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PO Box 17188  
Greenlane  
Auckland 1546  
New Zealand

Electricity Authority  
By email: [submissions@ea.govt.nz](mailto:submissions@ea.govt.nz)

## Normal Frequency Management – Strategic Review

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Genesis Energy Limited (“Genesis Energy”) welcomes the opportunity to provide a submission to the Electricity Authority (“the Authority”) on the information paper “Normal Frequency Management – Strategic Review” dated March 2017 (“the paper”).

Genesis Energy acknowledges the Authority and Transpower for their work completed to-date to reduce frequency-keeping costs for the ultimate benefit of consumers. Savings to the tune of \$40 million per year is a commendable achievement.

However, we are concerned this good work has the real potential to be undone if the Authority proceeds with any of the initiatives outlined in the paper. While it is possible to implement a complicated methodology to procure more governor response in an effort to save less than \$10 million in procurement costs, it is unwise. It will lead to wealth transfers at best and increased market administration costs are guaranteed, which may be to the ultimate detriment of consumers.

Genesis Energy is also concerned the Authority has taken too narrow a focus in preparing the paper. Governor response is important, but so too are generators that provide a constant, uninterrupted supply of electricity to support grid stability and inertia. Some generator types are better equipped to provide the former, and others the latter. Both play an important role in keeping the lights on and this should be appreciated in any frequency keeping conversation.

### **Is this a complicated solution looking for a problem?**

To find the best solutions you first need to clearly identify the problem. It would appear the Authority’s problem is the remaining \$9.4 million in costs faced by the market to procure multiple frequency keeping (“MFK”).

This, in New Zealand market terms, is a small sum compared with the \$40 million already saved. We suggest the savings achieved to-date should be satisfactory and highlighted as a success, rather than a catalyst for potentially reversing this good work through further complicated intervention. Thus the paper is attempting to solve a problem that is not really a problem.

Further, the 'problem' - if 'solved' via the complex options in the paper – will likely give rise to greater market costs. The Authority itself recognises this: *“However, this is likely a false representation of savings, because providing governor responses imposes wear and tear and availability costs on the providers, and increased governor response would likely increase the amount of costs. Further, requiring governor response from parties who are not suited to provide it...may cost more than procuring MFK from relatively low-cost providers such as hydro.”*

As the Authority has correctly identified, some generators are ill-equipped to provide governor response compared with others.

Within Genesis Energy examples of this are;

- Our large Rankine cycle generators, even with their current modest narrow range droop settings, response to 'normal' system frequency causes boiler pressure and temperature cycling. Due to the process lags in the boiler pressure and temperature loops this cycling is at times amplified causing more harm than good to the system frequency.
- Our large combined cycle generator takes time to get back up to full output after it has responded to an over frequency event: while the event may be over in seconds, the plant may take minutes to recover. In the meantime, other generation – likely the marginal generator – will have to be dispatched to fill the shortfall.
- Our hydro generator governors are tuned to achieve the minimum recommended gain and phase stability margins in an islanded situation as per System Operator requirements. But even though they have compliant droop settings and no dead band, their response to small changes in frequency is generally minimal. This is because the length of their penstocks, combined with the System Operator stability requirements has forced their governor gains to be lowered significantly. We believe this may not be uncommon with many hydro unit governors de-tuned to achieve System Operator mandated islanded stability.

Procuring governor response from generators not suited to provide it will drive more costs into the market, to the detriment of consumers. This, we suggest, is the real problem.

### **Governor response in the context of grid stability**

Further to our point above, we are concerned the Authority is considering these changes in isolation; that is, not looking at the stability of the electricity system as a whole.

While governor response is important - and hydro generators with short penstocks are well placed to provide this and hydro generators with long penstocks should also be able to provide this on a case by case basis if the islanded stability requirements are relaxed - there is also an important role to be played by generators that provide grid stability and inertia, including large thermal and baseload geothermal units.

