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## **Schedule C5 - Procurement Plan**

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## Introduction and content

### INTRODUCTION

1. This is the ~~sixth~~<sup>fifth</sup> **procurement plan** under the **rules**. It commences on 1 December 2008<sup>98</sup> and applies for 12 months or until amended or replaced in accordance with the **rules**. 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 **rules** have the same meaning as contained in Part A of the **rules**. Some other terms are defined in Appendix B.

### CONTENT

3. The content and structure of this **procurement plan** is consistent with the content and structure set out in rule 4.2 of Section IV of Part C and includes:
  - 3.1 *[Revoked]*
  - 3.2 the principles the **system operator** will apply in making a **net purchase quantity assessment** (rule 4.2.1);
  - 3.3 the processes the **system operator** will apply in making a **net purchase quantity assessment** (rule 4.2.2) including:
    - 3.3.1 determining the requirements for complying with the **principal performance obligations** (rule 4.2.2.1); and
    - 3.3.2 determining the requirements for achieving the **dispatch objective** (rule 4.2.2.2.); 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 the **Principal Performance Obligations (PPOs)** (rule 4.2.2.3); 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 **(PPOs)** under the **rules** (rule 4.2.2.4);
  - 3.4 an assessment of the net purchase quantities required for the 12-month term provided by this **procurement plan** (rule 4.2.3);
  - 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 rule 4.2.4 (rule 4.2.4);
  - 3.6 financial information relating to the **administrative costs** for each **ancillary service** proposed in this **procurement plan** (rule 4.2.5);
  - 3.7 the technical requirements and key contract terms to support this

## Financial information concerning ancillary services (rule 4.2.5)

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 **Board** 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 rule 11 of section IV of Part C.
43. The **administrative costs** will be incurred at the following standard charge out rates:

Grade	Position	Rate \$/hr (excl GST)
1	Analyst/Engineer	<del>135430</del>
2	Senior Analyst/Engineer/Consultant	<del>166460</del>
3	Senior Advisor	<del>218240</del>

50. Any performance requirement in the **ancillary service** procurement contract that refers to a specific rule in the **rules** 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 **rules** or **regulations** 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 **rules** or **regulations**; 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 **rules** 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 **rules**, the liability (if any) of that party will be determined under and in accordance with the **regulations** and **rules** (including the limitations of liability contained in the **regulations** and **rules**) 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**

## Arrangements for unanticipated procurement of ancillary services (rule 4.2.7)

76. During a **grid emergency**, the **system operator** will rely on **ancillary service agents** complying with their obligations set out in ~~technical code~~ [technical code](#) B of schedule C3 of Part C of the **rules**.
77. Any departures from this **procurement plan** will be in accordance with rule 8 of section IV of Part C.
78. Where the **system operator** identifies a need to change any aspect of this **procurement plan**, then a request for variation pursuant to rule 7.2 of section IV of part C will be made to the **Board**.

## Comment on competitive cost pressures and degree of market innovation involved (rule 4.2.8)

79. Rule 4.2.8 of Section IV of Part C 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:

Ancillary service	Competitive cost pressures	Degree of innovation involved in procurement process (the process for future development is described below)
<b>Frequency keeping</b>	<b>Low</b> Frequency keeping has to be supplied separately for each HVAC island, and there are few stations with the capability.	<b>Medium</b> 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).  In light of North Island cost increases <del>since December 2007</del> , various concurrent initiatives to allow greater participation in the frequency keeping market are being actively explored by the system operator, both in the long and short term.
<b>Instantaneous reserve</b>	<b>Medium to High</b> Medium in the South Island as there are a limited number of providers but prices remain very low.  High in North Island as there are a variety of interruptible load and generation sources.	<b>High</b> Procurement using half-hour clearing markets. New Zealand's co-optimisation of energy and reserves is leading edge in electricity markets internationally.  <del>Furthermore, the system operator has explored various innovative initiatives to increase instantaneous reserve participation based on the recommendations of the 2008 National Winter Group,</del>
<b>Over frequency Reserve</b>	<b>Low</b> Most South Island generation plant owned by one of two companies	<b>High</b> A novel solution to a New Zealand-specific problem allowing better management of overall reserve costs.
<b>Voltage support</b>	<b>Low to Medium</b> Small number of providers because voltage support requirements tend to be localised.	<b>Medium</b> The combination of generator AOPOs and tendering for alternative solutions is in-line with world standards. Any concept of demand 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	<b>Low</b> But a simple procurement approach is appropriate given the relatively low cost of this

	cost of new entry is relatively low.	service.
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| 80. The **system operator** will engage constructively with the **Board**, its Advisory Groups (~~principally the CQAG~~) and the industry to pursue cost-effective development of **ancillary services** methodologies.

81. *[Revoked]*

- 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 rule 8 of section IV of Part C 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 **Board** for the time being for submitting **reserve offers** under rule 6.2 of section II of Part G.
- 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**

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 2007<sup>6</sup> to 30 November 2008<sup>7</sup> were \$~~40.8~~104.8 million. (1 December 2006<sup>5</sup> to 30 November 2007<sup>6</sup> was \$~~55.6~~40.8 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**;
  - 119.1A the availability fees for, and quantities of, any **fixed price/quantity frequency keeping**;
  - 119.2 the number of available providers of **frequency keeping**; and
  - 119.3 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 **Board** 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 A of the **rules**. 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 rule 5.1 of **technical code A** of Part C 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 G of the **rules** 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

127. [~~R~~evoked]

**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 standard in paragraph 124.1.3 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**, several different pre-event load times will be used to calculate the delivered quantities;

128.4.2 the maximum delivered quantity obtained from applying the pre-event loads 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:

### **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**.

### **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 200~~7~~<sup>6</sup> to 30 November 200~~8~~<sup>7</sup> were \$~~72.319.4~~<sup>72.319.4</sup> million. (1 December 200~~6~~<sup>5</sup> to 30 November 200~~7~~<sup>6</sup> was \$~~19.434.4~~<sup>19.434.4</sup> million).
149. The actual costs for the period of this **procurement plan** will be determined using the processes set out in Part G of the **rules** 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 **Board** 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 causes the grid 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 of the in frequency, and recover it to the normal band the frequency after an event causes the grid frequency to exceed 52 Hertz.
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);

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, which will cause to manage frequency recovery after the frequency to 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 200~~7~~<sup>6</sup> to 30 November 200~~8~~<sup>7</sup> were \$~~617,000~~<sup>627</sup>,000. (1 December 200~~6~~<sup>5</sup> to 30 November 200~~7~~<sup>6</sup> was \$~~617,000~~<sup>583,530</sup>).
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 **Board** in its reports provided under paragraph 82.

### **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 200~~7~~<sup>6</sup> to 30 November 200~~8~~<sup>7</sup> were \$~~9.66.9~~ million. (1 December 200~~6~~<sup>5</sup> to 30 November 200~~7~~<sup>6</sup> was \$~~6.94~~ million).
184. The **system operator** will provide an update on the current procurement costs for **voltage support** to the **Board** 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 rule 3.2 of section III of Part C 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**

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 200~~7~~<sup>6</sup> to 30 November 200~~8~~<sup>7</sup> were \$~~410,583,397,000~~. (1 December 200~~6~~<sup>5</sup> to 30 November 200~~7~~<sup>6</sup> was \$~~410,583,319,200~~).
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 **Board** 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**;

“**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;