase quantity of **black start** services during the term of this **procurement plan** in accordance with the processes set out in paragraphs 11 to 22 and taking into account historic performance of the power system, including (but not limited to) information about previous events on the system and the **system operator's** reasonable opinion about the risk and location of future events.
34. The **system operator** will use reasonable endeavours to procure the **black start** service at two sites in each **island** for the term of this **procurement plan**.

## Proposed procurement processes (clause 8.43(3)(d))

### TENDERING PROCESS

#### Invitation to tender

35. The **system operator** will, when inviting tenders for **ancillary services**, inform existing and potential **ancillary service agents** of the type of **ancillary services** sought and contact details for further information regarding the tender process.

#### Information disclosure

36. Unless otherwise required by the Code, the System Operator Service Provider Contract, or by **law**, the **system operator** will only disclose any information received during the tender process referred to above to the **Authority** (if so required by the **Authority**).

#### Contracting process

37. The **system operator** may enter into **ancillary service** procurement contracts with providers who can and do offer the required service compliant with the **system operator's** technical requirements and the Code, subject to—
- 37.1 the **system operator's net purchase quantity assessment** for each **ancillary service**; and
- 37.2 paragraphs 4 to 7 of this **procurement plan**.
- 37A. The **system operator** will negotiate in good faith **ancillary service** procurement contracts with **ancillary service agents** using the **system operator's** standard form **ancillary service** procurement contracts as starting points.

### MARKET MECHANISMS

38. The proposed mechanisms for procuring the quantities of each of the **ancillary services** required to meet the **PPOs** and the **dispatch objective** for each **trading period** are identified in Appendix A.
39. The **system operator** has determined that it is uneconomic to procure **black start, over frequency reserve, and voltage support** during the term of this **procurement plan** using half-hour clearing markets. For these **ancillary services** the **system operator** will use its reasonable endeavours to procure the required quantity to achieve what, in the reasonable opinion of the **system operator**, is the most cost-effective outcome.
- 39A. The **system operator** has determined that it may be uneconomic to procure all or some **frequency keeping** during the term of this **procurement plan** using half-hour clearing markets. Accordingly, the **system operator** may invite tenders for **fixed price/quantity frequency keeping** as well as **half**

**hour frequency keeping.** If so, the **system operator** will use its reasonable endeavours to procure a mix of **fixed price/quantity frequency keeping** and **half hour frequency keeping** that achieves, in the reasonable opinion of the **system operator**, the most cost-effective outcome. For the avoidance of doubt, the **system operator** may procure only **half hour frequency keeping** (even if tenders for **fixed price/quantity frequency keeping** are received) or only **fixed price/quantity frequency keeping**.

40. Where there is only one potential supplier for an **ancillary service**, the **system operator** will use reasonable endeavours to negotiate directly with that **ancillary service agent** to reach an outcome consistent with achieving the **dispatch objective**. The **system operator** will report to the **Authority** if such a situation should arise.

## Financial information concerning ancillary services (clause 8.43(3)(e))

41. The costs associated with the procurement of **ancillary services** are:
- 41.1 the **administrative costs** associated with establishing procurement processes, tendering, and entering into **ancillary service** procurement contracts; and
  - 41.2 the purchase cost of the **ancillary services**, as paid to **ancillary service agents** by the **system operator**.
42. Identifiable **administrative costs** are those significant costs incurred by the **system operator** as a direct consequence of implementing this **procurement plan** and that are specifically attributable to an **ancillary service** and that have been agreed to by the **Authority** and the **system operator**. The **system operator** will be entitled to recover these costs as an **allocable cost** in accordance with the **ancillary service** cost recovery methodology set out in clauses 8.55 to 8.70.
43. The **administrative costs** will be incurred at the following standard charge out rates:

<b>Grade</b>	<b>Position</b>	<b>Rate \$/hr (excl GST)</b>
1	Analyst/Engineer	135
2	Senior Analyst/Engineer/Consultant	166
3	Senior Advisor	218

## Technical requirements and key contract terms (clause 8.43(3)(f))

### TECHNICAL REQUIREMENTS

44. The key technical requirements for each **ancillary service** are set out in Appendix A.

### ANCILLARY SERVICE PROCUREMENT CONTRACT TERMS

45. When entering into **ancillary service** procurement contracts with **ancillary service agents** for the provision of **ancillary services**, the **system operator** must use its reasonable endeavours to ensure that the **ancillary service** procurement contracts include the key technical requirements and the key contracting terms.
- 45A. The general contracting terms negotiated between the **system operator** and the **ancillary service agents** must not be materially inconsistent with the key contracting terms described below.
46. The key contracting terms are as follows:

#### Disputes

47. In the event of a dispute between the parties in relation to the **ancillary service** procurement contract (not being a dispute under the **regulations** or Code) that the parties cannot resolve by negotiation, the parties can agree to refer the dispute for resolution by:
- 47.1 mediation; or
  - 47.2 independent expert determination; or
  - 47.3 Rulings Panel determination under Part 3 of the **enforcement regulations**; or
  - 47.4 arbitration in accordance with the provisions of the Arbitration Act 1996.
48. In the event that the parties do not agree to refer an unresolved dispute to one of the above forms of dispute resolution, or having been referred to such dispute resolution the dispute is not resolved within 100 **business days** (or such longer period as the parties may agree), either party may refer the dispute to an arbitrator for resolution. The arbitrator will be agreed between the parties or, failing agreement, will be an arbitrator appointed by the President for the time being of the New Zealand Law Society. Such arbitration shall be conducted under and in accordance with the provisions of the Arbitration Act 1996.

#### Obligations under the regulations and Code

49. Nothing in the **ancillary service** procurement contract will limit any obligation of the **ancillary service agent** or the **system operator** to comply with the **regulations** or Code or limit any liabilities arising due to the breach

of the **regulations** or Code by an **ancillary service agent** or the **system operator**.

50. Any performance requirement in the **ancillary service** procurement contract that refers to a specific clause in the Code will be subject to any **dispensation** granted to the **ancillary service agent**, provided the **ancillary service agent** has notified the **system operator** of the **dispensation**.

#### **Rights to terminate**

51. A party will have the right to terminate the **ancillary service** procurement contract (or an **ancillary service** schedule to the **ancillary service** procurement contract) immediately on notice to the other party where a change to the **regulations** or Code that occurs during the term of the **ancillary service** procurement contract:

- 51.1 results in the **ancillary service** procurement contract being materially inconsistent with the **regulations** or Code; or
- 51.2 imposes material additional obligations or material costs on the terminating party in respect of matters covered by the **ancillary service** procurement contract.

Whether any such change is material is to be decided by independent dispute resolution where the parties cannot agree.

52. A party will have the right to terminate the **ancillary service** procurement contract immediately on notice to the other party if:
- 52.1 the other party goes into liquidation, compromises with its creditors, enters statutory management or receivership, becomes insolvent, or is subject to any analogous event; or
- 52.2 the other party sells its business without the consent of the terminating party, such consent not to be unreasonably withheld; or
- 52.3 it becomes illegal for the terminating party to perform the **ancillary service** procurement contract.
53. The **system operator** will have the right to terminate an **ancillary service** schedule to the **ancillary service** procurement contract immediately on notice to the **ancillary service agent** if:
- 53.1 the **ancillary service agent** commits a material breach of the **ancillary service** procurement contract in relation to that **ancillary service**; and
- 53.2 such breach, if remediable, is not remedied to the **system operator's** reasonable satisfaction within 10 **business days** of the **system operator's** notice, or such longer period as the **system operator** may determine.
- 53A. A failure by the **ancillary service agent** to meet a performance requirement for the **ancillary service** will not be a material breach unless—

- 53A.1 the **ancillary service agent** has previously failed to meet the same performance requirement under its existing **ancillary service** procurement contract; or
- 53A.2 the **ancillary service agent** has failed to meet the performance requirement in paragraph 88A; or
- 53A.3 the effect of the failure is that the ancillary service was not provided at all when it should have been.

