

Instantaneous Reserve Ancillary Service Schedule

1. Glossary and Interpretation

1.1 Glossary:

In this Ancillary Service Schedule, unless the context otherwise requires, the following definitions apply:

BESS

means a Battery Energy Storage System, which may be an aggregated battery system;

Block

means a Block Dispatch Group or Station Dispatch Group specified in Appendix 1 under the field name "Block ID", with the characteristics specified in Appendix 1, which may provide Generation Reserve;

Dispatched

means dispatched to provide Instantaneous Reserve under this Ancillary Service Schedule;

GR Equipment

means Blocks, Stations, Units, and their Control Systems;

IL Equipment

means Load Sources and their Load Control Equipment;

IR Equipment

means IL Equipment and GR Equipment;

Hold Delay

means, for Interruptible Load, a timer used for the purpose of delaying the propagation of a trip signal following the activation of the under-frequency element in a frequency relay;

Load Control Equipment

means:

- (a) a relay for a Load Source capable of automatically shedding load at the Load Source when the Grid frequency reaches the trip frequency specified in Appendix 1; or
- (b) a controller for a Load Source capable of automatically shedding load at the Load Source when the Grid frequency falls below the Normal Band;

Load Source

means a source of load that may be shed to provide Interruptible Load, as specified in Appendix 1 under the field name "Load Source", and with the characteristics specified in Appendix 1. A Load Source may be a Local Network, or other equipment connected directly to the Grid, or equipment connected to a Local Network;

Monitoring Equipment

means equipment capable of measuring and recording Instantaneous Reserve response from IR Equipment (in MW or kW);

Operating Time

means, for Interruptible Load, the time from the trip frequency being reached to the load being disconnected (in ms);

Permanently Armed IL

means IL Equipment that is always armed and will trip for an event regardless of whether it is Dispatched;

Station

means a Generating Station specified in Appendix 1 under the field name "Station ID", with the characteristics specified in Appendix 1, which may provide Generation Reserve;

Time Tagged

means the relevant data is GPS clock time-tagged or, if GPS clock time-tagging capability is not available, aligned with the time-tagged frequency measurement from the relevant IR equipment; and

Unit

means a Generating Unit or BESS specified in Appendix 1 under the field name "Unit ID", with the characteristics specified in Appendix 1, which may provide Generation Reserve.

1.2 Interpretation:

In this Ancillary Service Schedule, unless the context otherwise requires, references to appendices are references to appendices of this Ancillary Service Schedule.

2. Provision of Instantaneous Reserve**2.1 Provision of Instantaneous Reserve:**

The Ancillary Service Agent must provide:

- (a) Instantaneous Reserve if Dispatched; and
 - (b) the IR Equipment and Monitoring Equipment,
- in accordance with this Contract.

3. Reserve Offers**3.1 Contract to Provide Reserve Offers:**

Subject to clause 3.12, this Ancillary Service Schedule is a contract to provide Reserve Offers under clause 13.37 of Part 13 of the Code for the term of this Ancillary Service Schedule and the IR Equipment and Grid Points of Connection specified in Appendix 1. The Ancillary Service Agent acknowledges that:

- (a) the Ancillary Service Agent is not authorised to provide Reserve Offers for IR Equipment or Grid Points of Connection not specified in Appendix 1; and
- (b) the making of a Reserve Offer does not oblige the System Operator to issue a Dispatch Instruction in respect of that Reserve Offer.

3.2 No offering of AUFLS or Other Contracted Load:

The Ancillary Service Agent must ensure that its Reserve Offers for Interruptible Load do not include any load that may reasonably be required to be shed to satisfy any obligation (of the Ancillary Service Agent or a third party) to provide:

- (a) Automatic Under-Frequency Load Shedding; or
- (b) load shedding under any other agreement with Transpower, in its capacity as System Operator or a Grid Owner, or a third party.

