

MINUTES OF CQTG MEETING 16

Held on Wednesday 25 February 2026, 9am – 3.30pm
Electricity Authority office – Wellington

Members present: Sheila Matthews (Chair), Graeme Ancell, Matt Copland, Brent Duder-Findlay, Brad Henderson, Stuart Johnston, Stuart MacDonald, Rob Orange, Jon Spiller, Philip Wong Too

Apologies Barbara Elliston, Mike Moeahu

In attendance: Phillip Beardmore, Otis Boyle, David Hume, Victor Lo, Roger Miller, Rob Mitchell, Amelia Tan, Nyuk-Min Vong (Vong), Neville Watson, Natalie Bartos, Hamish McKinnon, Charlie Chrystall, Nabil Adam, Ivani Molver, Connor McCarthy

1. Introduction

- 1.1 The Chair welcomed attendees to the sixteenth meeting of the Common Quality Technical Group (CQTG). A quorum was established, with ten out of twelve members present.
- 1.2 The purpose of the meeting was for CQTG members to discuss:
 - the Asset Owner Performance Obligations (AOPOs) for hybrid plant and for battery energy storage systems (BESS's) in the 'idle' state
 - voltage obligations under clause 8.23 of the Electricity Industry Participation Code 2010 (Code)
 - large load connections to New Zealand's power system
 - the Authority's preliminary thinking for stage 2 of the common quality information requirements workstream
 - the draft paper on short-listed options for the governance of harmonics on New Zealand's power system
 - the Authority's work plan for financial year 2026/27.
- 1.3 The draft minutes from meetings 12 and 15 were approved for publishing. Matt Copland noted that for meeting 12, the CQTG's views on the Authority's prioritisation of future security and resilience (FSR)-related work for financial year 2025/26 were not informed by any assessment of benefits, costs or risks. The Chair noted this and agreed the Authority would in future circulate a draft of its FSR-related work programme ahead of the relevant CQTG meeting, so members had time to consider the draft work programme and provide informed feedback.

2. Possible AOPOs for hybrid plant

- 2.1 Connor presented on System Operator (SO) recommendations for hybrid plant integration into the New Zealand power system, with a focus on possible AOPOs for hybrid plant.
- 2.2 There was some discussion around definitions. Australia's use of 'generating system' is defined as everything at a generating station that is below the plant controller. That is, it applies at level number three, rather than at level number two, on the SO's proposed four level set of definitions. There was general agreement from the CQTG that New Zealand should be consistent with Australia but there is still a need to ensure that definitions work for New Zealand. It was also noted that updating definitions may require an update to the soon-to-be-published Connected Asset Commissioning, Testing and Information Standard (CACTIS).
- 2.3 It was suggested there is a need to consider the basis for droop for a hybrid plant.
- 2.4 The CQTG discussed what AOPOs that might apply to a hybrid plant and a BESS that is 'idle'. Key points included:
 - (a) Imposing voltage support obligations on an idle BESS would create non-trivial costs for the BESS owner, as it would require inverters to remain energised. One member estimated that a 100MW BESS could consume approximately 4GWh of energy per year due to inverter losses.
 - (b) For solar PV stations, or hybrid plants containing solar PV generating units, the cost of providing voltage support would be even higher than for BESS as these plants do not generate electricity overnight. Complying with voltage support obligations during these periods would cause a predictable increase in costs as the asset owner would otherwise prefer to de-energise their inverters.
 - (c) These costs are likely to incentivise asset owners to electrically disconnect their assets from the network when idle, or schedule outages of their assets. How would switching off inverters fit within the definition of 'idle'? Frequent electrical disconnection and reconnection would increase operational costs and fail to deliver the intended voltage support outcomes.
 - (d) The possibility of an idle state voltage AOPO being defined as the requirement for a BESS/hybrid to not make voltage worse at their point of connection (eg, compensate their VAR usage overnight).
 - (e) The possibility of having a state-dependent approach to idle state voltage AOPOs – for example:
 - (i) when the asset is not electrically connected it has no AOPO
 - (ii) when the asset is electrically connected but not injecting or absorbing active power, the AOPO is to not make voltage worse at the point of connection
 - (iii) when the asset is electrically connected and cleared in the energy and/or reserves market(s), the AOPO is to provide voltage support per clause 8.23 (and forthcoming new clause 8.23A) of the Code.

