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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 – Code amendment proposal on common quality-related information*

OVERVIEW

The Electricity Engineers' Association (EEA) welcomes the opportunity to comment on the Electricity Authority's consultation paper on "*Promoting reliable electricity supply – a Code amendment proposal on common quality-related information*". This submission reflects feedback from EEA members and our broader engagement across the electricity engineering community, including distribution and transmission companies, consultants, and technology providers.

We support the Authority's objective to improve the clarity, quality, and timeliness of information provided to the system operator. Reliable supply depends on accurate, validated, and consistent technical and modelling information about connected and connecting assets, particularly as the generation mix transitions to higher levels of inverter-based resources (IBRs), distributed energy resources (DER), and hybrid plants.

The EEA supports the proposed amendment to:

- Clarify and modernise the common quality information requirements in Part 8 of the Electricity Industry Participation Code; and
- Incorporate by reference a new system operation document—the *Connected Asset Commissioning, Testing and Information Standard (CACTIS)*—authored by the system operator and approved by the Authority.

We support the staged approach, starting with enabling the system operator to access better asset-related information, followed by work on a broader information-sharing framework with Transpower (as grid owner) and distributors.

We also observe that the cumulative layering of obligations and cross-references within the Code has increased complexity over time. While outside the scope of this amendment, there may be merit in a future review to streamline and simplify Code structure, improving navigability and reducing duplication.

General Comments

We consider the proposed amendment the most effective and practical option available. It is preferable to alternatives such as voluntary guidelines or embedding all technical specifications in the Code, as it:

- Provides enforceability and consistency by embedding clear, enforceable obligations in the Code
- Enables timely updates to technical specifications through CACTIS while maintaining appropriate Authority oversight and industry consultation
- Streamlines processes and reduces transaction costs by removing ambiguity and standardising requirements; and
- Aligns with wider industry initiatives, including the EEA National Technical Connection Guidelines, to deliver a coherent, end-to-end connection and compliance framework.

We agree that the benefits of the proposal significantly outweigh the costs. The quantified benefits—operational efficiencies, avoided loss-of-load costs, and reduced investigation costs—are complemented by substantial unquantified benefits from reduced high-impact outage risks, improved situational awareness, and more efficient market operation. While we acknowledge the compliance costs for modelling, monitoring, and system upgrades, these are proportionate to the operational and market benefits delivered and can be managed through proportionate, scalable requirements and transitional arrangements.

We also identify potential unintended consequences—such as disproportionate impacts on smaller participants, connection delays during transition, confidentiality concerns, and duplication across the Code—that can be mitigated through clear thresholds, strong confidentiality protections, alignment with existing guidelines, and coordinated implementation planning.

In summary, we consider the proposal consistent with the Authority's statutory objectives and section 32(1) of the Electricity Industry Act 2010. It will materially improve the security, reliability, and efficiency of the electricity system, and provide a flexible and future-proof framework for managing common quality-related information.

Alignment with EEA National Technical Connection Guidelines

The proposed Connected Asset Commissioning, Testing and Information Standard (CACTIS) and the EEA–ENA–EA National Technical Connection Guidelines address complementary stages of the connection and compliance process. CACTIS will define the Code-level technical information, modelling, commissioning, testing, and operational communication requirements needed by the system operator,

while the Guidelines will set consistent, best-practice connection requirements for distributed energy resources and other embedded connections at the distribution level.

Alignment between the two will:

- Reduce duplication of data and testing requirements for asset owners
- Ensure consistent terminology, thresholds, and technical parameters; and
- Provide a clear, end-to-end pathway from connection application through to commissioning and ongoing operational obligations.

We encourage ongoing collaboration between the Authority, the system operator, and the EEA to ensure CACTIS and the National Technical Connection Guidelines remain consistent and mutually reinforcing.

Response to Specific Consultation Questions

Q1: Do you support the Authority's proposal to clarify the Code's common quality information requirements and describe the technical specifications in a document incorporated by reference in the Code?

Yes. The EEA supports the Authority's proposal to clarify and update the Code's common quality information requirements and to describe the associated technical specifications in a system operation document (the proposed Connected Asset Commissioning, Testing and Information Standard or CACTIS).

