MINUTES OF CQTG MEETING 9

Held on Tuesday 18 February 2025, 9:00am – 4.27pm
Electricity Authority office – Wellington

Members present:	Sheila Matthews (Chair), Graeme Ancell, Matt Copland, Brent Duder-Findlay, Barbara Elliston (10:05am – end), Brad Henderson (online), Stuart Johnston (online, 12:04pm – end), Stuart MacDonald, Mike Moeahu, Rob Orange, Jon Spiller, Gareth Williams.
Apologies:	None.
In attendance:	Nyuk-Min Vong (Vong), Phillip Beardmore, Otis Boyle, Elzeth Grant-Fargie, Rob Mitchell.
Guests:	Connor McCarthy (1:58pm – end), Joshi Snehalkumar (2:11pm – end)
Observer:	Natalie Bartos (9:05am – 9:30am, 3:00pm – 3:08pm), Seb Hart (3:00pm – 3:55pm), Roger Miller (9:05am – 9:30am, 3:00pm – 3:55pm).

Introduction

1.1 The Chair welcomed attendees to the ninth meeting of the Common Quality Technical Group (CQTG). A quorum was established, with all members present.

1.2 The Chair provided an overview of the meeting agenda and the meeting's objectives, which were to provide feedback on:

(a) the Code amendment proposals to address the frequency-related common quality issue (Issue 1)

(b) the system operator's system studies on reactive power flows at the GXP

(c) an appropriate threshold for voltage obligations

(d) the system operator's literature review on BESS obligations

(e) the draft Document Incorporated by Reference (DIBR) related to the information-related common quality issue (Issue 6)

1.3 The group accepted the draft minutes from the seventh and eighth CQTG meetings, which the Chair will sign and upload to the Authority's website.

Action Item	9.1: CQTG chair to sign the minutes of the seventh and eighth CQTG meetings and publish the minutes on the Authority's website.

2. Frequency Code amendment proposals paper

2.1 Rob M presented the frequency Code amendment proposals agenda item. The Authority proposed three options in the June 2024 'Addressing more frequency variability in New Zealand's power system' consultation paper:

(a) Option 1: Lower the 30MW threshold for generating stations to be excluded by default from complying with the frequency-related asset owner performance obligations (AOPOs) and technical codes in Part 8 of the Code.

(b) Option 2: Set a permitted maximum dead band beyond which a generating station must contribute to frequency keeping and instantaneous reserve.

(c) Option 3: Procure more frequency keeping to manage frequency within the normal band, and procure more instantaneous reserve to keep frequency above 48Hz for contingent events and above 47Hz (in the North Island) and 45Hz (in the South Island) for extended contingent events.

2.2 The Authority has decided to proceed with options 1 and 2, but to discontinue investigating option 3 further. Before the meeting, the CQTG were provided with a draft of the consultation paper that outlines these decisions and proposes Code amendment proposals to give effect to options 1 and 2.

2.3 The purpose of this section of the meeting was to obtain the CQTG's feedback on the draft consultation paper, and to decide on some key aspects of the proposals. Key points raised in the CQTG's discussion included:

Option 1: Lower the 30MW threshold

(a) Natalie Bartos and Roger Miller joined the meeting virtually at 9:05am.

Agreement that the introduction of BESS on New Zealand's power system is unlikely to result in the same significant fall in the cost of reserves that was seen when the Hornsdale Power Reserve was completed in South Australia, as that was more attributable to the local market rules rather than the intrinsic benefit of BESS. Therefore, it is appropriate to use the historical prices in New Zealand to estimate the future cost of reserves, without having to factor in the unpredictability of the introduction of BESS. The case study on the Hornsdale Power Reserve will be removed from the paper.

Natalie Bartos and Roger Miller left the meeting at 9:30am.

(b) Agreement that lowering the 30MW threshold for the frequency-related AOPOs down to 10MW is appropriate, and is preferred over a 5MW threshold for the reasons described in the draft consultation paper.

