Transpower House
96 The Terrace
PO Box 1021, Wellington
New Zealand
Telephone +64-4-590 7000
Facsimile: +64-4-495 7100
www.transpower.co.nz
jeremy.cain@transpower.co.nz
04 590 7544

6 October 2015

John Rampton
Market Design
Level 7, ASB Tower
2 Hunter Street
Wellington

By email: submissions@ea.govt.nz

Dear John

Generation Fault Ride Through

We welcome the opportunity to comment on the Authority's second consultation for *Generation Fault Ride Through,* published August 2015, and appreciate the additional attention necessary to the standards to take into account the commissioning of the HVDC.

We support the underlying policy objective but consider that an updated cost benefit analysis for the revised proposal would need to include the additional compliance (e.g. retrofit) and other transaction costs (e.g. administrative costs for generators and the System Operator).

Consistent with the policy objective and System Operator analysis we recommend changes to the drafting, outlined below.

Application of standards - voltage levels

The policy objective (refer 4.2.3) is for the fault ride through standards to apply to generating stations that export 30 MW or more to a local network or the grid.

The drafting for the obligation contained in clause 8.25 specifies that assets only connected to the 110kV and 220kV remain connected. This does not reflect the policy intent and would create incentives to connect only to lower voltages. To avoid this issue the drafting needs to delete when *connected to the grid at 110 kV or 220 kV* and substitute all instances of "the grid" with "a network".

Reactive current response

We consider the drafting at 8.25 (B) (1) for ride-through fault response will cause problems for voltage stability because full reactive current for such a long period would be expected to create a significant and unwanted voltage rise. The reactive current requirement should not be the 'maximum' regardless of the system voltage because during the period of the fault itself, the reactive current from a generator close to the fault is not a controlled value and for a generator remote from the fault this requirement would require unwanted modifications to their excitation control systems. In addition if the voltage has recovered acceptably then generation would be expected to return immediately to Voltage or MVAR

setpoint control (depending on its dispatch situation) and not attempt to put out maximum reactive current.

We consider the response must allow for generators' differing positions in relation to the fault location and for that reason the reactive current response must be appropriate to the voltage conditions each generator faces. An 'appropriate' response is a suitably controlled response of up to the maximum generator reactive current capabilities specified in the generator asset capability statement (ACS). The magnitude of any particular response after fault clearance would vary depending on the voltage at the generator terminals and the excitation control system specified in the generator ACS.

We propose for 8.25B (1)

> *Each generator must ensure that each of its generating units generates or absorbs reactive current as appropriate to reverse the measured change in its terminal voltage without exceeding the generating unit's transient rating limit both during the period of a fault on the grid as described in clause 8.25A (1), and for at least 6 seconds during the post-fault recovery period.*

The specification for the 6 seconds will assist generator performance settings for generators connected by converters and those using external devices (e.g. Statcoms) to provide reactive current.

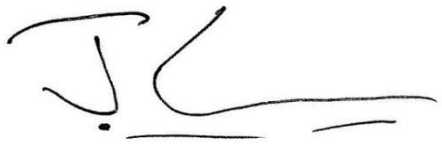
Voltage envelope

The voltage envelope definitions relate to the positive sequence component of the voltage, consistent with the analysis in the System Operator report (refer section 6.2 clause 8.3.13). We recommend replacing the term 'line to line' used under 8.25A (1) and (2) with "phase to earth". This will require a change also to clause 8.25A (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 phase to earth voltage to the nominal operating phase to earth voltage of the 110kV or 220kV bus.*

If you have any questions about this submission please contact Micky Cave 04 590 7309 in the first instance.

Yours sincerely



Jeremy Cain
Regulatory Affairs & Pricing Manager