

Procurement Plan 2021

Consulting on changes to enable battery
energy storage systems and other
improvements to procurement of ancillary
services

Consultation paper

Submissions close at **5.00pm** on **Tuesday 7 December 2021**

9 November 2021



Executive summary

Clause 8.42A(1) of the Electricity industry Participation Code 2010 (Code) requires that the system operator conduct a full review of the ancillary services procurement plan at least once every 2 years. After carrying out a review, the system operator has decided to propose a number of amendments to the current procurement plan.

On 24 September 2021, the system operator advised the Electricity Authority (Authority) of its decision and submitted a draft procurement plan and supporting information to the Authority. Before deciding whether to approve the draft procurement plan, the Authority must consult on the proposed amendments.

The system operator proposes to amend:

- the ancillary services procurement methodologies and processes, detailed in the main body and Appendix A of the procurement plan
- the technical requirements, detailed in Appendix B of the procurement plan, for each of the ancillary services:
 - frequency keeping
 - instantaneous reserve
 - over frequency reserve
 - black start
 - voltage support.

In addition, the draft procurement plan includes changes intended to align with a Code amendment developed by the Authority that will enable energy storage systems (ESSs) to provide instantaneous reserve while discharging. The Code currently does not allow this and this represents a regulatory gap. Developments in new technologies, particularly in battery ESS, and corresponding investment announcements in large battery technology, are occurring with increasing frequency.

While the proposed Code amendment is technology neutral, it requires a complementary amendment to the ancillary services procurement plan to give effect to specific ESS technologies. This will initially focus on battery ESSs that can meet the system operator's technical requirements for instantaneous reserve. Future procurement plan amendments will be required to enable aggregations of smaller, distributed battery ESSs – and other ESS technologies – to participate in ancillary services markets.

Some of the proposed amendments may trigger consequential changes to ancillary services procurement contracts. Any such changes will be implemented as and when the relevant procurement contracts become due for renewal.

This consultation paper relies on supporting information provided by the system operator, particularly the system operator's view regarding the objectives, alternative means of providing, and the costs and benefits of the proposed changes.

The Authority will consider all submissions received, including the system operator's should it wish to provide a submission or, having reviewed other submissions, a cross submission. Once finalised, the procurement plan will take effect when it is adopted by the Authority by giving notice in the Gazette. The Authority expects to be able to do this by 1 April 2022.

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1 What you need to know to make a submission

What this consultation paper is about

- 1.1 The purpose of this paper is to consult with interested parties on the Authority's proposal to adopt the changes to the procurement plan proposed by the system operator.
- 1.2 The system operator's procurement plan plays a key role in the set of rules, contracts and other arrangements that collectively deliver common quality and orderly system operation.
- 1.3 The procurement plan sets out, for each ancillary service, the principles that the system operator will apply, and the process that the system operator will follow, in assessing the quantity required to be purchased for each service. The procurement plan also sets out the proposed approach to procuring the ancillary services it needs and the key terms the system operator intends to include in the contracts it negotiates with ancillary service providers.
- 1.4 On 24 September 2021, the system operator submitted a draft procurement plan to the Authority to apply from 1 April 2022. The amendments, if adopted, would result in a procurement plan that:
 - (a) improves the reliability of ancillary service arrangements through enhancements to:
 - (i) frequency keeping
 - (ii) instantaneous reserve
 - (iii) over frequency reserve
 - (iv) black start
 - (v) voltage support.
 - (b) enables a battery energy storage system (battery ESS) to exercise its unique capability to offer instantaneous reserve across its full capacity range, from charging at its full rate of charge to discharging at its full rate of discharge, and any state in between
 - (c) is generally clearer and easier to understand, thereby reducing uncertainty and risk.
- 1.5 The procurement plan is a document incorporated by reference into the Code in accordance with the Electricity Industry Act 2010 (Act). The process for amending or replacing the procurement plan is governed by clauses 8.42A to 8.44 of the Code, and generally by Schedule 1 of the Act.
- 1.6 Clause 8.44 requires that the Authority consult on a draft procurement plan submitted to the Authority by the system operator. This consultation paper has been prepared to fulfil that obligation.

How to make a submission

- 1.7 The Authority is required to provide a copy of all the submissions it receives to the system operator, and to publish the submissions, which it will do by making them available on the Electricity Authority website and notifying interested persons through *Market Brief*.

- 1.8 The Authority's preference is to receive submissions in electronic format (Microsoft Word) in the format shown in Appendix A. Submissions in electronic form should be emailed to battery@ea.govt.nz with "Consultation Paper – Procurement Plan 2021" as the subject line.
- 1.9 If you cannot send your submission electronically, post one hard copy to either of the addresses below, or fax it to 04 460 8879.

Postal address

Procurement Plan Submissions
Electricity Authority
PO Box 10041
Wellington 6143

Physical address

Procurement Plan Submissions
Electricity Authority
Level 7, Harbour Tower
2 Hunter Street
Wellington

- 1.10 Please note the Authority wants to publish all submissions it receives. If you consider that we should not publish any part of your submission, please:
- (a) indicate which part should not be published
 - (b) explain why you consider we should not publish that part
 - (c) provide a version of your submission that we can publish (if we agree not to publish your full submission).
- 1.11 If you indicate there is part of your submission that should not be published, we will discuss with you before deciding whether to not publish that part of your submission.
- 1.12 However, please note that all submissions we receive, including any parts that we do not publish, can be requested under the Official Information Act 1982. This means we would be required to release material that we did not publish unless good reason existed under the Official Information Act to withhold it. We would normally consult with you before releasing any material that you said should not be published.

When to make a submission

- 1.13 Please deliver your submissions by **5pm** on Tuesday **7 December 2021**.
- 1.14 We will acknowledge receipt of all submissions electronically. Please contact the Authority info@ea.govt.nz or 04 460 8860 if you don't receive electronic acknowledgement of your submission within two business days.

