

## Appendix B Draft Procurement Plan amendment

### Appendix B – Key technical requirements for ancillary services (paragraph 54)

- B1. For the avoidance of doubt, a key technical requirement that is expressed as an **ancillary service agent** right or obligation does not confer or impose that right or obligation on an **ancillary service agent** unless and until that right or obligation is included in an **ancillary service** procurement contract between the **system operator** and the **ancillary service agent**.

#### Frequency keeping

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##### Performance requirements and technical specifications for frequency keeping

- B2. The **ancillary service agent** must provide one or more **frequency keeping units** and trained operators or **control equipment** at an **FK site** that, collectively, are capable of meeting the performance requirements in:
- B2.1 paragraphs B3 and B4, for **single provider frequency keeping**;
  - B2.2 paragraph B5, for **multiple provider frequency keeping**; and
  - B2.3 paragraphs B6 to B7, for both **single provider frequency keeping** and **multiple provider frequency keeping**.

##### *Single provider frequency keeping performance requirements*

- B3. Subject to paragraph B7, when providing **single provider frequency keeping** the **ancillary service agent** must:
- B3.1 when there is a **grid frequency error**, ensure the relevant **FK site** responds to eliminate the **grid frequency error**;
  - B3.2 ensure the relevant **FK site** provides 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 single provider frequency keeping periods**;
  - B3.3 at all times maintain the frequency of the **grid** within the **normal band**, and use reasonable endeavours to continuously maintain the frequency of the **grid** as close as possible to 50 Hertz;
  - B3.4 at all times maintain **frequency time error** within the limits specified in clause 7.2C(1) of the **Code**, and use reasonable endeavours to continuously maintain **frequency time error** as close as possible to zero; and
  - B3.5 return **frequency time error** to zero at least once every **day**.
- B4. Subject to paragraph B7, the **ancillary service agent** must ensure the deviation of the **grid frequency** over any of the **ancillary service agent's single provider frequency keeping periods** does not exceed the maximum allowable deviation specified in the **ancillary service agent's ancillary service** procurement contract. Such deviation must be determined by reference to the **system operator measured frequency** but excluding any frequency measurements that are outside the **normal band**.

### ***Multiple provider frequency keeping performance requirements***

- B5. Subject to paragraph B7, when providing **multiple provider frequency keeping** the **ancillary service agent** must:
- B5.1 comply with **regulating instructions** issued to it; and
  - B5.2 ensure that the relevant **FK site** provides a **response rate** of at least 0.4 **MW** per minute per **MW** in the dispatched **MW band**.

### ***General frequency keeping performance requirements***

- B6. The **ancillary service agent** must ensure that each **frequency keeping unit** and item of **control equipment** at an **FK site** is maintained in accordance with good industry practice.
- B7. In meeting the performance requirements in paragraphs B3, B4 and B5, the **ancillary service agent's FK site** is not required to operate outside the limits of the **MW band** contained in the relevant **dispatch instruction** issued in accordance with Part 13 of the **Code** or above the relevant **control max** or below the relevant **control min**.

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

- B8. The **ancillary service agent** must comply, and provide monitoring equipment that complies, with:
- B8.1 paragraphs B9 to B11, for **single provider frequency keeping**;
  - B8.2 paragraphs B12 to B15, for **multiple provider frequency keeping**; and
  - B8.3 paragraph B16, for both **single provider frequency keeping** and **multiple provider frequency keeping**.

### ***Single provider frequency keeping monitoring requirements***

- B9. The **ancillary service agent** must provide monitoring equipment that accurately measures and records in a time-tagged manner the following:
- B9.1 **FK output** at each of its **FK sites** that provides single provider frequency keeping;
  - B9.2 frequency of the **grid** in Hertz; and
  - B9.3 frequency time error.
- B10. When an **FK Site** is providing **single provider frequency keeping** the relevant monitoring equipment must measure and record:
- B10.1 **FK output** at an agreed location in the **grid** at least once every 8 seconds, each measurement accurate to within plus or minus 2% of the measured value;
  - B10.2 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
  - B10.3 **frequency time error** using a GPS clock or agreed equivalent at least twice every 1 minute.
- B11. 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**.