### **Payment and invoicing**

- 54. The payment and invoicing terms of the **ancillary service** procurement contract will recognise and be consistent with the obligations of the parties under the Code in respect of payment and invoicing.
- 55. The **system operator** may delegate its invoicing obligations under the **ancillary service** procurement contract to the **clearing manager**. Invoices for **ancillary services** will be paid by the **clearing manager** on the **system operator's** behalf.

### **Limitation of liability**

- 56. Where a party breaches an obligation under the **ancillary service** procurement contract that is also an obligation contained within the **regulations** or Code, the liability (if any) of that party will be determined under and in accordance with the **regulations** and Code (including the limitations of liability contained in the **regulations** and Code) and that party will have no liability under the **ancillary service** procurement contract.
- 57. The **system operator's** liability to the **ancillary service agent** under the **ancillary service** procurement contract is limited to situations where the **system operator** has breached the provisions of the **ancillary service** procurement contract. For the avoidance of doubt, the **ancillary service agent** will have no claim against the **system operator** for failing to follow the **procurement plan** in any respect.
- 58. The **system operator** will only be liable to the **ancillary service agent** for direct loss suffered by the **ancillary service agent** and caused by the **system operator's** breach of the **ancillary service** procurement contract. The **system operator** will not be liable for loss of use, revenue or profit, any third party damages, and third party settlement or any costs associated with such items, even where such losses may be direct losses.
- 59. The **ancillary service agent's** liability to the **system operator** under the **ancillary service** procurement contract is limited to situations where the **ancillary service agent** has breached the provisions of the **ancillary service** procurement contract.
- 60. The **ancillary service agent** will only be liable to the **system operator** for direct loss suffered by the **system operator** and caused by the **ancillary service agent's** breach of the **ancillary service** procurement contract. The **ancillary service agent** will not be liable for loss of use, revenue or profit, any third party damages, and third party settlement or any costs associated with such items, even where such losses may be direct losses.

61. The maximum liability of each party to the other party under the **ancillary service** procurement contract will be as follows:
- 61.1 \$100,000 in any 12 month period in respect of all defaults of obligations contained in the general contracting terms of the **ancillary service** procurement contract (and not contained in an **ancillary service** schedule to the **ancillary service** procurement contract) irrespective of the number of defaults; and
  - 61.2 In respect of defaults of obligations contained in an **ancillary service** schedule to the **ancillary service** procurement contract:
    - 61.2.1 the combined maximum liability for any single event or related series of events will be the lesser of 5% of the total amount of the expected annual fees payable for that particular **ancillary service** (such total to be set by the **system operator** prior to the execution of the **ancillary service** procurement contract) or \$100,000; and
    - 61.2.2 the combined maximum liability in any 12 month period will be the lesser of 20% of the total amount of the expected annual fees payable for that particular **ancillary service** (to be set by the **system operator** prior to the execution of the contract) or \$300,000, irrespective of the number of events.

### **Force majeure**

62. The parties will be able to rely on force majeure in certain circumstances to limit any liability under the **ancillary service** procurement contract for a breach of the provisions contained in the **ancillary service** procurement contract. The following situations will be included in the definition of force majeure within the **ancillary service** procurement contract:
- 62.1 any event or circumstance occasioned by, or in consequence of, any act of God (being an event or circumstance (i) due to natural causes, directly or indirectly and exclusively without human intervention, and (ii) which could not by any amount of ability have been foreseen or, if foreseen, could not by any amount of human care and skill have been resisted), strikes, lockouts, other industrial disturbances, acts of public enemy, wars, blockades, insurrections, riots, epidemics, aircraft, or civil disturbances; or
  - 62.2 the binding order of any Court, government or a local authority (except where the **ancillary service agent** seeks to invoke this paragraph and the local authority which made the binding order is the owner of, or is otherwise associated with or related to, the **ancillary service agent**); or
  - 62.3 any other event or circumstance beyond the control of the party invoking this paragraph and being such that, by the exercise of reasonable care acting in accordance with good industry practice, such party could not have prevented such failure.
63. Any force majeure provision contained in the **ancillary service** procurement

contract will not apply to any liability of the **ancillary service agent** that arises due to a breach of the **regulations** or Code whether or not such obligation arises in the provision of **ancillary services**.

### **Claims for failure to perform**

64. The **system operator** may notify the **ancillary service agent** of a claim that the **ancillary service agent** has failed, or is unable, to meet a performance requirement in the **ancillary service** procurement contract or comply with a **dispatch instruction** for the **ancillary service**.
65. If the claim is accepted (voluntarily by the **ancillary service agent** or after dispute resolution):
- 65.1 the **system operator** will not be liable to pay the **ancillary service agent** for providing the **ancillary service** for the relevant period; and
  - 65.2 the **ancillary service agent** must take remedial steps to ensure that it is able to meet the performance requirement and/or comply with **dispatch instructions**.

### **Tests**

66. For some **ancillary services** a minimum number of tests of the equipment used to provide or monitor them will be required (each a “**baseline test**”). The **ancillary service agent** must pay the costs of any **baseline test**.
67. For each **ancillary service** the **system operator** may request:
- 67.1 a test of the equipment used to provide or monitor the **ancillary service** (which may be in addition to a **baseline test**) (an “**on-demand test**”); and/or
  - 67.2 a statement of the capability and operational limitations of the equipment used to provide or monitor the **ancillary service**,
- which, if requested, the **ancillary service agent** must carry out or provide within a timeframe agreed between the **system operator** and the **ancillary service agent**. Unless the **system operator** and the **ancillary service agent** agree otherwise, if an **on-demand test** has been requested but not carried out and passed within 30 **business days** of the **system operator’s** request, the **ancillary service agent** will be deemed to be incapable of providing or monitoring the **ancillary service** from the end of that period until the **on-demand test** is carried out and passed.
68. The **system operator** will pay the **ancillary service agent’s** reasonable costs of an **on-demand test** unless:
- 68.1 the equipment fails the **on-demand test**; or
  - 68.2 the **system operator** requested the **on-demand test** within 20 **business days** of the **ancillary service agent** notifying the **system operator** that the **ancillary service agent** had completed remedial action on the equipment in response to a claim by the **system operator** under paragraph 64, and the sole purpose of the

**on-demand test** is to determine the sufficiency of that remedial action.

69. If equipment used to provide or monitor an **ancillary service** fails a **baseline test** or **on-demand test** the **ancillary service agent**:
- 69.1 will be deemed to be incapable of providing or monitoring the **ancillary service** until the test is passed; and
- 69.2 must re-test the equipment until the test is passed, and the **ancillary service agent** must pay the costs of any such re-test unless:
- 69.2.1 the equipment is used to provide or monitor **non-mandatory frequency keeping** and/or **instantaneous reserve** and no other **ancillary service**; or
- 69.2.2 otherwise agreed with the **system operator**.

### **Inspections**

70. The **system operator** may inspect any equipment used by the **ancillary service agent** to provide or monitor an **ancillary service**. The **system operator** must not interfere unreasonably with the **ancillary service agent's** business in carrying out such an inspection.
71. The **system operator** will give the **ancillary service agent** at least five **business days'** notice of any such inspection, unless the **system operator** reasonably believes that the equipment is being used in a manner inconsistent with providing the **ancillary service** in accordance with the **ancillary service** procurement contract, in which case the **system operator** may give less or no notice.

### **Sub-contracting and assignment**

- 71A. The **ancillary service agent** may not sub-contract any of its obligations under the **ancillary service** procurement contract to any person without the **system operator's** prior consent. If the **ancillary service agent** does sub-contract any of its obligations under the **ancillary service** procurement contract, it will remain primarily responsible for the performance of those obligations, including for any breach of the **regulations** or Code arising from the performance or non-performance of those obligations.
72. The **system operator** may assign its interest in the **ancillary service** procurement contract to any person who takes over the role of **system operator**. Otherwise, neither party may assign its interest in the **ancillary service** procurement contract to any person without the consent of the other party.

