

Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016

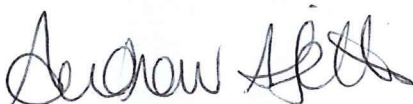
Under section 38 of the Electricity Industry Act 2010, and having complied with section 39 of that Act, I make the following amendment to the Electricity Industry Participation Code 2010.

At Wellington on the 17th day of October 2016



Dr Thomas Brent Layton
Chairperson
Electricity Authority

Certified in order for signature:



Andrew Springett
Senior Legal Counsel
Electricity Authority



Susie Kilty
Partner
Buddle Findlay

14 October 2016

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Amendment

1 Title

This is the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

2 Commencement

This amendment comes into force on 24 November 2016.

3 Code amended

This amendment amends the Electricity Industry Participation Code 2010.

4 Clause 1.1 amended (Interpretation)

In clause 1.1(1), insert in its appropriate alphabetical order:

"**reactive current** means the component of electrical current on a **line** 90 degrees out of phase with the voltage on the **line**".

5 Clause 8.21 amended (Excluded generating stations)

(1) In clause 8.21(1), after "purposes of clauses 8.17, 8.19", insert ", 8.25D,".

(2) In clause 8.21(1), after "comply with clauses 8.17, 8.19", insert ", 8.25A, and 8.25B".

6 New clauses 8.25A, 8.25B, 8.25C, and 8.25D inserted

After clause 8.25, insert:

"8.25A Fault ride through

"(1) Each **generator** must ensure that each of its **assets**, when **connected** to a **network**, is capable of remaining stable and **connected** when the **grid**'s lowest **line-to-line** voltage is within the no-trip zone shaded and marked "No-trip zone" in Figure 8.1 (for an **asset** in the North Island) or Figure 8.2 (for an **asset** in the South Island) for the period of 6 seconds immediately following the commencement of a zero impedance three-phase short circuit fault, or an unbalanced short circuit fault, on any part of the **grid** at 110 kV or 220 kV in the **island** in which the **asset** is **connected**.

"(2) Each **generator** must ensure that each of its **assets**, when **connected** to a **network**, is capable of remaining stable and **connected** when the highest **line-to-line** voltage at Haywards 220 kV bus (for an **asset** in the North Island) or Benmore 220 kV bus (for an **asset** in the South Island) is within the no-trip zone shaded and marked "No-trip zone" in Figure 8.3 for the period of 1 second immediately following the commencement of a trip of the **HVDC link**.

"(3) Whether a **generator** is complying with subclause (2) must be determined using power system analysis that uses—

"(a) study cases provided by the relevant **grid owner**; and

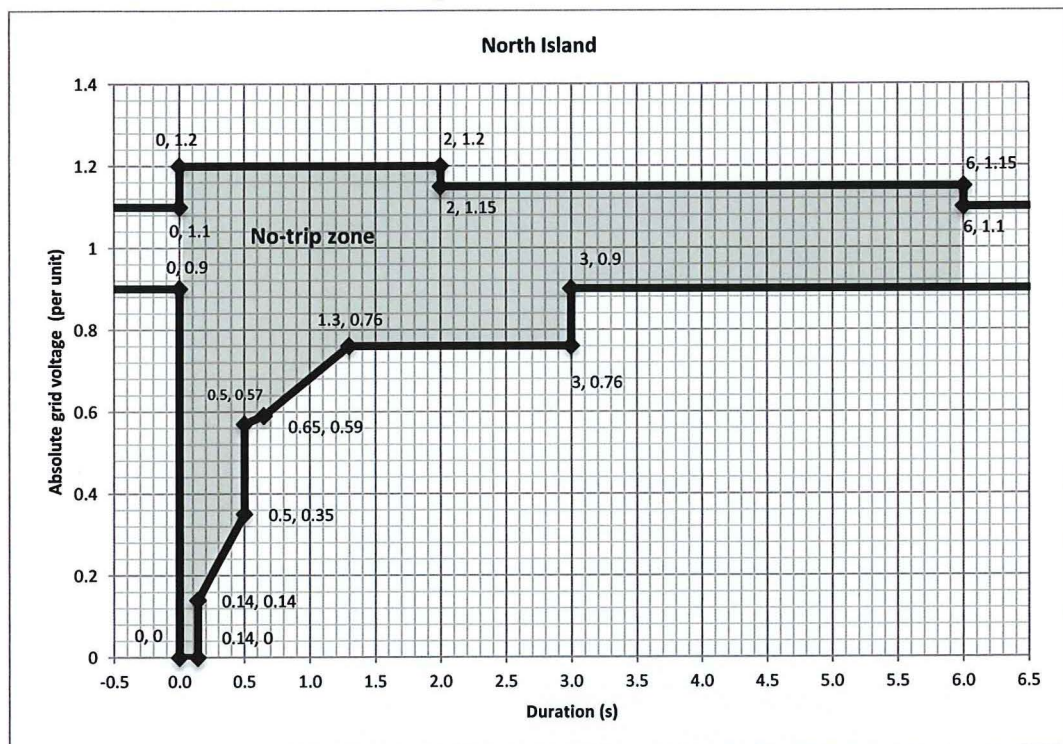
"(b) relevant system assumptions provided by the **system operator**.