2 The system operator proposes to amend the current procurement plan

The system operator has reviewed the procurement plan

- 2.1 The procurement plan is the system operator's plan for procuring ancillary services. Clause 8.42A(1) of the Code requires the system operator to review the procurement plan at least once every two years.
- 2.2 The Authority was last notified of a review of the procurement plan in 2020. The Authority consulted on the amendments proposed by the system operator as required by clause 8.44(1). After considering submissions and a cross submission from the system operator, the Authority decided to amend the procurement plan and duly provided notice of the amended procurement plan in the *Gazette*. Accordingly, the current procurement plan has been in effect since 1 December 2020.
- 2.3 The system operator has now notified the Authority of the results of its most recent review, as required by clause 8.42A(1). The system operator advised the Authority that the focus of its review was to:
- (a) implement changes to the procurement plan consequential to the Authority's draft decision to amend the Code to enable an energy storage system (ESS) to offer instantaneous reserve while discharging¹
 - (b) in respect of each ancillary service, ensure that the procurement plan remains fit for purpose.
- 2.4 As part of its review, in August 2021, the system operator invited comments from participants as required by the Code and received five submissions, one of which was submitted in confidence. The 4 parties that provided non-confidential submissions to the system operator were:
- (a) Mercury Energy
 - (b) Contact Energy
 - (c) SolarZero
 - (d) EnelX.
- 2.5 The system operator's review findings, and its consideration of the submissions it received, are reflected in the draft procurement plan it submitted to the Authority on 24 September 2021.
- 2.6 Having received the system operator's draft procurement plan and the supporting information required under clause 8.42A(2), the Authority is now consulting on the draft procurement plan in accordance with clause 8.44.

The issues being addressed by the changes

- 2.7 The following paragraphs provide a high level description of the proposed amendments to the procurement plan for each of the ancillary services. The system operator provided

¹ The Authority consulted on a proposal to amend the Code from 8 April 2021 to 6 May 2021, see: <https://www.ea.govt.nz/development/work-programme/evolving-tech-business/batteries-as-instantaneous-reserve/consultations/>. The Authority subsequently decided to amend the Code, subject to complementary amendments being made to the procurement plan, see: <https://www.ea.govt.nz/development/work-programme/evolving-tech-business/batteries-as-instantaneous-reserve/development/>.

further context and rationale for each of the proposed amendments when it consulted with participants in August 2021.²

Frequency keeping

2.8 If adopted, the proposed changes to frequency keeping would:

- (a) introduce a requirement for back-up single provider frequency keeping providers to conduct a pre-contract technical review
- (b) introduce a maximum response time for back-up single provider frequency keeping
- (c) increase monitoring requirements for back-up single provider frequency keeping;
- (d) introduce a requirement for measurement accuracy for single provider frequency keeping when monitoring frequency time error
- (e) increase and align the data retention requirements for both multiple and back-up single provider frequency keeping
- (f) align single provider frequency keeping requirements for block and station dispatch groups with multiple provider frequency keeping
- (g) align offer timeframe requirements with the current gate closure period requirements
- (h) introduce additional dispatch requirements
- (i) introduce responsibilities to share data with the system operator associated with special testing.

Instantaneous reserve

2.9 The changes proposed to instantaneous reserve intend to:

- (a) improve certain provisions related to performance requirements, monitoring, periodic testing and data sharing
- (b) make complementary changes that give effect to the Authority's draft decision to amend the Code to enable battery ESS to offer instantaneous reserve while discharging.

2.10 If adopted, the proposed changes to instantaneous reserve would:

- (a) introduce performance requirements for the different forms of instantaneous reserve
- (b) increase instantaneous reserve monitoring
- (c) reduce the frequency of periodic testing of equipment used to provide interruptible load other than that provided by battery ESS
- (d) introduce a requirement for instantaneous reserve equipment to be tested upon completion of changes to equipment that could impact its instantaneous reserve performance
- (e) make distinctions between requirements for generation reserve and interruptible load provided by battery ESS and interruptible load other than that provided by battery ESS

² The system operator's August 2021 consultation paper is attached as Appendix E.

- (f) introduce responsibilities to share data with the system operator associated with special testing and responses to under-frequency events.

Over frequency reserve

2.11 If adopted, the proposed changes to over frequency reserve would:

- (a) reduce the frequency of periodic testing of over frequency reserve equipment
- (b) introduce data sharing responsibilities associated with special testing.

Black start

2.12 If adopted, the proposed changes to black start would:

- (a) introduce requirements for ancillary service agents to notify the system operator upon rectification of an issue causing failure to perform black start
- (b) reduce the baseline testing requirements for black start equipment.

Voltage support

2.13 If adopted, the proposed changes to voltage support would:

- (a) introduce responsibilities to share data with the system operator associated with special testing.

Potential Future Procurement Plan Changes

2.14 The system operator's review highlighted a number of other issues that will require further investigation, possibly resulting in future changes to the procurement plan.

2.15 For participant information only (i.e., these topics are not discussed further in this consultation paper), the possible future changes identified by the system operator relate to:

- (a) single provider frequency keeping provision methodology
- (b) single provider frequency keeping performance requirements
- (c) interruptible load over-delivery
- (d) classifications for instantaneous reserves
- (e) additional requirements for tail water depressed reserve
- (f) incorporating references to companion guides.

2.16 Please note that these are potential topics only and more or less topics may come to light once further reviews have been carried out. The system operator's August 2021 consultation paper provides further context for its future procurement plan work program. A copy is attached as Appendix E.

3 The Authority is now consulting on the system operator's draft procurement plan

3.1 Before deciding whether to approve the draft procurement plan, the Authority must consult on the proposed amendments.

3.2 The consultation process is different from the process for making a Code amendment. This is because:

- (a) the procurement plan consultation process is specifically provided for in the Code rather than the Act
 - (b) the amendments are developed and proposed by the system operator, not the Authority
 - (c) the procurement plan is a document incorporated by reference into the Code under section 32(3) and Schedule 1 of the Act.
- 3.3 In preparing this consultation paper, the Authority has drawn on the material submitted by the system operator in support of the draft procurement plan, including:
- (a) the material the system operator published as part of its engagement with participants during the review process
 - (b) the information the system operator provided about the proposed amendments, which is included in this consultation paper as Appendix B
 - (c) the feedback provided to the system operator in the 4 non-confidential submissions it received, and the system operator's consideration of those views; a table of the submissions received is included in Appendix C.