### **New long term contracts**

73. The following provisions will be included in any **new long term contract** for **fixed price/quantity frequency keeping, over frequency reserve, voltage support** or **black start**.
74. If, in the **system operator's** reasonable opinion, the number or duration of

maintenance outages of equipment used to provide or monitor the **ancillary service** is such that the **ancillary service agent's** ability to provide or monitor the **ancillary service** in accordance with the **new long term contract** has been substantially detrimentally affected, the **system operator** may, by giving one month's prior written notice to the **ancillary service agent**, terminate the **new long term contract**.

75. Any availability or event fee payable under the **new long term contract** is to be subject to adjustment no more frequently than once every 12 months in accordance with an objective formula to be agreed between the **system operator** and **ancillary service agent**.

## **Arrangements for unanticipated procurement of ancillary services (clause 8.43(3)(g))**

76. During a **grid emergency**, the **system operator** will rely on **ancillary service agents** complying with their obligations set out in **technical code B** of schedule 8.3.
77. Any departures from this **procurement plan** will be in accordance with clause 8.47.
78. Where the **system operator** identifies a need to change any aspect of this **procurement plan**, then a request for variation pursuant to clause 8.46 will be made to the **Authority**.

## Comment on competitive cost pressures and degree of market innovation involved (clause 8.43(3)(h))

79. Clause 8.43(3)(h) requires an inclusion in the **procurement plan** of 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**. These are set out in the following table:

<b>Ancillary service</b>	<b>Competitive cost pressures</b>	<b>Degree of innovation involved in procurement process</b> (the process for future development is described below)
<b>Frequency keeping</b>	<p><b>Low</b></p> <p>Frequency keeping has to be supplied separately for each HVAC island, and there are few stations with the capability.</p>	<p><b>Medium</b></p> <p>Procurement using half-hour clearing markets. Procurement process in line with international practice for the few markets that do not use AGC (automatic generation control).</p> <p>Various long term initiatives to allow greater participation in the frequency keeping market are being actively explored by the system operator, including AGC and the introduction of a national market.</p>
<b>Instantaneous reserve</b>	<p><b>Medium to High</b></p> <p>Medium in the South Island as there are a limited number of providers but prices remain very low.</p> <p>High in North Island as there are a variety of interruptible load and generation sources.</p>	<p><b>High</b></p> <p>Procurement using half-hour clearing markets. New Zealand's co-optimisation of energy and reserves is leading edge in electricity markets internationally.</p> <p>As the delivery of interruptible load reserve is critical in avoiding cascade failure, the system operator must have confidence that reserve will be delivered in a timely manner and in sufficient quantity to avoid such an event. Options for changing measurement and monitoring resolution requirements are to be explored in the short term, with a view to improving overall resolution.</p>
<b>Over frequency Reserve</b>	<p><b>Low</b></p> <p>Most South Island generation plant owned by one of two companies</p>	<p><b>High</b></p> <p>A novel solution to a New Zealand-specific problem allowing better management of overall reserve costs.</p>
<b>Voltage support</b>	<p><b>Low to Medium</b></p> <p>Small number of providers because voltage support requirements tend to be</p>	<p><b>Medium</b></p> <p>The combination of generator AOPOs and tendering for alternative solutions is in-line with world standards. Any concept of demand</p>

	localised.	side participation in provision of voltage support would require an amendment to the Part A definition of voltage support. An investigation of the potential for demand side participation should be undertaken by interested industry participants, including the system operator.
<b>Black Start Services</b>	<b>Medium</b> Not many generators have black start capability, but cost of new entry is relatively low.	<b>Low</b> But a simple procurement approach is appropriate given the relatively low cost of this service.

80. The **system operator** will engage constructively with the **Authority**, its Advisory Groups and the industry to pursue cost-effective development of **ancillary services** methodologies.

81. *[Revoked]*

## **System operator reporting to the Authority (clause 8.43(3)(i))**

82. The **system operator** will report to the **Authority** in relation to the procurement of **ancillary services** as follows:
- 82.1 settlement volumes, prices, costs, and **administrative costs** where appropriate, on a monthly basis;
  - 82.2 any issues arising with respect to cost allocation, liability and disputes, on a monthly basis;
  - 82.3 the details of any late cancellation of an offer or late submission of a new or revised offer reported to the **system operator** under paragraph 112; and
  - 82.4 other general procurement issues to be contained within the **system operator** monthly report provided in accordance with clause 3.14.

## Appendix A

### QUANTITIES, PRICING & TENDER ARRANGEMENTS FOR EACH INDIVIDUAL ANCILLARY SERVICES

83. This appendix of this **procurement plan**, for each **ancillary service**, sets out:
- 83.1 its objective and purpose;
  - 83.2 the technical requirements;
  - 83.3 the performance requirements;
  - 83.4 any monitoring requirements;
  - 83.5 any special testing requirements (that is, in addition to those set out in paragraphs 66 to 69);
  - 83.6 the quantity required to be purchased;
  - 83.7 any alternative arrangements that prevail or might prevail; and
  - 83.8 forecast expenditure figures.

## A1 FREQUENCY KEEPING ANCILLARY SERVICE

### Purpose and objective of frequency keeping

84. The purpose of **frequency keeping** is to balance any generation and demand inequalities with the objective of maintaining the grid frequency at or near 50 Hertz under normal operating conditions. Factors that contribute to inequalities under normal operating conditions include unanticipated load changes, differences in generator ramping, and the inherent inaccuracies between the modelled and actual system conditions.
85. **Frequency keeping** is defined as the use of spare generating capacity to continuously maintain:
- 85.1 the **grid** frequency at 50 Hertz; and
  - 85.2 the system frequency to New Zealand standard time.
86. The **system operator** will procure **frequency keeping** from **ancillary service agents** that can meet the **system operator's** requirements set out in this **procurement plan**.

### Performance requirements and technical specification for frequency keeping

87. The **ancillary service agent** must provide one or more **generating units** and trained operators or **control equipment** at an **FK site** that, collectively, are capable of meeting the performance requirements in paragraphs 88 and 88A.
88. Subject to paragraph 92, when dispatched to provide **frequency keeping** (in accordance with clause 13.73(c)), the **ancillary service agent** will:
- 88.1 when there is a **grid frequency error**, respond to eliminate the **grid frequency error**;
  - 88.2 provide an average **response rate** of at least 10 **MW** per minute when the **grid frequency error** is greater than 0.2 Hertz (that is, when the **grid** frequency is outside the **normal band**) over all of the **ancillary service agent's frequency keeping periods**;
  - 88.3 use all reasonable endeavours to continuously maintain the frequency of the **grid** as close as possible to 50 Hertz, but at all times to within the **normal band**;
  - 88.4 use all reasonable endeavours to continuously maintain **frequency time error** as close as possible to zero but at all times within the limits specified in clause 7.2(1)(b)(v); and
  - 88.5 return **frequency time error** to zero at least once every **day**.
- 88A Subject to paragraph 92, the **ancillary service agent** will ensure the standard deviation of the **grid** frequency over any of the **ancillary service agent's frequency keeping periods** does not exceed the maximum allowable standard deviation specified in the **ancillary service agent's ancillary service** procurement contract. Such standard deviation will be

determined by reference to the **system operator measured frequency** but excluding any frequency measurements that are outside the **normal band**.

89. *[Revoked]*

90. The **ancillary service agent** must ensure that each **generating unit** and item of **control equipment** at an **FK site** is maintained in accordance with good industry practice.

91. *[Revoked]*

92. In meeting the performance requirements in paragraphs 88 and 88A, the **ancillary service agent** is not required to generate outside the limits of the **MW band** contained in the **dispatch instruction** issued in accordance with Part 13 or above the relevant **control max** or below the relevant **control min**.