For the avoidance of doubt, the Ancillary Service Agent must not make a Reserve Offer for IR Equipment that has been armed, or may be dynamically/remotely armed, to meet Automatic Under-Frequency Load Shedding obligations or any other load shedding agreement.

3.3 Maximum Reserve Offer Quantity:

The Ancillary Service Agent must not submit Reserve Offers that exceed the maximum quantities of Fast Instantaneous Reserve or Sustained Instantaneous Reserve specified in Appendix 1.

3.4 Maximum Size of an Individual Installation:

The maximum size of any individual installation that can be included in an aggregated Load Source is specified in Appendix 1.

3.5 Disaggregation of Interruptible Load:

The System Operator may request that aggregated Load Sources be disaggregated for Interruptible Load Reserve Offers. In this case, the System Operator must provide the Ancillary Service Agent with 40 Business Days' advance notice and advise the Grid Exit Point at which the disaggregated Load Sources can be offered.

3.6 Changes to Maximum Reserve Offer Quantity:

Despite clause 13.3 of Part A2: General Terms, if the System Operator reasonably believes that the maximum quantities of Fast Instantaneous Reserve or Sustained Instantaneous Reserve that can be provided by the Ancillary Service Agent in accordance with this Ancillary Service Schedule are higher or lower than the maximum quantities specified in Appendix 1, the System Operator may, by notice to the Ancillary Service Agent, increase or decrease the maximum quantities of Fast Instantaneous Reserve or Sustained Instantaneous Reserve specified in Appendix 1 for the relevant IR Equipment. The System Operator must use reasonable endeavours to contact the Ancillary Service Agent and discuss the matter prior to providing notice under this clause (but any failure to do so will not invalidate any notice).

3.7 Update Interruptible Load Offer in Grid Emergency:

If:

- (a) the System Operator instructs the Ancillary Service Agent or a third party to shed load during a Grid Emergency; and
- (b) the shedding of such load has an impact on the ability of the Ancillary Service Agent to provide Interruptible Load in accordance with any Reserve Offer it has submitted,

the Ancillary Service Agent must, as soon as is reasonably possible, revise the Reserve Offer.

3.8 Personnel:

A Reserve Offer may be submitted, revised or cancelled by the personnel specified in Appendix 2. The Ancillary Service Agent must ensure such personnel are trained in accordance with Good Industry Practice and can be contacted by the System Operator at the times and at the telephone and mobile numbers specified in Appendix 2.

3.9 Suspension of Reserve Offers - Performance Standards:

If at any time the System Operator is not satisfied (acting reasonably) that the Ancillary Service Agent can meet the Performance Standards for IR Equipment or its Monitoring Equipment then, if so notified by the System Operator (which notice must outline the areas of concern that the System Operator has), the Ancillary Service Agent must not submit any Reserve Offers for the IR Equipment until and unless it has provided evidence that demonstrates to the reasonable satisfaction of the System Operator that the Ancillary Service Agent can meet the Performance Standards.

3.10 Suspension of Reserve Offers - Commissioning and Testing:

The System Operator may, on notice to the Ancillary Service Agent, restrict Reserve Offers below the maximum quantities of Fast Instantaneous Reserve or Sustained Instantaneous Reserve specified in Appendix 1 for Trading Periods during which relevant IR Equipment or its Monitoring Equipment is being commissioned or tested.

3.11 No Reserve Offers Without a Test

(a) Interruptible Load Excluding BESS

The Ancillary Service Agent must not submit an Interruptible Load Reserve Offer for IL Equipment other than BESS unless the Ancillary Service Agent has:

- (i) conducted and passed an End-to-End Test of the IL Equipment and its Monitoring Equipment, and the test results have been assessed

and approved by the System Operator in writing, in the previous 24 months; or

- (ii) demonstrated fully compliant operational performance of the IL Equipment and its Monitoring Equipment by responding to an Under-Frequency Event in the previous 24 months.