"(4) A **generator** is not required to comply with subclause (1) in respect of an **asset** in the event of a fault of a type described in subclause (1) if the **asset** becomes isolated from the **grid** as a result of the fault.

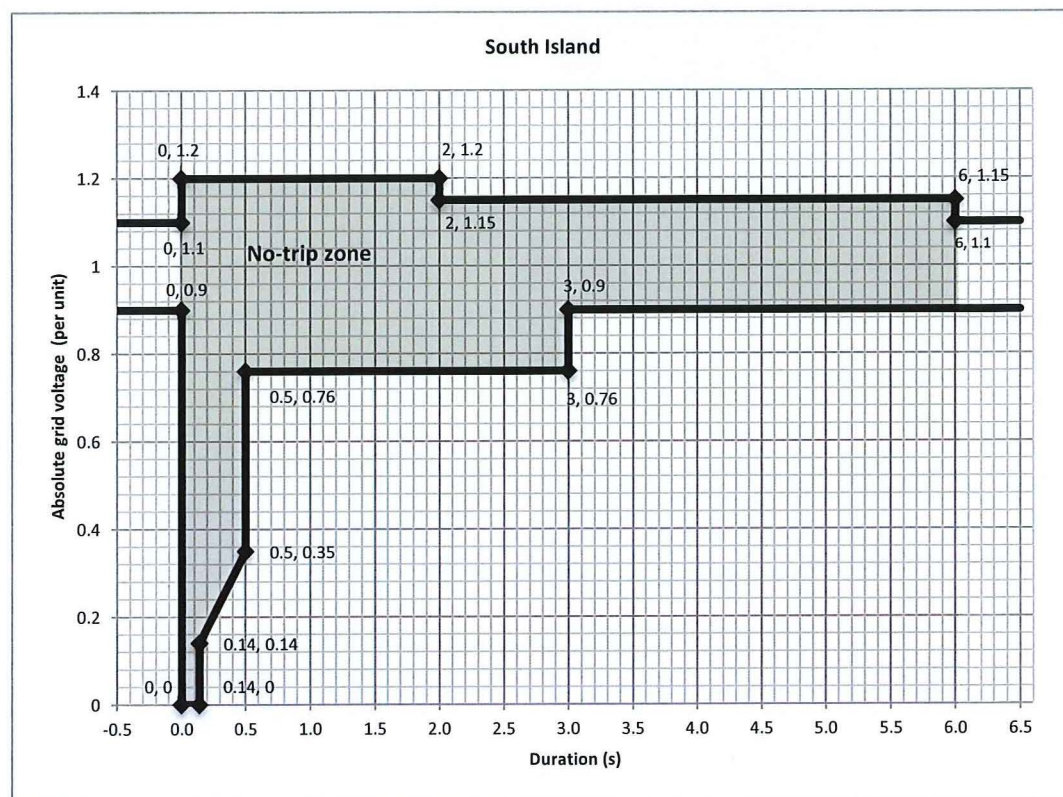
"(5) A **generating unit** need not comply with subclause (1) to the extent that it is complying with a **special protection scheme** approved by the **system operator**.

"(6) The absolute **grid** voltage (per unit) shown on the Y axis of Figure 8.1 and Figure 8.2 is the ratio of **grid** lowest **line-to-line** voltage on a **line** to the nominal operating voltage of the **line** (that is, 110 kV or 220 kV).

