Mercury

Future Security and Resilience
Electricity Authority
Via email
fsr@ea.govt.nz

12 August 2025

Promoting reliable electricity supply: Code amendment proposal on common quality-related information

Mercury welcomes the opportunity to provide feedback to the Electricity Authority (the Authority) on its recent consultation on Part 8 *Promoting reliable electricity supply: Code amendment proposal on common quality-related information* (the Paper).

The Authority proposes updating Part 8 Code provisions to enable the System Operator (SO) to share common quality-related information. Technical obligations would be moved into a new document, the Connected Asset Commissioning, Testing and Information Standard (CACTIS), incorporated by reference in the Electricity Code. CACTIS itself would be authored and maintained by Transpower, under the Authority's oversight.

We welcome the Authority's ongoing efforts to modernise Part 8 obligations and support system reliability. Nonetheless, certain elements of the proposal warrant close attention given their potential operational, technical and commercial impacts.

1. Protection and security of intellectual property needs further consideration

1.1 Consider AEMO framework as an option for suppliers to protect IP

In our experience there are a limited number of suppliers willing to supply the remote and small-scale New Zealand market with its unique conditions. Suppliers to the wind sector are extremely sensitive to the intellectual property (IP) contained within their electrical models and often will only provide some sensitive information directly to the System Operator (and will not give it to Asset Owners). As noted by the Authority, this is the case in Australia, where the Australian Energy Market Operator (AEMO) framework allows equipment manufacturers to protect their IP by supplying AEMO with modified information that still meets usability requirements and modelling obligations.

The current Code Amendments/CACTIS proposal does not consider that the Asset Owner may not be the owner of the IP contained within the models. The commercial reality is that contracts with suppliers prohibit the Asset Owner from sharing supplier information with third parties. This will be problematic under the current proposal where:

i. There is no option for equipment manufacturers to provide modelling information directly to the System Operator to protect their IP, as in Australia; and
ii. The System Operator wishes to release model information to third parties, but the Asset Owner is not legally able to give permission under the terms of its contract for the System Operator to do this.

In our view, the proposed IP protection regime is unlikely to be acceptable to key suppliers to Mercury, especially the request for unencrypted models. If suppliers cannot be satisfied that their IP will be protected that there is a very real risk that they will withdraw from the New Zealand market. We would urge the Authority to:

> engage directly with key suppliers to ensure that the amendments meet their IP protection requirements; and
> consider adopting a framework like that used by AEMO to enable participants to satisfy System Operator needs without exposing sensitive IP. Note that this would not need to be the default pathway, simply an option for suppliers in the wind sector where sensitivities are higher than in the hydro sector, for example.

1.2 Impacts of bringing model provisions into the Code

For recent projects our suppliers have provided model information directly to the System Operator with confidentiality arrangements negotiated between the supplier and the System Operator. We are concerned that bringing the model provision into the Code (incorporated by reference) may reduce the flexibility for suppliers to enter such bespoke arrangements. We are concerned that if such bespoke arrangements are not possible and the suppliers are not satisfied with the default arrangements set out in the Code, then we will no longer have access to equipment from key suppliers.

2. Increased costs due to increased modelling requirements

The Paper proposes additional modelling requirements, particularly for inverter-based resources. This will impose increased costs on the developers of such resources, just at a time when wind, solar and batteries are likely to be the marginal forms of new generation, meaning that the costs of these will be borne by consumers. In our view, where there is a System Operator requirement to develop models for their systems, notably the TSAT models, it would be more efficient for development to be carried out by a single party (e.g. the System Operator) rather than every proponent having to individually develop a TSAT model from their other models.

3. Grandfathering considerations for existing assets

There appears to be no provision for grandfathering for existing assets under the proposed amendments. Firstly, if the new requirements are to apply to existing assets, then the rationale for this should be clearly justified on a cost benefit basis, noting that satisfactory system performance has been able to be maintained, and retrofitting assets to meet the proposed new requirements is likely to be disruptive, costly, resource intensive and take a period of time to implement. If there is no provision for grandfathering, then the Authority should allow for a reasonable and practical phase in period. We discuss factors for consideration below.

3.1 Modelling

Several existing wind farms simply predate PowerFactory and PSCAD modelling. It may be impossible for Asset Owners to provide such models since the models simply do not exist and Asset Owners do not have the necessary IP rights to develop such models.

For other assets there are likely to be development time and costs associated with developing models that meet the proposed requirements of the System Operator. The Authority will need to allow adequate phase in time for Asset Owners to develop models, considering the resource available within New Zealand for the creation of such models.