(b) Generation Reserve Excluding BESS

The Ancillary Service Agent must not submit a Generation Reserve Offer for GR Equipment other than BESS unless the Ancillary Service Agent has:

- (i) conducted and passed a Test of each such item of GR Equipment, and the Test results have been assessed and approved by the System Operator in writing:
 - (A) in the previous four years for analogue equipment and non-self-monitoring digital equipment; and
 - (B) in the previous ten years for self-monitoring digital equipment; and
- (ii) provided an up-to-date Asset Capability Statement for the GR Equipment, demonstrating its Instantaneous Reserve capability, in compliance with the Code.

(c) BESS

The Ancillary Service Agent must not submit a Reserve Offer for BESS unless the Ancillary Service Agent has:

- (i) for BESS that may provide Interruptible Load as part of an aggregated Load Source, complied with clause 3.11(a); and
- (ii) for all other BESS, complied with clause 3.11(b).

3.12 Certain Reserve Offers not Valid:

Reserve Offers submitted by the Ancillary Service Agent in breach of clause 3.2, 3.3, 3.5, 3.8, 3.9, 3.10 or 3.11 are deemed not to have been submitted pursuant to a valid and enforceable contract with the System Operator to provide Reserve Offers (in terms of clause 13.37 of Part 13 of the Code). The System Operator may remove any such Reserve Offers in a Price-responsive Schedule or Non-response Schedule.

4. Dispatch Instructions

4.1 Staff and Facilities Available to Meet Dispatch Instructions:

The Ancillary Service Agent must ensure that the personnel specified in Appendix 3 (or other personnel who are no less qualified) are trained in accordance with Good Industry Practice and can be contacted by the System Operator at the times and at the telephone and mobile numbers specified in Appendix 3.

5. Performance Standards

5.1 Interruptible Load Excluding BESS:

The Ancillary Service Agent must ensure that all IL Equipment other than BESS that is the subject of a Reserve Offer submitted by the Ancillary Service Agent and Dispatched:

- (a) provides reduced Demand from the Grid automatically whenever the frequency of the Grid falls to or below the trip frequency specified in Appendix 1 for the relevant IL Equipment equal to or exceeding the Dispatched quantity of Interruptible Load;
- (b) in the case of Fast Instantaneous Reserve, responds within 1 second of the frequency of the Grid falling to or below the trip frequency specified in Appendix 1 for the relevant IL Equipment and sustains the response for at least 60 seconds; and
- (c) in the case of Sustained Instantaneous Reserve, responds within 60 seconds of the frequency of the Grid falling to or below the trip frequency specified in Appendix 1 and sustains the response for at least 30 minutes or until instructed by the System Operator, whichever is the lesser.

5.2 Generation Reserve Excluding BESS:

The Ancillary Service Agent must ensure that all GR Equipment that is the subject of a Reserve Offer submitted by the Ancillary Service Agent and Dispatched:

- (a) provides additional Supply into the Grid automatically whenever the frequency of the Grid falls below the frequency specified in the definition of Under-Frequency Event in the Code equal to or exceeding the Dispatched quantity of Generation Reserve;
- (b) in the case of Fast Instantaneous Reserve, responds within 6 seconds of the frequency of the Grid falling below the frequency specified in the definition of Under-Frequency Event in the Code and sustains the response for at least 60 seconds;
- (c) in the case of Sustained Instantaneous Reserve, responds within 60 seconds of the frequency of the Grid falling below the frequency specified in the definition of Under-Frequency Event in the Code and sustains the

response for at least 15 minutes or until instructed by the System Operator, whichever is the lesser;