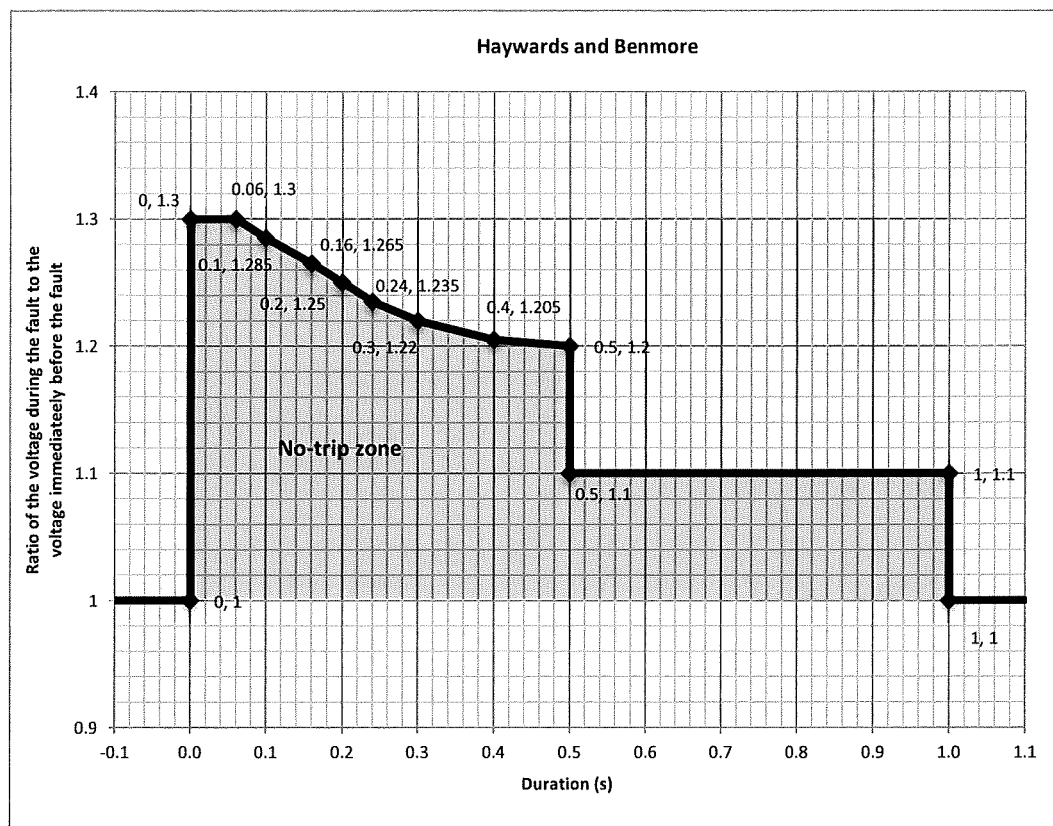
"Figure 8.1: North Island no-trip zone during 110 kV or 220 kV faults



"Figure 8.2: South Island no-trip zone during 110 kV or 220 kV faults



"Figure 8.3: Haywards and Benmore no-trip zone during permanent loss of the HVDC link



"8.25B Reactive current and active power output

- "(1) Each **generator** must ensure that each of its **generating units** generates **reactive current** to oppose the change in its terminal voltage without exceeding the maximum transient **reactive current** specified in the **generator's asset capability statement** for the period of 6 seconds immediately following the commencement of a fault on the **grid** of a type described in clause 8.25A(1).
- "(2) Each **generator** must ensure that each of its **generating units** provides **active power** output relative to pre-fault **active power** output at least in proportion to the **grid** voltage at the **grid injection point** for the period of 6 seconds immediately following the clearance of a fault on the **grid** of a type described in clause 8.25A(1).
- "(3) Subclause (2) does not apply to a **wind generating station** if there has been a reduction in the intermittent wind power source during the 6 seconds following the commencement of the fault.

"8.25C Use of additional equipment

A **generator** may comply with clause 8.25A in relation to a **generating station** by—

- "(a) ensuring that the performance of **generating units** that comprise the **generating station** comply; or
- "(b) installing additional equipment within the **generating station**; or
- "(c) a combination of the methods described in paragraphs (a) and (b).

"8.25D Application

Clauses 8.25A and 8.25B do not apply—

"(a) to a **wind generating station** when it operates at less than 5% of rated **MW**; or

"(b) to any **asset** at an **excluded generating station**."

7 Clause 8.31 amended (Grant of dispensations)

(1) In clause 8.31(1), replace "The **system operator**" with "Subject to subclause (1A), the **system operator**".

(2) After clause 8.31(1), insert:

"(1A) If the **system operator** grants a **dispensation** from clause 8.25A or clause 8.25B to an **asset owner** under subclause (1), and the granting of the **dispensation** could impose readily identifiable and quantifiable costs on any other person, the **system operator** must not impose a condition on the **asset owner** in accordance with subclause (1)(a) that has effect earlier than 24 November 2018."

8 Clause 8.38 amended (Authority may require excluded generating stations to comply with certain clauses)

(1) In clause 8.38(1), replace "Despite clauses 8.17 and 8.19" with "Despite clauses 8.17, 8.19, and 8.25D".

(2) In clause 8.38(1), replace "comply with clauses 8.17 and 8.19" with "comply with clauses 8.17, 8.19, 8.25A, and 8.25B,".

Explanatory Note

This note is not part of the amendment, but is intended to indicate its general effect.

This amendment to the Electricity Industry Participation Code 2010 ("Code") comes into force on 24 November 2016.

The amendment amends Parts 1 and 8 of the Code. The amendment requires asset owners to comply with fault ride through standards for generating units to ensure that assets remain stable and connected to the grid during transient system disturbances. This new obligation will improve reliable supply by the New Zealand electricity industry for the long-term benefit of consumers, which will promote the Authority's statutory objective.

Date of notification in the *Gazette*: 27 October 2016