Electricity Engineers' Association

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To: The Electricity Authority
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From: Electricity Engineers' Association of NZ

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Subject: EEA Submission – Consultation Paper – *Promoting reliable electricity supply – a voltage-related Code amendment proposal*

OVERVIEW

The Electricity Engineers' Association (EEA) appreciates the opportunity to provide a submission in response to the Electricity Authority's consultation paper *Promoting reliable electricity supply – a voltage-related Code amendment proposal.*

The EEA represents engineers, technical specialists, and industry professionals from across the electricity supply chain. Our members span the generation, transmission, distribution, and supply sectors, including consultants, equipment suppliers, and service providers. We work collectively to promote engineering excellence, support safe and reliable system operation, and enable the transition to a decarbonised electricity system.

This submission draws on the technical, operational, and regulatory expertise of our members, many of whom are directly involved in voltage management, system planning, and the integration of inverter-based and distributed energy resources. It also reflects the practical realities faced by electricity distribution businesses (EDBs), embedded generators, and system operators in managing system strength and voltage quality in an evolving energy landscape.

We support the Authority's objective to strengthen common quality requirements under Part 8 of the Code, and agree that voltage management and fault ride-through capability are critical for maintaining reliability as the system becomes more decentralised, inverter-based, and dynamic. The proposed amendments are a timely and necessary step toward future-proofing the electricity system.

In our submission, we provide feedback on the proposal's alignment with statutory objectives, its relative merits compared to alternative options, and the implications for sector participants. We offer practical suggestions for mitigating compliance costs—particularly for smaller EDBs and embedded generators—and ensuring the amendments are implemented in a proportionate and sustainable way across the sector.

Key themes in our response include:

- **System reliability and security:** Proactive voltage support and fault ride-through obligations are essential to managing emerging risks to system stability and power quality.
- **Targeted, proportionate regulation:** We support the Authority's use of threshold-based obligations and legacy clause provisions to minimise unnecessary compliance burdens, especially for smaller or legacy participants.
- **Implementation and regulatory alignment:** The success of the proposal will depend on clear guidance, support for capability-constrained participants, and coordination with Commerce Commission price-quality path resets and planning cycles.
- **Ongoing collaboration:** Continued engagement through the Common Quality Technical Group (CQTG) and the wider industry will be critical to refining implementation pathways and developing complementary measures over time.

The EEA looks forward to working with the Authority and the wider sector to ensure that the proposed Code amendments deliver enduring benefits for system performance, consumer outcomes, and coordinated sector-wide progress.

Discussion Questions

Q1. Do you agree the issues identified by the Authority are worthy of attention?

Yes, the EEA agrees that the voltage-related issues identified by the Electricity Authority are worthy of attention. We support the Authority's proactive approach in addressing emerging system risks associated with increasing penetration of inverter-based, variable generation, and changes to reactive power flows across the power system.

As a member of the Authority's Common Quality Technical Group (CQTG), the EEA has contributed to identifying and assessing these issues, and we endorse the technical basis for the problem definition, including:

- The growing scale and impact of voltage deviations due to reduced system strength
- The increasing risk of network performance issues and potential for widespread disturbances linked to disconnection of inverter-based resources
- The erosion of the effectiveness of existing fault ride through obligations, given the trend towards a larger share of generation being under the current 30 MW compliance threshold.

These issues represent a material and near-term challenge to system reliability and quality, particularly as the sector accelerates toward a highly electrified and decentralised future. The EEA believes the timely resolution of these matters will support the long-term interests of consumers by maintaining

voltage stability, reducing the risk of economic harm from poor power quality or interruptions, and improving the efficiency of system operation and investment.

We also acknowledge that addressing these challenges will require coordinated updates to industry practices, technical standards, and operational responsibilities across both transmission and distribution networks. Smaller EDBs and embedded generators may face resource and capability constraints in responding to these changes. Accordingly, we emphasise the importance of implementation support and alignment with regulatory processes—such as Commerce Commission price-quality path resets—to ensure all parties can meet new obligations in a proportionate and sustainable way.

The EEA is committed to continuing to support this transition through the development of practical technical guidance, active collaboration with members, and alignment with wider regulatory reforms. Ongoing engagement through the CQTG and the broader industry will be critical to ensuring that the issues are addressed effectively and equitably across the sector.

Q2. Do you agree with the objective of the proposed amendment? If not, why not?

Yes, the EEA supports the objective of the proposed Code amendment, to promote the reliable supply of electricity to consumers by addressing voltage-related challenges arising from the increasing penetration of inverter-based, variable, and distributed generation.

The objective is well aligned with the sector's transition toward a low-emissions, electrified future and with the goals of the Authority's Future Security and Resilience (FSR) programme. Ensuring that the Code keeps pace with the changing physical characteristics of the power system is essential to maintaining system strength, voltage quality, and overall reliability.

