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Electricity Authority
By email: fsr@ea.govt.nz

Code amendment proposal on common quality-related information

Meridian appreciates the opportunity to provide feedback on the Authority's consultation paper 'Promoting reliable electricity supply: Code amendment proposal on common quality-related information'.

Our feedback on the proposal is as follows:

- We recognise the core issue driving these proposals – the need for the System Operator (SO) to have access to accurate and timely information about assets connected to New Zealand's power system to effectively manage system stability. As noted, this information will only become more important as new technologies are connected to the grid. The Authority notes that, in the absence of detailed information, the SO will operate the transmission network more conservatively. We agree this is not a desirable outcome. Making full use of available grid capacity is a better outcome for all parties, particularly consumers who avoid paying for unnecessary generation constraints and/or unnecessary grid upgrades. We therefore support the overall intent of these proposals.

- We support the approach of bringing together the various information and communications requirements applying to asset owners under a single document incorporated by reference in the Code. This will hopefully result in more flexible and fit-for-purpose requirements over time.

- We are concerned that the draft Connected Asset Commissioning, Testing and Information Standard (CACTIS) includes changes which signal a shift from a more flexible, collaborative and needs-based approach to more prescriptive requirements. While we recognise that a certain level of prescription may simplify the process from the SO's perspective, there can be very real costs imposed on asset owners as a result of these information requirements. It is important that all information requirements are fit-for-purpose with regard to the particular asset, project or risk at hand. It is likely to be difficult to right-size these requirements for all scenarios with prescriptive rules. Rather, we consider leaving a degree of flexibility and pragmatism and allowing for discussion and agreement between the SO and asset owners will generally result in more fit-for-purpose requirements. We have made specific

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comments along these lines in our initial feedback on the draft CACTIS, as attached at Appendix B. We also note that more prescriptive requirements are likely to drive a more compliance-focussed regulatory regime, which will ultimately impose greater costs on the Authority, the SO and asset owners.

- Overall, the CACTIS seems to shift more responsibility on to asset owners. For example, the SO has specified multiple models that asset owners will need to provide to the SO to undertake connection studies. Some of these models are predominantly used by the SO. However, the responsibility for completing the relevant modelling falls on asset owners, including accessing the relevant external skills and expertise where this is needed. This is likely to be challenging, particularly where there are few or no New Zealand-based organisations with the relevant knowledge. This could impose significant additional cost and complexity on asset owners.

- Further to the above, we note that generally New Zealand-based generators do not hold a lot of negotiating leverage in their relationship with Original Equipment Manufacturers (OEMs) who operate in a much larger international market. This is likely to push asset owners towards relaying on third-party consultants to meet the SO's requirements, introducing additional cost and contractual complexity. It may also give rise to friction between OEM and third-party consultants with regards to use of proprietary intellectual property (IP).

- The proposed requirement to use the Transient Security Assessment Tool (TSAT) for final validation will create a reliance on TSAT supplier Powertech. TSAT is not commonly used internationally and there is limited expertise available to provide support. Transpower has identified that the costs for TSAT translation are NZ$50-100k, which is significant and may increase over time, leaving asset owners with an unavoidable and uncontrollable cost. As an alternative, we recommend that asset owners be required to provide a WECC generic model which the SO can convert into TSAT. This approach would also avoid a proliferation of service provider contracts i.e. requiring each asset owner to pay for translation to TSAT, requiring multiple service provider agreements and likely increasing costs.

- It is unclear whether the draft CACTIS is intended to codify the requirements set out in GL-EA-010 Generator Testing Requirements. The draft CACTIS refers in clause 2.2 to the form for a commissioning plan "from time to time published by the system operator" which we understand to be DT-EA-338 Code Commissioning Plan Template. This template notes in section 2.7 that the engineering methodology provided by an asset owner must include a full description of the proposed tests, the details of which are listed in GL-EA-010 Generator Testing Requirements. It is not clear whether these cross-referenced documents result in a requirement for an asset owner to meet the exact testing requirements specified in this document. It would be helpful if the intent of this is clarified. Meridian's preference is that the detailed testing requirements are a starting point for negotiation with the SO. Otherwise, we recommend that the testing requirements are set at the level of minimum requirements to ensure that all compulsory tests add sufficient value to the commissioning process. We note that asset owners already have strong incentives to ensure the proper functioning of connected assets via the Asset Owner Performance Obligations (AOPOs). Imposing strict and non-negotiable testing requirements will only increase costs for little benefit.