### ***Multiple provider frequency keeping monitoring requirements***

- B12. The **ancillary service agent** must provide monitoring equipment that accurately measures and records in a time-tagged manner the following:
- B12.1 FK output at each of its FK Sites that provides multiple provider frequency keeping; and
  - B12.2 the regulating instructions received for each of its FK sites that provides multiple provider frequency keeping.
- B13. When an **FK Site** is providing **multiple provider frequency keeping** the relevant monitoring equipment must measure and record:
- B13.1 **FK output** at an agreed location in the **grid** at least once every 1 second, each measurement accurate to within plus or minus 2% of the total expected **FK output** range of the **FK site**; and
  - B13.2 the regulating instructions received for the FK site.
- B14. If requested by the **system operator** in writing before the end of a calendar month during which an **FK site** was dispatched to provide **multiple provider frequency keeping**, the **ancillary service agent** must provide the **system operator** with the data recorded by the monitoring equipment for that **FK site** and month within 5 **business days** following the request.
- B15. If an **FK site** is a **block dispatch group**, **station dispatch group** or group of load sources then, for the purposes of paragraphs B12 to B14, the **FK site** is to be treated as the **allocated frequency keeping units** within the **FK site** for the relevant period.

### ***General frequency keeping monitoring requirements***

- B16. The **ancillary service agent** must maintain the monitoring equipment in accordance with good industry practice.

### **Offer requirements for frequency keeping**

- B17. The **ancillary service agent** may, no later than 2 hours prior to a **trading period**, submit an offer to provide **frequency keeping** for that **trading period**. Each offer submitted is valid until revised or cancelled in accordance with paragraph B21 or B22.
- B18. Each offer to provide **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 of the **Code**.
- B19. There will be separate **ancillary service** procurement contract schedules for **single provider frequency keeping** and **multiple provider frequency keeping**. The **ancillary service agent** must have:
- B19.1 an **ancillary service** procurement contract for **single provider frequency keeping** from an **FK Site** in order to offer **single provider frequency keeping** from that **FK Site**; and
  - B19.2 an **ancillary service** procurement contract for **multiple provider frequency keeping** from an **FK Site** in order to offer **multiple provider frequency keeping** from that **FK Site**.
- B20. Each offer to provide **frequency keeping** must include the following information:
- B20.1 a unique code for the **FK site** for which the offer is made;
  - B20.2 a unique code for the **ancillary service agent** submitting the offer;

- B20.3 the **trading day** for which the offer is made;
- B20.4 the **trading periods** for which the offer is made;
- B20.5 the **control min** and **control max** for the **FK site** for which the offer is made; and
- B20.6 up to five separate **MW bands** and prices.
- B21. The **ancillary service agent** may revise an offer to provide **frequency keeping** by submitting a revised offer before the **gate closure** for the offer. Each such revision must be submitted or notified to the **system operator** using the same **information system** approved by the **Authority** for the time being for revising **reserve offers** under clause 13.46 of the **Code**.
- B22. The **ancillary service agent** submit a new or revised offer to provide **frequency keeping** after the **gate closure** for the offer only in circumstances where a **bona fide physical reason** necessitates the cancellation or submission or where the **system operator** has issued a **formal notice**.
- B23. If the **ancillary service agent** submits a new or revised offer to provide **frequency keeping** later than one hour prior to the beginning of the **trading period** in respect of which the offer is made, the **ancillary service agent** must report the submission to the **system operator** in writing together with an explanation of the reasons for the 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.
- B24. The **system operator** must, as soon as reasonably practicable, confirm to the **ancillary service agent** the receipt of any new or revised offer to provide **frequency keeping** using the same **information system** approved by the **Authority** for the time being for confirming receipt of **reserve offers** under clause 13.51(2) of the **Code**.
- B25. If at any time the **system operator** is not satisfied (acting reasonably) that the **ancillary service agent** can meet the relevant performance requirements 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 offers to provide **frequency keeping** until and unless it has provided evidence that demonstrates to the **system operator's** reasonable satisfaction that it can meet the performance requirements.
- B26. **Multiple provider frequency keeping** offers for an **FK site** must be subject to a minimum and may be subject to a maximum **MW band**. The minimum and maximum **MW bands** must be based on the results of the **MFK technical review** of the **ancillary service agent**, including the measurement accuracy of the **ancillary service agent's** monitoring equipment for the **FK site**. The **system operator** must publish the minimum **MW band** on its website.

## Dispatch requirements for frequency keeping

- B27. The **system operator** must 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.
- B28. 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** must 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

- B28A. Prior to offering **frequency keeping** for an **FK site** for **dispatch** for the first time, **ancillary service agents** must have conducted and passed a **baseline test** or otherwise

demonstrated the capability of the relevant **FK Site** to provide **frequency keeping** to the satisfaction of the **system operator**.

