



Electricity Authority  
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15 July 2025

## Voltage-related Code amendments proposal

We welcome the opportunity to submit on the Electricity Authority's (Authority's) consultation *Voltage-related Code amendment proposals* published 3 June 2025, under the Future Security and Resilience (FSR) project.<sup>1</sup> This submission is from Transpower in its roles as system operator and grid owner.

Transpower strongly supports the two proposed amendments outlined below for embedded generation:

1. place voltage support obligations on embedded generating stations that can export 10MW or more of electricity and which are connected at the grid exit point voltage
2. lower, to 10MW (from 30MW), the threshold for generating stations to comply with fault ride through asset owner performance obligations.

These amendments are important in reducing the risk of power system events like the one recently experienced in Spain and Portugal.<sup>2</sup>

We also support the approach for existing embedded stations connected before 1 July 2026 to be absolved from fault-ride through obligations (with no requirement to obtain dispensation) if compliance would mean costly modifications of plant. We agree with using written notification (in an asset capability statement) that an existing generator would not be able to comply.<sup>3</sup>

For embedded plant connecting after this July 2026 date, the voltage support and fault ride through obligations can be factored into the investment case for embedding generation > 10MW. We agree that the compliance assessment to the system operator need not contain any power system studies that are additional to those undertaken for the distributor.<sup>4</sup> From a grid owner perspective, this power system information is also necessary for its own understanding of voltage support and fault-ride through capability in the distribution network. Without this understanding, the grid owner could be considering voltage support investment in the grid that may not be necessary.

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<sup>1</sup> [Future security and resilience | Our projects | Electricity Authority](#)

<sup>2</sup> 18 April 2025

<sup>3</sup> Paragraph 3.26 [Voltage related code amendment proposal](#)

<sup>4</sup> Paragraph 3.36 Ibid

We support the ongoing work between the system operator and the Authority towards a proportionate cost approach to fault ride-through assessments.<sup>5</sup>

### Blackout event in Spain shows what is at stake for mixed - technology systems

The system operator needs information to have sufficient assurance that a generating station will operate as intended and will not adversely affect the system operator's ability to avoid cascade failure of the electricity system. The Authority's proposals should help mitigate the risk of system-wide disturbances like the one experienced across Spain and Portugal on April 18th, 2025<sup>6</sup>, where inadequate dynamic voltage regulation contributed to cascade failure and grid blackout.

The unexpected injection of reactive power from Madrid and Valencia into the grid network contributed to a rise in system voltage, and highlights the need to coordinate reactive power scheduling between transmission and distribution system operators to maintain stable voltages. The loss or reduction in power output from distributed generating stations with capacities greater than 1 MW was identified as another factor causing the transmission network voltage to rise. The anomalous increase in effective demand led to a reduction in energy exports to France, which in turn caused a voltage rise in the transmission network due to decreased electrical power flow toward the interconnection.

Extending voltage support obligations to embedded generation assets connected at the grid exit point (GXP) voltage will help manage distribution network voltages and control the reactive power flowing through the GXP. The fault ride-through obligations will also assure the system operator and consumers that smaller generating stations will remain connected to the power system to maintain system stability.

### Code drafting for voltage support obligations needs to close loophole risks

We are concerned that the proposed Code amendment under clause 2B creates risk that a generator can avoid the voltage support obligation through, for example:

- changing the ownership of the generator transformer to the EDB; or
- allowing an EDB to permanently agree with the embedded generator to have its embedded generation operate in a constant reactive power or constant power factor mode (2B(c)).

To reduce the risk that embedded generators can argue that the voltage support obligation should not apply, we suggest the Authority considers the following.

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<sup>5</sup> Consultation planned for later in 2025.

<sup>6</sup> [Blackout in Spanish Peninsular Electrical System 28th April 2025](#)

- (i) Whether replacing the undefined term "*connected*" with the defined term "*electrically connected*"<sup>7</sup> would remove the risk that asset ownership changes remove the obligation.
- (ii) Whether the text "*at which a grid owner has agreed to provide services to the local network owner*" implies agreement through the transmission agreement, and if so should that be clearly stated.
- (iii) Whether the "*direction*" from an EDB to the generator referred to in clause 2B(c) should be qualified to ensure any direction is reasonable for network operations, such as managing congestion.

### We recommend progressing other FSR policy development work

Finally, we take this opportunity to stress the importance of progressing other FSR work to enable secure and economic integration of new technologies and resources for the benefit of consumers. In our submission on the frequency Code amendments<sup>8</sup> consultation we highlighted reviewing the prioritisation of the Authority's FSR roadmap initiatives and developing a frequency management strategy.

