

MINUTES OF CQTG MEETING 5

**Held on Monday 10 June 2024, 9:00am – 4.43pm
Electricity Authority office – Wellington**

Members present:	Sheila Matthews (Chair), Graeme Ancell, Matt Copland, Brent Duder-Findlay, Barbara Elliston, Mike Moeahu, Stuart MacDonald (9:00am-3:45pm, 3:54pm-end), Jon Spiller.
Virtual attendance:	Brad Henderson, Stuart Johnston (9:00am–9:59am, 11:27am–4:15pm) Rob Orange, Gareth Williams (9:00am-1:06pm, 2:37pm-4:11pm).
Apologies:	None.
In attendance:	Phillip Beardmore, Nyuk-Min Vong (Vong), Nasser Usman Faarooqui (9:31am-4:00pm), Clive Bull, Elzeth Grant-Fargie (9:00am-3:15pm), Chris Otton (2.07pm – 3:06pm), Rob Mitchell.

Introduction

- 1.1 The Chair welcomed attendees to the fifth meeting of the Common Quality Technical Group (CQTG). A quorum was established, with all members in attendance (including the Chair). Brad Henderson, Stuart Johnston, Rob Orange and Gareth Williams were attending virtually over Microsoft Teams.
- 1.2 The Chair provided an overview of the meeting agenda and the meeting's objectives.
- 1.3 The group approved the minutes of the third and fourth CQTG meetings.
- 1.4 The Chair provided an update regarding the open action item 1.7, which was recorded as "Prepare a letter from the CQTG to MBIE, urging MBIE to prioritise proposing an amendment to the Electricity (Safety) Regulations 2010, to permit the supply of electricity to installations operating at 230 volts AC to be within 10% of 230 volts AC". The Chair explained that the Authority would raise the issue with MBIE through other channels instead, and that action item 1.7 should be amended accordingly and remain open.

Action Item 5.1: CQTG chair to sign the minutes of the third and fourth CQTG meetings and publish the minutes on the Authority's website.

2. Part 8 Code amendment proposal paper – Part 1

FSR-001 (Periodic testing of wind generation)

- 2.1 Clive provided an overview of the proposed Code amendment, detailing the historical context that led to wind generation being excluded from the periodic testing requirements in the Code. Key points raised in the CQTG's discussion included:
- (a) Agreement that the historical reasons for the exclusion of wind generation from the periodic testing requirements are no longer valid, and the current exclusion is providing wind generation with an unfair advantage over other generation technologies.
 - (b) The wording in the Code should focus on the purpose of the periodic testing requirements (eg, demonstrating compliance with asset owner performance obligations (AOPOs)), to ensure the testing requirements capture emerging technologies instead of just existing technologies. For example, consider broadening the Code term 'control system' so it applies to all technologies – perhaps 'a control system is a system that dynamically adjusts control output signals in a programmed response to continuously changing input signals'.
 - (c) Support for making the periodic testing requirements in Part 8 of the Code output-focussed, with specific testing requirements placed in a standalone document (perhaps a document incorporated by reference into the Code that is managed by the system operator). The goal would be for this document to expand on the requirements in the Code, while reducing unnecessary transaction costs that arise with unenforceable testing guidelines.
 - (d) A guideline for connections and commissioning, which includes testing as part of commissioning, is currently being developed by the Electricity Engineers' Association.
 - (e) Consider applying periodic testing requirements to resources such as large dynamically-controlled loads and energy storage systems, in addition to new technologies that may not have been considered to this point.
 - (f) Consider developing a consistent de minimus resource capacity for compliance with periodic testing obligations across all technologies – 10MW was one suggestion.
- 2.2 The CQTG agreed the Authority should proceed with the Code amendment proposal.

Action Item 5.2: Proceed with the current Code amendment proposal.

Action Item 5.3: Look at broadening the term 'control system' in the Code in a way that can apply to all technologies – for example, a control system is a system that dynamically adjusts control output signals in a programmed response to continuously changing input signals.

Action Item 5.4: Authority to consider reviewing the periodic testing requirements, so that Part 8 of the Code contains high-level output-focussed obligations and specific testing requirements are placed in a separate document incorporated by reference into the Code.