This approach:

- **Improves clarity and consistency** by replacing ambiguous or outdated Code provisions with a structured and adaptable framework for technical specifications.
- **Enables more timely updates** in response to evolving technologies (particularly inverter-based resources) and power system needs, without requiring formal Code amendment processes.
- **Supports more efficient planning and real-time operation** by ensuring the system operator has access to validated, standardised, and fit-for-purpose asset data.

We also support the use of incorporation by reference under the Legislation Act 2019 as a practical mechanism for managing detailed technical requirements that benefit from being authored and maintained by the system operator, with appropriate governance and consultation processes overseen by the Authority.

Importantly, we see strong potential for CACTIS to align with and complement the EEA National Technical Connection Guidelines, which are being developed to improve the consistency and efficiency

of DER connection processes. Ensuring alignment between CACTIS and these guidelines would provide a coherent end-to-end framework for asset owners, helping to streamline compliance and support best practice across the sector.

To maximise the effectiveness of this approach, we recommend:

- That the development and ongoing review of CACTIS is conducted transparently and collaboratively with the sector.
- That the requirements within CACTIS are scalable and proportionate to the size, complexity, and risk of connected assets.
- That implementation support and practical guidance is made available, especially for smaller or first-time connecting parties.

In summary, we support the proposal as a necessary and pragmatic step toward ensuring a secure, reliable, and efficient electricity system, and as a foundation that can integrate with wider industry initiatives.

Q2: Do you have any comments on the drafting of the proposed amendment?

Yes. The EEA broadly supports the drafting of the proposed Code amendment and the intent to streamline and clarify information provision requirements. However, we offer the following comments and suggestions for improvement:

1. Clarity of Definitions and Scope: The revised definitions for asset capability statement, connected asset commissioning, testing and information standard (CACTIS), and high-speed monitor are helpful. However, it would be beneficial to clarify:
    - Whether the asset capability statement definition applies only to transmission-connected assets or also includes embedded generation (i.e., connected via distribution networks).
    - The scope of "assets" covered by CACTIS, including whether obligations apply to DER, hybrid plants, and industrial demand assets (especially those participating in flexibility markets).
2. Interaction with Other Parts of the Code: The relationship between the amended Part 8 requirements and other Code sections, particularly Parts 6 (Connection) and 12 (Registry and information exchange), should be clarified. We note that while clarifying the relationship between Part 8 and other Code sections at the outset is important, there remains a material risk of creating inconsistencies if future amendments are made in isolation. We recommend a formal cross-impact review process whenever changes are proposed to either CACTIS or relevant Code parts, to ensure alignment and avoid conflicting obligations.

It may be helpful to include cross-references or guidance to avoid duplication or misalignment of obligations, particularly where similar or overlapping information is required.

3. Transitional Arrangements: While the amendment includes a proposed effective date of 1 July 2026, it would be useful to explicitly outline transitional provisions, particularly:
    - For existing asset owners who may need to update models, provide new information, or install high-speed monitors.
    - For distributors implementing real-time controllable load visibility.
4. Governance and Change Control for CACTIS: The proposed amendment allows for CACTIS to be reviewed and updated by the system operator every two years (or more frequently as required), with the Authority retaining approval rights.

    We recommend that the amendment include more detail or reference to a transparent consultation process (like other system operation documents), to ensure industry input is considered when CACTIS is amended.
5. Alignment with EEA Connection Guidelines: As noted in our response to Q1, we recommend the Code amendment acknowledge or allow for alignment with other industry-developed guidelines, such as the EEA National Technical Connection Guidelines, to ensure consistency for asset owners and reduce duplication of technical requirements.
6. Terminology Consistency: Consistent use of terms such as "generating station," "generating unit," "connected asset," and "asset owner" will help improve clarity and avoid confusion—especially where obligations vary based on size thresholds (e.g., 1 MW, 10 MW).

In summary, while we support the intent and general drafting of the amendment, we encourage the Authority to address the points above to improve clarity, alignment, and practical implementation.

Q3: Do you see any unintended consequences in making such an amendment? Please explain your answers.?

Yes. While we support the intent, several risks could arise without careful design and implementation. We outline the main ones and suggested mitigations:

1. Disproportionate compliance burden for smaller parties

- Risk: Detailed modelling, commissioning evidence, and high-speed monitoring could be costly for small generators, aggregators, and industrial loads, slowing connections.
- Mitigate: Clear size/risk thresholds, templated submissions, "good-enough" model options for lower-risk assets, and phased compliance.