4 The Authority has evaluated the draft procurement plan amendments

The system operator's proposed amendments

- 4.1 The amendments proposed by the system operator following its review are set out in clean and tracked change versions, attached as Appendix D.
- 4.2 Appendix B fulfils the system operator's requirement under 8.42A(2)(a)–(c) to provide:
- (a) an explanation and a statement of the objectives of the proposed change
 - (b) an evaluation of the costs and benefits of the proposed change
 - (c) an evaluation of alternative means of achieving the objectives of the proposed change.
- 4.3 Appendix C fulfils the system operator's requirement under clause 8.42A(2)(d) to provide a list of the persons consulted and a summary of the submissions received.

The objectives of the proposed amendments are to improve and expand the procurement of ancillary services

- 4.4 The objective of reviewing the procurement plan is to ensure ancillary services continue to be procured competitively, reliably and efficiently.
- 4.5 More specifically, drawing from the supporting material submitted by the system operator, the objectives of the proposed procurement plan amendments include:
- (a) reducing ancillary service costs by enabling more competitive and efficient ancillary service procurement
 - (b) reducing system operator administrative costs
 - (c) improving reliability through enhanced ancillary service monitoring and testing
 - (d) ensuring the procurement plan reflects actual practice and processes

- (e) providing a procurement plan that is clearer and easier to understand, thereby reducing uncertainty and risk
- (f) aligning with a draft Code amendment to enable battery ESS owners to offer instantaneous reserve while discharging.

The benefits are expected to outweigh the costs

- 4.6 The Authority has considered the costs and benefits of the individual amendments proposed by the system operator, drawing on the material submitted with the draft procurement plan.
- 4.7 The Authority considers that the proposal to replace the existing procurement plan with the draft procurement plan included in Appendix D would meet the objectives summarised in paragraph 4.5 above, and as set out in Appendix B for each specific proposed amendment.
- 4.8 The Authority accepts the system operator's determination that there should be few identifiable costs arising for ancillary service providers. This is because the proposed amendments are broadly administrative in nature and/or reflect current practice.
- 4.9 While the overall magnitude of the costs and benefits is difficult to quantify, the Authority's view is that the benefits of the proposal would outweigh any costs. Further, with respect to the part of the proposed amendments to enable a battery ESS to offer instantaneous reserve while discharging, we note that the Authority's own analysis of the costs and benefits of that specific change has revealed strong quantified net benefits. That analysis was included in paragraphs 3.11 to 3.28 of this consultation paper: <https://www.ea.govt.nz/assets/dms-assets/28/Consultation-Paper-Battery-Energy-Storage-Systems-Offering-Reserve.pdf>
- 4.10 However, the Authority is cautious that changes that seem small may have implications for participants of which it is unaware. The Authority therefore invites stakeholders to comment on the assessment of the costs and benefits of the proposal.

Q1. Do you agree with the Authority's overall assessment of the proposal? If not, what alternative assessment would you make and why?

The Authority invites comments on alternatives

- 4.11 Appendix B provides a column in the table submitted by the system operator that provides the system operator's views on alternative means to the amendments it has proposed.
- 4.12 The Authority acknowledges the system operator's views but understands that other alternatives may exist that have not been identified, and therefore invites stakeholder feedback on alternative means.

Q2. Are there alternative means to any of the individual amendments proposed by the system operator that you consider better meet the proposal objectives? If so, please describe the alternative and why you prefer it.

- 4.13 The Authority also invites stakeholder feedback on the technical drafting proposed by the system operator to give effect to the amendments.

Q3. What comments do you have on the proposed drafting of the amendments, as set out in Appendix D? If you disagree with the drafting or can suggest improved drafting, please provide this.

The Authority proposes to replace the procurement plan in its entirety

- 4.14 The process of amending the procurement plan allows the Authority to choose whether to amend the current procurement plan or replace it in its entirety. The Authority bases its decision on the extent of the amendments proposed by the system operator.
- 4.15 In this case, the Authority proposes to replace the existing procurement plan in its entirety with the draft procurement plan set out in Appendix D, incorporating any further amendments the Authority may make following this consultation.

Appendix A Format for submissions

Submitter	
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Question	Comment
<p>Q1. Do you agree with the Authority's overall assessment of the proposal? If not, what alternative assessment would you make and why?</p>	
<p>Q2. Are there alternative means to any of the individual amendments proposed by the system operator that you consider better meet the proposal objectives? If so, please describe the alternative and why you prefer it.</p>	
<p>Q3. What comments do you have on the proposed drafting of the amendments, as set out in Appendix D? If you disagree with the drafting or can suggest improved drafting, please provide this.</p>	

Appendix B Information submitted by the system operator in support of its draft procurement plan

- B.1 The system operator included the following table in its draft procurement plan submission to the Authority.
- B.2 This information includes an explanation of each proposed change, a statement of its objectives, an evaluation of the costs and benefits and an evaluation of alternative means of achieving the objectives. This information is required by clause 8.42A(2).