- B28B The **ancillary service agent** must conduct and pass a **baseline test**, or otherwise demonstrate the capability of the relevant **FK Site** to provide **frequency keeping** to the satisfaction of the **system operator**, at least once every four years.
- B29. Notwithstanding clause B28B, the **ancillary service agent** must conduct a **baseline test** of equipment and/or trained operators that may be used for providing or monitoring **back-up SFK** at least once every six months, provided that the **ancillary service agent** is not required to conduct such a **baseline test** if the equipment and/or trained operators have provided or monitored **single provider frequency keeping** in the previous six months.
- B29A. Other than those **baseline tests** described in paragraphs B28A, B28B and B29, there are no other **baseline tests** for equipment and/or trained operators that are used, or may be used, to provide or monitor **frequency keeping**.
- B30. A **baseline test** or **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 B3 (for **single provider frequency keeping**) or B5 (for **multiple provider frequency keeping**) or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.
- B31. A **baseline test** or **on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraphs B9 and B10 (for **single provider frequency keeping**) or B12 and B13 (for **multiple provider frequency keeping**).

## Instantaneous reserve

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### Performance requirements and technical specifications for instantaneous reserve

- B32. To be able to provide **instantaneous reserve** the **ancillary service agent** must have equipment that can provide **fast instantaneous reserve** and/or **sustained instantaneous reserve**. Only **ancillary service agents** that can meet the following technical requirements ~~of these definitions~~ can provide **instantaneous reserve**.
- B32.1 An **ancillary service agent** must ensure that at all times the equipment that is the subject of the **reserve offer**:
- B32.1.1 is maintained in accordance with good industry practice so that the equipment is able to provide **instantaneous reserve** that meets the standards set out in this **procurement plan**;
- B32.1.2 is able to respond, when dispatched, within the timeframe applicable to either **fast instantaneous reserve** or **sustained instantaneous reserve**, as the case may be;
- B32.1.2.1. For fast instantaneous reserve in the case of interruptible load excluding that provided by battery energy storage systems, the drop in load (in MW) must occur within 1 second of the grid system frequency falling to or below 49.2 Hertz, or the trip frequency specified in the ancillary service agent's ancillary service procurement contract, and must be sustained for a period of at least 60 seconds;
- B32.1.2.2. for sustained instantaneous reserve in the case of interruptible load excluding that provided by battery energy storage systems, the average drop in load (in MW) must occur over the first 60 seconds after

the grid system frequency falls to or below 49.2 Hertz, or the trip frequency specified in the ancillary service agent's ancillary service procurement contract, and must be sustained until instructed by the system operator;

~~B32.1.2~~B32.1.3 meets, where relevant, the requirements for frequency response and control set out in clause 5(1) of technical code A of schedule 8.3 of the Code and has been approved by the system operator;

B32.1.4 is available and has the capacity to provide the quantity of instantaneous reserve specified in the reserve offer; and

B32.1.5 in the case of all equipment providing generation reserve, or battery energy storage systems providing interruptible load:

B32.1.5.1. provides stable performance with adequate damping;

B32.1.5.2. responds with a droop set within the range 1.5 - 7 per cent or with a controlled response as agreed with the system operator;

B32.1.5.3. does not adversely affect the operation of the grid because of any of its non-linear characteristics or rate of change in output;

B32.1.6 in the case of all equipment providing generation reserve, or battery energy storage systems providing interruptible load:

B32.1.6.1. in the North Island, remain connected:

32.1.6.1.1. at all times when the frequency is above 47.5 Hertz;

32.1.6.1.2. for at least 120 seconds when the frequency is at 47.5 Hertz;

32.1.6.1.3. for at least 20 seconds when the frequency is at 47.3 Hertz;

32.1.6.1.4. for at least 5 seconds when the frequency is at 47.1 Hertz;

32.1.6.1.5. for at least 0.1 seconds when the frequency is at 47.0 Hertz;

32.1.6.1.6. at any frequencies between those specified above, for times derived by linear interpolation.

B32.1.6.2. in the South Island, remain connected:

32.1.6.2.1. at all times while frequency is at or above 47 Hertz; and

32.1.6.2.2. for 30 seconds if the frequency falls below 47 Hertz but not below 45 Hertz.

B32.2 An **ancillary service agent** dispatched to provide **instantaneous reserve** in accordance with Part 13 of the **Code** must:

B32.2.1 provide additional **supply** into the **grid** equal to or exceeding the dispatched quantity of **instantaneous reserve** automatically when there is an **under-frequency event**; and/or

B32.2.2 reduce **demand** from the **grid** equal to or exceeding the dispatched quantity of **instantaneous reserve** automatically when the frequency of the **grid** falls to or below the **trip frequency**.

