Meeting date: 10 August 2023

CQTG meeting number 2 – briefing

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1. Objectives of CQTG meeting 2

1.1. The primary objectives of the second CQTG meeting are to:

(a) consider the Authority's assessment of:

(i) the medium list of options considered by the CQTG at its 6 July 2023 meeting

(ii) the 10 additional 'long list' options identified by the CQTG at its 6 July meeting

(b) agree a short list of options to address the identified common quality issues

(c) obtain feedback from the CQTG on the high-level scopes of 'no-regrets' system studies.

2. Meeting agenda

Time	Item
9.15 am	**Sign in at reception (to meet Rob Mitchell)**
9:30 am	**Meeting starts - Minutes and Actions from previous meeting (15 mins)**
9:45 am	**Assessment of options raised at the last CQTG meeting (45 mins)** • assessment of additional options against first evaluation criterion • more information needed regarding some of the additional options
10:30 am	**Morning tea (15 minutes)**
10:45 am	**Short list of options (90 mins)** • agreeing a short list of options
12:15 pm	**Lunch (45 minutes)**
1:00 pm	**Scoping studies - Frequency (60 mins)** • obtaining CQTG feedback on the high-level frequency-related scoping studies
2:00 pm	**Scoping studies - Voltage (55 mins)** • obtaining CQTG feedback on the high-level voltage-related scoping studies
2:55pm	**Next meeting (5 mins)**
3:00 pm	**End of meeting**

3. Status of actions

3.1. A summary of the action points is included below:

Action	Who	When	Status
• Incorporate feedback from the CQTG in the summary description of the first, second, third and fifth of the seven issues set out in the April 2023 Part 8 common quality issues paper.	Authority	14/07/2023	Completed
• Include in the long list of options the additional options agreed by the CQTG at its meeting 1.	Authority	14/07/2023	Completed
• Evaluate against the first of the seven evaluation criteria the options added to the draft long list during the CQTG's meeting 1.	Authority	28/07/2023	Partially completed
• Prepare a draft short list of options to address the Part 8 common quality issues.	Authority	28/07/2023	Completed
• Prepare draft scopes for 'no regrets' system studies for several options to address the Part 8 common quality issues.	System operator	03/08/2023	Completed
• Prepare draft scopes of work for allocating frequency keeping costs to the causers of frequency deviations, and reviewing the dispensations and equivalence arrangements framework.	Authority	03/08/2023	Closed
• Prepare a letter from the CQTG to MBIE, urging MBIE to prioritise proposing an amendment to the Electricity (Safety) Regulations, to permit the supply of electricity to installations operating at 230 volts AC to be within 10% of 230 volts AC	Authority	30/08/2023	

4. Revised summary description of four common quality issues

4.1. Following feedback from the CQTG at its 6 July 2023 meeting, the Authority has clarified the summary description of four of the seven common quality issues identified in the April 2023 issues paper. The clarifications are as follows:

(a) Issues 1 and 2 – to more clearly state that the issue arises because of increasing amounts of variable and intermittent resources, primarily in the form of wind and solar PV generation

(b) Issue 3 – to include the fall in system strength caused by the uptake of inverter-based resources

(c) Issue 5 – to include the current ambiguity over who manages harmonics, including the allocation of harmonics.

4.2. The table below shows the revised summary descriptions of the seven issues.

4.3. **Common quality issues**

Issue	Summary description of issue
Issue 1	• ~~Inverter-based~~An increasing amount of variable and intermittent resources, primarily in the form of wind and solar PV generation, is likely to cause more frequency fluctuations, which are likely to be exacerbated over time by decreasing system inertia
Issues 2, 3, 4	• An increasing amount of~~Inverter-based~~ variable and intermittent resources, primarily in the form of wind and solar PV generation, is likely to cause greater voltage deviations, which are exacerbated by changing patterns of reactive power flows • Increasing amounts of inverter-based variable and intermittent resources will~~can~~ reduce the transmission network's system strength thereby increasing~~e~~ the likelihood of network performance issues due to inverter-based resources disconnecting from the power system • Over time increasingly less generation capacity is expected to be subject to fault ride through obligations in the Code, as more generating stations export less than 30 MW to a network
Issue 5	• There is some ambiguity around the applicability of harmonics standards and who manages harmonics (including the allocation of harmonics)
Issue 6	• Network operators have insufficient information on assets wanting to connect, or which are connected, to the power system to provide for the planning and operation of the power system in a safe, reliable, and economically efficient manner
Issue 7	• The Code is missing some terms that would help enable technologies, and contains some terms that appear to not be fit for the purpose of appropriately enabling technologies