(c) Agreement on a grandfathering approach. The CQTG recommended:

(i) all generating stations between 10MW-30MW on the date of implementation should be grandfathered, rather than just a subset, as many of these stations are unlikely to have the capability to comply with the frequency AOPOs, based on a review of the existing generation in this category.

(ii) grandfathering should apply for clauses 8.17 and 8.19.

(iii) the grandfathering arrangement should be revoked and compliance required with the frequency AOPOs if a generating station is later upgraded. The Authority will need to consider what constitutes an upgrade.

(d) Agreement that the proposed implementation date should be 1 July 2026, which would provide around 12 months' notice to the industry from when the consultation paper is published. Any generating stations not compliant by that date could apply for a dispensation.

(e) Advice on the costs to be included in the cost-benefit analysis. The CQTG recommended:

(i) **Dispensation costs:** estimate total dispensation costs (ie, asset owner and system operator) at 2-3 times the cost imposed on the system operator.

(ii) **Periodic testing costs:** if the current periodic testing requirements apply, this would be expected to be around $100,000-$200,000 per generating station.

(iii) **Alternative approaches to periodic testing:** the Authority is working on a new document incorporated by reference into the Code as part of FSR Issue 6 (network information), which will consider how the financial burden of compliance testing for clauses 8.17 and 8.19 can be reduced for generating stations between 10MW-30MW. The CQTG recommended that in respect of clause 8.17, periodic testing should not be required if the asset owner can demonstrate via high speed power quality data that testing is not required. For clause 8.19, the CQTG recommended that a paper-based compliance approach should be permitted for periodic testing.

(iv) **Cost of investigating under-frequency events:** this cost would be negligible for participants that are required to comply with an investigation by the system operator.

(v) **Cost of wear and tear:** the cost of wear and tear on inverters is negligible and should be removed from the paper, however the cost on BESS may be reasonably material and should be investigated further.

Option 2: Set a permitted maximum dead band

(a) Barbara Elliston joined the meeting at 10:05am.

BESS is so fast to respond that it will face more work supporting frequency than other technology types, even if all dead bands are set equally. The CQTG recommended the Authority consider additional work on ramp rates and droop settings.

Action Item	**9.2: Authority to consider additional work on ramp rates and droop settings for generating stations.**

(b) Recommendations to incorporate into the consultation paper:

(i) **Dead band size:** a uniform ±0.1Hz dead band was recommended. Any generator that is unable to comply could apply for a dispensation.

(ii) **Implementation timeframes:** Generating stations should be compliant with the new dead band requirement no later than the next periodic test, but with IBR generation able to comply via a paper-based compliance process.

(iii) **Estimated costs:** changing the dead band should be a simple control system change, and the routine testing cost for dead bands should be a relatively low incremental cost.

Action Item	**9.3: Authority to incorporate the CQTG's feedback into the frequency consultation paper, regarding: (i) 10MW threshold / ±0.1Hz dead band (ii) implementation timeframes (iii) grandfathering approach (iv) estimated costs (v) alternative approaches to achieving compliance with the periodic testing requirements in the DIBR for smaller generating stations.**

3. GXP power factor study

3.1 Vong presented the GXP power factor study agenda item. Key points from the CQTG's discussion included:

(a) The study recommended applying a 0.95 power factor at 30% of maximum demand at the GXP.

(b) Discussion considered regional or GXP-specific power factor requirements instead of a blanket approach, as many distribution networks do not currently face issues.

Stuart Johnston joined the meeting virtually at 12:04pm.

(c) Price signals could help manage reactive power, as its effects influence distribution pricing. The Authority should ensure alignment between the review of common quality requirements in Part 8 and the network connections project, with input from the Network Connections Technical Group if needed.