- It is not entirely clear which obligations will apply to existing assets from the point the CACTIS comes into force and/or whether there will be any transition period for existing assets. We generally assume that information requirements associated with connection processes will not apply to existing assets and that new information requirements for existing assets would only be triggered, for example, by a substantive change to asset configuration. This will of course have a significant bearing on the costs imposed on asset owners. We request that the Authority clearly set this out in any final decision.

- The Authority's cost-benefit analysis comprises a qualitative assessment which identifies a range of costs and benefits and notes their magnitude as being negligible, modest or material. It ultimately concludes that net benefits are expected to be modest. The Authority has adopted a qualitative approach to this assessment despite identifying quantifiable costs for a range of obligations to be imposed on asset owners, such as modelling translation and validation costs and the costs of high-speed monitors. Based on this information alone, it would be possible for the Authority to aggregate at least some of the cost that these requirements will impose at a system level. This would have been a helpful benchmark to determine the minimum required benefits. Meridian's view is that the Authority's cost-benefit approach in the paper is inadequate. The very real costs imposed on asset owners from this proposal warrant a more careful and thorough consideration than the Authority has undertaken.

Our responses to the Authority's specific consultation questions are attached as Appendix A. Detailed comments on the draft CACTIS are attached as Appendix B.

Please contact me if you have any queries regarding this submission. This submission can be published in full.

Nāku noa, nā

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Appendix A: Responses to consultation questions

	Question	Response
1	Do you support the Authority's proposal to clarify the Code's common quality information requirements and describe the technical specifications in a document incorporated by reference in the Code?	Yes.
2	Do you have any comments on the drafting of the proposed amendment?	No.
3	Do you see any unintended consequences in making such an amendment?	Yes. These are discussed in the body of our submission.
4	Do you agree with the objective of the proposed amendment? If not, why not?	Yes.
5	Do you agree the benefits of the proposed amendment outweigh its costs? Please provide evidence to support your view. This may include incremental benefits and costs associated with the draft CACTIS.	We consider it is not possible to determine this based on the information the Authority has provided. There are real costs associated with this proposal, a number of which the Authority has identified. The Authority has made no effort to aggregate these costs or to quantify the benefits, however, making an overall assessment difficult.
6	Do you agree the proposed amendment is preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.	The Authority's assessment of relying on a working group to define clear expectations seems overly negative. The Authority has noted that such an approach would lack enforceability and lead to inconsistency in compliance. However, a working group could be utilised to refine reasonable information requirements which could subsequently be codified through the CACTIS and enforced by the Authority. Such an approach could simultaneously ensure reasonable, clear and enforceable requirements.
7	Do you agree the Authority's proposed amendment complies with section 32(1) of the Act?	It is difficult to say without a robust cost-benefit analysis.
8	Do you have any comments on the drafting of the proposed amendment?	No.

9	Q9. Do you have any comments on the draft Connected Asset Commissioning, Testing and Information Standard?	Yes, our detailed comments on the draft CACTIS are set out in Appendix B.