We are concerned that Asset Owners will be required to provide updates when the System Operator updates its modelling software. This exposes Asset Owners to potential costs that are difficult to predict.

3.2 Increased SCADA data

The increased SCADA data requirements are likely to require modifications and testing of site SCADA systems, central control systems as well as the ICCP links between the System Operator and each generator. Sufficient phase in time will need to be allowed so that changes can be rolled out in a controlled manner. For existing sites, costs and time may be material and we are not convinced that this has been allowed for in the cost assessment.

3.3 High Speed Fault Recorders

If the proposed requirement for high-speed data recorders is imposed on existing assets, then we believe the costs are grossly underestimated and would be more likely to be in the six-figure region. Further, the allowed phase in period for the implementation will need to be considerable. We note the following:

a. Many of the existing (particularly hydro) generating stations are configured with each generating unit having its own connection to the grid. This means that in such cases one high speed recorder will be required per generating unit, not per station.
b. Each high-speed data recorder is likely to require a power supply, secondary CT and VT feeds and communications connection. This will require modifications to the power supply systems, secondary wiring systems and communications and cybersecurity systems.
c. Physical space will need to be found to accommodate the systems.
d. The systems will require design, installation, and testing.
e. Plant outages are likely to be required if modifications of secondary wiring systems are required.

3.4 Testing Obligations

The proposed CACTIS document allows wind station assets commissioned before January 2016 to complete their first routine testing by 31 December 2028. Given this, it would be prudent for the System Operator to consider grandfathering some existing wind farms, as a few of them may not be able to meet the current testing requirements set out in the Generator Testing Requirements. These legacy assets were not designed with the current standards in mind, and meeting the testing obligations could require significant capital investment from asset owners.

4. Increased overall cost to Asset Owners

From the way the new documentation has been written It appears that one of the drivers is to shift cost from the System Operator to Asset Owner. This process could have a detrimental impact on the New Zealand market as the increased cost may have smaller developers reconsidering participating in the New Zealand market. It could also lead to distributed generation projects being scrapped or delayed.

5. General Comments on Draft CACTIS

The following is a summary of potential issues with the draft CACTIS documents:

a. Review periods for the System Operator of 20 days are too long as they allow only one month for changes prior to commissioning. This could lead to delays in commissioning. We suggest the Authority reduce the review period to 10 days.

b. The m1 model appears to be an additional requirement. This is not a validated model, and the Authority has not explained its' inclusion. We suggest the Authority remove this requirement.
c. 1.16(b) appears to go against the stated purpose of providing clear and defined information requirements. The Authority should remove 1.16(b).
d. Suppliers are unlikely to provide an unencrypted model. The Authority has not provided a reason as to why the System Operator requires an unencrypted model. We suggest the Authority remove this requirement.
e. The Authority should reconsider clause 4.16 as the Asset Owner is not capable of upgrading the supplier-owned models. The System Operator should coordinate upgrades directly with the model owner.
f. Clause 5.22 (a) – the Asset Owner will not be able to grant the consent to share the model as the Asset Owner does not own the IP. The System Operator should manage this with the IP owner.
g. Documentation requirements after testing wind, solar and BESS are excessive. Submission should be on an exceptions basis (i.e., Asset Owners should only be required to document and submit reports where there are changes between commissioning and retesting reports).
h. Figure A1 in Appendix A provides an illustration of the generating boundaries definition for a typical synchronous generating station. To ensure consistency in interpreting the reference point under Part 8, Clauses 8.23(a) and 8.23(b) of the Code, it is recommended that the generating unit boundary be standardised to only up to the LV side of the power transformer. This approach aligns with Clause 144 of Authority's Policy Statement dated 1 Aug 2022. Additionally, requiring synchronous generators to meet reactive power export obligations at the HV side of the transformer would present significant technical and economic challenges. Such a requirement would necessitate accounting for the transformer's reactive power losses, leading to increased generator ratings and higher capital costs. In many cases, this could render existing generators non-compliant with Clause 8.23(a) & (b), due to design limitations.

While we recognise the value of improved system visibility and performance assurance, the scale, frequency and technical complexity of the proposed obligations may impose disproportionate cost and compliance burdens, particularly for existing assets. We recommend the Authority adopt a risk-based approach that recognises the considerable, cost, time and effort that would be required to modify existing assets to comply with the proposed requirements.

If you have any questions about this submission, please do not hesitate to contact Phillip Wong Too [redacted]

Yours sincerely,

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Claudia Vianello
Regulatory Strategist