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
4	4	Reference to Code clause changing to reflect Code change. 8.43(1) has been changed to 8.43	House Keeping	None.	None.	None.
28	28	Wording has been generalised to make the pre-contractual technical review a requirement for parties wishing to provide single provider frequency keeping as well as maintaining the current requirement for multiple provider frequency keeping.	Introducing consistency between the requirements for single and multiple provider frequency keeping.	Status Quo.	Consistency of requirements across both frequency keeping services.	None.
51	51	Corrected the defined term from "Alternative Ancillary Service" to "Alternative Ancillary Service Arrangement".	House Keeping	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
58	58	Corrected the defined term from "Alternative Ancillary Service" to "Alternative Ancillary Service Arrangement".	House Keeping	None.	Clarity.	None.
A3	A3	The definitions of "MFK transition trading period" and "SFK transition trading period" (formerly "SFK return trading period") have been removed from this clause and added to Appendix D.	Improving clarity of the clauses and specificity of the definitions.	None.	Clarity.	None.
A4	A4	Simplified wording to clarify communication requirements for MFK and SFK transition trading periods.	Improving clarity of the clause	None.	Clarity.	None.
A5	A5	Simplified wording to clarify communication requirements for MFK and SFK transition trading periods.	Improving clarity of the clause	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B3.1	B3.1	Additional wording added to define the timeframe within which a single provider frequency keeper must commence a response to eliminate a grid frequency error.	Currently the requirement for single provider frequency keeping is only specified in the companion guide. This change makes response time a contractual obligation.	None.	Ensures all frequency keeping providers respond to eliminate grid frequency error with the same minimum response rate.	None, as this is formalising current practice.
B3.2	B3.2	Simplified wording to clarify the response rate requirement for single provider frequency keepers when the frequency is outside normal band.	The "normal band" is well defined and therefore it is unnecessary to define what is outside the normal band.	None.	Clarity.	None.
B3.3	B3.3	Added "act to" to clarify requirement for single provider frequency keepers to maintain frequency within normal band.	It is possible for single provider frequency keepers to be generating at the edge of their frequency keeping band and the frequency still exits the normal band.	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B3.4	B3.4	Added "act to" to clarify requirement for single provider frequency keepers to eliminate grid frequency error.	It is possible for single provider frequency keepers to be generating at the edge of their frequency keeping band and not be able to eliminate the grid frequency error.	None.	Clarity.	None.
B6	B7	The requirement for frequency keeping equipment to be maintained in accordance with good industry practice has been relocated for consistence with the other services.	House Keeping.	None.	Clarity.	None.
B10.1	B10.1	Increased the monitoring requirements for FK output when providing single provider frequency keeping.	This aligns the monitoring requirement applied to multiple frequency keeping. Additionally, one second data is also the same granularity of SCADA data.	Status Quo.	Consistency of requirements across both frequency keeping services.	Minimal, as many of the single provider frequency keepers also provide multiple provider frequency keeping.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B10.2	B10.2	Increases the monitoring requirements for frequency when providing single provider frequency keeping.	This aligns the monitoring requirements with the granularity of SCADA data.	Status Quo.	Improves the visibility of single provider frequency keeping performance.	It is possible that some single provider frequency keeping providers will incur costs improving their monitoring equipment. However, many providers already have equipment that meets or exceeds the new requirements.
B10.3	B10.3	Introduces an accuracy requirement for single provider frequency keeping providers monitoring frequency time error.	This aligns with B10.3 with B10.1 and B10.2 which already contains accuracy ranges for each measurement.	Status Quo.	Improves the accuracy of the monitoring of frequency time error.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B11	-	The requirement for single provider frequency keeping providers to retain data recorded by the monitoring equipment has been removed and merged with the same requirement for multiple provider frequency keepers. See New Clause 13.	Introducing consistency between the requirements for single and multiple provider frequency keeping.	None.	Consistency of requirements across both frequency keeping services.	None.
B14	-	The requirement for multiple provider frequency keeping providers to retain data recorded by the monitoring equipment has been removed and merge with the same requirement for single provider frequency keepers. See New Clause 13.	Introducing consistency between the requirements for single and multiple provider frequency keeping.	None.	Consistency of requirements across both frequency keeping services.	None.
B15	-	The requirement for multiple provider frequency keeping providers with block or station dispatch capabilities to be treated as allocated frequency keeping units has been moved to New Clause 14 in order to extend the	Introducing consistency between the requirements for single and multiple provider frequency keeping.	None.	Consistency of requirements across both frequency keeping services.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
		requirement to single provider frequency keepers.				
B17	B16	Updated frequency keeping offer requirements for consistency with the gate closure period as defined in Part 1 of the Code.	Improving clarity and consistency with Code definitions.	None.	Consistency with the Code.	None.
B19	B18	Replaced defined term: <i>single provider frequency keeping with back-up SFK</i> as the clause specifically refers to the ancillary services procurement contract schedule.	House Keeping.	None.	Clarity.	None.
-	B28	Introduces a requirement for frequency keeping units to be connected and able to perform frequency keeping	To ensure the service is provided for the full period that the frequency keeping units are dispatched, without any lag.	Status Quo.	Improves performance for all frequency keeping providers.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
		from the start of a dispatched trading period.				
B28A	B29	This clause has been updated to require that the baseline test conducted by frequency keeping providers prior to being dispatched must be to the reasonable satisfaction of the System Operator.	This addition prevents the System Operator from holding frequency keeping providers baseline testing to an unrealistic standard. This also maintains consistency with other special testing requirements.	None.	None.	None.
B28B	B30	Clarifying wording to emphasise that four yearly baseline testing is specific to multiple provider frequency keeping.	This change hasn't resulted in any functional change but has clarified the frequency of baseline testing required for multiple provider frequency keeping providers.	None.	Clarity.	None.
B29	B31	Clarifying wording to emphasise that six monthly baseline testing is specific to single provider frequency keeping.	This change hasn't resulted in any functional change but has clarified the frequency of baseline testing required for single provider frequency keeping providers.	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
-	B35	Introduces a requirement for ancillary service agents to provide results of frequency keeping testing to the System Operator.	This prevents the System Operator from having to send out request notices each time an Ancillary Service Agent conducts testing at an FK site.	None.	Automates data collection processes which are currently manual.	None.
B32	B36 – B39	Clause B32 has been split into B36 – B39 for clarity.	House Keeping.	None.	Clarity.	None.
-	B37.2.1	Introduces performance requirements for <i>interruptible load other than that provided by battery energy storage systems</i> providing fast instantaneous reserve.	This shifts the fast instantaneous reserve performance requirements for <i>interruptible load other than that provided by battery energy storage systems</i> from the definition of interruptible load under Part 1 of the Code.	None.	Clarity.	None.
-	B37.2.2	Introduces performance requirements for <i>interruptible load other than that provided by battery energy storage systems</i> providing sustained instantaneous reserve.	This shifts the sustained instantaneous reserve performance requirements for <i>interruptible load other than that provided by battery energy storage systems</i> from the definition of interruptible	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
			load under Part 1 of the Code.			
-	B37.4	Introduces response requirements for <i>generation reserve, and battery energy storage systems</i> providing interruptible load.	This extends these requirements to all excluded generators and battery energy storage systems offering or intending to offer generation reserve, and/or battery energy storage systems providing interruptible load. These requirements are also currently located in Appendix A of Technical Code A.	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
-	B37.5	Introduces requirements for <i>generation reserve, and battery energy storage systems</i> providing interruptible load to remain connected to the grid.	This extends these requirements to all excluded generators and battery energy storage systems offering or intending to offer generation reserve, and/or battery energy storage systems providing interruptible load. These requirements are also currently located in Appendix A of Technical Code A.	None.	Clarity.	None.
B32.2	B38	A change has been made to this clause to specify that an ancillary service agent equipment providing instantaneous reserve can provide additional supply and reduce demand with the same equipment.	This change has been made to incorporate battery energy storage systems.	None.	Allows equipment to provide instantaneous reserve in both the load and generation functions.	None.
B33	B40	Changes have been made to specify that this clause is for <i>interruptible load other than that provided by battery energy storage systems</i> .	This change has been done to exclude battery energy storage systems from performing with existing interruptible load requirements.	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B35	B42	Changes have been made to specify that this clause is for <i>generation reserve, and interruptible load provided by battery energy storage systems.</i>	This change has been made to exclude battery energy storage systems from performing with existing interruptible load requirements.	None.	Clarity.	None.
B36	-	The definitions of UFE time and trip time have been removed from this clause and added to Appendix D.	This has been done to remove the clause and add clarity to the definitions.	None.	Clarity.	None.
B37	B43	This clause has replaced the existing B36 to increase the required monitoring resolution for both fast and sustained instantaneous reserves. Additionally, the requirements from Existing Clause B38 have been added to New Clause 43 for simplicity.	This change has been made to combine three of the monitoring requirement clauses for instantaneous reserves into a single clause.	Status Quo.	Improving the monitoring of both fast and sustained instantaneous reserve performance allows better understanding of providers responses during an under frequency event. Additionally, most IL providers use response to an event to meet	It is likely that some IR providers will incur costs improving their monitoring equipment. However, many providers already have equipment that meets or exceeds the new requirements.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
					their periodic testing requirements. This update to monitoring requirements will ensure that sufficient test data is provided to the system operator.	
B38	-	Combined into New Clause 43. Additionally, this clause has been altered and the extend the timeframe (pre and post -event) an ancillary services agent must provide data for.	This change has been made to align the content contained within New Clause 43 with current event evaluation processes.	None.	Clarity.	None.
B45	B50	Reducing the frequency of end-to-end testing on equipment used to provide interruptible load other than battery energy storage systems to once every 24 months.	This decreases the testing requirements without unduly affecting performance of the service.	None.	Clarity.	None, this change will likely decrease the cost of providing interruptible load by reducing the cost of testing.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B46	B51	Clarifying wording has been added to refer scope of end-to-end tests back to B47. This addition hasn't made a functional change.	House Keeping.	None.	Clarity.	None.
B46A	B52	Changes have been made to specify that this baseline testing clause is for <i>generation reserve, and interruptible load provided by battery energy storage systems.</i>	This change has been made to ensure battery energy storage systems providing interruptible load comply with the existing special testing requirements for generation reserve.	None.	Clarity.	None.
-	B53	This requirement has been added to require ancillary service agents to conduct a baseline test if any changes are made to their equipment that could impact their instantaneous reserve performance.	This change is needed as the System Operator needs visibility of the performance capability of reserves at all times. There is a significant risk if the capability of reserves changes within the contract period without the system operator being aware.	None.	Ensures that the performance capabilities of all instantaneous reserves are kept up to date.	None, as this is formalising current practice.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B46B	B54	Changes have been made to specify that this baseline testing clause is for <i>generation reserve, and interruptible load provided by battery energy storage systems</i> and that baseline tests must be used to validate the asset capability statement modelled response.	This change has been made to ensure battery energy storage systems providing interruptible load comply with the existing special testing requirements for generation reserve.	None.	Clarity.	None.
-	B57	Introduces requirement for ancillary services agents to provide the result of instantaneous reserve testing or under frequency event responses to the System Operator.	This avoids the System Operator from having to send out request notices each time an Ancillary Service Agent conducts testing on instantaneous reserve equipment or responses to an under-frequency event.	None.	Automates data collection processes which are currently manual.	None.
B54	B63	Reducing the frequency of over frequency reserve baseline testing to once every 24 months.	This decreases the testing requirements without unduly affecting performance of the service.	None.	Clarity.	None, this change will likely decrease the cost of providing over frequency reserve