Other priority work for voltage support should include:

- Further analysis of Voltage Short List Option 2: Arrangements for the system operator and distributors to co-ordinate with each other in managing reactive power flows through a GXP in order to further support voltage at both sides of the GXP
- Stage 2 of the common quality information sharing policy development for how the system operator, grid owner and distributors can share asset capability and modelling information to ensure the right signals for appropriate levels of voltage support investment in the grid and distribution networks.<sup>9</sup>

Our answers to each of the proposals are given through two separate tables in the Appendix.

Yours sincerely

**Joel Cook**  
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**Head of Power Systems**

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<sup>7</sup> **electrically connect** means to operate a device so that electricity is able to flow, including through a point of connection, and **electrically connected, electrically connecting, electrical connection**, and similar phrases have corresponding meanings

<sup>8</sup> Transpower submission [Frequency-related Code amendments](#) 17 June 2025

<sup>9</sup> [Code amendment proposal on common quality-related information](#)

## Appendix A- Response to Questions

<b>Submitter</b>	<b>Transpower NZ Ltd.</b>
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1. Place voltage support obligations on embedded generating stations that can export 10MW or more of electricity and which are connected at the grid exit point voltage.

Questions	Comments
Q1. Do you agree the issues identified by the Authority are worthy of attention?	Yes.
Q2. Do you agree with the objective of the proposed amendment? If not, why not?	<p>Yes.</p> <p><b>[GO]</b> We agree the voltage support requirements should be applied to units connected at the GXP voltage. Grid assets must operate within specific voltage ranges. Grid capacity for real power flow is dependent on managing reactive power at the grid edge (i.e. grid exit points and grid injection points). For voltage constrained regions the grid owner must assess how connections to the grid affect regional load limits under steady state conditions.</p> <p><b>[SO]</b> We agree with the proposed amendment. These changes will assist the system operator in regulating reactive power flowing through the GXP, thereby helping to control grid system voltage. Additionally, it enables the system operator to monitor non-compliant plants' ability to ride through faults, aiding in the management of this secondary risk and ensuring the secure operation of the power system.</p>
Q3. Do you agree we have correctly identified the benefits and costs of the proposed amendment?	Yes. The benefits and costs have been correctly identified.
Q4. Do you agree the benefits of the proposed amendment outweigh its costs?	<p>We acknowledge there will be both initial and ongoing compliance costs for some asset owners. Transpower, as system operator, will incur increased costs of commissioning testing and validating</p>

Questions	Comments
	models, compliance monitoring, and greater co-ordination of system operation. These additional costs, however, will be substantially outweighed by the system security and resilience benefits to New Zealand consumers.
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. These extended obligations are necessary to ensure power system stability. This is particularly important as the system is already transitioning to a more diverse resource base.
Q6. Do you agree the proposed amendment complies with sections 17(1) and 32(1) of the Act?	Yes.
Q7. Do you have any comments on the drafting of the proposed amendment.	Yes. We are concerned that the proposed Code amendment under clause 2B creates risk that a generator can avoid the voltage support obligation.  Please see the main letter for drafting considerations.

<b>Submitter</b>	<b>Transpower NZ Ltd.</b>
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2. Lower, to 10MW, the threshold for generating stations to comply with the Code's fault ride- through asset owner performance obligations

Questions	Comments
Q1. Do you agree the issues identified by the Authority are worthy of attention?	Yes.
Q2. Do you agree with the objective of the proposed amendment? If not, why not?	<p>Yes.</p> <p><b>[GO]</b> Without generator (grid connected or embedded) ride-through obligations, the grid owner may need to invest in grid assets to ensure adequate voltage recovery after faults, with costs recovered from those not causing the issue. Obligations that extend to smaller generation units are expected to improve resilience for regions.</p> <p><b>[SO]</b> With expectations for a significant share of future investment being from smaller-scale, intermittent resources, being clear on fault ride-through obligations will support reliability for consumers.</p>
Q3. Do you agree we have correctly identified the benefits and costs of the proposed amendment?	Yes.
Q4. Do you agree the benefits of the proposed amendment outweigh its costs?	Yes.
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.
Q6. Do you agree the proposed amendment complies with sections 17(1) and 32(1) of the Act?	Yes.
Q7. Do you have any comments on the drafting of the proposed amendment.	No.