The EEA agrees that targeted changes to the common quality requirements in Part 8 of the Code are a necessary step to:

- Ensure greater participation of distributed and mid-scale generation in voltage support and fault ride through
- Maintain voltage quality across both transmission and distribution networks
- Reduce the operational and economic risks to consumers from power quality issues or interruptions; and
- Provide clearer expectations and technical responsibilities that support coordinated system operation across the sector.

We particularly support the principle of proportionate obligations and welcome the use of 'legacy clause' arrangements to avoid imposing uneconomic compliance burdens on existing generation. The

proposed approach is pragmatic and allows the sector to prioritise upgrades where they deliver the greatest value.

The EEA is committed to supporting the successful implementation of the proposed amendments by working with the Authority, system operator, and our members to clarify technical requirements, align supporting standards, and promote best practice.

Q3. Do you agree we have correctly identified the benefits and costs of the proposed amendment?

Overall, the EEA agrees that the Authority has identified the key benefits and costs associated with the proposed amendments and has provided a well-reasoned qualitative and quantitative assessment.

We support the view that the proposed changes are likely to deliver significant system-wide benefits, particularly:

- Improved voltage stability and power quality for consumers
- Deferred or avoided investment in more expensive grid and distribution-level voltage support assets (e.g. STATCOMs, SVCs)
- Reduced reliance on ancillary services such as instantaneous reserve to manage the risk of widespread disconnection from inverter-based generation
- Improved coordination of reactive power across the grid and distribution interface, which supports more efficient network operation and planning.

We also note the importance of addressing these issues early, as the cost of inaction will likely increase over time due to continued growth in inverter-based, distribution-connected generation and the progressive loss of system strength.

On the cost side, we appreciate the Authority's recognition of:

- The compliance burden on embedded generators, particularly for smaller players
- The potential reduction in active power export capacity if reactive power capability must be prioritised
- The need to ensure the fault ride through obligations are applied in a proportionate and cost-effective manner.

We strongly support the inclusion of 'legacy clause' provisions and the proposal to align reactive power compliance expectations with the capabilities already assessed by distributors. These mitigations help ensure the proposals are implementable and do not unduly penalise existing generators or impose unnecessary duplication of compliance activity.

We also encourage the Authority to continue working with the Commerce Commission to ensure that affected EDBs, particularly smaller ones, are able to incorporate compliance costs and operational requirements into price-quality path resets or customised pathways. This coordination will be critical

for supporting timely and sustainable implementation of the proposed amendments across a diverse range of network sizes and capabilities.

We encourage continued engagement with industry through the Common Quality Technical Group (CQTG) and the wider industry, including our members. Ongoing collaboration will be essential to refining the practical implementation of the proposed obligations, supporting proportionate compliance pathways, particularly for smaller or legacy sites, and ensuring that changes are workable and effective across both transmission and distribution contexts.

Q4. Do you agree the benefits of the proposed amendment outweigh its costs?

Yes, the EEA agrees that the benefits of the proposed amendment outweigh the associated costs.

We support the Authority's view that these changes are necessary to maintain voltage stability, power quality, and the resilience of the electricity system as it transitions toward increased electrification and greater uptake of inverter-based and distributed energy resources. The amendments provide a structured and proportionate approach to assigning responsibility for voltage support and fault ride through capability, and they will help reduce long-term system costs, avoid costly reactive infrastructure investments, and improve outcomes for consumers.

We acknowledge, however, that compliance with the proposed obligations particularly for smaller or legacy generators and for some smaller EDBs, may present resourcing, capability, and funding challenges. The EEA welcomes the proposed legacy clauses and the focus on proportionate compliance as sensible mitigations. We also encourage the Authority to work with the Commerce Commission to consider how compliance obligations, particularly capital or operating cost impacts on EDBs, could be recognised within DPP resets and default/customised price-quality path settings.

This would help ensure that smaller EDBs are not unduly disadvantaged in meeting their obligations and can recover reasonable costs where appropriate. There may also be opportunities to align implementation timeframes with upcoming regulatory resets or asset management planning cycles to support efficient and timely investment.

We encourage continued collaboration through the Common Quality Technical Group (CQTG) and wider industry engagement to ensure practical implementation pathways are developed, particularly for smaller participants, while preserving the core system and consumer benefits that the proposal seeks to achieve.

Q5. Do you agree the proposed amendment is preferable to other options? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.

Yes, the EEA agrees that the proposed amendment is preferable to the other options considered and is consistent with the Authority's statutory objective to promote competition, reliable supply, and the efficient operation of the electricity industry for the long-term benefit of consumers.