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
						by reducing the cost of testing.
-	B66	Introduces requirement for ancillary services agents to provide the result of over frequency reserve testing to the System Operator.	This prevents the System Operator from having to send out request notices each time an Ancillary Service Agent conducts testing on over frequency reserve equipment.	None.	Automates data collection processes which are currently manual.	None.
-	B74	Introduces requirement for ancillary services agents to provide the result of voltage support testing to the system operator.	This prevents the System Operator from having to send out request notices each time an Ancillary Service Agent conducts testing on voltage support equipment.	None.	Automates data collection processes which are currently manual.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B66	B82	Unnecessary wording has been removed regarding the equipment subjected to monitoring requirements as well as an addition stating that an ancillary service agent must advise the system operator upon rectification of a failure preventing the provision of black start.	This aligns the requirements for black start with current operational practices.	None.	Improving communications.	None.
B67	B83	Simplified wording to clarify baseline testing requirements for black start equipment.	Improving clarity of the clause.	None.	Simplifying the requirements for providing baseline testing.	None.
B69	B84	This clause has been moved slightly for logical flow of the black start special testing requirement clauses. No functional changes have been made to this clause.	House Keeping.	None.	Clarity.	None.

Existing Clause #	New Clause #	Description of change	Objective	Alternatives	Benefits	Costs
B68	B85	Removing unnecessary wording about baseline tests for equipment used to provide or monitor black start. No functional changes have been made to this clause.	Improving clarity of the clause.	None.	Clarity.	None.
C24	C24	The definitions of baseline test has been removed from this clause and added to Appendix D. This definition has also changed.	Improving clarity of the clauses and specificity of the definitions.	None.	Clarity.	None.
C25.1	C25.1	The definitions of on-demand test has been removed from this clause and added to Appendix D. This definition has also changed.	Improving clarity of the clauses and specificity of the definitions.	None.	Clarity.	None.