Appendix B: Feedback on the draft CACTIS

Chapter	Feedback
1	• 1.3 & 1.4 – these clauses provide the SO with too much discretion to unilaterally determine the information that asset owners need to provide and the timeframes for the provision of this information. This risks creating an unreasonable burden on asset owners. Requiring that these things are determined by mutual agreement would place better incentives on both parties to discuss, negotiate and agree information requirements and would be more likely to lead to fit-for-purpose requirements. Alternatively, a mechanism allowing asset owners to challenge information requirements specified by the SO should be introduced. • 1.7 – the 3-month timeframe specified here is overly onerous. Based on our experience, a 1-month timeframe is realistic and sufficient. • 1.16 & 1.17 – we recommend a separate check of final hold point test results be required immediately following commissioning. It is not reasonable for an asset owner to have to wait 4 months to find out if retesting is required. By this point, asset owners have likely disengaged with the OEM. • General – the timeframes for building and connecting new generation projects is often dynamic. They can be impacted by numerous factors, many of which are uncontrollable. We recommend this chapter includes a mechanism to modify the specified information provision timeframes by mutual agreement between the asset owner and SO to retain sufficient flexibility to respond to changing project schedules. • General – it would be helpful to include a definition of “asset” which differentiates between those assets that, when connected to the grid, will have a significant impact on the power system and should therefore be subject to the processes and timeframes set out in the CACTIS, and those that will not have a significant impact. For example, it is possible that an asset owner will connect a substation without generating units attached which would have little to no impact on the power system.

2	• 2.3 – reference here to a change to a control system setting is too broad and encompasses settings which would have no or little power system impact. Changes to a control system setting should be defined in relation to the limited specific parameters which would impact the power system. Alternatively, flexibility could be provided for the SO and the asset owner to:
	  ○ agree that particular changes are not material enough to warrant a full commissioning plan; or
	  ○ modify the commissioning plan template to ensure that it is fit-for-purpose for a particular piece of work.
	• 2.5 – this clause requires that protection and control settings be specified in a commissioning plan. These settings are currently specified in the engineering methodology document, which is finalised after the commissioning plan. We consider the engineering methodology document will continue to be the appropriate place to detail these settings. We recommend the requirement to include these settings in a commissioning plan be removed.

3	• 3.5(a) – 2 business days to update the ACS is insufficient in cases where modelling or more complex analysis is required; it can often take weeks to collect the relevant information. We suggest this clause is changed to require that an asset owner notifies the SO immediately about a change to the capability of an asset but is provided 3 weeks to formally update the ACS. • 3.5(b) – this requirement defines “temporary” changes to asset capability as being 4 weeks or less. However, the SO is allowed 20 business days to provide feedback on ACS updates. This could lead to a scenario where the ACS for a temporary change has only just been reviewed before the asset capability changes again. We recommended temporary changes are defined as up to 3 months to avoid such a situation.