B32.3 In determining the response capability specified in the definition of **fast instantaneous reserve** and **sustained instantaneous reserve** set out in Part 1 of the **Code**, the **system operator** must use reasonable endeavours to exclude inertial response.

## Assessment of performance requirements for interruptible load other than that provided by battery energy storage systems

- B33. In assessing the delivery of **interruptible load** quantities other than that provided from battery energy storage systems, the **system operator** must apply the following methodology:
- B33.1 **Fast instantaneous reserve** must be calculated as the total reduction in load that occurs within one second of either the grid system frequency falling to or below 49.2 Hz or 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**.
- B33.2 **Sustained instantaneous reserve** must be calculated as the average reduction in load that occurs over the first 60 seconds after either the grid system frequency falls to or below 49.2 Hz or the trip time. The average reduction in load is to be calculated from the **pre-event load**. **Sustained instantaneous reserve** load is not to be restored until advised by the **system operator**.
- B33.3 The **fast instantaneous reserve** and **sustained instantaneous reserve** delivered quantities must be determined from the aggregate load response:
- B33.3.1 recorded at the **ancillary service agent's** equipment; or
- B33.3.2 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.
- B33.4 If the analysis required for the purpose of paragraph B33.3 indicates an under-delivery of **interruptible load**, the analysis must 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.
- B34. In determining the **pre-event load** the **system operator** must apply the following methodology when calculating delivered quantities:
- B34.1 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** must 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.

## Assessment of performance requirements for generation reserve, and interruptible load provided by battery energy storage systems ~~fast instantaneous reserve other than interruptible load~~

- B35. In assessing the delivery of **fast instantaneous reserve** quantities from generation reserve, or interruptible load provided by battery energy storage systems, ~~other than interruptible load~~ the **system operator** must apply the following methodology:
- B35.1 Equipment that is the subject of a **reserve offer** for **fast instantaneous reserve** is deemed to comply with the performance requirement in paragraph B32.2 if and only if the equipment's actual response meets or exceeds its **asset capability statement** modelled response.
- B35.2 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:

- B35.2.1 the frequency profile of the **under-frequency event**;
  - B35.2.2 the equipment's real power output immediately before the start of the **under-frequency event** ("**pre-event real power output**");
  - B35.2.3 the number of **generating units** on **partly loaded spinning reserve** mode;
  - B35.2.4 the number of hydro **generating units** on **tail water depressed reserve** mode; and
  - B35.2.5 the amount of **fast instantaneous reserve** dispatched for **generating units**.
- B35.3 Subject to paragraph B32.3, the equipment's actual response must be calculated as the additional real power output of the equipment compared to the **pre-event real power output** of the equipment.
- B35.4 In determining the **pre-event real power output** of the equipment, the **system operator** must apply the following methodology when calculating the delivered quantities:
- B35.4.1 to account for possible timing errors contained in the data provided by the **ancillary service agent**, the **pre-event real power output** at several different times must be used to calculate the delivered quantities;
  - B35.4.2 the maximum delivered quantity obtained from applying the **pre-event real power outputs** must be used to determine the reserve response during an **under-frequency event**; and
  - B35.4.3 **generating unit** data must be used if measured and provided by the **ancillary service agent**.
- B35.5 On request, the **system operator** must provide each **ancillary service agent** with details of the **system operator's** assessment under paragraph B35.4 of the **ancillary service agent's** delivery of **fast instantaneous reserve** quantities.

## Assessment of performance requirements for instantaneous reserve generally

- B36. For the purposes of assessing the delivery of **instantaneous reserve** quantities:
- B36.1 the **UFE time** (in the case of **instantaneous-generation reserve, or interruptible load provided by battery energy storage systems other than interruptible load**) must be determined by reference to the **system operator measured frequency**; and
  - B36.2 the **trip time** (in the case of **interruptible load other than that provided by battery energy storage systems**) must be determined by reference to the **ancillary service agent's** locally measured frequency of the **grid**, if available, and provided to the **system operator**.