### **Monitoring requirements for frequency keeping**

93. The **ancillary service agent** must provide monitoring equipment that accurately measures and records in a time-tagged manner the following:

- 93.1 generation output at an **FK site**;
- 93.2 frequency of the **grid** in Hertz; and
- 93.3 **frequency time error**.

94. When dispatched to provide **frequency keeping** the monitoring equipment must:

- 94.1 measure and record generation output at an agreed location in the **grid** at least once every 10 seconds, each measurement accurate to within plus or minus 5%;
- 94.2 measure and record frequency at least once every 2 seconds (or such longer period as the **system operator** may determine), each measurement accurate to within 0.01 Hertz; and
- 94.3 measure and record **frequency time error** using a GPS clock or agreed equivalent.

95. The **ancillary service agent** must maintain the monitoring equipment in accordance with good industry practice.

96. The **ancillary service agent** must ensure that the data recorded by the monitoring equipment is held by the **ancillary service agent** for at least 14 **business days** and is provided to the **system operator** within 5 **business days** of a written request from the **system operator**.

### **Dispatch requirements for frequency keeping**

97. The **system operator** will use all reasonable endeavours to issue **dispatch instructions** for **frequency keeping** at least five minutes in advance of the start or end of the relevant **trading period**, as the case may be.

98. If an **ancillary service agent** finds it cannot maintain the frequency or time error within the required targets the **ancillary service agent** must advise the **system operator** as soon as is practicable. If so notified the **system**

**operator** will review its **dispatch instructions** for **frequency keeping** and make any further **dispatch instructions** it considers reasonably necessary or desirable to maintain the frequency or time error within the required targets.

### **Special testing requirements for frequency keeping**

99. There will be no **baseline tests** for equipment used to provide or monitor **frequency keeping** during the term of this **procurement plan**.
100. An **on-demand test** of equipment and/or trained operators used for providing **frequency keeping** (other than monitoring equipment) must verify whether or not the relevant **FK Site** meets the performance requirements in paragraph 88, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.
101. An **on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraphs 93 and 94.
102. *[Revoked]*

### **Procurement proposal**

103. The **system operator** will seek closed tenders from potential providers of **frequency keeping**. The **system operator** will seek to secure at least one provider of **frequency keeping** in each **island**.
- 103A. A party that submits a tender for **fixed price/quantity frequency keeping** must also submit a tender for **half hour frequency keeping**.
104. The **system operator** may enter into **ancillary service** procurement contracts with other providers of **frequency keeping** at any time throughout the period of this **procurement plan**.
105. If part of the **grid** is **islanded** and the **system operator** reasonably believes there is a need for additional **frequency keeping** in that part of the **grid** in order to comply with the **policy statement** or **principal performance obligations**, the **system operator** may procure such **frequency keeping** under an **ancillary service arrangement** that does not comply with the contractual or technical requirements of this **procurement plan**. For the avoidance of doubt:
- 105.1 any such **ancillary service arrangement** is not an **alternative ancillary service arrangement**; and
- 105.2 the procurement of **frequency keeping** under this paragraph 105 is not a departure from the processes or arrangements set out in this **procurement plan** for the purposes of clause 8.47 or otherwise.

### **Pricing structure for procurement of fixed price/quantity frequency keeping**

- 105A. The **system operator** will procure **fixed price/quantity frequency keeping** on the basis of a monthly availability fee.

- 105B. The **constrained on amounts** and **constrained off amounts** payable to the **ancillary service agent** for a month in relation to the provision of **fixed price/quantity frequency keeping** will be deducted from the monthly availability fee paid to the **ancillary service agent** for that month. If the **constrained on amounts** and **constrained off amounts** exceed the monthly availability fee, the excess will be paid by the **ancillary service agent** to the **system operator**.

**Offer period for half hour frequency keeping**

106. The **system operator** will procure **half hour frequency keeping** from a half-hour clearing market. Offers to provide **half hour frequency keeping** will be sought for each **trading period**.
107. The **ancillary service agent** may, no later than 2 hours prior to a **trading period**, submit an offer to provide **half hour frequency keeping** for that **trading period**. Each offer submitted is valid until revised or cancelled in accordance with paragraph 110 or 111.
108. Each offer to provide **half hour frequency keeping** must be submitted to the **system operator** using the same **information system** approved by the **Authority** for the time being for submitting **reserve offers** under clause 13.38.
109. Each offer to provide **half hour frequency keeping** must include the following information:
- 109.1 a unique code for the **FK site** for which the offer is made;
  - 109.2 a unique code for the **ancillary service agent** submitting the offer;
  - 109.3 the **trading day** for which the offer is made;
  - 109.4 the **trading periods** for which the offer is made;
  - 109.5 the **control min** and **control max** for the **FK site** for which the offer is made; and
  - 109.6 up to five separate **MW bands** and prices.
110. The **ancillary service agent** may revise an offer to provide **half hour frequency keeping** by submitting a revised offer up to two hours prior to the beginning of the **trading period** in respect of which the offer is made. The **ancillary service agent** may cancel an offer to provide **half hour frequency keeping** up to two hours prior to the beginning of the **trading period** in respect of which the offer is made. Each such revision or cancellation must be submitted or notified to the **system operator** using the same **information system** approved by the **Authority** for the time being for revising or cancelling **reserve offers** under clause 13.46(1).
111. The **ancillary service agent** may cancel or submit a new or revised offer to provide **half hour frequency keeping** later than two hours prior to the beginning of the **trading period** in respect of which the offer is made only in circumstances where a **bona fide physical reason** necessitates the cancellation or submission or where the **system operator** has issued a **formal notice**, but not otherwise.

112. If the **ancillary service agent** cancels an offer or submits a new or revised offer to provide **half hour frequency keeping** later than two hours prior to the beginning of the **trading period** in respect of which the offer is made, the **ancillary service agent** must report the cancellation or submission to the **system operator** in writing together with an explanation of the reasons for the cancellation or submission. The **ancillary service agent** must provide the **system operator** with a written monthly report of all such cancellations and submissions by the 20<sup>th</sup> of the month following the month being reported.

#### **Offer period for frequency keeping generally**

113. The term of **ancillary service** procurement contracts for **frequency keeping** may vary to that of the term of this **procurement plan**. Without limitation, the **system operator** may enter into **new long term contracts** for **frequency keeping**.

#### **Quantity restriction for half hour frequency keeping**

114. The **system operator** may restrict the quantities of **half hour frequency keeping** the **ancillary service agent** may offer for **trading periods** during which the **FK site** is being commissioned.

#### **Frequency keeping selection**

115. Except when part of the **grid** is **islanded**, and subject to the availability of **fixed price/quantity frequency keeping** for the relevant **trading period**, only the minimum number of offers to provide **half hour frequency keeping** will be selected and dispatched for each **island** for each **trading period** to provide a **MW band** sufficient to meet the **system operator's net purchase quantity assessment** for that **trading period**.
116. Except when part of the **grid** is **islanded**, and subject to the availability of **fixed price/quantity frequency keeping** for the relevant **trading period**, for each **island** and **trading period** the lowest offer(s) to provide **half hour frequency keeping** that provides a **MW band** greater than or equal to the **system operator's net purchase quantity assessment** for that **island** and **trading period** will be selected and dispatched.

#### **Alternative ancillary service arrangements**

117. The **system operator** has no information indicating that any **alternative ancillary service arrangement** will be in operation over the period of this **procurement plan** which will decrease the quantity of **frequency keeping** needing to be purchased by the **system operator**.

#### **Frequency keeping procurement costs**

118. The actual procurement costs for **frequency keeping** for the procurement period 1 December 2009 to 30 November 2010 were \$47.1 million. (1 December 2008 to 30 November 2009 was \$47.5 million).
119. The costs for the procurement of **frequency keeping** during the period of

this **procurement plan** will be dependent on the following:

- 119.1 the offer prices and quantities received for **half hour frequency keeping**;
  - 119.2 the availability fees for, and quantities of, any **fixed price/quantity frequency keeping**;
  - 119.3 the number of available providers of **frequency keeping**; and
  - 119.4 the energy **offer** prices and quantities.
120. The **system operator** will provide an update on the current level of procurement costs for **frequency keeping** to the **Authority** in its monthly reports provided under paragraph 82.