(d) The existing power factor requirements primarily support transmission investment by Transpower as a grid owner, while the Part 8 common quality work is focussed on managing reactive power in real time / near real time. Despite these two differing foci, Part 8 and Part 12 requirements must remain consistent.

(e) The CQTG recommended that Transpower provide guidance on the intent and enforcement of current requirements.

Action Item	**9.4: Transpower (as the grid owner) to provide guidance on the intent and enforcement of the current power factor requirements**

(f) The CQTG requested access to the data and graphs used by the system operator in forming the recommendation of a hybrid criterion for monitoring and regulating reactive power flowing through GXPs.

(g) It was agreed that further work is needed before progressing a Code amendment for this option, including a potential review of power factor requirements in the default transmission agreement (Schedule 12.6 of the

Code). As a result, a Code amendment for this option will not be included in the upcoming voltage consultation paper.

Action Item	**9.5: Authority to circulate the GXP power factor study report, including relevant data and graphs to the CQTG.**

4. Co-ordinating reactive power flows through GXPs

4.1 Phillip presented the agenda item on co-ordinating reactive power flows through GXPs. Key points from the CQTG's discussion included:

(a) The system operator could provide distributors with visibility of GXP target voltages and possibly reactive power flow and tap positions.

(b) A lower cost alternative to Inter-control Centre Communications Protocol (ICCP) should be considered – eg, just publishing information rather than providing it via a communications infrastructure like ICCP, which is designed for actionable information that needs to be reliably secure. However, the CQTG noted that if an ICCP connection were to be required for distributors at some point in the future (under future power system operations), then installing ICCP now would simply bring forward the cost of ICCP rather than representing a new cost.

(c) A staged implementation approach was suggested, starting with improved information sharing and potentially progressing to full co-ordination between the system operator and distributors.

(d) The 'Alternative 1' presented was agreed as the preferred option, focusing on a simplified approach to co-ordinating the management of reactive power flows at GXPs, with enhanced information sharing between the system operator and distributors relative to the status quo.

Action Item	**9.6: Authority to further develop Alternative 1 for the co-ordination of reactive power flows through GXPs, to establish a bilateral information-sharing framework between the system operator and distributors.**

5. Threshold for voltage obligations

5.1 Elzeth presented the agenda item on the voltage options. Key points from the CQTG's discussion included:

Option 1: Assign voltage support obligations to some additional parties

(a) It was suggested that industry objections to the voltage range proposed by the Authority for embedded generation connected at the GXP nominal voltage may stem from a general hesitancy to support any change over the status quo of no obligation. Grandfathering could help address this concern.

Connor McCarthy arrived at 1:58pm.

(b) The current voltage range for transmission-connected generation is based on the capabilities of synchronous generation from the 1990s and the economic conditions of that time.

(c) Distributors should retain the ability to negotiate voltage operational requirements with embedded generators as they have the best understanding of their networks. The CQTG noted that in Australia, a minimum requirement (eg, 10%) is set, with negotiations occurring between the generator and distributor for any additional requirements.

Joshi Snehalkumar arrived at 2:11pm.

(d) The Authority should consider the impact on existing assets that already meet current obligations before implementing any changes.

(e) Agreement to proceed with preliminary thinking for voltage option 1, ensuring that grandfathering aligns with the approach taken for frequency proposals.

Action Item	**9.7: Authority to proceed with voltage option 1, ensuring that grandfathering aligns with the approach taken for frequency proposals.**

Option 3: Require more generating stations to comply with the fault ride through obligations

(a) The primary purpose is to prevent multiple embedded generating stations from tripping due to a fault at the GXP.

(b) The Code could be worded to ensure that faults not directly connected to the distribution network (eg, islanded faults) do not cause unnecessary tripping.

(c) The current fault ride-through provisions in the Code were designed for transmission, not distribution. Protection settings must be carefully considered if applying fault ride-through requirements to distribution networks.

(d) In the future, fault ride-through could be managed by a Distribution System Operator (DSO).

