14 August 2023

Submissions
Electricity Authority
Level 7, Harbour Tower
2 Hunter Street
Wellington

By email: fsr@ea.govt.nz

Subject: Consultation Paper-Addressing more frequency variability in New Zealand's power system

Contact welcomes the opportunity to provide comment on the Authority's consultation paper above.

We agree that changes do need to be made to manage real time frequency as increased renewables are connected to the power system. Contact believes that a combination of Options 2 and 3 would be the most efficient way forward to address this issue. Our response is summarised below and in feedback to the specific questions in Appendix A.

Option 1 – Lowering the 30MW threshold for exemption

Contact does not support this option as it stands. Theoretically this option seems to address the issue, but in reality it is not possible for certain generation technologies to meet the frequency requirements of the code. For example, smaller geothermal units cannot physically contribute steady state frequency management, or an underfrequency event, as they cannot operate partially loaded and their governor operation differs from conventional plant. They do however respond to over frequency and contribute to system inertia. Consideration should be given to this technology being exempt from option 1.

Options 2 and 3 – Introducing a maximum deadband and increasing Procurement Quantities

Contact supports a combination of options 2 and 3. We believe that applying a technology specific maximum deadband, widening of the normal frequency band, and increasing the amount of MFK and reserves procured would be an efficient solution to the issue for the following reasons:

1. applying a technology specific maximum deadband will result in maintaining the reliability of thermal, wind, and geothermal plant when these generation types are excluded
2. widening of the normal frequency band is possible due to reduced amount of frequency dependant load on the system
3. the reduction of procured MFK quantities was appropriate at the time, but the current band is no longer fit for purpose to manage the intermittency on the power system in the future, this option also compliments item 2 above.

4. Option 3 utilises existing market services reducing transaction costs.

Should you have any questions on the above, please let us know.

Yours sincerely

Gerard Demler
Transmission Manager, Contact Energy

Appendix A

Submitter	Contact
Q1. Do you agree the Authority should be short listing for further investigation the first frequency related option to help address Issue 1? If you disagree, please explain why?	Disagree. This approach is impractical for certain technologies. For example, smaller geothermal units cannot physically contribute steady state frequency management, or an underfrequency event, as they cannot operate partially loaded and generally run with the governor wide open. They do however respond to over frequency and contribute to system inertia.
Q.2 What do you consider to be the main benefits and costs associated with the first frequency-related option?	Theoretically procurement costs may reduce but in reality, imposing a dispensation cost on plant that has no possible means of complying or recovering that cost is an inefficient approach, and it is unlikely that these costs are fully internalised. We also question the transactional costs of this blanket approach to lowering the 30MW threshold. The additional System Operator resource required to assess all connections down to 5MW will only add to their operational costs regarding additional resourcing and would negatively affect the lead times for the compliance assessment of new generation connections.
Q3. What costs are likely to arise for the owners of (single site and virtual) generating stations under the 30MW threshold if the threshold were to be lowered to 5MW or 10MW?	As per our response to Q1, dispensation costs would be assigned to plant that have no way of meeting the new compliance requirements.
Q4. What do you consider to be the pros and cons of aligning the AS/NZS 4777.2 standard with the Code requirement for generating stations to ride through an underfrequency event for six seconds?	We are not familiar with this standard so have no comment.
Q5. Do you consider a permitted maximum dead band should be based on the technology of the generating station? Please give reasons with your answer.	Agree, the proposed maximum deadband must take into consideration (exclude) both thermal and geothermal technologies to maintain reliability and to meet design lifetimes of that plant. This will ensure that these units are available when needed to manage security of

	supply. Wind turbines would also need to be considered in this technology-based assessment, as too smaller deadband will result in excessive wear and tear. We don't foresee any issues BESS (subject to this being applied when in generation mode) and solar technologies.
Q6. Do you consider the Authority should be short listing the widening of the normal band for frequency as an option to help address the identified frequency-related issue? Please give reasons with your answer	We agree with widening the normal band. The current band is a legacy of frequency dependant loads on the system in the past, but this is no longer the case, and it would make sense to extend this band due to modern load attributes.
Q7. Do you agree the Authority should be short listing the second frequency-related option to help address Issue 1? If you disagree, please explain why.	Agree, but it needs to exclude certain technologies as mentioned in our response to Q6 above, and the option needs to be in combination with option 3 (refer to the summary response above)
Q8. What do you consider to be the main benefits and costs associated with the second frequency-related option?	There would be benefits when applied to generation that is able to comply as no costs would be imposed. As mentioned in our Q2 response, there would be unnecessary dispensation costs applied to technologies (thermal and geothermal) that are unable to comply.
Q9. What costs are likely to arise for the owners of generating units if a permitted maximum dead band were to be mandated in the Code that was not less than the inherent dead band in generating units?	Please refer to our response to question 8.
Q10. What do you consider to be the main benefits and costs associated with the third frequency-related option?	The main benefit is that you are utilising existing and proven market services. Frequency keeping quantities have been reduced over time to reduce procurement costs and to make use of the benefit of the influence of the HVDC's FKC function. The current band is no longer fit for purpose to meet the generation intermittencies in the future. We support increasing these quantities and allowing market participants to decide on the risk/benefit to their plant when offering into the MFK service. If the Authority wishes to review the cost assignment for MFK then it could look at a combination of both purchaser and supply causer allocation, this allocation will need to be verified

	technically. The widening of the MFK band will offset the increased procurement costs. Utilising an existing known service such as MFK is more efficient than introducing an additional capability market for control response. If a faster response service is required in the future, then implement this when it is required. The increasing supply of reserves coming onto the system in the form of IL and future BESS projects would somewhat offset the cost of increasing the quantity of reserves procured.
Q11. Do you have any comments on the Authority's assessment of options to help address Issue 1 identified in our 2023 Issues paper?	We agree with the Authority's assessment of option 3.