Definition	Description of change	Objective	Alternatives	Benefits	Costs
allocated frequency keeping unit	This definition has been removed as it is no longer	House Keeping.	None.	Clarity.	None.

	used within the procurement plan.				
availability fee	This definition has been renamed from availability price for consistency with the ASPC Schedules.	House Keeping.	None.	Clarity.	None.
baseline test	This definition has been relocated for C24 with additional information for the sake of clarity.	This definition was changed to remove a circular reference with on demand test and end-to-end test.	Status Quo.	Clarity.	None.
battery energy storage system	Definition was added to specify a subgroup of energy storage system as defined by the Code.	The requirements in the procurement plan have only been contemplated for energy storage systems with an electro-chemical storage component.	None.	Increasing competition to the instantaneous reserve market.	None.
black start equipment	This definition has been updated to include wording previously added in the ASPC IR schedule.	House Keeping.	None.	Clarity.	None.
end-to-end test	Simplified wording for clarity.	Definition changed to remove a circular reference with baseline test and on demand test.	Status Quo.	Clarity.	None.

event fee	This definition has been renamed from event price for consistency with the ASPC Schedules.	House Keeping.	None.	Clarity.	None.
generating unit	Definition has been removed as changes to the Code has rendered the definition unnecessary.	House Keeping.	None.	Clarity.	None.
MFK period	This definition has been removed as it is not used within the Procurement Plan. The definition will be added to the ASPC MFK schedule.	House Keeping.	None.	Clarity.	None.
MFK technical review	This definition has been removed as it is no longer used within the Procurement Plan.	House Keeping.	None.	Clarity.	None.
MFK transition trading period	This definition has been relocated clause A3.1 to Appendix D.	Improving clarity of the clauses and specificity of the definitions.	Status Quo.	Clarity.	None.
on demand test	This definition has been relocated for C25.1 adding that it is at the specific request of the System Operator	Definition changed to remove a circular reference with baseline test and end-to-end test.	Status Quo.	Clarity.	None.

SFK period	This definition has been removed as it is not used within the procurement plan. The definition will be added to the ASPC back-up SFK schedule.	House Keeping.	None.	Clarity.	None.
SFK transition trading period	This definition has been renamed from SFK return trading period. Additionally, has be relocated from clause A3.1 to Appendix D.	Improving clarity of the clauses and specificity of the definitions.	Status Quo.	Clarity.	None.
single provider frequency keeping period	Removing unnecessary wording adding a minimum number of trading periods.	It is unlikely that a single provider frequency keeping provider will provide single frequency keeping for 24 trading periods in a continuous 30 day period. Therefore, this portion of the definition is being removed.	Status Quo.	Clarity.	None.
trip frequency	Changes have been made to this definition to exclude battery energy storage system.	This change has been done to ensure battery energy storage systems are subject to UFE time rather than trip time.	Status Quo.	Clarity.	None.

trip time	This definition has been relocated clause B36.2 to Appendix D. Additional changes have been made to specify trip time only relates <i>to interruptible load other than that provided by battery energy storage systems</i>	This change has been done to ensure battery energy storage systems are subject to UFE time rather than trip time.	Status Quo.	Clarity.	None.
UFE time	This definition has been relocated clause B36.1 to Appendix D.	Improving clarity of the clauses and specificity of the definitions.	Status Quo.	Clarity.	None.

Appendix C The system operator's summary of the submissions it received

- C.1 The system operator submitted the following table as supporting material. This information is required by clause 8.42A(2)(d) of the Code.
- C.2 The system operator consulted with participants included in the Authority's participant register, which may be accessed at: <https://www.ea.govt.nz/operations/industry-participants/participant-register/>
- C.3 Non-confidential submissions were received from Contact Energy, Mercury Energy, EneIX and solarZero.
- C.4 The system operator elected to submit respondents' full submissions.
- C.5 Commentary in the "Transpower's Response" column reflects the system operator's own views.

Q1. Do you agree with the proposed changes to the frequency keeping requirements?

Organisation	Comment	Transpower's Response
Contact Energy	Agree.	-
Mercury Energy	Yes.	-

Q2. Do you agree with the proposed changes to the instantaneous reserve requirements?

Organisation	Comment	Transpower's Response
Contact Energy	<p>Disagree.</p> <p>B37.2.2 The procurement plan still specifies that the sustained instantaneous reserve response must be sustained until instructed by the system operator (SO). This is not possible in practice for Interruptible Load (IL), as sites cannot sign up to participate with an unknown event duration, due to temperature / process / production implications. We have raised this issue previously and the SO procurement plan</p>	<p>As a result of this feedback we have amended clause B37.2.2 to cap the required sustained instantaneous reserve response to the lesser of 30 minutes or until instructed by the system operator. We have also added reasonable endeavours to maintain the sustained instantaneous reserve response after the 30 minute period for as long as the grid system frequency remains below the normal band.</p>

<p>consultation document from Nov 2019, section 3.31 discussed this issue and stated “Restoration times are already specified in the system operator’s Policy Statement, paragraph 17”. Our interpretation of this, and what we have applied in practice, is that sustained reserve response must be maintained for up to 30 minutes, based on the SO policy statement clause 17.1.6. We support the SO’s current approach to place participation requirements in one place within the procurement plan, so it would make sense for the 30 minute limit to be incorporated directly into the plan, rather than continue to rely on a link to the policy statement.</p> <p>B43.1 With respect to monitoring equipment at our generation stations, none of Contact’s existing stations can provide data at 0.02s intervals. As per our response to this requirement in last year’s review, Contact believes that 0.02s interval monitoring for IR is overly onerous. This timestamp is the industry standard for monitoring voltage performance, so we question the technical value of reducing from 0.1s to 0.02s when compared to the cost of implementing this. Any reduction in measuring intervals from the current requirements will come at a cost that would vary on a site by site basis. This cost is approximated at up to \$10000 per unit to upgrade or replace existing relays, and would need to be recovered through our reserve offers therefore increasing reserve costs.</p> <p>With respect to monitoring equipment for IL, Contact initially commenced participation in the IL market utilising off the shelf monitoring technology which delivered</p>	<p>Noted.</p> <p>As a result of this feedback we have reduced the monitoring requirements to specify that the monitoring equipment must</p>
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	<p>frequency and power data at 0.02s intervals. This technology was expensive, resulting in IL only being economic for larger industrial sites that were already providing IL. Utilising this technology constrained the ability to contract new IL. Last year Contact developed new IL metering technology to provide power and frequency interval data at 0.1s. At this time the SO was signalling in their procurement plan review a reduction from the required 1s data interval and we believe developing technology to deliver 0.1s interval data is reasonable. Increasing this requirement to 0.02s would restrict, if not completely inhibit, the ability to increase IL participation in the reserve market therefore inhibiting competition. As per above, we question the value of the 0.02s requirement when monitoring this type of response.</p>	<p>accurately measure and record the fast instantaneous reserve, at no greater than 0.1 second intervals.</p>
<p>EnelX</p>	<p>We are comfortable with the performance requirements set out in clause B37.2 as they relate to FIR and SIR provided by interruptible loads, as this is largely a formalisation of current practice.</p> <p>However, we seek clarification on how the proposed amendments are intended to apply to behind-the meter storage that is used to provide IR, e.g. a battery that is co-located with an industrial load. In such a scenario, the battery would be used to supply the industrial load when the site responds to an under-frequency event and, where the battery capacity is greater than the site's load requirements, could provide additional IR by exporting to the grid. This is the same as how an industrial customer might use a backup generator to help provide the IR service.</p>	<p>Noted.</p> <p>Due to the fact that this is an issue that can scale from grid-scale (behind the GXP level) right down to residential (behind the ICP level) there is further investigation to be done from a technical perspective before the system operator can confirm whether or not we are comfortable with the risk that comes from interpreting injection behind-the meter as interruptible load.</p>