## A2 INSTANTANEOUS RESERVE ANCILLARY SERVICE

### Purpose and objective of instantaneous reserve

121. The purpose of the **instantaneous reserve ancillary service** is to manage frequency recovery after an **under-frequency event**, with the objective of arresting the frequency fall, and recovering the frequency after an **under-frequency event**.
122. The **system operator** will procure **instantaneous reserve** from **ancillary service agents** that can meet the **system operator's** requirements set out in this **procurement plan**.
123. The **system operator** will procure **instantaneous reserve** as:
  - 123.1 **fast instantaneous reserve (FIR)**; and
  - 123.2 **sustained instantaneous reserve (SIR)**.

### Performance requirements and technical specification for instantaneous reserve

124. To be able to provide **instantaneous reserve** the **ancillary service agent** must have equipment that can provide **FIR** and/or **SIR**. The definitions of **fast instantaneous reserve** and **sustained instantaneous reserve** are set out in Part 1. Only **ancillary service agents** that can meet the technical requirements of these definitions can provide **instantaneous reserve**.
  - 124.1 An **ancillary service agent** must ensure that at all times the equipment that is the subject of the **reserve offer**:
    - 124.1.1 is maintained in accordance with good industry practice so that the equipment is able to provide **instantaneous reserve** that meet the standards set out in this **procurement plan**;
    - 124.1.2 is able to respond, when dispatched, within the timeframe applicable to either **FIR** or **SIR**, as the case may be;
    - 124.1.3 meets, where relevant, the requirements for frequency response and control set out in clause 5(1) of **technical code A** of schedule 8.3 and has been approved by the **system operator**;
    - 124.1.4 is available and has the capacity to provide the quantity of **instantaneous reserve** specified in the **reserve offer**; and
    - 124.1.5 is available and has the capacity to provide the **dispatched** quantity of **instantaneous reserve**.
  - 124.2 An **ancillary service agent** dispatched to provide **instantaneous reserve** in accordance with Part 13 must provide either:
    - 124.2.1 additional generation automatically following an **under-frequency event** which is consistent with the **dispatched** quantity of **instantaneous reserve**; or
    - 124.2.2 reduced **demand** or load disconnection consistent with the **dispatched** quantity of **instantaneous reserve** whenever

the frequency of the **grid** falls to or below the **trip frequency**.

- 124.3 In determining the response capability specified in the definition of **fast instantaneous reserve** and **sustained instantaneous reserve** set out in Part 1, inertial response will be excluded.

### **Assessment of performance requirements for interruptible load**

125. In assessing the delivery of **interruptible load** quantities the **system operator** will apply the following methodology:
- 125.1 **FIR** will be calculated as the total reduction in load that occurs one second after the **trip time**, and which is sustained for a period of at least 60 seconds. The total reduction in load is to be calculated from the **pre-event load**.
- 125.2 **SIR** will be calculated as the average reduction in load that occurs over 60 seconds after the **trip time**. The average reduction in load is to be calculated from the **pre-event load**. **SIR** load is not to be restored until advised by the **system operator**.
- 125.3 The **FIR** and **SIR** delivered quantities will be determined from the aggregate load response:
- 125.3.1 recorded at the **ancillary service agent's** equipment; or
- 125.3.2 recorded at the **ancillary service agent's contracted GXPs** (if any), if no data is recorded at the **ancillary service agent's** equipment or the **system operator** reasonably considers it is not appropriate to assess delivered quantities from this data.
- 125.4 If the analysis required for the purpose of paragraph 125.3 indicates an under-delivery of **interruptible load**, the analysis will be performed on each item of the **ancillary service agent's** equipment or each of the **ancillary service agent's contracted GXPs**, as the case may be. The data may be time adjusted to account for possible timing errors.
126. In determining the **pre-event load** the **system operator** will apply the following methodology when calculating delivered quantities:
- 126.1 To account for possible timing errors in data and a possible reduction in **pre-event load** due to the influence of falling frequency, the **pre-event load** will be taken at a previous steady state frequency, prior to the frequency falling. That is, at a time when frequency is within a +/-0.1 Hertz band for at least 60 seconds.
127. *[Revoked]*

### **Assessment of performance requirements for FIR other than interruptible load**

128. In assessing the delivery of **FIR** quantities other than **interruptible load** the **system operator** will apply the following methodology:
- 128.1 Equipment that is the subject of a **reserve offer** for **FIR** will be deemed to comply with the performance requirement in paragraph 124.2 if and only if the equipment's actual response meets or exceeds its **asset capability statement** modelled response.
  - 128.2 The equipment's **asset capability statement** modelled response is the response that could reasonably be expected if all the information in the equipment's current **asset capability statement** is correct, taking into account:
    - 128.2.1 the frequency profile of the **under-frequency event**;
    - 128.2.2 the equipment's generating output immediately before the start of the **under-frequency event** ("**pre-event generating output**");
    - 128.2.3 the number of **generating units** on **partly loaded spinning reserve** mode;
    - 128.2.4 the number of hydro **generating units** on **tail water depressed reserve** mode; and
    - 128.2.5 the amount of **FIR dispatched** for **generating units**.
  - 128.3 Subject to paragraph 124.3, the equipment's actual response will be calculated as the additional generating output of the equipment compared to the **pre-event generating output** of the equipment.
  - 128.4 In determining the **pre-event generating output** of the equipment the **system operator** will apply the following methodology when calculating the delivered quantities:
    - 128.4.1 to account for possible timing errors contained in the data provided by the **ancillary service agent**, the **pre-event generating output** at several different times will be used to calculate the delivered quantities;
    - 128.4.2 the maximum delivered quantity obtained from applying the **pre-event generating outputs** will be used to determine the reserve response during an **under-frequency event**; and
    - 128.4.3 generating unit data will be used if measured and provided by the **ancillary service agent**.
  - 128.5 On request, the **system operator** will provide each **ancillary service agent** with:
    - 128.5.1 the model the **system operator** uses to determine **asset capability statement** modelled response under paragraph 128.2 in respect of the **ancillary service agent's** assets; and
    - 128.5.2 details of the **system operator's** assessment under paragraph 128.4 of the **ancillary service agent's** delivery of **FIR** quantities.

### **Assessment of performance requirements for instantaneous reserve generally**

129. For the purposes of assessing the delivery of **instantaneous reserve** quantities, the **UFE time** (in the case of **instantaneous reserve** other than **interruptible load**) or the **trip time** (in the case of **interruptible load**) will be determined by reference to the **system operator measured frequency**.

### **Monitoring requirements for instantaneous reserve**

130. The **ancillary service agent** must provide monitoring equipment that accurately:
- 130.1 measures in a time tagged manner the **instantaneous reserve** response (in **MW**) from the **ancillary service agent's** equipment at no greater than 6 second intervals for **FIR** and no greater than 10 second intervals for **SIR**; and
  - 130.2 uses such measured response data to record in a time tagged manner:
    - 130.2.1 for **FIR**, the actual **instantaneous reserve** response (in **MW**) from the **ancillary service agent's** equipment over intervals no greater than six seconds; and
    - 130.2.2 for **SIR**, either the average **instantaneous reserve** response (in **MW**) at no greater than 60 seconds, or the actual **instantaneous reserve** response (in **MW**) at no greater than 10 seconds, from the **ancillary service agent's** equipment.
131. The monitoring referred to in paragraph 130 is required during all periods for which the **ancillary service agent's** equipment is dispatched to provide **instantaneous reserve**:
- 131.1 commencing not less than six seconds prior to the **UFE time** (in the case of **instantaneous reserve** other than **interruptible load**) or the **trip time** (in the case of **interruptible load**), in both cases as determined by reference to the **system operator measured frequency**; and
  - 131.2 ending not less than 15 minutes later for **SIR** and 60 seconds later for **FIR**.
132. The **ancillary service agent** must ensure that the data recorded by the monitoring equipment under paragraph 131 is held by the **ancillary service agent** for at least 14 **business days** and is provided to the **system operator** within 5 **business days** of a written request from the **system operator**.
133. The **ancillary service agent** may provide an independently verified error range for data it provides to the **system operator** under paragraph 132, which the **system operator** will have regard to in any assessment of the **ancillary service agent's** compliance with performance requirements using the data.

