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Submissions
Electricity Authority
By email: submissions@ea.govt.nz

Normal Frequency Asset Owner Performance Obligations

Meridian welcomes the opportunity to provide feedback on the Electricity Authority's consultation paper 'Normal Frequency Asset Owner Performance Obligations'.

The proposed changes to normal frequency Asset Owner Performance Obligations (AOPOs) will have significant cost implications for Meridian and/or result in widespread non-compliance by our generation plants. In particular, the proposal to introduce a maximum allowable deadband of ± 0.025 Hz is incompatible with a majority of Meridian's plant. We expect other generators will be in a similar position. We therefore do not consider the Authority's current proposal to be appropriate.

Meridian recommends the Authority delay the introduction of a maximum allowable deadband until such a time as it is ready to propose an accompanying compensation regime.

Further details are set out below. Meridian is happy to provide additional technical information to the Authority, should this be helpful.

Hydro plant impacts

None of Meridian's existing hydro stations (7 sites, 35 units) have a *settable* deadband in the control system. However, all hydro units have an *inherent* deadband as a result of mechanical backlash. The inherent deadband ranges from ± 0.015 Hz to ± 0.060 Hz. It cannot be altered without a complete governor/machine rebuild.

At a deadband limit of ± 0.025 Hz, as proposed in the consultation paper, it is estimated that 70% of Meridian's hydro units would be unable to comply, and would need to request dispensations. Should such a deadband be made mandatory (without provision for dispensations), we estimate it would cost approximately \$250,000 per unit to attempt to adjust the inherent deadband at each of our non-compliant units. This would equate to around **\$6 million** in total. As we expect most other generators to have a similar level of non-compliant plant, it is likely a proportion of these costs would be recovered through the wholesale market.

Further, undertaking such adjustments would have uncertain outcomes. As such, even following the imposition of these costs, it could not be guaranteed that Meridian's plant would comply with such a deadband limit.

Wind plant impacts

Of Meridian's existing wind farms, only West Wind and Te Uku have governors. Turbines at our Te Apiti and White Hill wind farms do not have governors and therefore are unable to provide frequency support.

Due to the nature of New Zealand's wind resource, and the location of our turbines, the pitching systems in our generators are more active than is the case in most other countries. In effect, pitching controls currently operate at the limit of their designs. Enforcing tight governor deadbands at West Wind and Te Uku will result in increased pitching activity. This activity will be well beyond the limitations of the equipment.

Operating Meridian's wind turbines in this manner will trigger maintenance activities not normally required within the life of a wind farm. This would be broadly equivalent to a half life refurbishment on a hydro or thermal plant. It would entail a major change to Meridian's current maintenance practices. Meridian expects the costs of this additional refurbishment at our existing sites with governor function could be around **\$30 million**.

Further, tight governor deadbands are expected to reduce generation from Meridian's wind farms by forcing turbines to operate away from maximising the wind resource. Meridian calculates annual lost energy as a result of a deadband limit of $\pm 0.025\text{Hz}$ could be up to 13 GWh, or roughly 2% of production at West Wind and Te Uku.

Meridian considers these impacts could be sufficient to discourage future wind farm developers from choosing to install governors at their wind farms. In a worst case situation, such a requirement may discourage investment in wind generation. These outcomes would clearly be counter to the Authority's objectives. This potential dynamic efficiency impact should be account for in the Authority's cost-benefit analysis.

Purpose of AOPOs

As stated in clause 8.16 of the Code, the purpose of AOPOs is to "assist the System Operator in complying with the principle performance obligations" (PPOs). The System Operator's PPOs are primarily concerned with system stability and security. In Meridian's view, it is not the objective of the AOPOs to *minimise* the quantity of frequency keeping support which needs to be procured, provided the PPOs are being met.

We are concerned that the Authority's proposal seeks to extract additional frequency keeping support through the AOPOs for free (but at significant cost to generators), rather than procuring this support through the ancillary services procurement process. Such an approach departs from the cost allocation principles of exacerbator or beneficiary pays.

Meridian recommendation

Given the substantial degree of non-compliance which would result, and/or the significant cost implications, Meridian considers a maximum allowable deadband of $\pm 0.025\text{ Hz}$ is not appropriate. Establishing a deadband limit that requires widespread dispensations would achieve little additional benefit in the frequency keeping contribution of existing plant while imposing significant administration costs on the industry. Furthermore, we question whether it is appropriate to use the AOPOs to minimise the quantity of frequency keeping support procured through market arrangements.

We understand the Authority sees the introduction of a maximum deadband as a first step, with a later phase being to introduce compensation arrangements for those generators holding dispensations. We understand the Authority may await the development and implementation

of a national frequency keeping market (with an associated transition to marginal pricing for frequency keeping) before finalising any compensation arrangements.

Meridian recommends the Authority delay the introduction of a maximum allowable deadband until such a time as it is ready to propose an accompanying compensation regime. This will ensure that generators have appropriate information to make the trade off between complying with a deadband obligation and seeking a dispensation. It will also provide additional time for the Authority (and System Operator) to gather information on the physical limitations and frequency keeping contributions of existing plant, which will help inform what an appropriate deadband limit would be.

If the Authority decides to progress with introducing a specific maximum allowable deadband into the Code at this point in time, the deadband needs to be more reflective of the capabilities of existing plant. Any maximum allowable deadband should only be applied to plant with a *settable* deadband. Plant with an *inherent* deadband, which cannot be altered without substantial cost, should be automatically exempt.