- (d) in the North Island, remains connected:
 - (i) at all times when the Grid frequency is above 47.5 Hz;
 - (ii) for at least 120 seconds when the Grid frequency is at 47.5 Hz;
 - (iii) for at least 20 seconds when the Grid frequency is at 47.3 Hz;
 - (iv) for at least 5 seconds when the Grid frequency is at 47.1 Hz;
 - (v) for at least 0.1 seconds when the Grid frequency is at 47.0 Hz; and
 - (vi) at any Grid frequencies between those specified above, for times derived by linear interpolation;
- (e) in the South Island, remains connected:
 - (i) at all times while Grid frequency is at or above 47 Hz; and
 - (ii) for 30 seconds if the Grid frequency falls below 47 Hz but not below 45 Hz;
- (f) meets, where relevant, the requirements for frequency response and control set out in clause 5(1) of Technical Code A of Schedule 8.3 of Part 8 of the Code;
- (g) provides stable performance with adequate damping;
- (h) responds with a Droop within the range 1.5% to 7% or with a controlled response approved by the System Operator in writing; and
- (i) does not adversely affect the operation of the Grid because of any of its non-linear characteristics or rate of change in output.

5.3 Instantaneous Reserve Provided by BESS > 5 MW

The Ancillary Service Agent must ensure that BESS with capacity more than 5 MW that is the subject of a Reserve Offer submitted by the Ancillary Service Agent and Dispatched:

- (a) complies with the Performance Standard in clause 5.2(a) when providing Generation Reserve;
- (b) complies with the Performance Standards in clauses 5.2(b) to 5.2(e);
- (c) provides stable performance and does not adversely affect operation of the Grid;
- (d) provides a controlled dynamic response appropriate for both its inherent control characteristics and its location on the Grid. The control action must be approved by the System Operator in writing and measurement delays, digital sample rates, speed of response (MW/sec), sensitivity of

response (MW/Hz) and Grid sensitivity (MW/Hz) must be as specified in Appendix 1 for the BESS;

- (e) if Droop control is used:
 - (i) responds with an appropriate Droop across the full range of the BESS's capability from charging to injection;
 - (ii) if Droop is specified on rated capacity, the Droop setting is equivalent to at least 2% on a base of the maximum contracted potential MW response (from charging through to injection response); and
 - (iii) the Droop control is consistent with the controlled dynamic response approved by the System Operator under subclause (d); and
 - (iv) if the maximum response delivered by the Droop control is maintained, using a suitable control action, as the Grid frequency recovers to the lower limit of the Normal Band, the response must return to a proportional response to Grid frequency while the Grid frequency is within the Normal Band. If reduction of the BESS's output is required to achieve this, it must be fast (in the order of 5 MW/sec) and must not continue if the Grid frequency falls below the lower limit of the Normal Band; and
- (f) has a controlled ramp rate for all changes in MW that are not related to Grid frequency deviations, within the range of 10 to 25 MW/min unless otherwise approved by the System Operator in writing.

5.4 Instantaneous Reserve Provided by BESS \leq 5 MW

The Ancillary Service Agent must ensure that all BESS with capacity not more than 5 MW that is the subject of a Reserve Offer submitted by the Ancillary Service Agent and Dispatched either:

- (a) complies with the Performance standards in clause 5.1, provided that any Generation Reserve response to an event will be treated as if it were an Interruptible Load response to that event for the purposes of assessing compliance with those Performance Standards; or
- (b) complies with the Performance Standards in clause 5.3.

5.5 Assessment methodologies

The System Operator must assess the Ancillary Service Agent's compliance with the Performance Standards in clauses 5.1 to 5.4 using the relevant assessment methodology set out in the Procurement Plan. The Procurement Plan commencing 7 August 2025 contains assessment methodologies in paragraphs B47 to B49.