5. Assessment of the medium list of options

5.1. As agreed at the CQTG's 6 July 2023 meeting, the Authority has done the following:

(a) assessed the medium list of options considered at the 6 July meeting against evaluation criteria 2 – 7 in **Appendix B**

(b) assessed, where able, the 10 additional options raised by the CQTG at the 6 July meeting against evaluation criterion 1 in **Appendix B**

- *The option is feasible / implementable with little or no risk of unintended consequences.*

(c) for those additional options that pass this first assessment, assessed, where able, these options against evaluation criteria 2 – 7 in **Appendix B**.

5.2. When assessing the options against evaluation criteria 5 and 6, the Authority found it needed an additional evaluation rating to those presented at the 6 July meeting. As a result:

(a) criterion 5 now includes the following evaluation rating

Yes (✓)	Option is a causer-pays approach or beneficiaries-pay approach to providing the required service/output

(b) criterion 6 now includes the following evaluation rating

Somewhat (✓)	Theoretically possible for participants to decide how best to achieve the outcome

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5.3. The Authority also found that it required further clarification from the CQTG in relation to four of the 10 options:

(a) the two additional voltage-related options

(b) two of the information-related options.

5.4. The Authority has included this on the agenda for the 10 August 2023 CQTG meeting.

5.5. The Authority's assessment of options to address the identified common quality issues is in **Appendix A**.

5.6. The table below shows the options ranked from highest to lowest. The Authority has added comments against some of the options – on matters relevant to the CQTG's consideration of a short list of options.

5.7. The Authority seeks the CQTG's advice on an appropriate short list of options.

5.8. Ranking of options in the medium list following the Authority's assessment

Option	Option description	Score	Comment
4	Lower the minimum frequency keeping threshold below 4 MW and have a national market for frequency keeping	10	Over the next 12-24 months, the Authority plans to look at the regulatory settings for encouraging competition in frequency regulation services as part of a separate project to the review of common quality requirements in Part 8 of the Code. This option will be considered as part of the work to be undertaken in that separate project.
5	Allocate frequency keeping costs to the causers of frequency deviations	10	The Authority is looking at the regulatory settings for allocating frequency keeping costs as part of a separate project to the review of common quality requirements in Part 8 of the Code. This option will be considered as part of the work to be undertaken in that separate project.
3	Procure more frequency keeping to manage frequency within the normal band (49.8–50.2 Hz), and procure more instantaneous reserve to keep frequency above 48 Hz for contingent events and above 47 Hz (in the North Island) and 45 Hz (in the South Island) for extended contingent events	9	No change to Part 8 of the Code is required for the system operator to implement this option. However, a Code-permitted deadband beyond which a generating station must contribute to managing / supporting frequency has implications for the system operator's procurement of frequency keeping and instantaneous reserves. Therefore, this option is included in the 'no regrets' frequency system studies to be undertaken by the system operator.
7	Review the dispensations and equivalence arrangements framework (for frequency obligations)	9	The Authority will add a project to review the dispensations and equivalence arrangements to its prioritisation of projects for the financial year 1 July 2024 - 30 June 2025. Therefore, no consideration of this option is needed as part of the review of common quality requirements in Part 8 of the Code.
12	Review the dispensations and equivalence arrangements framework (for voltage obligations)	9	The Authority will add a project to review the dispensations and equivalence arrangements to its prioritisation of projects for the financial year 1 July 2024 - 30 June 2025. Therefore, no consideration of this option is needed as part of the review of common quality requirements in Part 8 of the Code.
21	New / amended / obsolete definitions are identified and addressed as part of the work on the common quality issues	9	The high ranking of this option is consistent with feedback received in submissions on the Common Quality Issues Paper.

