
From: Tim Ryan <tim.ryan@ready.energy>
Sent: Tuesday, 21 June 2022 1:38 PM
To: Mass Consultation
Cc: [REDACTED]
Subject: Clarification of application of MASS Specification to Control and Metering; Future impacts of higher frequency control for FFR on FCAS (esp VPPs)
Follow Up Flag: Follow up
Flag Status: Flagged

MASS CONSULTATION SUBMISSION - Tim Ryan - Ready Energy - 21-June-2022

Clarification of application of MASS Specification to Control and Metering;

Future impacts of higher frequency control for FFR on FCAS (esp VPPs)

We want to draw to the attention of the MASS Review an area of significant ambiguity in the MASS wrt to "measurement" and the necessary bifurcation for CONTROL versus METERING

I met with Julius Susanto (AEMC) as a followup from the AEMC's FOS Review webinar Friday May 27th as he was keen to *"explore further your [my] comments on the MASS, particularly on how you are [I am] viewing the control of the VPP to provide fast responses, (as opposed to local controls from the batteries, inverters, etc)."*

The concern we have, that I raised in the FOS webinar, and prior in other forums, is that the changed 200ms sampling rate for a "Aggregated Ancillary Service Facility" [VPP/s] in the MASS (attached)* is unsuitable for the operations of VPP, and that the significant delta, (of 150ms) to the "normal" large system Ancillary Service Facility ie 50ms, poses a real risk of unexpected outcomes and sawtooth frequency response.

The debate around the MASS amendments has at times been acrimonious because the VPP trial participants were initially given a compliance exemption and they wished that to continue rather than conform to the original MASS when the trial concluded (though that was clearly never the intent).

What is now apparent, confirmed with both AEMC and AEMO, is that the MASS Specification is clearly ambiguous at best, and significantly misleading at worst when it comes to the requirements for CONTROL - as against METERING

The only discussion on sampling rates is in section 5 (specifically 5.3.2 Table 4) - *"The equipment required to measure and record the delivery of FCAS, including both the source transducer and data recorder, must have the characteristics detailed in Table 4."*

The issue is that this wording applies not JUST to *measurement* - but all equipment!

It was Julius' belief, until our conversation, that the 200ms sampling issue I was concerned about applied ONLY to MEASUREMENT of delivered FCAS ie kW/KWh (ie "metering") - as it was "understood" that control must be at <50ms for any/all FCAS participation.

It should also be noted that the AS4777.2 2020 is very specific that $\leq 50\text{ms}$ was the sampling requirement and that nexus should be consistent.

What controls FCAS? The control of FCAS is simply the deviation away from 50Hz and any excursion $\pm 0.150\text{Hz}$ (NOB - normal operating band) - the control is RoCoF (Rate of Change of Frequency).

Appendix 2 sets out a simplistic description of this. For more clarity though RoCoF is a "slope" [0.125Hz/s Mainland, and 0.4Hz/s Tasmania] - however there is no mention of, let alone requirement specifying, the maximum sample rate allowed to calculate it.

To date, for FCAS and for PFR (by thermal generators), RoCoF is based on sampling data <50ms. The expectation is that big batteries with sophisticated systems will have even faster response - this is why the Rule Change for FFR was made.

This brings the second issue [**Future impacts of higher frequency control for FFR on FCAS (esp VPPs)**] into focus.

Inertia in a machine generation system is to all intents and purposes "instantaneous" and output control is later exercised through the governor. Synthetic Inertia will bring with it new challenges.

A live issue - particularly important for Consumer Protection - is what the future might hold with separate operation of FFR and FCAS and a reasonable expectation that the faster control, and significantly higher contribution to FFR (battery) resources, is likely to dominate the mix of frequency services and therefore revenue opportunities.

With FFR systems, Synthetic Inertia is trying to emulate the near instantaneous inertia of the current system however, now as a service, it's therefore likely that it will diminish the opportunities (or "money pot") for FCAS in general but especially VPPs. That VPPs might have a lesser control frequency is just not an option!

Returning the main/first issue.

It reasonable then to suggest, if not require, that all Frequency Control Services should have sampling and control at the highest sampling rates.

I have discussed this sampling issue with people designing/building VPPs (esp control equipment) and there appears to a common misunderstanding that the 200ms is across the board measurement for control and metering (and appears to driven by a misunderstanding of what is meant by "measurement").

This misunderstanding needs to be corrected as a matter of urgency.

SUMMARY

So we have two major consumer issues - firstly that it appears that systems provided, or being designed, may not meet the requirements (and therefore will be barred from participation) and, secondly, that without clear focus and understanding of market segmentation (and associated costs) the opportunities for VPPs may be limited ... and reducing over time.

Lastly, without going into a dissertation on the mathematics, the system security risks of mismatched sampling, on latency and jitter, and consequential financial impacts and/or rewards, cannot be overstated.

This is not an immediate risk (the VPP volumes are small and thermal PFR is currently dominant) but it's a fatal flaw for people building VPPs and for more so for consumers that are being enticed into buying batteries on promises of VPP revenues (through all sorts of schemes).

We hope to see detailed discussion of controls versus metering, and clearer requirements for control, in the Review's Report/s.

If you have any queries, or you require me to make further representations, please do not hesitate to contact me on 0419 857 926 or tim.ryan@ready.energy

Cheers Tim

* https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2021/mass/final-determination/market-ancillary-services-specification-v70-clean.pdf?la=en

--

Tim Ryan,
Founder & CEO,
Ready.Energy