## Monitoring requirements for instantaneous reserve

- B37. The **ancillary service agent** must provide monitoring equipment that accurately:
- B37.1 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 **fast instantaneous reserve** and no greater than 10 second intervals for **sustained instantaneous reserve**; and

- B37.2 uses such measured response data to record in a time tagged manner:
- B37.2.1 for **fast instantaneous reserve**, the actual **instantaneous reserve** response (in **MW**) from the **ancillary service agent's** equipment over intervals no greater than six seconds; and
- B37.2.2 for **sustained instantaneous reserve**, 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;
- B38. The monitoring referred to in paragraph B37 is required during all periods for which the **ancillary service agent's** equipment is dispatched to provide **instantaneous reserve**:
- B38.1 in the case of generation reserve, or interruptible load provided by battery energy storage systems~~instantaneous reserve other than interruptible load~~, commencing not less than six seconds prior to the **UFE time** (determined in accordance with paragraph 36); and
- B38.2 in the case of interruptible load other than that provided by battery energy storage systems~~interruptible load~~, commencing not less than six seconds prior to when the equipment providing the **interruptible load** activates; and
- B38.3 in all cases, ending not less than 15 minutes later for **sustained instantaneous reserve** and 60 seconds later for **fast instantaneous reserve**.
- B39. The **ancillary service agent** must ensure that the data recorded by the monitoring equipment under paragraph B38 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**.
- B40. The **ancillary service agent** may provide an independently verified error range for data it provides to the **system operator** under paragraph B39, which the **system operator** must have regard to in any assessment of the **ancillary service agent's** compliance with performance requirements using the data.
- B41. For hydro **generating stations**, the data referred to in paragraph B38 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**. For other **generating stations** providing **partly loaded spinning reserve**, the data referred to in paragraph B38 must be measured, recorded and provided by **generating unit**.
- B42. The **ancillary service agent** must maintain the monitoring equipment in accordance with good industry practice.

## Offer requirements for instantaneous reserve

- B43. If the **system operator** reasonably believes- that the maximum quantities of **fast instantaneous reserve** and **sustained instantaneous reserve** 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 **fast instantaneous reserve** and **sustained instantaneous reserve** specified in the **ancillary service** procurement contract. -The **system operator** must use reasonable endeavours to contact the **ancillary service agent** and discuss the matter prior to providing such notice, but any failure to do so does not invalidate the notice;
- B44. If at any time the **system operator** is not satisfied (acting reasonably) that the **ancillary service agent** can meet the relevant performance requirements then:
- B44.1 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** until and unless it has provided evidence that demonstrates to the **system operator's** reasonable satisfaction that it can meet the performance requirements;

- B44.2 **reserve offers** submitted by the **ancillary service agent** (or any **reserve offers** relating to specific equipment) are deemed not to be submitted pursuant to a valid and enforceable contract with the **system operator** and must not be accepted by the **system operator**; and
- B44.3 if such reserve offers are in the price-responsive schedule or the non-response schedule (as the case may be), the system operator may require the removal of such reserve offers from the relevant price-responsive schedule or non-response schedule (as the case may be).

## Special testing requirements for instantaneous reserve

- B45. For **interruptible load**, the **ancillary service agent** must either:
  - B45.1 conduct an **end-to-end test** of all items of equipment it uses for providing **interruptible load**; or
  - B45.2 have demonstrated fully compliant operational performance of that equipment by responding to an **under-frequency event**,  
at least once every 12 months.
- B46. The scope of the **end-to-end test** must be agreed between the **ancillary service agent** and the **system operator** and may not 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.
- B46A. For **generation instantaneous reserve, and interruptible load provided by battery energy storage systems, other than interruptible load**, the **ancillary service agent** must conduct a **baseline test** of the relevant equipment used to provide **instantaneous reserve**:
  - B46A.1 at least once every four years for analogue equipment and non-self-monitoring digital equipment;
  - B46A.2 at least once every ten years for digital equipment.
- B46B. For the avoidance of doubt, a **baseline test** for **instantaneous generation reserve, and interruptible load provided by battery energy storage systems, other than interruptible load**, may be combined with testing required under Schedule 8.3, Technical Code A, Appendix B, Clause 2 of the Code.
- B47. The **ancillary service agent** must not submit **reserve offers**:
  - B47.1 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 B45;
  - B47.2 for **instantaneous reserve**, other than **interruptible load**, unless it has conducted and passed the **baseline test** of the relevant equipment in accordance with paragraph B46A.
- B48. For the avoidance of doubt—
  - B48.1 there are no other **baseline tests** for equipment used to provide or monitor **instantaneous reserve**; and
  - B48.2 paragraphs B44.2 and B44.3 apply to any **reserve offers** submitted in breach of paragraph B47.
- B49. An **end-to-end test, baseline 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 B32, or such lesser performance requirements as the **system operator** may determine in consultation with the **ancillary service agent**.

- B50. An **end-to-end test, baseline test, or on-demand test** of monitoring equipment must verify whether or not the monitoring equipment meets the performance requirements in paragraph B37.

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