- 2.5 Some CQTG members recommended aligning the frequency and voltage AOPOs for simplicity, so that either both types of AOPO apply or, preferably, neither.
- 2.6 The Authority confirmed that the CQTG's feedback would be incorporated into the Authority's upcoming consultation on options for AOPOs on a BESS in idle state and hybrid plant.

Action Item 16.1: Authority to incorporate CQTG feedback in the Authority's upcoming consultation on what AOPOs might apply to a BESS that is 'idle' and to a hybrid plant such AOPOs.

Connor McCarthy and Natalie Bartos left the meeting.

3. Clause 8.23 voltage support obligations

- 3.1 Ivani presented on the technical analysis done to support a change to voltage support obligations in clause 8.23 of the Code. CQTG feedback was sought on whether to:
- (a) move the point of compliance from the generating unit terminals to the high voltage side of the connection transformer at the point of connection
 - (b) change the minimum reactive power requirements, from +50%/-33% to either:
 - (i) Option 1: +/-39.5%; or
 - (ii) Option 2: +/-33%.
- 3.2 The CQTG agreed that the point of compliance should be moved to the point of connection, for the reasons presented.
- 3.3 The CQTG noted that an advantage of the +/-33% option is that it would remove an incentive to embed the generation asset in the distribution network rather than connect to the transmission grid.
- 3.4 The CQTG also noted that Australia's +/-39.5% is approximately equivalent to +50%/-33% when taking into account transformer impedance.
- 3.5 Although some members expressed a preference for the SO to undertake a more fulsome study to determine an appropriate percentage, it was acknowledged that doing so would require other important work to be deprioritised. The CQTG agreed that a further SO study would not necessarily improve the basis for the percentage, due to imperfect knowledge informing key underlying assumptions.
- 3.6 The CQTG agreed the Authority should go with +/-39.5%. The CQTG suggested that if the +50%/-33% percentage is to be changed, then existing generation assets should be grandfathered until their next upgrade (not routine/periodic test).

Action Item 16.2: Authority to incorporate CQTG feedback in the Authority's upcoming consultation on revising the point of compliance under clause 8.23 of the Code.

4. Large load modelling and performance requirements

- 4.1 Nabil presented on initial work done by the SO to consider AOPOs for large loads.
- 4.2 There was confirmation that there has been a number of expressions of interest from industry in this area.
- 4.3 There was some discussion on whether the draft proposed standards for large loads are achievable, and about how overseas jurisdictions are approaching similar requirements:
 - (a) NZECP 36:1993 was noted to have some limits around current injection and that it could possibly be useful in managing large loads.
 - (b) The SO confirmed it is developing requirements based on other jurisdictions such as EirGrid and the Alberta Electric System Operator, and on the work of the Energy Systems Integration Group's (ESIG) Large Loads Task Force, which the SO is part of. A key exception is not requiring large loads to remain electrically connected at 55Hz.
 - (c) It was noted the California Independent System Operator has published requirements and that Transpower, as a transmission grid owner, is progressing work on this. However, the group noted that regulation needs to be proportionate.
 - (d) The SO noted it is more concerned about voltage ride through than frequency ride through.
 - (e) Owners of transmission grid-connected large loads are industry participants under the Electricity Industry Act 2010 and therefore are regulated by the Code. The Authority will look into whether distribution-connected loads can be regulated by the Code.
- 4.4 Nabil clarified this large load work would be done in stages.

Action Item 16.3: Authority to look into whether distribution-connected loads can be regulated by the Code.