We believe the selected option strikes an appropriate balance between technical effectiveness, implementation feasibility, and regulatory proportionality. Specifically, it:

- Targets voltage support and fault ride-through obligations to embedded generators of sufficient scale (≥10 MW) and at critical network locations
- Avoids undue compliance burden on smaller or legacy generators through legacy clause provisions
- Encourages greater participation by distribution-connected generation in supporting system strength and voltage stability, key to maintaining reliability as traditional synchronous plant retires
- Aligns with future system needs without introducing overly complex or administratively burdensome mechanisms such as new ancillary service markets for reactive power or system strength.

We note that robust implementation support will be critical to realising these benefits, particularly for smaller EDBs and generators with limited in-house technical resources. In practice this could include:

- Development of clear, fit-for-purpose guidance and worked examples by the Authority and CQTG
- Timely provision of template modelling tools or screening criteria to help participants assess compliance requirements without commissioning full-scale studies
- Coordination of training workshops or 'clinic' sessions to help smaller EDBs and embedded generators integrate obligations into their asset management and planning processes
- Alignment of compliance timeframes with upcoming Commerce Commission resets (e.g. DPP and customised path determinations) to enable cost recovery for necessary capital and operational investments.

These measures will help ensure the amendments are adopted smoothly, avoid unnecessary disputes, and deliver measurable improvements in voltage quality and system resilience on schedule.

The EEA supports the Authority's intent to further investigate complementary options (such as coordinated reactive power management at GXPs) and encourages continued engagement with the CQTG and our wider membership to shape these future developments.

Q6. Do you agree the proposed amendment complies with sections 17(1) and 32(1) of the Act?

Yes, the EEA agrees that the proposed amendment complies with both section 17(1) and section 32(1) of the Electricity Industry Act 2010.

In our view, the proposal is clearly consistent with the Authority's objective under section 15—to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers. It addresses a real and growing risk to power system reliability and quality by enabling more equitable and technically sound participation in voltage support and fault ride-through responsibilities as the generation mix evolves.

With respect to section 17(1), the Authority has followed a robust process of engagement and consultation through the Common Quality Technical Group (CQTG), prior issues papers, and stakeholder submissions. The resulting proposal is technically justified, proportionate in its obligations, and includes appropriate legacy provisions. It also reflects practical feedback from participants on compliance feasibility, aligning well with the Authority's functions to develop and administer the Code in a way that promotes efficient, reliable outcomes.

With respect to section 32(1), the Authority has presented a clear regulatory statement that outlines:

- the objectives of the proposed amendment
- the evaluation of its costs and benefits (including both quantitative estimates and qualitative impacts); and
- consideration of reasonable alternative options, including their feasibility and alignment with the statutory objective.

We consider that this approach satisfies the procedural and analytical requirements of section 32(1) and provides a sound basis for decision-making. We also support the Authority's intent to continue refining implementation details and complementary options (e.g. reactive power coordination at GXPs), in consultation with industry.

Q7. Do you have any comments on the drafting of the proposed amendment?

The EEA supports the intent and general structure of the proposed drafting and acknowledges the Authority's effort to ensure the obligations are clearly defined, proportionate, and practically implementable. We particularly support the inclusion of:

- Legacy clause provisions, which help to avoid unnecessary retrofits or dispensations for existing generating stations that cannot comply without modification

- **Clear applicability thresholds** (e.g. 10 MW export capability) to reduce ambiguity around which parties are in scope
- **Default voltage support requirements** that allow for flexibility and local discretion through agreement with distributors.

However, we offer the following observations and suggestions for consideration in refining the drafting:

1. **Clarity of GXP-related voltage obligations:** The conditions referencing "the same nominal voltage as the supply busbar voltage of the GXP that is electrically closest" may require further clarification or guidance. It may be unclear for some parties (particularly new entrants) whether this applies in edge cases (e.g. multiple GXPs nearby or network reconfigurations). Including a simplified explanatory note or cross-reference to an authoritative source for GXP configuration may assist.
2. **Definition of 'maximum export' and treatment of hybrid or variable assets:** The Code should clarify whether the 10 MW threshold applies to nameplate capacity, average export, or export under specific operating conditions. This is particularly important for hybrid generation and storage systems where maximum export capability may fluctuate. A consistent and auditable basis for determining compliance is essential.
3. **Coordination of obligations between distributors and generators:** While the drafting recognises that distributors may direct alternative voltage control modes, further guidance may be helpful to ensure expectations are consistent across parties. For example, should distributors be required to document or publish default expectations for embedded generators? This could improve transparency and consistency, particularly for smaller participants.
4. **Asset capability statement updates:** The obligation for owners of non-compliant existing assets to update asset capability statements is reasonable. However, it would be helpful for the Authority or system operator to issue template language or provide examples to reduce variability and ensure the updates contain the required information.

The EEA is happy to support a technical review of the final drafting through the Common Quality Technical Group (CQTG) prior to finalisation, to ensure alignment with implementation expectations across both transmission and distribution contexts.

Contact

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