FSR-002 (Provision of asset capability information to network owners and operators) and FSR-003 (Provision of dynamic models for control interactions investigation)

- 2.3 Nasser introduced the proposed Code amendments, and proposed Code amendments. A summary of the key points from the CQTG's discussion included:
- (a) Emphasis on the reluctance of original equipment manufacturers (OEMs) to provide unencrypted information, not just in New Zealand but globally. This is proprietary information and it's commercially sensitive, so if the Authority tries to require this information, then there would likely be unintended consequences. For instance, the information provided by OEMs may be altered and different versions may be provided to different parties.
 - (b) If the current proposal were to go ahead, there would need to be clauses to protect against OEMs that fail and are no longer able to support their equipment.
 - (c) An alternative proposal could be for the system operator to build enough of a model and seek input from specialist engineers at the OEMs to contribute to that model. This approach would need the system operator / grid owner to take a leading role, and the model would have to be confidential, with no risk of it becoming publicly available.
 - (d) In the case of parties causing or contributing to oscillatory issues, the Code does not go far enough to obligate those parties to support the system operator's studies into determining who the causer is, and what caused the issue.
 - (e) Whether distribution network operators would require access to the information too, when asset owners are connecting to their networks.
 - (f) Whether OEMs may be reluctant to provide information to the grid owner or distributors due to a perceived conflict of interest as they can make investments that financially affect developers' plans.
 - (g) Noted that the Code does not currently require information to be provided to all affected parties. In the Australian market, there are user guides with root-mean-square (RMS) level information on local generation. If you're connecting in a certain area, you can access the relevant user guide, to help gain an understanding of what the settings of the local generation mean.
 - (h) Noted that the system operator does not have an issue with modelling information from synchronous generators. The problem is that the Code does not place the relevant requirements on inverter-based resources.
 - (i) Noted that Transpower, as the main grid owner, requires modelling information for protection coordination settings. Transpower, as grid owner, uses electromagnetic transients (EMT) models to verify RMS models and for dynamic grid behaviour. This is to ensure that the models are representative of how the equipment will actually behave on the grid.
 - (j) Consideration on whether the system operator should be responsible for investigating issues caused by generators, or if the obligation should sit with another party instead.

- (k) An escrow agreement regarding open models between the OEM and Transpower may be possible, although those agreements should perhaps be facilitated through the asset owner.
- (l) The CQTG recommended that the Authority engages with asset owners, and possibly OEMs, to discuss the need to obtain unencrypted models.

2.4 The CQTG recommended that more work is done in relation to FSR-002 and FSR-003 before progressing these to the Code amendment stage. The Authority agreed to consider a revised approach for addressing these items.

Action Item 5.5: Authority to exclude FSR-002 and FSR-003 from the Code amendment proposal paper and consider a revised approach to moving these options forward.

FSR-004 (Embedded generation to provide an asset capability statement)

2.5 Rob Mitchell introduced the proposed Code amendment. Key points raised in the CQTG's discussion included:

- (a) What are the expected costs on asset owners to provide this information to the system operator? It would be minimal for the system operator to receive and store the information, but not necessarily for asset owners to provide this information to the system operator. SolarZero already provides this information and does not find it onerous because the inverters it uses are similar.
- (b) The need to consider introducing thresholds for this information, with a suggestion of aligning with the 1MW threshold at the point of connection to the grid or a local network specified in clause 8.21(2) of the Code. There will be larger generation, and also virtual power plants to take into account. We also need to align with the work being done by the Authority's Network Connection Technical Group (NCTG).
- (c) The usefulness of the information for the grid owner to assist in forward planning and coordination. If the information is already available, it makes sense to share it or allow access to multiple users rather than having to request it separately.

Action Item 5.6: Authority to progress this item and specify an appropriate (eg, 1MW) threshold at the point of connection that applies to both generation and load.

FSR-005 (Expand the definition of "causer" for an under-frequency event)

2.6 Rob Mitchell introduced the proposed Code amendment. The CQTG agreed with the intent but recommended amending the proposal to refer to the action or behaviour that triggers an under-frequency event (ie, someone either increasing load extremely quickly or decreasing generation output extremely quickly), rather than listing the types of participants that could cause an under-frequency event.

Action Item 5.7: Authority to amend the wording and progress this item.

FSR-006 (Specify that adjustable droop must be within the specified range)

- 2.7 Rob Mitchell introduced the proposed Code amendment. Key points raised in the CQTG's discussion included:
- (a) The difficulty in understanding whether the current range is future-proof. It may be necessary to update the range in the future at short notice. The Code currently requires the system operator to agree the droop settings with the asset owner, which provides some flexibility. However, this may result in unnecessary transaction costs if the system operator struggles to reach an agreement with the asset owner.
 - (b) Support for implementing a short-term improvement by specifying the range in the system operator's 'GL-EA-953' document rather than in the Code.
 - (c) Support for a new document incorporated by reference in the Code, which would cover the connection process and could include a section for droop requirements.
- 2.8 The CQTG recommended removing this proposal from the consultation paper and, for the time being, addressing it in the system operator's documentation instead.