(e) For 10–30MW generation newly obligated to comply with the fault ride-through requirements in the Code, these can be deemed to comply if historical data demonstrates compliance.

(f) Support for changing the terminology in clause 8.23 of the Code to refer to the point of compliance / measurement for reactive power support being at the grid connection point (high voltage side of the transformer) rather than at the generating unit terminals.

(g) The CQTG recommended alignment with Australian standards, with edge cases addressed through grandfathering.

Action Item	**9.8: Authority to proceed with voltage option 3, ensuring alignment with other options by linking fault ride-through to GXP voltage and the 10MW threshold.**

6. BESS literature review

6.1 Natalie Bartos, Seb Hart and Roger Miller joined the meeting virtually at 3:00pm.

6.2 Connor presented the system operator's literature review on common quality obligations for energy storage systems (ESSs) and hybrid generation plants in overseas jurisdictions. Key points from the CQTG's discussion included:

(a) Agreement that no further work (ie, system studies) is necessary.

Natalie Bartos left the meeting at 3:08pm.

(b) Agreement that there should be no frequency AOPOs when an ESS is idle. However, the Authority should consider clarifying the definition of "idle".

(c) Clarify the voltage AOPOs when in standby mode, ensuring alignment with how solar operates at night. Additionally, there was agreement that asset owners should be responsible for compensating their own reactive power (VARs).

Roger Miller and Seb Hart left the meeting at 3:55pm.

Action Item	**9.9: Authority to clarify the definition of "idle" in relation to BESS AOPOs, and to clarify the voltage AOPOs when in standby mode.**

7. Information requirements – document incorporated by reference

7.1 Joshi presented the agenda item on a document incorporated by reference (DIBR) in the Code that relates to FSR Issue 6 (network information). Key points from the CQTG's discussion included:

(a) The purpose of the DIBR is to provide greater clarity to asset owners and the system operator beyond what is currently specified in the Code.

(b) Protection co-ordination is a major risk for generation projects, impacting both cost and timing. The CQTG recommended that the Authority and system operator consider adding a requirement for protection co-ordination studies into the DIBR.

(c) Automatic Under-Frequency Load Shedding (AUFLS) testing could be incorporated into the DIBR. While the AUFLS Technical Requirements (ATR) report currently applies only to the North Island, including AUFLS testing in the DIBR would consolidate all testing requirements into a single document.

(d) The CQTG expressed their support for the inclusion of the DIBR as a document incorporated by reference in the Code.

Action Item	**9.10: Authority / system operator to consider adding a requirement for protection co-ordination studies into the DIBR.**

8. Any other business

8.1 Due to time constraints, the list of outstanding actions from the previous two meetings was not reviewed. The Authority took an action to email an update on the status of the actions to CQTG members.

Action Item **9.11: Authority to email the list of outstanding actions from CQTG meetings 7 and 8 to members.**

8.2 The Authority is developing a roadmap for the regulation of ESSs, to better co-ordinate and address regulatory issues related to ESSs (particularly BESS). Volunteers were sought for a CQTG subgroup to support this work. Graeme Ancell, Stuart Johnston, Stuart MacDonald, Mike Moeahu, Rob Orange, and Jon Spiller volunteered.

8.3 The meeting closed at 4:27pm.

Summary of outstanding action points

No.	Action	Who	Status
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.	Authority	In progress
5.15	• Authority to consider the appropriateness of including in the Code a new definition 'generating system'.	Authority	Not started
7.2	• Voltage issue: Authority to consider clarifying the terms "synchronised", and "available for dispatch" in clause 8.23 of the Code.	Authority	In progress
7.4	• Voltage issue: Authority to consult distributors (likely via Electricity Networks Aotearoa (ENA)) on a ±33% net reactive power range for generators connected to distribution networks, explaining the reasons for this range when doing so.	Authority	Not started
7.5	• Voltage issue: System operator to carry out further voltage-related studies to determine whether the GXP power factor requirements in the Code should be revised.	System operator	In progress
7.7	• Voltage issue: Authority to consider submitters' concerns about the potential costs of Option 2 as part of	Authority	In progress

