18th November 2021

Australian Energy Market Operator (AEMO)
GPO Box 2008
Melbourne VIC 3001
mass.consultation@aemo.com.au

Amendment of the Market Ancillary Service Specification (MASS) – DER and General Consultation

Hydro Tasmania welcomes the opportunity to make a submission in response to AEMO's MASS DER and General Consultation process. Hydro Tasmania currently operates in all 8 Frequency Control Ancillary Services (FCAS) markets and participated in the AEMO Virtual Power Plant (VPP) demonstration trial via our VPP located in Queensland.

Hydro Tasmania has reviewed and proposed amendments throughout the MASS consultation process. In our view, the changes enacted by AEMO throughout this process have significantly improved readability and useability of the MASS. We have provided some further and final comments regarding both the General and DER sections of the MASS in Attachment A for AEMO's consideration. These comments relate to:

1. Frequency Deviation Settings Provided by Switching Controllers (Section 6.1);
2. Compliance Monitoring and Action (Section 10.3 and Appendix B);
3. Control Response Delay (CRD) (Section 10.4e);
4. Maintain at all times a Setpoint Change Deadband (Section 10.4f)
5. Regulation Tests (Section 10.6); and
6. Proposed application of 5% Discount Rates for fast FCAS provision (11.3.2c);
7. Other general comments.

Hydro Tasmania would welcome the opportunity to participate in future technical working groups and discussions as this work evolves. If you have any queries on this submission or require further information please contact John Cooper (john.cooper@hydro.com.au or (03) 6240 2261).

Yours sincerely,

Colin Wain
Manager Policy Development

Attachment A – Hydro Tasmania comments on proposed MASS amendments

6.1 Frequency Deviation Settings Provided by Switching Controllers

Hydro Tasmania suggests that the Default Frequency Deviation Setting in Tasmania should remain unchanged (see Table 6 below).

Table 6 Frequency Settings for Tasmania

Level	Raise FCAS Frequency Deviation Setting (Hz)	Lower FCAS Frequency Deviation Setting (Hz)	Frequency Rate of Change Multiplier
Frequency Deviation Setting range	49.50 Hz to 48.75 Hz	50.50 Hz to 51.25 Hz	0.875
Default Frequency Deviation Setting	49.~~5125~~ Hz	50.~~5825~~ Hz	0.875

Subject to the system inertia and primary frequency response (PFR) conditions at the time, Tasmania system frequency deviation introduced by the Basslink power flow reversal could reach 0.4 - 0.6Hz, occasionally up to 0.8Hz. On this basis, we consider the existing default setting reasonably reflects the Tasmania system frequency condition, and therefore, suggest the current definition be maintained. Hydro Tasmania also notes that the current Default Frequency Deviation Settings are asymmetric, and query whether this was intentional, or a slight error in the MASS.

10.3 Compliance Monitoring and action and Appendix B

In principle, Hydro Tasmania considers it appropriate to coordinate the provision of FCAS services of all kinds. However, this principle isn't always upheld. For instance, when the automatic generation control (AGC) instructions are contradictory to the contingency FCAS response. As currently drafted in section 10.3 and the example provided in Appendix B, the MASS would direct generating units to respond to AGC instruction, even if its correction direction is in conflict with the contingency FCAS response.

Hydro Tasmania considers the MASS could be improved by addressing this conflict, and mitigating adverse impacts on the power system, such as:

1. Likely interference with primary frequency response (PFR) resulting in undesired system frequency recovery delay; and/or
2. The introduction of uncertainty to the fast contingency FCAS evaluation, alongside an opposite AGC instruction, which could discount a governor response, subsequently resulting in an under delivery of contingency FCAS.

To achieve the harmonious operation between each of these functions, it is important that the AGC regulation correction direction be in phase with the contingency FCAS response, thereby assisting with, rather than resisting power system frequency recovery.

10.4(a) Ancillary Service Facility – Control Request Feedback

Hydro Tasmania notes there is a new item 'Control Request Feedback' proposed in Section 10.4(a). From its definition provided in Table 1, Hydro Tasmania has difficulty in understanding the

requirement for older hydropower units that utilise pulse control facilities, and feel it may be impractical for the facilities if the pulses are accumulated in a physical position of governor components (i.e. setter motor shaft position), where digital feedback is not available.

Hydro Tasmania would therefore encourage AEMO to provide further clarification of the requirement, and provide an explanation of the technical driver behind it. Hydro Tasmania would welcome the opportunity to engage with AEMO directly on this matter and identify a potential solutions.