Option	Option description	Score	Comment
35	Remove the obligation on the system operator to eliminate from the power system any deviations from New Zealand standard time caused by variations in system frequency	7	
8	Assign voltage support obligations to distributed energy resources (eg, by revising the 'point of connection' definition)	6	This option is included in the 'no regrets' voltage system studies to be undertaken by the system operator.
9	Manage the import and export of reactive power at a GXP (eg, by revising the GXP power factors distributors must maintain, as specified in the Connection Code)	6	This option is included in the 'no regrets' voltage system studies to be undertaken by the system operator.
19	Where a flexibility provider is providing a service to an asset owner, leave it to the flexibility provider rather than the asset owner to provide the network operator with the information required by the network operator to use the flexibility service	6	
14	Asset owners (grid-connected parties, grid owners, and embedded generators) are made responsible for managing the harmonics caused by their asset(s)	5 - 6	

Option	Option description	Score	Comment
1	Lower the 30 MW threshold for generating stations to be excluded by default from complying with the frequency-related asset owner performance obligations (AOPOs) referred to in cause 8.21 of the Code	4	This option is included in the 'no regrets' frequency system studies to be undertaken by the system operator.
10	Lower the 30MW threshold for generating stations to be excluded by default from complying with the fault ride through obligations referred to in cause 8.21 of the Code	4	This option is included in the 'no regrets' voltage system studies to be undertaken by the system operator.
11	Require alignment of voltage-related connection standards across distribution networks	4	The Authority will consider this option as part of a separate project that is reviewing the regulatory settings for distribution networks. Therefore, no consideration of this option is needed as part of the review of common quality requirements in Part 8 of the Code.
13	Locate up-to-date standard(s) for harmonics in one piece of legislation / regulation (eg, the Electricity Industry (Safety) Regulations 2010 or the Code)	4	Note the wording of this option has been amended slightly to refer to "up-to-date" harmonics standard(s).
15	Remove the first-mover advantage associated with total harmonic distortion (THD) by requiring the first mover to give up some of their share of THD	4	
16	Lower the deminimis for generating stations to provide real time operational data to the system operator, and require the same information to be provided to distribution network operators in relation to embedded generating stations	4	Relevant Code provision is clause 8.25(6), which says if the system operator reasonably considers it necessary to assist it in planning to comply, and complying, with the principal performance obligations and achieving the dispatch objective, the system operator may apply to the Authority to require an embedded generator to provide information regarding the intended output of a group of embedded generating stations that total greater than 10 MW in capacity and that are connected to the same grid exit point. If the Authority approves the system operator's request, the information must be provided to the system operator by the relevant embedded generator in a form and manner determined by the Authority. An embedded generator means a generator who owns or operates 1 or more embedded generating stations. An embedded generating station means 1 or more generating units that are directly connected to a local network or an embedded network and that injects into a local network or an embedded network at a single point of injection.
18	Require wind generation to undertake periodic testing and provide results to system operator and distribution network operators so they can keep their models up to date	4	Relevant Code provision is clause 1 of Appendix B of Technical Code A of Schedule 8.3, which says for the purposes of Appendix B (Routine testing of assets and automatic under-frequency load shedding systems), generating unit does not include a generating unit for which wind is the primary power source.
39	Require asset owners (grid-connected parties, grid owners, and embedded generators) to provide asset capability information, encrypted if required by the asset owner or its vendor, that network owners require to optimise their network investments	4	
2	Set a permitted dead band beyond which a generation station must contribute to frequency keeping and instantaneous reserve	3	This option is included in the 'no regrets' frequency system studies to be undertaken by the system operator.

Option	Option description	Score	Comment
17 & 20	Require asset owners (grid-connected parties, grid owners, and embedded generators) to provide asset capability information that network operators require to meet their regulatory obligations. This includes asset owners providing network operators with sufficiently detailed information so that there is no "black box" when the network operator comes to use the information for equipment performance assessment and checking compliance with technical requirements on the asset owner set out in the Code (eg, the system operator checking compliance with technical requirements in Part 8 of the Code)	2	
6	Put in place ramping limits on generation plant for post-disturbance or change-of-MW output (eg, due to wind gust or cloud covering)	0	

6. Scoping studies

6.1. At the first meeting, two sub-groups of the CQTG were formed to assist the Authority in scoping the 'no regrets' system studies related to the frequency and voltage issues noted in the issues paper.

6.2. The Authority seeks the CQTG's feedback on the high-level scope of these 'no-regrets' system studies.

Appendix A Part 8 common quality options assessment

A.1. Refer to the separate Microsoft Excel workbook.

Appendix B Part 8 common quality options assessment criteria

B.1. Refer to the separate PDF document.