134. For thermal **generating stations**, the data referred to in paragraph 131 must be measured, recorded and provided by **generating unit**. For hydro **generating stations**, the data referred to in paragraph 131 may be measured, recorded and provided by **generating station** unless the **generating station** is providing both **tail water depressed reserve** and **partly loaded spinning reserve**, in which case the data must be measured, recorded and provided by **generating unit**.
135. The **ancillary service agent** must maintain the monitoring equipment in accordance with good industry practice.

### **Special testing requirements for instantaneous reserve**

- 135A. The **ancillary service agent** must conduct an **end-to-end test** of all items of equipment it uses for providing **interruptible load**, at least once during the term of this **procurement plan**, unless the **ancillary service agent** has demonstrated fully compliant operational performance of that equipment by responding to an **under-frequency event** in the 12 month period immediately preceding the commencement of this **procurement plan**.
- 135B. The scope of the **end-to-end test** must be agreed between the **ancillary service agent** and the **system operator** and will not necessarily require the full contracted amount of **interruptible load** to be shed, provided the functionality of the equipment is demonstrated to the **system operator's** reasonable satisfaction.
- 135C. The **ancillary service agent** must not submit **reserve offers** for **interruptible load** unless it has conducted and passed the **end-to-end test** of the relevant equipment or demonstrated fully compliant operational performance of that equipment in accordance with paragraph 135A.
136. For the avoidance of doubt—
- 136.1 there will be no other **baseline tests** for equipment used to provide or monitor **instantaneous reserve** during the term of this **procurement plan**:
- 136.2 paragraphs 135A, 135B, 135C, and this paragraph apply to **ancillary service agents** that are contracted to provide **interruptible load** under an **existing long term contract**:
- 136.3 paragraphs 143.2 and 143.3 apply to any **reserve offers** submitted in breach of paragraph 135C.
137. An **end-to-end test** or **on-demand test** of equipment used for providing **instantaneous reserve** (other than monitoring equipment) must verify whether or not the equipment meets the performance requirements in paragraphs 124.1, 124.2 and 124.3, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.
138. An **end-to-end test** or **on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraph 130.

### **Procurement proposal**

139. The **system operator** will seek closed tenders from potential providers of **instantaneous reserve**.
140. The **system operator** may enter into **ancillary service** procurement contracts with other providers of **instantaneous reserve** at any time throughout the period of this **procurement plan**.

### **Offer period for instantaneous reserve**

141. The **system operator** will procure **instantaneous reserve** on a half-hour clearing market. **Reserve offers** will be sought for each **trading period** in accordance with clauses 13.37 to 13.54.
142. If the **system operator** reasonably believes (acting in accordance with good industry practice) that the maximum quantities of **FIR** and **SIR** that can be provided by the **ancillary service agent** are higher or lower than the maximum quantities specified in the **ancillary service** procurement contract, the **system operator** may, by written notice to the **ancillary service agent**, increase or decrease the maximum quantities of **FIR** and **SIR** specified in **ancillary service** procurement contract. The **system operator** will use reasonable endeavours to contact the **ancillary service agent** and discuss the matter prior to providing written notice under this clause (but any failure to do so will not invalidate any written notice).
143. If at any time the **system operator** is not satisfied (acting reasonably) that the **ancillary service agent** can meet the relevant performance requirements the **ancillary service agent** agrees that:
- 143.1 if so notified by the **system operator** (which notice shall outline the areas of concern that the **system operator** has), the **ancillary service agent** will not submit any **reserve offers** until and unless it has provided evidence which demonstrates to the reasonable satisfaction of the **system operator**, acting in accordance with good industry practice, that it can meet the performance requirements;
- 143.2 **reserve offers** submitted by the **ancillary service agent** (or any **reserve offers** relating to specific equipment) will be deemed not to be submitted pursuant to a valid and enforceable contract with the **system operator** and should not be accepted by the **system operator**; and
- 143.3 if such **reserve offers** are in a **pre-dispatch schedule** the **system operator** may require the removal of such **reserve offers** from a **pre-dispatch schedule** under clause 4(e) of Schedule 13.3.
144. The term of **ancillary service** procurement contracts for **instantaneous reserve** may vary to that of the term of this **procurement plan**. Without limitation, the **system operator** may enter into **new long term contracts** for **instantaneous reserve**.

### **Pricing structure for procurement of instantaneous reserve**

145. **Reserve offers** dispatched by the **system operator** will be priced and settled in accordance with subpart 4 of Part 13.

### **Quantity restriction for instantaneous reserve**

146. The **system operator** may restrict the quantities of **instantaneous reserve** the **ancillary service agent** may offer for **trading periods** during which the equipment used for providing **instantaneous reserve** is being commissioned.

### **Alternative ancillary service arrangements**

147. The **system operator** has no information indicating that any **alternative ancillary service arrangement** will be in operation over the period of this **procurement plan** which will decrease the quantity of **instantaneous reserve** needing to be purchased by the **system operator**.

### **Instantaneous reserve procurement costs**

148. The actual procurement costs for the procurement period 1 December 2009 to 30 November 2010 were \$21.9 million. (1 December 2008 to 30 November 2009 was \$66.2 million).
149. The actual costs for the period of this **procurement plan** will be determined using the processes set out in Part 13 and will be dependent on the following:
- 149.1 the offer prices and quantities received for **instantaneous reserve**;
  - 149.2 the number of available providers of **instantaneous reserve**; and
  - 149.3 the energy **offer** prices and quantities.
150. The **system operator** will provide an update on the current procurement costs for **instantaneous reserve** to the **Authority** in its monthly reports provided under paragraph 82.

## **A3 OVER FREQUENCY RESERVE ANCILLARY SERVICE**

### **Purpose and objective of over frequency reserve**

151. The purpose of the **over frequency reserve** ancillary service is to manage frequency recovery after an event that might otherwise cause the **grid** frequency to exceed 52 Hertz in the North Island or 55 Hertz in the South Island. For such an event, the **system operator**'s objective is to arrest the rise in frequency and recover it to the **normal band**.
152. The **system operator** will procure **over frequency reserve** from **ancillary service agents** that can meet the **system operator**'s requirements set out in this **procurement plan**.

### **Performance requirements and technical specification for over frequency reserve**

153. To be able to provide **over frequency reserve**, the **ancillary service agent** must provide **relay equipment** that:
- 153.1 will, when armed, automatically disconnect the **generating unit** to which it is fitted within half a second of the frequency of the **grid** rising to or above the **required frequency** for that **generating unit**;
  - 153.2 if the **system operator** has remote arming and/or disarming control of the **relay equipment**, will immediately arm or disarm (as appropriate) when it receives a remote arming or disarming signal from the **system operator's** co-ordination centre;
  - 153.3 is available at all times to provide **over frequency reserve** during the period of this **procurement plan** except:
    - 153.3.1 where the **relay equipment** is taken out of service under the conditions specified in the **ancillary service** procurement contract; and
    - 153.3.2 during the period in which any tests are conducted; and
    - 153.3.3 during any **trading period** when the **generating unit** is not generating **electricity**; and
  - 153.4 is maintained in accordance with good industry practice so that the **relay equipment** is able to provide **over frequency reserve** in accordance with the **ancillary service** procurement contract.
154. The conditions under which outages may occur on the **relay equipment** are specified in the **ancillary service** procurement contract with the **ancillary service agent**.