5. Code amendment proposals for information requirements – Part 2

- 5.1 Otis presented on the Authority's preliminary thinking for stage 2 of the common quality information-related workstream.
- 5.2 CQTG members noted Asset Capability Statement (ACS) information contains confidential information outside of models. This would need to be excluded from any ACS information shared with distributors.
- 5.3 The CQTG agreed that the SO sharing ACS information with the grid owner function within Transpower should be easier and lower cost to achieve than sharing ACS information with distributors, because the grid owner is not competing with generators.
- 5.4 The CQTG agreed with Otis' recommendations on the following issues:

- (a) Issue 1 – Grid owner access to ACS information: The CQTG did not see any real issue with all ACS data being shared with the grid owner.
- (b) Issue 2 – Grid owner access to models: The CQTG noted this would make coordination between the SO and the grid owner easier.
- (c) Issue 3 – Grid owner access to information about applications for dispensations and equivalence arrangements: CQTG agreed the grid owner should have access to this information.
- (d) Issue 4 – Benchmarking TSAT models and conducting fault ride through studies: There was no comment on this.
- (e) Issue 5 – Visibility of large loads: The CQTG's feedback on this topic was discussed under the 'Large load modelling and performance requirements' section above.

6. Criteria for loss of 'legacy' status under the CACTIS Code amendment

- 6.1 The CQTG discussed the CACTIS Code amendment proposal's criteria for assessing whether a modification to an asset would result in the asset losing its 'legacy' status. Under the proposed criteria, an asset would be considered to be modified for the purpose of the legacy clause arrangements if there was a change of 5% or greater in the asset's:
 - (a) MW rating, or
 - (b) frequency response curve for 100 milliseconds or longer, or
 - (c) voltage response curve for 100 milliseconds or longer.
- 6.2 It was noted that over time the number of assets subject to these criteria might be expected to fall as old assets are decommissioned.
- 6.3 The CQTG discussed the implications of the proposed criteria for generators altering the dead bands for their generating units in order to comply with the forthcoming introduction of the dead band Code amendment.
- 6.4 The CQTG agreed the 3-part 5% threshold for loss of 'legacy' status under the CACTIS Code amendment should not apply:
 - (a) to dead band changes made by generators in order to comply with the dead band Code amendment due to come into effect on 1 July 2026
 - (b) if the SO and asset owner agreed otherwise, both acting reasonably.

Action Item	16.4: Authority to incorporate CQTG feedback on the threshold for an asset to lose its 'legacy' status under the proposed common quality information requirements Code amendment.
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7. Harmonics governance options

- 7.1 Rob presented on a draft of the Authority's consultation paper on options to improve the governance of harmonics on New Zealand's power system. The key discussion points are summarised below.

7.2 Current state of harmonics and data visibility:

- (a) There is limited visibility of the current harmonics situation, and obtaining a system-wide snapshot would be valuable. However, it is hard to do this without good data.
- (b) Transpower would like more visibility to support investigations of harmonics issues.
- (c) It would be useful for the transmission grid owner to compare existing NZECP 36:1993 compliance measurements against AS/NZS 61000 requirements to understand whether any parties would be affected under the new standard and how many busbars might be impacted.

7.3 Harmonics database:

- (a) Currently, the grid owner supplies harmonics data on request. It is unclear whether industry participants want direct access to a database of harmonic measurements, or are satisfied with the current manual process, especially since requests are infrequent and simple to process.
- (b) One member's view was that access to raw harmonics data would be preferable, as it would better enable stakeholders to perform their own analysis and build tools (eg, open-source visualisation or mapping tools) without the need for data cleansing.
- (c) If a harmonics database was established but not mandated, compliance implications would need to be considered. For instance, what would happen if a voluntary database highlighted potential non-compliance?
- (d) A centralised harmonics database would support more effective long-term management of harmonics, including ongoing monitoring for things like vector shifts. However, there was disagreement from the CQTG on whether the benefits are likely to be significant enough to justify the costs.