Meridian's responses to the Authority's specific consultation questions are attached in Appendix A.

Please contact me if you have any questions regarding this submission.

Yours sincerely,



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Appendix A: Meridian responses to consultation questions

	Question	Meridian Response
1.	<p>Do you agree that the problems identified with the current generator AOPOs are creating inefficiencies?</p>	<p>Meridian agrees the requirement to “maintain” frequency within the normal band could result in differing interpretations of this requirement.</p> <p>However, we consider there is a lack of information with respect to how generators are currently complying with this Code obligation and what physical plant limitations may exist.</p> <p>As such, we do not consider it is possible at this point to say conclusively that the current AOPOs are creating inefficiencies.</p>
2.	<p>Do you have any comments relating to the drafting of the proposed Code amendment?</p> <p>Please provide comments and suggested drafting improvements with reference to specific parts, schedules and clauses of the draft proposed Code amendment set out in Appendix A.</p>	<p>The proposal to introduce a maximum allowable deadband of ± 0.025 Hz is incompatible with a majority of Meridian’s plant. Given the substantial degree of non-compliance which would result, and/or the significant cost implications, we do not consider the Authority’s current proposal to be appropriate.</p> <p>Meridian recommends the Authority delay the introduction of a maximum allowable deadband until such a time as it is ready to propose an accompanying compensation regime. This will ensure that generators have appropriate information to make the trade off between complying with a deadband obligation and seeking a dispensation. It will also provide additional time for the Authority (and System Operator) to gather information on the physical limitations and frequency keeping contributions of existing plant, which will help inform what an appropriate deadband limit would be.</p> <p>If the Authority decides to progress with introducing a specific maximum allowable deadband into the Code at this point in time, the deadband needs to be more reflective of the capabilities of existing plant. Any maximum allowable deadband should only be applied to plant with a settable deadband. Plant with an inherent deadband, which cannot be altered without substantial cost, should be automatically exempt.</p>
3.	<p>What comments do you have on the Authority’s proposal for an eight-month transition period?</p>	<p>If a maximum allowable deadband is introduced, Meridian will need to consider additional plant investment or proceed with seeking dispensations for a majority of our plant. We consider this process is likely to take at least 12 months (and will be further influenced by alignment with existing budget</p>

		<p>cycles).</p> <p>Given the currently proposed deadband will result in widespread dispensation applications, the Authority should also give consideration to the time required by the System Operator to process a large number of applications.</p> <p>We therefore consider an eight-month transition period to be too short.</p>
4.	<p>What costs do you anticipate that affected parties, particularly generators, may face in transitioning to the new regime if the proposed Code amendment were to proceed?</p>	<p>As described in the cover letter:</p> <ul style="list-style-type: none"> • forced compliance with a ± 0.025 Hz deadband at Meridian's hydro assets is estimated to incur costs of \$6 million (with compliance not guaranteed). • compliance with a ± 0.025 Hz deadband at Meridian's West Wind and Te Uku wind farms would incur an additional half-life refurbishment cost of around \$30 million and an annual energy loss of up to 13 GWh. <p>In the case that dispensations are agreed for all Meridian's plants, our primary cost will be associated with applying for dispensations (and any cost associated with a future compensation regime).</p>
5.	<p>What on-going costs, relative to the status quo, do you anticipate that affected parties, particularly generators, might incur if the proposed Code amendment was to proceed?</p>	<p>See response to Question 4.</p>
6.	<p>What comment do you have on the Authority's evaluation of the alternatives and the cost-benefit assessment of the preferred Code amendment (the proposal) set out in sections 5.3 and 5.4?</p>	<p>Meridian considers Option 2 (deferring Code amendments pending other developments relating to normal frequency) is preferable to Option 1, as:</p> <ul style="list-style-type: none"> • it would provide time to collect information on the physical limitations and frequency keeping contribution of existing plant, allowing for a more informed assessment of the problem and a more informed solution; • it would provide for the concurrent development of a new frequency keeping obligation and an associated compensation regime, which would provide a much clearer framework for generators to trade off the costs of compliance with the costs of dispensations, resulting in better investment decisions. <p>Meridian considers the foregone benefits of</p>

		<p>deferring Code amendments will be low given the extent of dispensations expected to be sought.</p> <p>We consider the Authority's estimate of benefits is highly uncertain. Without precise information on the frequency keeping contribution of existing plant within the normal band, it is difficult to have confidence in any estimation of a reduction in frequency keeping costs.</p>
7.	<p>What comment do you have on the Authority's assessment of the proposed Code amendment against the requirements of section 32(1) of the Act?</p>	<p>As already noted, Meridian considers there is a lack of information with respect to how generators are currently complying with this Code obligation and what physical plant limitations may exist.</p> <p>As such, we do not consider it is possible at this point to say with confidence that the current AOPOs are creating inefficiencies.</p> <p>We therefore disagree with the Authority's assessment.</p>
8.	<p>What comment do you have on the Authority's assessment of the proposed Code amendment against the Code amendment principles?</p>	<p>Meridian does not consider that the proposal meets Principle 2, in that there is not a clearly identified efficiency gain or market or regulatory failure.</p> <p>Further, the Authority has not complied with Principle 3 in that it has not completed a quantitative cost benefit analysis. Meridian considers completing a quantitative cost benefit analysis in this case is possible, however it would require the Authority to first gather information on the frequency keeping performance and physical limitations of current generation plant.</p> <p>At a minimum, Meridian considers the Authority needs to update its cost benefit analysis with cost information provided through submissions to this consultation.</p>