Appendix A Format for submissions

Submitter	*Brian Leylanc*

Questions	Comments
Q1.1 Do you support the Authority's proposal to amend the Code to require smaller generating stations to comply with frequency-related asset owner performance obligations?	*I doubt if it will make a big difference. The real problem is too much wind and solar power that cannot help manage the frequency*
Q1.2 Do you consider the 'legacy clause' provisions in the Code amendment proposal should apply to a generating station for a finite period of time (eg. 10 years)? Please explain your answer.	*Some Hydropower stations will not be able to control frequency without major modifications.*
Q1.3 Do you see any unintended consequences in making such an amendment? Please explain your answer.	*Considerable expense and not much benefit.*
Q1.4 Do you agree the proposed Code amendment is preferable to the other options identified? If you disagree, please explain why and give your preferred option in terms consistent with the Authority's main statutory objective in section 15 of the Electricity Industry Act 2010.	*No. A better option is to limit the amount of wind and solar power because, as overseas experience shows, it inevitably leads to higher power prices.*
Q1.5 Do you agree with the analysis presented in the Regulatory Statement? If not, why not?	*No comment.*
Q1.6 Do you have any comments on the drafting of the proposed amendment?	*I think it is a waste of time and effort.*

Q2.1 Do you consider there to be any type of generation technology that cannot, and never will be able to, comply with a dead band of ±0.1Hz? Please explain your answer.	*To my knowledge, rotating machines with governors have no problem. I am not familiar with the problems of inverters.*
Q2.2 Do you support the Authority's proposal to amend the Code to specify a permitted maximum dead band of ±0.1Hz, beyond which a generating station must contribute to frequency management and support?	*No commen*
Q2.3 Do you see any unintended consequences in making such an amendment? Please explain your answer.	*How will it be measured and enforced?*
Q2.4 Do you agree the proposed Code amendment is preferable to the other options identified? If you disagree, please explain why and give your preferred option in terms consistent with the Authority's main statutory objective in section 15 of the Electricity Industry Act 2010.	*No.*
Q2.5 Do you agree with the analysis presented in the Regulatory Statement? If not, why not?	*No commen*
Q2.6 Do you have any comments on the drafting of the proposed amendment?	*I think it will be difficult to enforce.*

I can't find anything related to option three. This is my preferred option. If payments are made for providing inertia or technology that has an equivalent effect, we could see many old power stations repurposed as synchronous condensers providing voltage support and inertia. There is also the SMART water heater thermostat under development by my team. By the end of the year a trial installation will be under evaluation on the Haast network. This technology controls water heater temperature and also switches them on and off and it also ramps the input to the water heater up or down according to the frequency. It could be programmed to cut in at 49. 95 Hz and have the water heaters off, at say, 49.5 Hz. As the ramp down is proportional to the frequency there should be no great problem with system stability. There is more than 500 MW water heater load available on the system most of the time it could make a very substantial contribution to frequency keeping. If the System Operator was prepared to pay for this service via a levy on all consumers – because all consumers would benefit – we could have a system up and running within a few years.