#### **Monitoring requirements for over frequency reserve**

155. The **ancillary service agent** must provide monitoring equipment that:
- 155.1 is available at all times (except during an **allowed outage** or during a test);
  - 155.2 continuously measures and transmits to the designated interface point information as to whether or not the **relay equipment** is armed (except during an **allowed outage** or during a test); and
  - 155.3 is maintained in accordance with good industry practice.

#### **Special testing requirements for over frequency reserve**

156. The **ancillary service agent** must conduct a **baseline test** of each item of **relay equipment** at least once during the term of this **procurement plan** (or less frequently, if agreed by the **system operator**). There will be no other **baseline tests** for equipment used to provide or monitor **over frequency reserve** during the term of this **procurement plan**.
157. A **baseline test** or **on-demand test** of **relay equipment** must verify whether or not the **relay equipment** meets the performance requirements in paragraphs 153.1 and 153.2, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.

158. An **on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraph 155.2.

### **Procurement proposal**

159. The **system operator** will seek closed tenders from potential providers of **over frequency reserve**.
160. The **system operator** may enter into **ancillary service** procurement contracts with other providers of **over frequency reserve** at any time throughout the period of this **procurement plan** where the **system operator** identifies a particular need.
161. The **system operator** will continue to procure **over frequency reserve** under **existing long term contracts** during the term of this **procurement plan** (unless any such **existing long term contract** is terminated during the term of this **procurement plan**).

### **Offer period for over frequency reserve**

162. The term of **ancillary service** procurement contracts for **over frequency reserve** may vary to that of the term of this **procurement plan**. Without limitation, the **system operator** may enter into **new long term contracts** for **over frequency reserve**.

### **Pricing structure for procurement of over frequency reserve**

163. The **system operator** will procure **over frequency reserve** on the basis of:
- 163.1 a monthly availability fee; and/or
  - 163.2 a single event fee.

### **Alternative ancillary service arrangements**

164. The **system operator** is unaware of any bilateral or alternative arrangements for the provision of **over frequency reserve**, over the period of this **procurement plan**, to manage frequency recovery after the frequency exceeds the **over frequency limit**.

### **Over frequency reserve procurement costs**

165. The actual procurement costs for the procurement of **over frequency reserve** for the procurement period 1 December 2009 to 30 November 2010 were \$723,000. (1 December 2008 to 30 November 2009 was \$638,000).
166. The actual costs for the period of this **procurement plan** will be dependent on the following:
- 166.1 the availability fee charged by the **ancillary service agents** and any events that occur during the procurement period;
  - 166.2 the number of available **ancillary service agents** to provide **over frequency reserve**; and
  - 166.3 the **dispatch** of generation.

167. The **system operator** will provide an update on the procurement cost of **over frequency reserve** to the **Authority** in its reports provided under paragraph 82.

#### A4 VOLTAGE SUPPORT ANCILLARY SERVICE

##### **Purpose and objective of voltage support ancillary service**

168. The purpose of the **voltage support** ancillary service is to provide additional **reactive power** resources of the static or dynamic type, depending on the location and **network** loading conditions, to contribute to **network** voltage control when dispatched.
169. The **system operator** will procure **voltage support** from **ancillary service agents** that can meet the **system operator's** requirements set out in this **procurement plan**.

##### **Performance requirements and technical specification for voltage support**

170. In order to provide **voltage support**, the **ancillary service agent** must provide either:
- 170.1 continuously variable **reactive power** resources that have:
    - 170.1.1 the capability of providing the contracted **reactive power** quantities whilst the **grid** is operated to the voltage range, as specified in the **technical codes**; and
    - 170.1.2 both automatic and 24-hour manual voltage control facilities; or
  - 170.2 static **reactive power** resources that have:
    - 170.2.1 provision for manual control available on a 24-hour basis; and
    - 170.2.2 automatic operation to parameters and for conditions specified by the **system operator**.
171. All **voltage support equipment** provided by an **ancillary service agent** must have data and analogue indications of the **reactive power** and status of the **voltage support equipment**, provided in accordance with the requirements of the **technical codes**.
172. To be able to provide **voltage support**, the **ancillary service agent** must provide **voltage support equipment** that:
- 172.1 is available at all times to provide **voltage support** during the period of this **procurement plan** at the maximum **reactive power** and network busbar(s) specified in the **ancillary service** procurement contract, except:
    - 172.1.1 where the **voltage support equipment** is taken out of service under the conditions specified in the **ancillary service** procurement contract; or
    - 172.1.2 during the period in which any tests are conducted;
  - 172.2 is able to respond, when dispatched, in accordance with the response times specified in the **ancillary service** procurement contract; and

- 172.3 is maintained in accordance with good industry practice so that the **voltage support equipment** is able to provide **voltage support** in accordance with the **ancillary service** procurement contract.

### **Monitoring requirements for voltage support**

173. The **ancillary service agent** must provide monitoring equipment that:
- 173.1 is available at all times (except during an **allowed outage** or during a test);
- 173.2 continuously measures and transmits to the designated interface point the **reactive power** provided by the **voltage support equipment** (except during an **allowed outage** or during a test); and
- 173.3 is maintained in accordance with good industry practice.

### **Special testing requirements for voltage support**

174. There will be no **baseline tests** for equipment used to provide or monitor **voltage support** during the term of this **procurement plan**.
175. An **on-demand test** of **voltage support equipment** must verify whether or not the **voltage support equipment** meets the performance requirements in paragraphs 172.1 and 172.2, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.
176. An **on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraph 173.2.

### **Procurement proposal**

177. The **system operator** will seek closed tenders from potential providers of **voltage support**.
178. The **system operator** may enter into **ancillary service** procurement contracts with other providers of **voltage support** at any time throughout the period of this **procurement plan** where the **system operator** identifies a particular need.
179. The **system operator** will continue to procure **voltage support** under **existing long term contracts** during the term of this **procurement plan** (unless any such **existing long term contract** is terminated during the term of this **procurement plan**).

### **Offer period and pricing structure for voltage support**

180. The term of **ancillary service** procurement contracts for **voltage support** may vary to that of the term of this **procurement plan**. Without limitation, the **system operator** may enter into **new long term contracts** for **voltage support**.

### **Pricing structure for procurement of voltage support**

181. The **system operator** will procure **voltage support** on the basis of:
- 181.1 a monthly availability fee; and/or
  - 181.2 a single event fee.

**Alternative ancillary service arrangements**

182. The **system operator** has no information indicating that any **alternative ancillary service arrangement** will be in operation over the period of this **procurement plan** that will decrease the quantity of **voltage support** needing to be purchased by the **system operator**.

**Voltage support procurement costs**

183. The actual procurement costs for the procurement of **voltage support** for the procurement period 1 December 2009 to 30 November 2010 were \$7.9 million. (1 December 2008 to 30 November 2009 was \$7.8 million).
184. The **system operator** will provide an update on the current procurement costs for **voltage support** to the **Authority** in its reports provided under paragraph 82.

## A5 BLACK START SERVICE

### Purpose and objective of black start service

185. The purpose of the **black start** service is to maintain equipment that can initialise the supply for the progressive reliving of the **grid** following a partial or total blackout.
186. The **system operator** will procure the **black start** service from **ancillary service agents** that can meet the **system operator's** requirements set out in this **procurement plan**.