4	• 4.4 – Meridian's existing hydro and wind models do not include protection systems. This requirement, if applied retrospectively, could impose significant costs. • 4.5 – TSAT models are uncommon and not provided by OEMs. As far as we are aware, there are no third-party resources available in the New Zealand market who could undertake this work as such models are only used by Transpower. A more reasonable approach would be for asset owners to provide a generic model to the SO and for the SO to translate this into TSAT for its own use. • 4.6 – asset owners do not currently have access to unencrypted RMS models. These are directly submitted by the OEM to the SO. If the SO sets out clear and reasonable requirements for these models, we can seek to incorporate this in our contracts with OEMs. • 4.10(d) – requires asset owners to ensure that the models we submit can be used in real time operations. It is unclear to us how we can do this; our understanding is such models do not readily integrate with real time operations. It is also unclear to us whether this clause requires non-dynamic controls to be modelled; we have historically agreed informally with the SO that any systems that act over a longer time period (minutes) are generally not useful to include in dynamic models. • 4.10(f) – this requirement is too vague. Further, we query how this requirement would work if the control signal used is part of an encrypted block. • 4.11(e) – we are unsure if BESS models include a state of charge parameter. We note also that droop and ramp rate settings are agreed between the asset owner and the SO; it is not clear why these would need to be changed by the SO. • 4.12(b) – the reference to phase-locked loop (PLL) settings may become outdated with the increasing integration of grid-forming inverters. • 4.13 – we can only validate encrypted PF, PSCAD and generic WECC models. • 4.14 – as noted, we will not have access to a TSAT model. It will make the most sense to validate the PowerFactory model. We are not sure why validation of the PSCAD model is required here. • 4.15(a) – we understand the need to provide a full model description, however we consider the more specific items listed here are already represented in the model. Providing details of these will create an additional burden for no benefit. • 4.15(f) – it is unlikely that an OEM would provide information on the impact of configurable parameters on control system performance. We consider this requirement is too broad. The SO's focus should be on ensuring the as-left product is stable, not how parameters should be adjusted to make it stable. • 4.15(g) – these models are not 1-to-1 comparisons so we are unlikely to be able to provide detailed cross-referencing. We will only be able to comment on model features at a high level. • 4.15(i) – it is unclear to us whether we will be able to provide this. • 4.16 – we note this requirement will impose costs on asset owners from providing updated models. As such, it would be helpful if the SO could give sufficient advance notice of upgrades to its software package version to allow asset owners to budget for this expense. • 4.17 – 1 month is not a reasonable timeframe, particularly considering that we have some older assets with no OEM support and there are constraints in accessing the relevant consulting expertise. • 4.19 – we query whether it is a good use of resource to require the submission of an updated validation report when the performance of the asset has not changed.
5	• 5.12 – undertaking studies of the suitability of an asset's voltage control system settings in conjunction with assets such as STATCOMs and SVCs will require Transpower to provide sufficiently detailed models. • 5.22 & 5.33 – requirements to share encrypted models should be based on mutual discussion and agreement between the relevant asset owners.

6	• 6.3(b) – as noted in relation to Chapter 2, reference here to a change to a control system setting is too broad and encompasses settings which would have no or little power system impact. Changes to a control system setting should be defined in relation to the limited specific parameters which would impact the power system. • General – it would be preferable to provide asset owners with greater discretion around when testing is required. Given the obligation on asset owners to meet AOPOs, they are well-incentivised to undertake testing when a change is made that may impact performance. • General – Meridian's view is that the SO should be responsible for undertaking grid-scale PSCAD studies. They hold the relevant information to undertake such studies and/or are best placed to work with other asset owners to obtain the required information. Meridian's recent experience with connecting and commissioning the Ruakākā BESS was that this required significant effort and we expect this will only get more difficult as more renewable generation is added to the system and PSCAD models need to be obtained from more asset owners. We understand in Australia, a grid-scale PSCAD study is conducted by AEMO while the asset owner is responsible for completing studies up to the point of connection (assuming an infinite grid). We recommend such an approach is also adopted in New Zealand.
7	• 7.3 – we query whether the requirement to undertake model validation every time routine testing is undertaken is an efficient use of resources. • 7.7 – it is not clear what exactly is covered by "modify an existing asset". We presume this would only encompass modifications that affect the likes of PPOs, AOPOs or ACS. It may be helpful to clarify this. • 7.13(a) – it may be helpful to further elaborate on transient response, steady state response and alternating current disturbance response. • 7.13(d) – this requirement will impose a significant burden on the owners of older assets without providing much value. • 7.19 – Typically frequency protection is part of inverter controls rather than protection relays making it difficult to define 'self-monitoring'. We would argue that 10 years would be a sufficient testing frequency if the settings are backed up or duplicated on feeder relays.
8	• 8.19 – we consider this clause provides too much discretion for the SO to determine what is reasonable. We recommend the information provided is based on negotiation and mutual agreement between the parties. • 8.27 – the requirement for +/- 2% accuracy is likely to be difficult to achieve for assets that don't have metering class CT/VT.
9	• 9.3 – limiting the provision of data to the specified file types may unnecessarily create additional work. At present, the SO is happy to receive data in PQZIP files. This could instead require the SO and asset owners to work together to ensure the SO is able to read the provided files. • 9.4 – Table K specifies requirements for station-level data. Meridian generally only has data available at a unit level for hydro stations. Is an aggregation of unit data sufficient for this purpose?