5.6 Monitoring Equipment:

The Ancillary Service Agent must ensure that, when the relevant IR Equipment is Dispatched, the Monitoring Equipment accurately:

- (a) measures and records (in a Time Tagged manner):
 - (i) for Fast Instantaneous Reserve, the actual Instantaneous Reserve response (in MW) from the IR Equipment over intervals no greater than 0.1 seconds;
 - (ii) for Sustained Instantaneous Reserve, the average Instantaneous Reserve response (in MW) from the IR Equipment over intervals no greater than 0.1 seconds until 60 seconds after the UFE Time or Trip Time, as applicable, and then at no greater than 1 second intervals; and
 - (iii) the locally measured frequency at 0.01 Hz resolution and the relay activation signal;
- (b) measures and records the Instantaneous Reserve response from the IR Equipment during the period:
 - (i) commencing not less than 15 seconds prior to:
 - (A) the UFE Time in the case of Instantaneous Reserve other than Interruptible Load; or
 - (B) the Trip Time in the case of Interruptible Load; and
 - (ii) ending:
 - (A) not less than 60 seconds later for Fast Instantaneous Reserve; and
 - (B) not before the Instantaneous Reserve response ends for Sustained Instantaneous Reserve;
- (c) subject to clause 5.8, measures and records the Instantaneous Reserve response of each individual Unit, or Load Source providing Instantaneous Reserve; and
- (d) where possible, measures and records Instantaneous Reserve response from the IR Equipment net of any Demand or Supply response from other sources at the same Grid Point of Connection.

5.7 Data for Hydro Stations

For hydro Stations, the data referred to in clause 5.6 may be measured and recorded by Station unless the Station is providing both Tail Water Depressed Reserve and Partly Loaded Spinning Reserve, in which case the data must be measured and recorded by Unit.

5.8 Data Records:

The Ancillary Service Agent must ensure that the data recorded by the Monitoring Equipment is held by the Ancillary Service Agent for at least 15 Business Days and is provided to the System Operator within 5 Business Days of a written request from the System Operator. Interruptible Load data provided to the System Operator under this clause must be aligned using the Trip Time and be in the format specified on the System Operator's website, unless otherwise agreed with the System Operator.

5.9 Capability Data:

The Ancillary Service Agent must provide the System Operator with such data as the System Operator may reasonably require from time to time to enable the

System Operator to model the Ancillary Service Agent's Instantaneous Reserve capability.

5.10 Review Meetings:

The parties must use reasonable endeavours to meet at least once during the term of this Ancillary Service Schedule to discuss the System Operator's performance in regard to the issuing of Dispatch Instructions for Instantaneous Reserve and the Ancillary Service Agent's provision of Instantaneous Reserve against the Performance Standards.

6. Price

6.1 Final Reserve Price:

Subject to clauses 2 and 3.3(c) of Part A2: General Terms, the System Operator must pay to the Ancillary Service Agent the relevant Final Reserve Price for all Instantaneous Reserve Dispatched.

7. Tests

7.1 Baseline Tests:

(a) Interruptible Load

Subject to clause 7.2, the Ancillary Service Agent must conduct an End-to-End Test of IL Equipment and its Monitoring Equipment at least once every 24 months.

(b) Generation Reserve

The Ancillary Service Agent must conduct a Test of each item of GR Equipment and its Monitoring Equipment at least:

- (i) once every four years for analogue IR Equipment and non-self-monitoring digital IR Equipment; and
- (ii) at least once every 10 years for self-monitoring digital IR Equipment.

7.2 End-to-End Test Not Necessary

The Ancillary Service Agent is not required to conduct an End-to-End Test of IL Equipment under clause 7.1(a) if it has demonstrated fully compliant operational performance of the IL Equipment and its Monitoring Equipment by responding to an UFE in the previous 24 months.

7.3 Test After Failure:

If:

- (a) the Ancillary Service Agent fails to meet a Performance Standard or comply with a Dispatch Instruction under this Ancillary Service Schedule for any Trading Period; and
- (b) the System Operator requests a Test of the relevant IR Equipment or Monitoring Equipment within 20 Business Days of becoming aware of the failure by the Ancillary Service Agent,

then, despite clause 4.5 of Part A2: General Terms, the Ancillary Service Agent must meet the costs incurred by the Ancillary Service Agent in conducting the Test regardless of whether or not the results from the Test show that the Ancillary Service Agent is able to meet the relevant Performance Standards.