The new Code definition of energy storage system does not distinguish between behind-the-meter and grid-connected systems. As a result, behind-the-meter storage may fall under the description of “interruptible load provided by battery energy storage systems” in the draft procurement plan. While the draft performance requirements, technical specifications and assessment of performance requirements for this category of IR providers might be suitable for grid-connected energy storage systems, they are not appropriate for behind-the-meter systems.

We recommend that the procurement plan be amended to clarify that loads using behind-the-meter energy storage systems to help provide the IR service are still loads, and are thus captured by the procurement plan requirements that relate to “interruptible load other than that provided by battery energy storage systems.” For simplicity and to avoid confusion, it may be best to create two new terms based on the type of controller needed to meet the requirements set out in the procurement plan, e.g.:

- Providers using switching controllers, which covers interruptible load (load only) and loads that use a form of behind-the-meter generation to help provide the service (including generators and energy storage systems).
- Providers using proportional controllers, which includes generation reserve and interruptible load provided by grid-connected battery energy storage systems.

When the Authority requested we produce changes to the Procurement Plan to accommodate the injection from battery energy storage systems we were to focus specifically at the grid-scale level. The Authority noted in their Code change consultation that there will be subsequent work to specifically consider aggregated or residential level battery energy storage systems. However, following the amendments and in the interim before the work on aggregation with the Authority is complete, any battery energy storage system that can demonstrate meeting the requirements set out in the Procurement Plan we would be comfortable incorporating the equipment into a AS Procurement Contract.

Noted. We will consider this comment as part of our subsequent workstream with the Authority on aggregated residential generation responses.

<p>While not common at present, interest in behind-the-meter battery storage systems is growing, particularly for large energy users. A requirement to install a proportional controller and meet the associated requirements in the procurement plan would present a significant barrier to the growth of this type of battery installation.</p> <p>We support the proposed amendments to clauses B.40.1 and B.40.2 to enable FIR and SIR delivery to be calculated from either the grid frequency falling to or below 49.2 Hz, or the trip time.</p> <p>We do not support the proposal that the measurement and recording requirements for FIR and SIR commence at not less than 60 seconds prior to the UFE time or trip time. At 0.02s granularity, this is a significant amount of data for providers to store, and it's not clear what utility this amount of data before a UFE provides. 15 seconds is a more reasonable requirement and is more in line with the approach taken in other frequency markets. For example, in Australia's NEM the recording requirement commences at least 5 seconds before the UFE time for the fast (6-second) service and at least 20 seconds for the slow (60-second) service.</p> <p>We also recommend amending clause B43.2 to be specific about when the obligation ceases (as clause B43.1 is for FIR) instead of "until the instantaneous reserve response ends". As SIR providers must sustain a response until instructed by Transpower, this may require an IR provider to capture and store a significant amount of data at one second intervals for an unknown period of time. Setting a specific timeframe</p>	<p>Noted.</p> <p>Noted.</p> <p>As a result of this feedback we have reduced the monitoring requirements to specify that the monitoring equipment must accurately measure and record the instantaneous reserve response commencing not less than 15 seconds prior to the UFE time or trip time as applicable. This change combined with the drop in required monitoring granularity should significantly ease the data storage requirements.</p> <p>The change that has been made to clause B37.2.2 is relevant to this point which has capped the required response to a sustained instantaneous reserve response to 30 minutes. Clause B43.2 specifies that monitoring and recording must continue until the instantaneous reserve response ceases which is now specified in B37.2.2.</p>
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	<p>(e.g. 15 minutes) makes the obligation clearer for providers and importantly enables them to configure their meters and systems to comply. If needed, any further data required for SIR performance verification beyond the 15-minute period can be provided in one-minute intervals.</p> <p>We support the drafting in clause B43.4 that allows recorded data to be aligned with the time-tagged frequency measurement from the same device if GPS time-tagging capability is not available.</p> <p>We seek Transpower’s clarification on when providers will be required to comply with these new monitoring and recording requirements. As an existing IR provider, Enel X will need to procure and replace all customer meters in order to comply. We recommend that Transpower allow existing providers to conduct a staged transition to the new meters over a 12-month period from the effective date of their next ancillary service procurement contract.</p> <p>We support the decision to decrease how often end-to-end testing must be conducted by interruptible load providers from 12 months to 24 months. We agree with Transpower’s conclusion that this change will reduce participants’ compliance requirements without unduly affecting performance of the service.</p>	<p>Noted.</p> <p>AS Procurement Contracts are effective of the Procurement Plan that is gazetted at the time of the contract’s execution. These changes are due to be gazetted in April 2022. Therefore, any contract executed after this date will be subject to new the new requirements.</p> <p>Noted.</p>
Mercury Energy	No – We recommend further Industry consultation and cost benefit analysis before proceeding with this change.	Noted.