10.4(e) Control Response Delay (CRD)

Hydro is aware that a new technical requirement associated with a time constant of 1st order transfer function has been proposed to measure the AGC response time delay in Section 10.4(e) of the MASS.

While the MASS indicates the details are still to be determined, Hydro Tasmania would like to clarify at a high level, whether this measurement will include both AEMO and participant AGC from end-to-end, or solely participant AGC alone.

10.4 (f) Maintain at all times a Setpoint Change Deadband greater than or equal to half of the facility's minimum Regulation FCAS offer quantity as defined in Sections 10.1 and 10.218.

Hydro Tasmania notes the requirement in 10.4(f), which states that 'Ancillary Service Facility must have a control system that can maintain a Setpoint Change deadband'. However, as per the definition in Table 1, the Setpoint Change Deadband is a value set in AEMO's AGC. Hydro Tasmania would like to clarify how this deadband setting can be appropriately maintained by a participant's Ancillary Service Facility, when this value is physically set in AEMO's AGC.

Further, Hydro Tasmania would encourage AEMO to provide further clarity regarding proposed configurations. In particular, Hydro Tasmania queries why the Setpoint Change Deadband has to be greater than or equal to half of the facility's minimum regulation FCAS offer. Further clarity on this point will ensure that participants understand the rationale for this requirement, and implement accordingly.

10.6 Regulation Tests

Hydro Tasmania notes that the draft MASS document proposes to extend the regulation facility routine test cycle from 2 to 4 years. We consider a 4 year interval to be reasonable. However, as mentioned in our previous submission (5th August 2021), this will be challenging for Hydro Tasmania to effectively conduct testing of all ~50 Hydropower units in this timeframe.

Hydro Tasmania is concerned that this obligation may result in increased downtime and increase costs associated with testing requirements. While the regulation tests details are still to be determined, Hydro Tasmania would like to engage with AEMO in developing the regulation tests approach and ensure the regulation tests can be carried out through the entire hydro fleet in a practical and cost-effective manner, whilst maintaining a robust process that can reasonably demonstrate ancillary service facilities are performing as required.

11.3.2c Proposed application of 5% Discount Rates for VPP operators providing fast contingency FCAS with less than 200 assets metered at 200ms resolution.

Hydro Tasmania acknowledges the review carried out by the University of Melbourne which considers (among other things) the appropriateness of applying a FCAS discount rate. Hydro Tasmania considers that this study has provided a sound reference to understand the impact of data resolution to the FCAS evaluation.

Section 3.4 of the University of Melbourne report ("Site aggregation") states that *'increasing the number of the sites will substantially improve (reduce) the verification error'*. Hydro Tasmania is unable to find an explanation from the report as to how increasing the number of assets will create a fundamental improvement to the FCAS evaluation. As such, we remain unclear how this conclusion has been reached in the analysis presented. We would encourage further clarification on this finding.

Hydro Tasmania would like to note that, while the statistical error (probability) may decrease with a larger sample size, this may not accurately reflect physical outcomes. For instance, a VPP with a greater number of units will likely experience greater transmission losses. Therefore, we encourage further work to better understand the overall errors associated with the delivery of FCAS from VPP. Given the 200ms measurement requirement is a step change to the VPPs, Hydro Tasmania would suggest that the MASS should focus on the 200ms implementation at this stage. Delaying the inclusion of the 5% discount proposal for both participants under and over 200 sites will allow for a more conclusive decision to be reached once further information is available.

Lastly, with the new 200ms data in place, Hydro Tasmania would like to clarify whether the existing regional high speed data logger (50ms) will remain relevant, or become redundant following these amendments.

Other general comments

Hydro Tasmania notes a slight disparity in the terminology used between the frequency references in figure 1 (power system frequency) and figure 6 (local frequency). Hydro Tasmania queries whether these terminologies are considered interchangeable, or are defined differently. In the event that these terms are defined differently, Hydro Tasmania considers that it would be beneficial to clarify.

In addition, Hydro Tasmania would like to note that, while the delay FCAS services (5 mins) are categorised as contingency FCAS, they are effectively implemented by AGC instruction. Therefore, if the Contingency FCAS is referred in the governor response path as shown in figure 1 and 6, we recommend that AEMO amend the schematic to be 'Contingency FCAS (6s and 60s only)' to avoid confusion.