Action Item 5.8: Authority to exclude the FSR-006 Code amendment proposal from the paper and consider whether droop settings are appropriately included in Part 8 of the Code or elsewhere (eg, a document incorporated by reference in the Code or in a system operator technical document).

FSR-007 (Amend the requirement for generating units to have a speed governor)

- 2.9 Elzeth introduced the proposed Code amendment. The CQTG agreed with the proposal.

Action Item 5.9: Authority to proceed with the proposal.

FSR-008 (Amend the requirement for generating units to have an excitation system)

- 2.10 Elzeth introduced the proposed Code amendment. The CQTG agreed with the proposal.
- 2.11 The CQTG also suggested revising the reference to 'voltage control mode' in clause 5(2)(a) of Technical Code A of Schedule 8.3 of the Code, as part of addressing the three key voltage-related issues. The purpose would be to require the asset owner to agree the voltage control mode and ensure that the asset operates continuously in the agreed voltage control mode.

Action Item 5.10: Authority to proceed with the proposal

Action Item 5.11 Authority to consider revising the reference to 'voltage control mode' in clause 5(2)(a) of Technical Code A of Schedule 8.3 of the Code, as part of addressing the three key voltage-related issues.

FSR-009 (Replace references to ‘static var compensators’ with ‘reactive compensation devices’)

2.12 Elzeth introduced the proposed Code amendment. The CQTG agreed with the proposal, although recommended using the term “dynamic reactive power compensation devices”.

Action Item 5.12: Authority to proceed with the proposal, subject to changing the term to “dynamic reactive power compensation devices”.

3. Battery Energy Storage Systems (BESS) obligations

3.1 Vong presented on the issues faced by the system operator in relation to BESS. The key points from the CQTG’s discussion included:

- (a) There is no specific category for BESS in the Code, so the system operator’s current approach is to define BESS as either load or generation based on the BESS’s activity (ie, charging or discharging) at the time.
- (b) The Code places different obligations on generation and load, and since a BESS can switch between the two near instantaneously, it makes it difficult to manage in real time for both the system operator and the BESS owner. This is compounded by the lack of real time data available to the system operator, and also the lack of clarity of requirements when the BESS is idle.
- (c) A recommendation from the CQTG to treat BESS as generation for the purposes of Part 8. This is intended to be a short-term solution to provide clarity and improve efficiency by simplifying the Part 8 requirements on BESS. The CQTG noted that this suggestion alone would not maximise the benefits that BESS can provide to the power system, and more work is needed to come up with a more comprehensive solution for BESS in the Code.
- (d) BESS provides new capabilities to the electricity market. The Authority should ensure that the Code is updated promptly to avoid constraining emerging technologies by requiring them to comply with outdated rules. The CQTG recommended focusing on the optimal product or service that can be obtained with a new technology, and then design the Code to enable it to be delivered.
- (e) Requiring a BESS to respond to frequency changes as part of its Part 8 common quality obligations means the BESS will have to cycle between charge and discharge many more times. This has a significant impact on the life of a BESS and therefore the expected profitability of a BESS. The impact on investment in BESS’s will need to be carefully considered.

Action Item 5.13: Authority to add a Code amendment proposal to treat BESS as generation for the purposes of Part 8.

4. Update on relevant workstreams from Operations Policy team

4.1 Chris Otton gave an oral summary of upcoming work by the Authority's Operations Policy team that may be relevant to the CQTG's work. The main areas are:

- (a) Market participation requirements for BESS. This would be focused on obligations in Part 13 of the Code and would include how to ensure a BESS can offer into the wholesale electricity market its full energy output range, and how ancillary services would fit around this.
- (b) Review of the multiple frequency keeping (MFK) services. MFK doesn't involve frequency management, it operates on too long of a timeframe. However, this project could potentially look at allowing MFK data to be used as part of a frequency management tool.

5. Definition of "generating unit"

5.1 Phillip led a discussion on the definition of "generating unit". The current definition can be open to interpretation, and there is support for addressing it in this project. A suggestion was made that there may be benefit in introducing a new definition 'generating system' in the Code, similar to Australia. The CQTG agreed the current definition of 'generating station' in the Code appears to be appropriate.

5.2 The CQTG agreed with the following strawman definitions for 'generating unit' and 'generating system':

- (a) 'Generating unit' is the smallest entity with its own frequency and voltage control system.
- (b) 'Generating system' is one or more generating units being controlled by a common frequency and voltage control system.