	<p>B43: Monitoring function for the instantaneous reserves. The proposed changes to requirements of measurements accuracy is not realistic and can't be achieved by 72% of current equipment (28 machines out of 39), 28% (11 machines out of 39) possibly could meet requirements after modification. In a best-case scenario 72% of existing equipment could achieved 0.04 second intervals, but it still will not meet proposed requirements. Based on this we suggest reviewing the technical expectation in section B43 and consider more realistic requirements.</p>	<p>As a result of this feedback we have reduced the monitoring requirements to specify that the monitoring equipment must accurately measure and record the fast instantaneous reserve, at no greater than 0.1 second intervals.</p>
<p>solarZero</p>	<p>B37.4.2: We support a controlled response as agreed with the SO. We would not support a mandatory droop setting for battery technologies.</p> <p>B37.4.3: The statement <i>does not adversely affect the operation of the grid because of any of its non-linear characteristics or rate of change in output</i> is a broad. Some definition/guidance would be helpful.</p> <p>B43.1: 0.02s is too short in terms of monitoring the MW response. We would be keen to work with Transpower to define a longer timeframe that met Transpower's needs and also was feasible in terms of current technology.</p>	<p>Noted.</p> <p>Noted.</p> <p>As a result of this feedback we have reduced the monitoring requirements to specify that the monitoring equipment must accurately measure and record the fast instantaneous reserve, at no greater than 0.1 second intervals.</p>

Q3. Do you agree with the proposed changes to the over frequency reserve requirements?

Organisation	Comment	Transpower's Response
Contact Energy	Agree.	-
Mercury Energy	Yes.	-

Q4. Do you agree with the proposed changes to the voltage support requirements?

Organisation	Comment	Transpower's Response
Contact Energy	Agree. Regarding B73 , what on-demand tests does the SO propose for this service, are they modelled or system tests? There is nothing detailed in the Companion Guide to Testing.	On-demand tests are defined as baseline tests conducted at the request of the system operator. Due to the fact voltage support hasn't been procured in several contract cycles there aren't well defined testing procedures. However, if we determined it necessary to procure voltage support these testing procedures would be redefined in the companion guides.
Mercury Energy	Yes.	-

Q5. Do you agree with the proposed changes to the black start requirements?

Organisation	Comment	Transpower's Response
Contact Energy	Agree.	-
Mercury Energy	Yes.	-

Q6. What comments do you have on the intended future changes for single provider frequency keeping provision methodology?

Organisation	Comment	Transpower's Response
Contact Energy	No comment.	-
Mercury Energy	No comment.	-

Q7. What comments do you have on the intended future changes for single provider frequency keeping performance requirements?

Organisation	Comment	Transpower's Response
Contact Energy	Why are additional testing requirements required when the provider is already required to do regular testing?	We aren't intending to introduce additional testing rather reviewing the monitoring requirements during testing. Additional investigation is needed to determine what these reinforcements will be. We don't anticipate this will change the nature of the existing testing.
Mercury Energy	No comment.	-

Q8. What comments do you have on the intended future changes for interruptible load over-delivery?

Organisation	Comment	Transpower's Response
Contact Energy	<p>Contact has previously commented on this issue in past consultations, these comments still apply.</p> <p>We support option 1 (dynamic arm/disarm). This option directly addresses the issue and is a durable solution that can withstand future changes to the power system. In our experience, building the capability to manage dynamic arming/disarming of relays was immaterial relative to building the overall reserves market platform. Where existing providers do not currently dynamically arm/disarm relays, we believe Transpower could introduce a set</p>	Noted.

timeframe by which all participants must meet the requirement. In our view the importance of being able to dynamically follow dispatch instructions will increase in the future. There will be an increased reliance on this product to manage system security due to the decommissioning of conventional generation providers and to maximise reserve constrained HVDC transfer to replace this generation. Requiring providers to dynamically follow dispatch instructions would also be consistent with Transpower's interpretation of the Code, which as stated requires participants to comply with dispatch instructions by following dispatch to within 1MW.

When Contact first contracted IL, we understood the requirements placed on us to include dynamically arming/disarming. We have since learnt that this is not a mandatory requirement. The SO has mentioned in the consultation document that it can request information about the ability of IL equipment to dynamically arm/disarm, to help manage this issue. However, just because equipment can dynamically arm/disarm, it doesn't mean a provider will dynamically arm/disarm IL, now or in the future. Currently there is a disincentive for providers to arm/disarm, as there are no controls in place around over-delivery. Therefore, if an IL provider is only dispatched for part of their portfolio, the provider may as well leave the whole portfolio armed to decrease the risk of under delivery.

Therefore, we do not believe it is a reasonable assumption by the SO that just because equipment can arm/disarm, it will not respond in a UFE when that provider is not dispatched or partially dispatched.

Noted.

Mercury Energy	No comment.	-
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Q9. What comments do you have on the intended future changes for classifications for instantaneous reserves?

Organisation	Comment	Transpower's Response
Contact Energy	Contact understands that any additional classifications of IR that battery energy storage systems can offer are awaiting code change proposal approval, and we look forward to those proposals flowing through to future updates of the procurement plan.	Noted.
Mercury Energy	No comment.	-

Q10. What comments do you have on the intended future changes for additional requirements for tail water depressed reserve?

Organisation	Comment	Transpower's Response
Contact Energy	No comment.	-
Mercury Energy	No comment.	-

Q11. What comments do you have on the intended future changes for incorporating references to companion guides?

Organisation	Comment	Transpower's Response
Contact Energy	Does referencing requirements in the companion guides in the procurement plan make these a legal obligation? If yes, we would prefer to leave these as guidelines only as there needs to be flexibility in these requirements to manage case by case testing requirements.	Our current thinking is to incorporate references to the companion guides to demonstrate requirements that are to the satisfaction of the system operator. That would not exclude other methodologies from being considered.
Mercury Energy	No comment.	-

Appendix D Draft procurement plan amendment

- D.1 Copies of both clean (D1) and marked-up (D2) versions of the proposed procurement plan are available as separate documents on the Authority's website in the same location as this consultation paper.

Appendix E The system operator's August 2021 consultation paper

- E.1 A copy of the system operator's August 2021 consultation paper is available as a separate document on the Authority's website in the same location as this consultation paper.