It is also important to think about security of supply, which requires a diverse generation mix. If the rain stops falling and the wind does not blow, you need storage lakes, geothermal plants, gas pipelines and coal stockpiles.

This hints at another risk of imposing governor response obligations on generators that are not suited to provide it: it could lead to inefficient investment decisions and the earlier retirement of thermal from a market that relies on it for diversity.

### **The best way forward**

When the Authority sought to clarify generator obligations in 2014, it noted submitters raised a number of concerns about the proposed requirements, including the ability for generators to comply and the costs of compliance. Genesis Energy was one such party.

These concerns remain should the Authority proceed with any of the initiatives it has outlined, and we strongly urge the Authority to take that feedback into consideration alongside the comments received during this round of consultation.

We also suggest the Authority monitors its procurement costs in the next few years to confirm that \$9.4 million is the new baseline. If this proves to be the case, we again suggest this is satisfactory, and the Authority's resources would be better spent on other work programme initiatives.

If you would like to discuss any of these matters further, please contact me via [margie.mccrone@genesisenergy.co.nz](mailto:margie.mccrone@genesisenergy.co.nz) or 09 951 9272.

Yours sincerely



Margie McCrone  
Regulatory Advisor

## Appendix A: Responses to Consultation Questions

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QUESTION	COMMENT
(a) Do you have any comments on how governor availability; wear and tear; and carrying costs compare between MFK and governor response?	<p>Genesis Energy believes it would be impossible to accurately delineate between the costs of governor response compared with MFK. Any attempt to compare such costs will have to rely on assumptions.</p> <p>This is because these kinds of costs are hard to quantify e.g. wear and tear costs will vary depending on how a plant is operated over its lifetime.</p>
(b) Do you have any comments on the extent to which MFK can be substituted by governor response?	<p>Genesis Energy considers that it may be technically possible to substitute MFK with governor response combined with frequent re-dispatching. However, we are not convinced it is practical to do so.</p>
(c) Do you think there are likely to be net benefits in progressing to a procured governor response service through tendering, given the technical challenges identified in this paper?	<p>No.</p>

<p>(d) Which option or options in section 5 do you agree with and which do you not, and why?</p>	<p>As per the cover letter above, Genesis Energy does not agree with any of the options in section 5 of the paper.</p> <p>We are alarmed that each is a complex ‘solution’ to a problem that is not a problem. We provide the following comments to explain these concerns further:</p> <p>Option A: Codify existing practices</p> <ul style="list-style-type: none"> <li>• Assuming Asset Owner Performance Obligations (“AOPOs”) were to be technology specific, this would still fail to account for differences within technology types e.g. the sub-processes that will differ from kit to kit.</li> <li>• AOPOs would almost need to be plant specific to fairly account for differences between individual generators. The administrative nightmare that would result would not be to the benefit of any party.</li> <li>• Innovation would likely be stifled. New technologies would not be able to participate in the scheme as they would not have been imagined when the System Operator was designing AOPOs.</li> </ul> <p>Options B, C and D: Administered pricing approaches</p> <ul style="list-style-type: none"> <li>• An inherent issue with setting a benchmark for performance is who is qualified to set the benchmark and how should it be set.</li> <li>• This is fraught with difficulty, especially considering the differences between generators (e.g. hydro and thermal generators), and within generator types (e.g. hydro with long and short penstocks) we discuss in the cover letter.</li> </ul> <p>Options E and F: Market pricing approach</p> <ul style="list-style-type: none"> <li>• Each of these options would involve significant complexity in both design and operation.</li> <li>• Adding complexity will add costs, which is likely to offset any procurement savings the Authority has suggested it could make.</li> </ul>
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(e) Are there any other features or options you would like to suggest?	No.
(f) Do you have any comments on the indicative analysis of governor response costs in Appendix E?	Figure 7 is incorrect. The plot shows responses for 2 and 3% droop settings, not 4 and 6% droop settings as specified.
(g) Are there any other issues you wish to bring to the Authority's attention?	No.