	evaluating the option's benefits and costs.		
7.9	• Voltage issue: Authority to add GFM as a topic to the system strength work in the FSR roadmap (item 6) in the next financial year.	Authority	Not started
7.10	• Harmonic issue: Authority to raise the device standard issue with MBIE and propose removing NZECP 36:1993.	Authority	In progress
7.12	• Harmonic issue: Authority to develop harmonics options 1 and 2, discuss with the harmonics sub-group, and present a draft options consultation paper to the CQTG in Q1 2025.	Authority	Not started
7.15	• Frequency issue: Authority to further investigate option 2, with a particular focus on learnings from Australia's implementation of a uniform small deadband.	Authority	In progress
7.16	• System operator to conduct a literature review on BESS performance obligations and share a proposed high-level scope for system studies with the CQTG.	System operator	In progress
8.1	• Authority / system operator to define "point of control" and specify the applicable transformer for routine testing of IBR in the DIBR	Authority / system operator	Not started
8.6	• Authority to clarify in the DIBR which: (i) control setting changes are considered/deemed to affect frequency control, and (ii) firmware changes are considered/deemed to affect frequency response performance.	System operator / Authority	In progress
8.7	• Authority to clarify in the DIBR which: (i) control setting changes are considered/deemed to affect voltage control, and	System operator / Authority	In progress

	(ii) firmware changes are considered/deemed to affect voltage response performance.		
8.9	• Authority to discuss internally the possibility of the NCTG looking at testing obligations on distribution-connected dynamic reactive power compensation devices.	Authority	Not started
8.11	• Authority to elaborate (under FSR-007) that further clarification of how clauses 8.17 and 8.19 would apply to BESS will be provided in the DIBR.	Authority	Not started
8.12	• Authority to follow up on Stuart M's question regarding how aggregators with ESS should be treated under the Code's AUFLS obligations.	Authority	Not started
9.1	• CQTG chair to sign the minutes of the seventh and eighth CQTG meetings and publish the minutes on the Authority's website.	Authority	
9.2	• Authority to consider additional work on ramp rates and droop settings for generating stations.	Authority	
9.3	• Authority to incorporate the CQTG's feedback into the frequency consultation paper, regarding: (i) 10MW threshold / ±0.1Hz dead band (ii) implementation timeframes (iii) grandfathering approach (iv) estimated costs (v) alternative approaches to achieving compliance with the periodic testing requirements in the DIBR for smaller generating stations.	Authority	
9.4	• Transpower (as the grid owner) to provide guidance on the intent and enforcement of the current power factor requirements	Grid owner	
9.5	• Authority to circulate the GXP power factor study report, including relevant data and graphs to the CQTG.	Authority	
9.6	• Authority to further develop Alternative 1 for the co-ordination of	Authority	

	reactive power flows through GXPs, to establish a bilateral information-sharing framework between the system operator and distributors.		
9.7	• Authority to proceed with voltage option 1, ensuring that grandfathering aligns with the approach taken for frequency proposals.	Authority	
9.8	• Authority to proceed with voltage option 3, ensuring alignment with other options by linking fault ride-through to GXP voltage and the 10MW threshold.	Authority	
9.9	• Authority to clarify the definition of “idle” in relation to BESS AOPOs, and to clarify the voltage AOPOs when in standby mode.	Authority	
9.10	• Authority / system operator to consider adding a requirement for protection co-ordination studies into the DIBR.	Authority / system operator	
9.11	• Authority to email the list of outstanding actions from CQTG meetings 7 and 8 to members.	Authority	

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

Dated this 24th day of June 2025

Sheila Matthews

Chair