7.4 Test After Changes to IR Equipment

The Ancillary Service Agent must conduct a Test of the IR Equipment following any change to the IR Equipment that may impact its Instantaneous Reserve performance. The Ancillary Service Agent must promptly (and in any event within 10 Business Days) notify the System Operator if the Ancillary Service Agent intends to make, or has made, a change to the IR Equipment that may impact its Instantaneous Reserve performance, regardless of whether the Ancillary Service Agent believes that such impact is of high consequence or likelihood.

7.5 Test Requirements – IR Equipment:

A Test of IR Equipment must verify whether or not the IR Equipment can meet the relevant Performance Standards in clauses 5.1 to 5.5, or such lesser standards as the System Operator may determine in consultation with the Ancillary Service Agent.

7.6 Test Requirements – Monitoring Equipment:

A Test of Monitoring Equipment must verify whether or not the Monitoring Equipment can meet the Performance Standards in clause 5.6.

7.7 Provision of Data for Compliance:

Within 15 business days of completing a Test, the Ancillary Service Agent must provide the System Operator with the corresponding Test data and verification of meeting the relevant Performance Standards. The Test data must include an indication of any time delays that occur in the measurement systems used by the relevant Load Control Equipment or Control System.

7.8 Breach of this clause 7

If the System Operator believes the Ancillary Service Agent has not complied with this clause 7, the System Operator may make a claim under clause 3.3 of Part A2: General Terms as if the Ancillary Service Agent had failed to meet a Performance Standard.

8. Limitation of Liability

8.1 Limitation of Liability:

If there is a default by either party of any obligation under this Ancillary Service Schedule (other than non-payment of any amounts due), that party and any Associated Person of that party will only be liable to the other party up to a combined maximum liability for any single event or related series of events of [\$] [\$ figure will be the lesser of 5% of the total amount of the expected annual Fees payable under this Ancillary Service Schedule or \$100,000] with a combined maximum liability in any 12 month period of [\$] [\$ figure will be the lesser of 20% of the total amount of the expected annual Fees payable under this Ancillary Service Schedule or \$300,000], irrespective of the number of events.

8.2 Suspension of Liability:

The Ancillary Service Agent will have no liability to the System Operator in respect of the Ancillary Service Agent's obligations under this Ancillary Service Schedule to be performed during any period the System Operator is in default under this Contract in relation to Instantaneous Reserve.

Appendix 1 – Capability

Interruptible Load

Load Control Equipment	Load Source (may be Market Node)	Maximum Quantity of FIR (MW)	Maximum Quantity of SIR (MW)	Able to arm intermediate values? (Y/N)	Permanently Armed (Y/N)	Trip Frequency (Hz)	Operating Time (ms)	On Delay(ms)	Frequency Measurement Delay (ms)	Maximum Size of Individual Installation

Generation Reserve

Unit ID	Station ID	Block ID	Market node	Reserve type (PLSR, TWDR or BESS)	Maximum quantity of FIR (MW)	Maximum quantity of SIR (MW)	Frequency Measurement Delays (ms)	Digital Sample Rates (ms)	Speed of Response (MW/s)	Sensitivity of Response (MW/Hz)

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Appendix 2 – Contact Details of Personnel Entitled to Submit, Revise and Cancel Reserve Offers

Unit ID	Station ID	Block ID	Load Source/Load Control Equipment	Name and Designation	Hours Available	Telephone Number	Mobile Number

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Appendix 3 - Contact Details of Personnel Capable of Carrying Out Dispatch Instructions

Unit ID	Station ID	Block ID	Load Source/Load Control Equipment	Name and Designation	Hours Available	Telephone Number	Mobile Number

[TITLE]

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