7.4 Compliance:

- (a) If NZECP 36:1993 was revoked, as supported by the CQTG, the consultation paper must be clear that this would mean revocation from both the Code and the Electricity (Safety) Regulations 2010.
- (b) The HVDC link and the Tiwai aluminium smelter operate with harmonics filters to meet the NZECP 36:1993 limits which are stricter than those in the AS/NZS 61000 standard.

7.5 Industry capability and costs:

- (a) Reducing ongoing transaction costs is important. Ideally, future arrangements would limit asset owners to installing no more than one harmonic filter at an installation, to provide an upper cap on potential future costs.
- (b) Developers need clarity on where harmonic capacity exists when selecting generation connection locations.

- (c) Many distributors have limited understanding of harmonics and related guidelines. It is a technically complex area that may require additional guidance or support.

Action Item	16.5: Authority to talk to Transpower, as a transmission grid owner, regarding the possibility of obtaining (i) a cost estimate to improve the provision of raw harmonics data; (ii) an assessment comparing current NZECP 36:1993 harmonics measurements against AS/NZS 61000 limits to identify potential costs for affected industry participants; and (iii) a harmonics ‘heat map’ for inclusion in the Authority’s consultation paper on harmonics governance options.
Action Item	16.6: Authority to incorporate feedback from the CQTG in the Authority’s consultation paper on harmonics governance options.

8. Draft Authority FSR work plan for the 2026/27 financial year

- 8.1 Sheila presented a list of topics that are being considered for the 2026/27 financial year’s work programme.
- 8.2 Attendees were asked to provide feedback on the prioritisation of topics – in particular, the following topics:
 - (a) System strength: There was the suggestion that the Authority consider something similar to what is being done in Tasmania using synchronous condensers to manage system strength.
 - (b) System inertia: It was noted this work would fall under the activity on frequency reserve strategy.
 - (c) Large load AOPOs: Following the initial work the SO presented earlier in this meeting, it was noted that modelling and technical requirements could form part of the next stage of work on this.

Action item	16.7: Authority to ensure the FSR work plan for financial year 2026/27 is captured in the Authority’s upcoming review of the FSR roadmap.
Action Item	16.8 Authority consultation on common quality information requirements (options 2 and 3) to include a section on modelling and technical requirements for large loads.

9. Any Other Business

- 9.1 It was noted that there will be a workshop on reactive power flows at grid exit points on 26 February 2026. Attendees were informed that last minute sign-ups will be online as in-person slots have filled up.
- 9.2 The timing of the next CQTG meeting has not been decided yet. CQTG members will be notified well ahead of time if a meeting needs to be convened to discuss any material in the Authority’s upcoming FSR-related consultations.
- 9.3 The meeting closed at 3.31 pm.

Summary of outstanding action points

No.	Action	Who	Status
5.15	Authority to consider the appropriateness of including in the Code a new definition ‘generating system’. Update: This is now included in the hybrid stations/BESS AOPO work.	Authority	In progress
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
7.7	Voltage issue: Authority to consider submitters’ concerns about the potential costs of Option 2 as part of evaluating the option’s benefits and costs.	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 2026.	Authority	Completed
8.11	Authority to elaborate (under FSR-007 in the first tranche of Code amendment proposals covering Issues 6 (information) and 7 (Code terminology)) that further clarification of how clauses 8.17 and 8.19 would apply to BESS will be provided in the DIBR. Update: This is now included in the hybrid stations/BESS AOPO work rather than the DIBR	Authority	In progress
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.	Authority	Not started
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	In progress

