12 November 2024
fsr@ea.govt.nz

**Addressing common quality information requirements and Part 8 Code Amendment proposal (Part 1)**

Mercury welcomes the opportunity to provide feedback to the Electricity Authority (the Authority) on its two recent consultations, which cover:

1. set of short-listed options to improve the common quality information available to network operators and owners about assets that are looking to connect to electricity networks
2. some amendment proposals that update key terms in the Electricity Industry Participation Code 2010 (the Code) to better enable emerging technologies to be used in New Zealand's electricity sector.

We answer the questions in the tables below, with reference to the applicable consultation paper. In our view, this is the most efficient way to provide feedback.

We highlight two matters of critical importance:

1. Fundamentally, any requirements that retrospectively apply to existing assets are likely to be unworkable. We cannot supply information that we do not have and there might be physical limitations in obtaining these with older assets;
2. There are intellectual property implications which have not been thoroughly addressed and may pose significant challenges for New Zealand asset owners and their vendors.

| **Addressing common quality information requirements consultation paper** [1] | |
|---|---|
| Q1. Do you agree with the key drivers of change in power system modelling requirements identified in this section? If you disagree, please explain why. | Yes, we broadly agree. |
| Q2. Are there any other drivers of change in power system modelling requirements which are not covered in this section? If so, please elaborate. | No, but we note that the extent of change observed in the NZ power system is likely to be less than other countries. Hydro and geothermal synchronous generation is likely to remain.<br><br>Information requirements need to be clear and easily understandable so that vendors know what needs to be supplied and there are clear channels of communication with the System Operator. Our recent experience is that it has taken a number of months to satisfactorily resolve model issues between some of our vendors and the System Operator. |

[1] Available from https://www.ea.govt.nz/documents/5739/Addressing_common_quality_information_requirements.pdf

The Mercury Building, 33 Broadway, Newmarket 1023
PO Box 90399, Auckland 1142
New Zealand
PHONE: + 64 9 308 8200
FAX: + 64 9 308 8209
mercury.co.nz

| | |
|---|---|
| | We urge the Authority to not under-estimate the importance of equipment manufacturers being reluctant to share information due to confidentiality concerns.<br><br>Suppliers highly value their intellectual property and are extremely sensitive to (perceived or actual) risks to this. If they believe their intellectual property may be put at risk, then they may withdraw from the NZ market. New Zealand is a small, distant market with consequent supply chain issues, and concern about intellectual property security has the potential to exacerbate these existing issues. |
| Q3. Do you agree with the Authority's elaboration on the common quality-related information issue set out in this section? If you disagree, please explain why. | Yes |
| Q4. Do you agree that the current provisions in the Code are insufficient to address the common quality-related information issue described in this section? If you disagree, please explain why. | Yes - as Asset Owners we are in a difficult position as some vendors are unwilling to provide information to us directly (our experience mirrors paragraph 4.13).<br><br>However, under the Code it is an asset owner obligation to provide information (paragraph 4.15) |
| Q5. Do you consider there to be any other aspects of the common quality-related asset information issue that are not covered in this section? If so, please elaborate. | The complexity of the situation means that it is very difficult for a party other than the SO to study interactions with other plant. This could lead to system study gridlock.<br><br>The Authority may need to consider releasing EMT models on the EMI database as done with PowerFactory now, while protecting IP. This is in order to allow EMT modelling for new connections.<br><br>We are concerned that the suggestion in paragraph 5.8 will be difficult to do. Disallowing the use of "black box" may be a step too far for some suppliers. As mentioned, suppliers can be extremely sensitive about the confidentiality of EMT models as these contain the software code of the actual machines. They may elect to leave the NZ market if they are not confident that confidentiality will be maintained. |
| Q6. Do you agree with the shortlisted options presented by the Authority? If you disagree, please explain why. | Under any of the option presented by the Authority vendors will need to have confidence that their IP will be protected, or they will simply leave the NZ market.<br><br>The information problems are not unique to New Zealand, with much more IBR installed in the NEM (Australia) than in New Zealand.<br><br>Most vendors supplying equipment to New Zealand will also supply equipment to the NEM. We suggest leveraging experience in the NEM and mirroring the relevant information requirements in the NEM as far as it is practical in order to not reinvent the wheel. It would be more efficient to replicate, as far as possible, a regime that vendors are already familiar with and find acceptable. |
| Q7. Do you have any feedback on the desirability of a document Addressing common quality information requirements 34 incorporated by reference in the Code specifying various common quality-related information requirements? | |
| Q8. Do you agree with the pros and cons associated with each option? What costs are likely to arise for affected parties (eg, asset owners, network | |

