

Electricity Authority
Via email: submissions@ea.govt.nz

9 May 2017

Normal Frequency Management: Strategic Review Information Paper

Mercury welcomes the opportunity to comment on the Normal Frequency Management: Strategic Review Information Paper.

We consider it is timely for the Authority to work with the System Operator to investigate the impact of the multiple frequency keeping (MFK) and frequency keeping control (FKC) initiatives on previous input assumptions for a national market for MFK and Asset Owner Performance obligations for governor response.

Mercury has been advocating for, and believes that there is merit in considering options for procurement of governor response. We are particularly pleased that the Authority is engaging with market participants on this important issue at an early stage. This is a complex, highly technical project. While a range of potential options for procuring governor response have been identified, working through the proposals in more detail will be critical to identifying how they might work in practice and therefore which options are feasible and most likely to achieve the Authority's goals.

For this reason we suggest that the Authority consider holding an industry workshop or establishing a technical working group to help progress the work. Likewise the Authority should consider requesting that Transpower undertake more testing of the impact of governor response and MFK to provide further insights into the extent to which governor response can substitute for MFK. Generators should also be asked to make an assessment of the costs associated with supplying governor response for frequency keeping purposes as this is an area with little data currently in our view. We will need to calculate both maintenance and opportunity costs so these can be factored into any decision making on procurement options.

Mercury is keen to fully understand the detail around all options before offering unconditional support for any of them. We are keen to work with the Authority to find a solution that is simple, least cost and pragmatic. Based on the information available in the paper we favour option F: tender based procurement of governor response.

We have provided some comments on the questions posed in the information paper, see the attached appendix. If you have any questions please contact me at nick.wilson@mercury.co.nz 09 580 3623.

Yours sincerely



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Consultation Questions

Question	Response
<p>(a) Do you have any comments on how governor availability costs, wear and tear costs, carrying capacity costs compare between MFK and governor response?</p>	<p>Our experience suggests that if one of our units is responding just as a governor action it will experience less wear and tear than if selected to also perform MFK.</p> <p>A hydro unit providing governor response will provide better response to frequency deviation however it is more likely to operate away from its most efficient point, i.e. into rough running ranges and cause increased runner cavitation which will increase Wear and Tear costs.</p>
<p>(b) Do you have any comments on the extent to which MFK can be substituted by governor response?</p>	<p>The System Operator is best placed to respond to this question in detail. We are aware that the System Operator has the capacity to undertake modelling that will provide relevant information and note that on page 9, footnote 11 of the information paper there is a reference to Transpower tests of both MFK and governor response behaviour. However, these tests have not yet been done while one of these functions is kept static. We believe such testing would provide further useful information.</p> <p>In general terms the extent to which governor response can substitute for MFK depends on factors such as the time of day, plant availability, plant response time and how much a plant operator will be compensated for setting a plant to particular settings.</p>
<p>(c) Do you think that 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>	<p>Mercury cannot say for sure, but we believe it is worth the Authority undertaking further investigations.</p> <p>The Authority would need to ask generators to provide some cost assessments for the supply of governor response, this would include both maintenance costs and opportunity costs.</p> <p>The net benefits of progressing to a governor response service should also consider interactions with the MFK market. For example, could MFK procurement be further reduced? Or would it be more efficient to increase MFK procurement in tandem with governor response?</p>
<p>(d) Which option or options in section 5 do you agree with and which do you not, and why?</p>	<p>We would need more detail on how any of the proposed options would be implemented before we could endorse any of them but in high level terms we favour option F's tender based procurement on the basis it would be easier to implement than option E. Option E would be more difficult to achieve physically as it may require changes in governor settings more often. In addition option F enables an element of competition which should help keep the cost of supplying the service lower which would benefit consumers. In preferring option F we are assuming that there would be an annual tender process which would enable annual planning.</p> <p>Of the options, E and F are preferred over A-D as we would have clarity over what we were tendering for. Option A on codifying existing practices provides no compensation for frequency keeping through governor response even though this service adds to the maintenance costs of our governor. In addition more detail is needed on how this option would work. E.g. would tightening the status quo include penalties? Option B: output-based benchmark and cost allocation is not favoured because we do not have sufficient information on the criteria for inclusion and it would not</p>



	<p>incentivise generators to offer more governor response for frequency keeping. In this respect option C: output-based benchmark with over and under payments is better than B but still requires lots of calculations to be undertaken and payment would be after the service has been provided via some kind of wash-up system. We believe this approach is too complicated; a simple, pragmatic approach is preferred. Option D: paying providers for relative contributions is too vague, potentially too complicated and the price signal is lost.</p>
(e) Are there any features or options you would like to suggest?	<p>No. However, as the issues raised in the information paper are complex and technical and potentially have significant implications. We suggest that the Authority consider holding an industry workshop or convening a working group so that relevant technical experts can be closely involved in the detailed design work to help ensure that the best option is fleshed out in a pragmatic way.</p>
(f) Do you have any comments on the indicative analysis of governor response costs in Appendix E?	<p>E1 - Opportunity cost of energy and reserves should be taken into consideration. I.e. a unit that is dedicated largely for frequency response (governor response) cannot be fully offered into the energy or reserve markets.</p> <p>We cannot comment on the methodology used in E2 – E6 as the link to the FKC Trial Technical Report on page 41 (footnote 43) does not work.</p> <p>E8 – Wear and Tear cost cannot be simplified into an overhaul cost only. Depending on MW load and how responsive the unit is in “governor response” different operational fatigue factors will have to be accounted for. These fatigue factors can be grouped into (but not limited to) – Turbine fatigue (based on rough running range operation), Cavitation fatigue (dependent on deviation from most efficient point) and Activity fatigue (based on responsiveness of the unit). All of the above fatigue factors contribute to asset condition which should be accounted for in the Wear and Tear costs.</p> <p>E9 – will this not contradict Clause 8.17 of Part 8 where “maximum possible injection” is required?</p> <p>E17 b – as per comments regarding E8. Wear and Tear cost encapsulates more than just efficiency impact.</p> <p>E17 c – this depends on the loading on hydro units. There may be scenarios where hydro schemes are loaded to full capacity in which case the availability cost will be same regardless of fuel type.</p>
(g) Are there any other issues you wish to bring to the Authority’s attention?	<p>Yes we believe the scope of this initiative should be expanded to include governor response incentives for providing instantaneous reserves. Governor response provides a significant amount (50 to 150 MW) of ‘free’ reserve for any given contingency which may still remain unaddressed.</p>