Action Item 5.14: Authority to add a Code amendment proposal to amend the definition of 'generating unit' and share it with the CQTG for review.

Action Item 5.15: Authority to consider the appropriateness of including in the Code a new definition 'generating system'.

6. Fault ride through (FRT) curves

6.1 Vong led a discussion on the system operator's literature review and initial studies. The key discussion points are summarised below:

- (a) Some machine-based synchronous generators, such as geothermal, will not be able to fully comply with the FRT curves in Part 8 of the Code. The CQTG noted this is likely to need more dispensations from the system operator, and so recommended amending the Code to address this issue.
- (b) Suggestion to amend the Code to state that the FRT requirements apply "subject to the machine's inherent stability characteristics" as an interim measure until the FRT curves are revised.

Action Item 5.16: Authority to add a Code amendment proposal in relation to the FRT requirements.

- 6.2 Two agenda items were not discussed due to time constraints:
- (a) Update on relevant workstreams from Retail & Networks team
 - (b) Update on status of other options in the long list of options

Action Item 5.17: Authority to send these updates in written form, along with the meeting slides, to the CQTG.

6.3 The meeting closed at 4:43pm.

Summary of outstanding action points

No.	Action	Who	When
1.7	<ul style="list-style-type: none"> • Authority to engage with MBIE, urging MBIE to prioritise proposing an amendment to the Electricity (Safety) Regulations 2010, to permit the supply of electricity to installations operating at 230 volts AC to be within 10% of 230 volts AC. <p><i>Noted the consultation is due to the Minister soon.</i></p>	Authority	Closed
5.1	<ul style="list-style-type: none"> • CQTG chair to sign the minutes of the third and fourth CQTG meetings and publish the minutes on the Authority's website. 	Authority	Closed
5.2	<ul style="list-style-type: none"> • Proceed with the current Code amendment proposal. 	Authority	Closed
5.3	<ul style="list-style-type: none"> • Look at broadening the term 'control system' in the Code in a way that can apply to all technologies – for example, a control system is a system that dynamically adjusts control output signals in a programmed response to continuously changing input signals. 	Authority	Closed
5.4	<ul style="list-style-type: none"> • Authority to consider reviewing the periodic testing requirements, so that Part 8 of the Code contains high-level output-focussed obligations and specific testing requirements are placed in a separate document incorporated by reference into the Code. 	Authority	

5.5	<ul style="list-style-type: none"> Authority to exclude FSR-002 and FSR-003 from the Code amendment proposal paper and consider a revised approach to moving these options forward. 	Authority	Closed
5.6	<ul style="list-style-type: none"> Authority to progress this item and specify an appropriate (eg, 1MW) threshold at the point of connection that applies to both generation and load. 	Authority	Closed
5.7	<ul style="list-style-type: none"> Authority to amend the wording and progress this item. 	Authority	Closed
5.8	<ul style="list-style-type: none"> Authority to exclude the FSR-006 Code amendment proposal from the paper and consider whether droop settings are appropriately included in Part 8 of the Code or elsewhere (eg, a document incorporated by reference in the Code or in a system operator technical document). 	Authority	Closed
5.9	<ul style="list-style-type: none"> Authority to proceed with the proposal. 	Authority	Closed
5.10	<ul style="list-style-type: none"> Authority to proceed with the proposal 	Authority	Closed
5.11	<ul style="list-style-type: none"> Authority to consider revising the reference to 'voltage control mode' in clause 5(2)(a) of Technical Code A of Schedule 8.3 of the Code, as part of addressing the three key voltage-related issues. 	Authority	Closed
5.12	<ul style="list-style-type: none"> Authority to proceed with the proposal, subject to changing the term to "dynamic reactive power compensation devices". 	Authority	Closed
5.13	<ul style="list-style-type: none"> Authority to add a Code amendment proposal to treat BESS as generation for the purposes of Part 8. 	Authority	Closed
5.14	<ul style="list-style-type: none"> Authority to add a Code amendment proposal to amend the definition of 'generating unit' and share it with the CQTG for review. 	Authority	Closed

5.15	<ul style="list-style-type: none"> Authority to consider the appropriateness of including in the Code a new definition 'generating system'. 	Authority	
5.16	<ul style="list-style-type: none"> Authority to add a Code amendment proposal in relation to the FRT requirements. 	Authority	Closed
5.17	<ul style="list-style-type: none"> Authority to send these updates in written form, along with the meeting slides, to the CQTG. 	Authority	Closed

Confirming the CQTG has approved these meeting minutes are a true and correct record.

Dated this 17th day of October 2024

Sheila Matthews

Chair