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Submissions
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To whom it may concern

Consultation Paper – Generation Fault Ride Through

Todd Energy welcomes the opportunity to provide comment on the Authority's consultation paper (the "Paper") on the generation fault ride through standard proposed to be added to the Code.

Our responses to the consultation questions are provided in the table below.

Q1	Do you agree with the System Operator's modelling assumptions and study methodology?	The System Operator's modelling assumptions would seem reasonable following a brief review of the detail in the SO report. However we would question whether the Grid Owner and System Operator should be more proactive in verifying and producing a more accurate power system model of the dynamic characteristics of connected load at the key GXP's, noting that *"the nature of the load has the greatest impact on system performance under faulted conditions"* (paragraph 2.4.4 from the Paper). There is little qualitative background information provided on the accuracy of the load model, and we would query whether the GO/SO is collecting adequate high-speed data in an effort to verify the dynamic load model under system disturbances. The SO/Code requires other asset owners (eg. Generators) to provide very accurate dynamic models at considerable collective cost, and this costly accuracy becomes watered down from a system dynamic model perspective unless the load model accuracy is comparative.
Q2	Should the fault ride through standard apply to generating stations smaller than 30 MW?	No. In the same manner as frequency requirements, "excluded generation stations" should not be required to meet the fault ride through standard. Further, it is unclear from the Paper (refer paragraphs 4.1.4 and 4.1.5) and the proposed Code changes (proposed clause 8.20A(1)) whether a generator that is connected to the grid or local network at a connection voltage less than 110kV is required to meet the no-trip-envelope of the fault ride through standard, from which it would otherwise seem hard to assess compliance from a practical sense.
Q3	Should the fault ride through standard apply to existing synchronous generating plant?	No. We strongly support the proposed Code change in the context that existing synchronous generation units are not required to comply as it is the expected future increase in wind generation connected to the power system that is driving the need for the

		standard. It is unreasonable to push these compliance costs onto existing synchronous generators. Todd Energy has interests in a number of existing co-generation plants where, within reason, security of supply to the on-site factory load is paramount and the economic basis for the investment in co-located generation. These installations need to maintain the ability to isolate from the grid in the event of significant transient disturbances where there is otherwise undue risk and cost should total loss of supply to the factory occur. Furthermore, the Authority's CBA would indicate there are no benefits in the immediate introduction of the standard so it would seem reasonable that only generation plant connecting in the future need comply, and investors can factor these compliance costs in plant selection.
Q4	Do you agree that a single composite standard for both the North and South Islands is likely to result in increased compliance costs?	It would seem a reasonable assumption.
Q5	Do you agree that the WGIP wind generation scenarios are appropriate for the NPV analysis?	No comment – will leave to those more actively involved in looking at potential wind development projects.
Q6	Do you agree with the Authority's input assumptions for the NPV calculations? If not, please provide alternative input values.	Neutral. One of the inputs to the NPV analysis is instantaneous reserves prices and it is hard to predict where these will settle with the introduction of the national reserves market following the pending HVDC Pole 3 commissioning. While average price should go down through increased competition, the average quantity of reserves required is likely to increase with increased HVDC transfer capacity. It is hard to comment without seeing the NPV sensitivities to the input assumptions.
Q7	Do you agree that there is a moderate to high probability of scenario B wind penetration levels being reached in the next 10 years?	No comment as will depend on various externalities that will continue to remain hard to predict.
Q8	Do you agree that there would be benefits in proceeding immediately with proposed fault ride through standards or should the effective date of the proposed standards be triggered at a future date by the level of wind generation penetration?	No. We see there would be some benefit in immediately including the standard in the Code but with an effective date in the future (eg. 5 years out, and in a similar vein to the routine asset testing requirements added under Part 8 of the Code). This would allow generation investors (wind especially) to phase in the requirements through the generation development process of concept design, primary plant evaluation and then procurement.

Q9	Do you agree with the Authority's overall assessment that the proposal best meets the objective of the proposal?	Yes, subject to responses above and further comment below. The objective of the proposal is to maintain the long term security of the grid, the notion that demand will continue to be met under grid contingencies. Where cogeneration plant are installed to satisfy stringent security of supply requirements of on-site co-located load, the owners of such plant should, within reason and with reasonable conditions imposed, be able to access a dispensation against the fault ride through standard where compliance would otherwise jeopardise security of supply to that co-located load. We note the Paper infers that synchronous generators (these being the likely form for majority of cogeneration plant installed) should largely be able to meet the standard, however the load and generation interdependencies for cogeneration plant are very much localised and thereby more complex, requiring detailed assessment against the standard on a case-by-case basis.

We provide the following further comments on the proposed Code changes from Appendix B of the Paper.

Subclause 8.20A(1):

> In the first sentence after the words "Each generator" add the text *", other than generators who are owners of excluded generating stations,"*.
>
> See also our response to Question 2 in the table above.

Subclause 8.20A(3):

> There are circumstances where Special Protection Systems (SPS) or other ancillary service contracts will require the tripping of a generation unit well within the 3 second window proposed under this sub-clause. Take for example existing generator provision of over-frequency reserve whereby the generation unit is required to trip instantaneously when the over-frequency threshold has been exceeded – it would be non-compliant with the subclause proposed by the Authority.
>
> We would suggest the proposed sub-clause be replaced with *"A generation unit need not comply with subclause (1) if this action is an intentional part of a special protection system or ancillary service product"*, or add this suggested text as further subclause under 8.20A(2).

Please get in touch (04 471 6555) should you wish to discuss any aspect of our submission further.

Yours sincerely

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