2. Connection delays during transition

- Risk: Rework to meet new information standards may stall projects in-flight and congest system operator and EDB engineering queues.
- Mitigate: Grandfathering for consented projects, transitional pathways, and a published prioritisation/service-level framework.

3. Vendor IP and model availability

- Risk: If confidentiality protections are seen as insufficient, OEMs may restrict RMS/EMT models or provide over-simplified black boxes.
- Mitigate: Standardised NDAs, encryption/obfuscation options, secure model "data room" arrangements, and clear limits on onward disclosure/use.

4. Interoperability and tool lock-in

- Risk: Prescribing specific platforms/encodings could create de-facto vendor lock-in and extra conversion costs, with potential fidelity loss.
- Mitigate: Accept multiple mainstream formats, publish validation criteria independent of tool, and provide conversion/validation guidance.

5. Duplication or inconsistency across the Code

- Risk: Overlap between Part 8, Parts 6 and 12, and technical codes may create conflicting obligations.
- Mitigate: Explicit cross-references, a single "source of truth" data schema, and removal of duplicate clauses during final drafting.

6. Operational impacts from periodic testing

- Risk: More frequent or prescriptive tests may increase outage needs or production losses.
- Mitigate: Outcome-based test criteria, ability to use in-service data, and coordinated test windows to minimise system and commercial impacts.

7. Information security and privacy

- Risk: Expanded datasets (including high-speed records and DER telemetry) increase cyber and privacy exposure.
- Mitigate: Minimum security controls (e.g., ISO 27001/SOC2-aligned), retention limits, and clear separation of consumer-identifiable data from system-level datasets.

8. Frequent changes to CACTIS causing churn. In addition, keeping CACTIS and the Code synchronised will require sustained resources and expertise, both for the system operator and for participants. Given that keeping the Code up to date has historically been challenging, the added complexity of CACTIS could exacerbate this unless sufficient resources and governance processes are committed upfront.

- **Risk:** If updates are too frequent, participants face ongoing rework and uncertainty.
- **Mitigate:** Predictable release cycles, impact assessments, versioning with deprecation periods, and industry consultation before changes take effect.

9. Cost pass-through to consumers

- **Risk:** New metering/monitoring and modelling requirements may raise network and project costs.
- **Mitigate:** Proportionate requirements, cost-benefit tests for new data fields, and targeted exemptions where consumer benefit is marginal.

10. Fragmented DER visibility

- **Risk:** If CACTIS and distribution-level visibility initiatives diverge, aggregators may face multiple, inconsistent telemetry asks.
- **Mitigate:** Align CACTIS with the EEA National Technical Connection Guidelines and define a harmonised DER data set and interfaces.

11. Innovation drag

- **Risk:** Over-prescriptive specs could disincentivise novel control schemes or flexible resources.
- **Mitigate:** Performance-based requirements, sandboxes/trials, and pathways to approve alternative but equivalent methods.

We consider these manageable with the mitigations above. Clear thresholds, strong confidentiality/security settings, alignment across Code parts, and coordination with EEA connection guidelines will minimise unintended impacts while delivering the reliability benefits intended.

Q4: Do you agree with the objective of the proposed amendment? If not, why not?

Yes. The EEA agrees with the objective of the proposed amendment, which is to better enable the system operator to plan to comply, and comply, with its Principal Performance Obligations (PPOs) and to achieve the dispatch objective by improving the accuracy, completeness, and timeliness of common quality-related information.

We consider that:

- Reliable supply depends on accurate, validated, and consistent information about connected and connecting assets, particularly as the generation mix transitions to higher levels of inverter-based resources (IBRs), distributed energy resources (DER), and hybrid plants.
- Clarity in obligations reduces uncertainty and inefficiency for both the system operator and asset owners, avoiding duplicated requests, rework, and bespoke arrangements.

- A dedicated system operation document (CACTIS) is a practical mechanism for maintaining technical requirements in a timely manner and keeping pace with emerging technologies, while still being subject to appropriate governance and consultation.

The objective aligns with the Government Policy Statement on Electricity, supporting secure supply at the lowest possible cost, and with the EEA work on National Technical Connection Guidelines, which aim to ensure consistent and efficient DER connection processes.