	Update: This is now included in the hybrid stations/BESS AOPO work.		
12.1	Authority to consider an external peer review on the system strength work.	Authority	Not started
13.1	Authority to consider incorporating the CQTG's feedback into the frequency-related decision paper.	Authority	Completed
13.2	Authority to consider incorporating the CQTG's feedback into the voltage-related decision paper.	Authority	Completed
13.3	Authority to consider incorporating the CQTG's feedback into the information-related decision paper.	Authority	Completed
13.4	System operator to consider incorporating the CQTG's feedback into the CACTIS.	System operator	Completed
14.1	Clarify that the reactive power threshold for asset group 2 is 10MVAR not 10MW.	System operator	Completed
14.2	Draft the Code clauses on grandfathering common quality information obligations, so as to link an existing asset's grandfathering status to its capability to comply with the Code obligation – ie, per the grandfathering provisions in the frequency and voltage Code amendment proposals.	Authority	Completed
14.3	Consider using 'reasonable endeavours' instead of 'best endeavours' in the CACTIS.	System operator	Completed
14.4	System operator to include in its periodic testing guidelines guidance on how high-speed data can be used for periodic testing.	System operator	In progress
14.5	Investigate the option of a uniform standard for use in timestamping / data recording for the New Zealand power system and electricity market.	System operator	???

14.6	System operator to incorporate in its commissioning guideline a recommendation that asset owners / developers submit draft studies to the system operator three months prior to the commissioning date.	System operator	???
14.7	Liaising with the Authority, the system operator to work with asset owners and OEMs to prepare contract template terms relating to the provision of models by OEMs. Include escrow terms.	System operator	Completed
14.8	Include in Part 8 of the Code a cost recovery mechanism for the system operator to do studies and model benchmarking on behalf of asset owners.	Authority	In progress
15.1	Authority to finalise and publish the minutes from meetings 13 and 14.	Authority	Completed
15.2	Authority to add to its work programme a review of the under- and over-frequency limits in the Code, considering changes expected to the power system such as large loads connecting.	Authority	In progress
15.3	Authority to consider reviewing the obligation on generators to notify the system operator of actions they have taken when frequency rises above 50.5Hz.	Authority	Not started
15.4	Authority to review the Code drafting for item FSR 102 (Clarify the connection transformer is at the point of connection) to address feedback from the CQTG.	Authority	Completed
15.5	Authority to add 'extended contingent event' after 'contingent event' in the definitions of 'fast instantaneous reserve' and 'sustained instantaneous reserve' under FSR 103.	Authority	Completed
15.6	Authority to add a subclause in the Code drafting under FSR 105 to explicitly capture embedded	Authority	Completed

	generation and network models provided by distributors.		
15.7	Authority to consider allowing the system operator to share dispensation information with the grid owner under stage 2 of the common quality-related information work.	Authority	In progress
15.8	Authority to amend drafting in clause 8.17 of the Code to clarify that the term “synchronised” applies to the asset not the asset owner (FSR 107).	Authority	Completed
16.1	Authority to incorporate CQTG feedback in the Authority’s upcoming consultation on what AOPOs might apply to a BESS that is ‘idle’ and to a hybrid plant such AOPOs.	Authority	In progress
16.2	Authority to incorporate CQTG feedback in the Authority’s upcoming consultation on revising the point of compliance under clause 8.23 of the Code.	Authority	Not started
16.3	Authority to look into whether distribution-connected loads can be regulated by the Code.	Authority	Completed
16.4	Authority to incorporate CQTG feedback on the threshold for an asset to lose its ‘legacy’ status under the proposed common quality information requirements Code amendment.	Authority	Completed
16.5	Authority to talk to Transpower, as a transmission grid owner, regarding the possibility of obtaining (i) a cost estimate to improve the provision of raw harmonics data; (ii) an assessment comparing current NZECP 36:1993 harmonics measurements against AS/NZS 61000 limits to identify potential costs for affected industry participants; and (iii) a harmonics ‘heat map’ for inclusion in the	Authority	Not started

	Authority's consultation paper on harmonics governance options.		
16.6	Authority to incorporate feedback from the CQTG in the Authority's consultation paper on harmonics governance options.	Authority	In progress
16.7	Authority to ensure the FSR work plan for financial year 2026/27 is captured in the Authority's upcoming review of the FSR roadmap.	Authority	Not started
16.8	Authority consultation on common quality information requirements (options 2 and 3) to include a section on modelling and technical requirements for large loads.	Authority	In progress

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

Dated this 26th August of 2026



Sheila Matthews

Chair