### Performance requirements and technical specification for black start services

187. The **ancillary service agent** must ensure that, when requested to provide **black start**, it provides such services by:
- 187.1 starting a **generating unit** and raising it to synchronous speed, without any power being obtained from the **grid** or any **local network**;
  - 187.2 operating the **generating unit** at zero load at synchronous speed for 15 minutes (or such shorter period as instructed by the **system operator**);
  - 187.3 having the **generating unit** switched on to de-energised **network busbar(s)**;
  - 187.4 providing generation output that supports the initial charging of transmission circuits and **assets**, and the progressive energising of the **grid** at **network busbar(s)**;
  - 187.5 providing the **reactive capability** specified in clause 8.23 for the **generating unit**;
  - 187.6 subject to paragraph 187.5, controlling the **network** voltage as instructed by the **system operator**; and
  - 187.7 providing an emergency frequency regulating reserve service by maintaining the frequency to between 49.25 Hertz and 50.75 Hertz, to the extent practicable.
188. The **ancillary service agent** must ensure that:
- 188.1 sufficient **black start equipment** is available at all times to provide the **black start** service in accordance with the **ancillary service procurement contract**;
  - 188.2 the **black start equipment** is able to start without power being obtained from the **grid** or any **local network**;
  - 188.3 sufficient **generating units** are available continuously to provide the **black start** service, except where there is an **allowed outage** preventing the provision of the **black start** service;
  - 188.4 such **generating units** are able to achieve the response times to

synchronous speed specified in the **ancillary service** procurement contract;

- 188.5 such **generating units** otherwise have the capabilities specified in the **ancillary service** procurement contract; and
- 188.6 such **generating units** and the **black start equipment** are maintained in accordance with good industry practice to enable the provision of the **black start** service in accordance with the **ancillary service** procurement contract.

### **Monitoring requirements for black start service**

- 189. Any failure of the starting equipment that compromises the ability of the **ancillary service agent** to perform **black start** must be reported to the **system operator** immediately. The cause of the failure must be determined and rectified as soon as practicable, and the **system operator** advised of the expected date of completion.

### **Special testing requirements for black start service**

- 190. The **ancillary service agent** must conduct a **baseline test** of each item of **black start equipment** at least once every six weeks during the term of this **procurement plan**, provided that the **ancillary service agent** is not required to conduct such a **baseline test** if the **black start equipment** has been generating for 66% or more of the time since the last such **baseline test**.
- 191. Without limiting any other rights the **system operator** may have to request tests of the **black start** service, the **system operator** may require the **ancillary service agent** to conduct a **baseline test** of the **black start** service no more than once during the term of this **procurement plan**.
- 192. Except as set out in paragraphs 190 and 191, there will be no **baseline tests** for equipment used to provide or monitor the **black start** service during the term of this **procurement plan**.
- 193. A **baseline test** or **on-demand test** of **black start equipment** must verify whether or not the **black start equipment** meets the performance requirements in paragraph 188.2.
- 194. A **baseline test** or **on-demand test** of the **black start** service must verify whether or not the **black start** service meets the performance requirements in paragraphs 187 and 188, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.

### **Procurement proposal**

- 195. The **system operator** will seek closed tenders from potential providers of the **black start** service.
- 196. The **system operator** may enter into **ancillary service** procurement contracts with other providers of the **black start** service at any time throughout the period of this **procurement plan** where the **system operator**

identifies a particular need.

197. The **system operator** will continue to procure **black start** under **existing long term contracts** during the term of this **procurement plan** (unless any such **existing long term contract** is terminated during the term of this **procurement plan**).

#### **Offer period for black start service**

198. The term of **ancillary service** procurement contracts for the **black start** service may vary to that of the term of this **procurement plan**. Without limitation, the **system operator** may enter into **new long term contracts** for the **black start** service.

#### **Pricing structure for procurement of black start service**

199. The **system operator** will procure the **black start** service on the basis of:
- 199.1 a monthly availability fee; and/or
  - 199.2 a single event fee.

#### **Alternative ancillary service arrangements**

200. The **system operator** has no information indicating that any **alternative ancillary service arrangement** will be in operation over the period of this **procurement plan** which will decrease the quantity of **black start** needing to be purchased by the **system operator**.

#### **Black start procurement costs**

201. The actual procurement costs for the procurement period 1 December 2009 to 30 November 2010 were \$499,000. (1 December 2008 to 30 November 2009 was \$398,000).
202. The actual costs for the period of this **procurement plan** will be dependent on the following:
- 202.1 the **black start** service availability fee and any event fees that accrue; and
  - 202.2 the number of available providers of the **black start** service.
203. The **system operator** will provide an update on the current procurement costs for **black start** to the **Authority** in its reports provided under paragraph 82.

## Appendix B

### GLOSSARY OF TERMS

“**allowed outage**” means an outage of that equipment that is permitted under an **ancillary service** procurement contract;

“**baseline test**” is defined in paragraph 66;

“**black start equipment**” means diesel generators or auxiliary hydro plant;

“**contracted GXPs**” means the **GXPs** at which an **ancillary service agent** may provide **interruptible load**, as set out in an **ancillary service** procurement contract for **instantaneous reserve**;

“**control equipment**” means equipment in respect of a **generating unit** or **demand block** that automatically responds to changes in frequency for the purposes of providing **frequency keeping**;

“**control min**” means the minimum quantity of power (in megawatts) an **FK site** must generate to provide **frequency keeping** to the relevant performance requirements;

“**control max**” means the maximum quantity of power (in megawatts) an **FK site** can generate and still provide **frequency keeping** to the relevant performance requirements. The **control max** offered for an **FK site** must be greater than or equal to **control min** plus twice the range of the offered **MW band** for the **FK site**;

**end-to-end test** means a **baseline test** to verify that the integrated components of an **interruptible load** system, other than the monitoring components, function correctly as part of the overall system from start to finish

“**existing long term contract**” means an **ancillary service** procurement contract entered into between the **system operator** and an **ancillary service agent** before the commencement date of this **procurement plan**, the term of which **ancillary service** procurement contract overlaps with the term of this **procurement plan**;

“**enforcement regulations**” means the Electricity Industry (Enforcement) Regulations 2010;

“**FIR**” means **fast instantaneous reserve**;

“**fixed price/quantity frequency keeping**” is defined in paragraph 26A;

“**FK site**” means a **generating unit**, **generating station**, **block dispatch group** or **station dispatch group** that is capable of providing **frequency keeping**;

“**frequency keeping period**” means, in relation to an **ancillary service agent**, all the **trading periods** within any continuous period of 30 days for which the **ancillary service agent** was dispatched to provide **frequency keeping**, provided the number of such **trading periods** is at least 24;

“**grid frequency error**” means the **grid** frequency deviation in Hertz from 50.00 Hertz;

“**half hour frequency keeping**” is defined in paragraph 26;

“**islanded**”, in relation to part of the **grid**, means that that part of the **grid** is disconnected from the rest of the **grid** owing to planned or unplanned outages;

“**MW band**” means a range in (**MW**) over which an **FK site** may vary its generation;

“**new long term contract**” means an **ancillary service** procurement contract entered into between the **system operator** and an **ancillary service agent** during the term of this **procurement plan**, the term of which **ancillary service** procurement contract exceeds the term of this **procurement plan**;

“**non-mandatory frequency keeping**” means **half hour frequency keeping** provided under an **ancillary service** procurement contract under which the **ancillary service agent** is not required to make mandatory offers to provide **half hour frequency keeping**;

“**on-demand test**” is defined in paragraph 67.1;

“**pre-event generating output**” is defined in paragraph 128.2.2;

“**pre-event load**” means the average load over a period of 60 seconds with a reasonable adjustment for any load change detected on the relevant **network**;

“**relay equipment**” means equipment fitted to a **generating unit** that automatically disconnects the **generating unit** when the frequency of the **grid** reaches the **required frequency** for that **generating unit**;

“**required frequency**” means, in relation to a **generating unit**, the frequency at which that **generating unit** is contracted to disconnect;

“**regulations**” means the **enforcement regulations** and any other regulations made under the **Act**;

“**response rate**” means the rate of change in generation output from an **FK site** in **MW** per minute;

“**SIR**” means **sustained instantaneous reserve**;

“**system operator measured frequency**” means the frequency of the **grid** as determined by **system operator** frequency logging;

“**trip frequency**” means the trip frequency for **interruptible load** specified in the relevant **ancillary service** procurement contract;

“**trip time**” means the time at which the frequency of the **grid** falls to or below the **trip frequency**;

“**UFE time**” means the time at which an **under-frequency event** occurs; and

“**voltage support equipment**” means assets capable of providing reactive power.