For these reasons, we agree the objective is both necessary and in the long-term interests of consumers, provided the implementation remains proportionate to asset size and risk, and is aligned with wider industry initiatives.

Q5: Do you agree the benefits of the proposed amendment outweigh its costs? Please provide evidence to support your view. This may include incremental benefits and costs associated with the draft CACTIS.

Yes. The EEA considers that the benefits of the proposed amendment clearly outweigh its costs.

The proposal will materially improve the security, reliability, and efficiency of the electricity system by ensuring the system operator has access to accurate, validated, and timely common quality-related information. This will enable the system operator to:

- Avoid overly conservative operating constraints
- Reduce the likelihood of unforeseen behaviours during disturbances, and
- Lower the risk of major outages.

The Authority's own Regulatory Statement identifies annual benefits of approximately $16,500 in operational efficiencies, $175,000 in avoided loss-of-load costs during emergencies, and $500,000 in avoided investigation costs, with additional long-term benefits from enhanced resilience and emergency response capability. The avoided cost of a single major outage or extended generation constraint would significantly exceed the compliance costs of the proposal.

The draft CACTIS introduces targeted improvements, such as high-speed data recording and real-time controllable-load indications, that will enhance fault analysis, improve situational awareness, and enable more precise, timely operational actions. These changes will reduce outage risk and improve market efficiency.

While we acknowledge the compliance costs associated with:

- Expanded modelling requirements for inverter-based resources (IBRs)
- Installation of high-speed monitors (estimated at $20,000–$30,000 per generating station), and
- Distributor SCADA upgrades for controllable-load visibility (estimated at ~$2.3 million nationally),

We note these are largely one-off or periodic costs that are proportionate to the value of the operational and market benefits delivered. For generators, clearer technical specifications will streamline commissioning and reduce delays; for distributors, real-time load visibility will improve emergency management and customer reliability outcomes.

In summary, we agree that the proposal delivers a positive net benefit to the electricity sector and consumers, and that the quantified and unquantified benefits, particularly the reduction in high-impact outage risks, significantly outweigh the associated costs. We support the amendment and the implementation of CACTIS, subject to proportionate, scalable requirements and coordinated transition planning to maximise these benefits.

Q6: Do you agree the proposed amendment is preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objectives in section 15 of the Electricity Industry Act 2010.

Yes. The EEA agrees that the proposed amendment is the most effective and practical option when assessed against the Authority's statutory objectives under section 15 of the Electricity Industry Act 2010.

The preferred approach—clarifying the Code's common quality information requirements and incorporating the technical specifications in a new system operation document (CACTIS), offers several clear advantages over the alternatives considered:

- Enforceability and consistency: Unlike voluntary guidelines or working groups, the proposal embeds clear, enforceable obligations in the Code, removing ambiguity and improving compliance across all asset owners.
- Timely updates to technical requirements: Locating detailed specifications in CACTIS enables the system operator, with Authority oversight, to update requirements more quickly in response to technological change, particularly the growing prevalence of inverter-based resources, while still consulting with industry.
- Efficiency in implementation: This approach streamlines the process for defining and maintaining technical specifications, reducing the transaction costs and delays associated with repeated bespoke negotiations between asset owners and the system operator.
- Alignment with industry initiatives: The proposed framework can be readily aligned with other sector-led work such as the EEA National Technical Connection Guidelines, creating a coherent, end-to-end connection and compliance process.

By comparison, the other options, such as placing all technical specifications in the main body of the Code, relying solely on investment in protection equipment, or using voluntary guidelines, would either be slower to update, impose higher costs without addressing the information gap, or lack enforceability and therefore fail to deliver consistent compliance.

In our view, the proposed amendment strikes the right balance between regulatory certainty, operational flexibility, and industry practicality, and is most likely to promote the long-term benefit of consumers through reliable supply, efficient system operation, and support for evolving technologies.

Q7. Do you agree the Authority's proposed amendment complies with section 32(1) of the Act?

Yes. The EEA agrees that the proposed amendment complies with section 32(1) of the Electricity Industry Act 2010. By clarifying information provision requirements and incorporating detailed technical specifications in CACTIS, the amendment will enhance the reliability of supply and the efficient operation of the electricity industry. It addresses identified gaps and ambiguities in the Code, supports the system operator in meeting its principal performance obligations, and promotes the long-term benefit of consumers through improved system security, resilience, and operational efficiency.

Contact

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