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# Consultation papers for the Future Security and Resilience – Review of common quality requirements in the Code

Northpower Submission to the Electricity Authority

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Northpower appreciates the opportunity to provide feedback to the Electricity Authority on the three consultation papers addressing common quality requirements in Part 8 of the Code.

The consultation papers highlight issues related to intermittent and low inertia generation, identifying five key concerns:

1. Increased variability in frequency.
2. Larger voltage deviations exacerbated by changing patterns of reactive power flows.
3. A reduction in the transmission network's system strength, increasing the likelihood of performance issues if inverter-based resources disconnect from the power grid.
4. An anticipated increase amount of increasing generation subject to fault ride-through obligations in the Code, particularly for generators under 30 MW.
5. Ambiguity regarding the application of harmonic standards and the management and allocation of harmonics.

Northpower believes that the engineering studies and results presented in these papers have been conducted by specialists and are reliable.

A consensus is that the decreasing costs of solar PVs are driving the rise in installations of generators with capacities below 30 MW. Contributing factors include:

1. Distribution networks provide significantly more opportunities for connecting solar farms, with a greater number of HV distribution lines compared to transmission lines.
2. Connecting to HV distribution is more cost-effective than connecting to transmission.
3. The Grid Operator does not face time constraints in processing applications, unlike the requirements outlined in Part 6 of the Code.

Northpower supports changes to the Code; however, we urge caution regarding retrospective changes, as they could significantly affect smaller generation plants and residential customers who would incur the associated costs. Two key concerns include:

1. Lowering the threshold for a generating station's AOPO frequency requirement from 30 MW to 5-10 MW would subject historically installed generators, like our Wairua station, to new requirements, with both the technical implications and costs remaining uncertain.
2. The paper suggests that AS/NZS 4777.2 inverters should ride through under-frequency events for six seconds. Currently, New Zealand's under-frequency setting is at 45 Hz, with a maximum disconnect delay of one second and a two-second disconnection time. This aligns with anti-islanding protection, which is an integral part of the inverter's electrical safety system. Notably, 45 Hz is below the threshold of the AUFLS system. Additionally, many proposed changes in this paper appear to be retrospective, and it is unclear if this proposal falls into that category, thereby directly impacting small-scale distributed generation owners.

Northpower maintains that while distributors have a responsibility to ensure that generators do not negatively impact their networks, we are not in a position to enforce national grid requirements on generators; this responsibility should continue to rest with the System Operator. Additionally, the current harmonic standards are outdated, and Northpower supports a review of these standards.

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