| | |
|---|---|
| operators and network owners) under each of the options? | |
| Q9. Do you consider any perceived conflicts of interest under the second and third shortlisted options to be material in nature? If so, please elaborate | |
| Q10. Do you propose any alternative options to address the common quality-related information issue? If so, please elaborate. | |
| Q11. Do you agree with the Authority's high-level evaluation of the short-listed options to help address the common quality related information issue? If you disagree, please explain why. | See above |

| **Part 8 Code amendment proposal – Part 1 Consultation paper[2]** | |
|---|---|
| FSR-001: Remove the exclusion for wind-powered generation from periodic testing requirements | Q.1.1 We do not support the Authority's proposal to apply the periodic testing requirements to wind generation without first modifying the testing requirements so that they are fit for purpose.<br><br>For example, frequency protection is typically built into the machine/inverter controls. It is simply not practical to carry out the testing detailed in Appendix B of Technical Code A 2 (Generating unit frequency response). We believe that the same implications apply for solar and BESS inverters and suggest that the exemption for wind is applied to all IBR. (We would suggest that simple verification (rather than testing) of frequency protection settings would be appropriate since the machines require accurate measurements of frequency to function) Similarly, 3 (governor) and 5 (voltage) cannot be tested at the machine level (but can be tested at the station level - at least their non synchronous generation equivalents – which appears to be the intention of the FSR-008 amendment). |
| | Q.1.2 The unintended consequences will be that some testing requirements might be practically impossible to meet. Testing would require back-to-back test equipment to create an artificial grid which would likely need to bespoke for the NZ market and is expected to be costly to implement. |
| | Q.1.3 No. The code amendment is unworkable with the current wording of the testing requirements. The proposed amendments to the testing requirements (FSR-008) do not go far enough. |
| | Q.1.4 No. With the current test requirements, the testing is practically unworkable for wind turbines and IBR where protection and control is integrated into the inverter control system. Testing would require creation of an artificial grid with sufficient capability to |

[2] Available from https://www.ea.govt.nz/documents/5740/Part_8_Code_amendment_proposal_-_Part_1.pdf

| | |
|---|---|
| | enable the machine and inverter to operate while varying the frequency and voltage. Such test equipment is likely to cost in the millions and would require the physical disconnection of the units from the grid, the back-to-back test grid generator to be wired in, and then the whole process reversed to enable the machine to be connected back to the grid. The test equipment alone would be container sized and worth millions, each test could cost several tens of thousands in work to connect and disconnect the equipment. Given that there are hundreds of wind turbines in NZ we are talking about an exponential cost. Practically there would be very little benefit. The machine controls require accurate measurements of power voltage and frequency in order to function and a simple examination of settings would suffice to give confidence that protection and control have not deviated. |
| FSR-002: Clarify that embedded generators must provide an asset capability statement in a format specified by the system operator | We broadly agree but 1 MW might be too small and may encompass commercial scale solar and battery installations. |
| FSR-003: Include distributors and energy storage systems as potential causers of under-frequency events | No comment |
| FSR-004: Amend the requirement to have a speed governor | We are supportive except for the Clause 3 proposal. As discussed in response to FSR-001 it is simply not practical to test wind turbines and IBR at the unit level (depending on the outcome of FSR-008). Tests need to be made at the generating system (plant controller level). |
| FSR-005: Amend the requirement to have an excitation system | We are supportive except for the Clause 5 proposal. As discussed in response to FSR-001 it is simply not practical to test wind turbines and IBR at the unit level (depending on the outcome of FSR-008). Tests need to be made at the generating system (plant controller level). |
| FSR-006: Amend the Code to apply to all dynamic reactive power compensation devices | Some of the required information (models / block diagrams) may be difficult to obtain for older devices. Often these are part of a system (e.g. overall wind farm voltage control system) and would suggest that testing at the overall system level (rather than just the reactive device) should be allowed.<br><br>For example, if these are part of an overall wind farm voltage control system, do these form part of a “generating unit” (under the proposed FSR-008 amendment), or would they need to be tested separately. We also suggest a lower size limit is implemented, and the definition of what “connected to the grid” is made clearer. |
| FSR-007: Treat energy storage systems as only generation for the purposes of Part 8 | We are broadly supportive of this Code amendment. |
| FSR-008: Clarify the definition of generating unit | One consideration which we do not see mentioned by the Authority is that some generators (e.g. old wind turbines and likely some actuated hydro machines) do not have frequency or voltage control |

| | |
|---|---|
| | systems at all – it is unclear whether these would cease to become generating units under the proposed definition of the Code. |
| FSR-009: Clarify the Code's fault ride through requirements | We are broadly supportive of this Code amendment. |

Yours sincerely,

Claudia Vianello
**Regulatory Strategist**