



5 Jan 2023

Mr Charles Popple
AEMC Reliability Panel Chair

Lodged via the AEMC website

Dear Charles,

Reliability Panel review of the Frequency Operating Standard

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in renewable energy and energy storage along with more than 7,000 solar and battery installers.

The CEC is committed to accelerating NEM decarbonisation while maintaining a secure and reliable supply of electricity for customers.

We welcome the opportunity to comment on the Reliability Panel's Draft Determination on the Frequency Operating Standard. This is an important reform which will support the ongoing stability of the transitioning power system.

The Clean Energy Council is generally supportive of the Panel's proposals. We have made some suggestions which we think will help make the draft FOS consistent with NEM decarbonisation.

While the FOS itself is a technical document, the introduction of parameters such as the RoCoF standard will have far reaching consequences for the speed and stability of decarbonisation. The Panel must therefore give greater consideration to the implications of the revised FOS, as they will have significant commercial and environmental impacts.

We are generally supportive of the various elements of the FOS, noting the following:

- the rationale for the setting of the Primary Frequency Control Band should be given further consideration, at a future date. We are therefore supportive of the Panel's commitment to reconsider these values once they have been in operation for some time.
- the decision to reject a maximum contingency size is also supported, on the basis of the potential impacts this could have on the renewable generation and storage investment pipeline. However, we agree with points made that maximum contingency sizes may continue to be imposed 'through the back door' of the connection agreement process, particularly through relatively opaque interpretations of NER clause S5.2.5.12. We look forward to working with AEMO and AEMC to address issue through the Access standards review.
- the approach to removal of the limit on accumulated time error, while maintaining reporting obligations, represents a sensible outcome

The focus of the remainder of this submission is on the introduction of the RoCoF standard. While we are supportive of standardisation of this power system requirement, we encourage the Panel to give further consideration to the role of this standard in the overall process of NEM decarbonisation.

AEMO and the Panel have identified that a standardised approach to RoCoF is required primarily on the basis of maintaining secure operation of thermal synchronous units, as well as the safe operation of emergency frequency control schemes.

The CEC considers more work must be undertaken by AEMO and the Panel to assess the requirement for a minimum RoCoF level from synchronous thermal units. This is critical to understanding the magnitude of the underlying issue, and therefore whether the cost imposed on customers is justified.

For example, if the requirement for 1Hz/S RoCoF is driven by uncertainty regarding the RoCoF ride-through capability of legacy thermal units, it follows that AEMO should work with the operators of said legacy assets to develop more accurate models and remove this uncertainty. This is currently the approach taken by AEMO for legacy IBR generators, particularly legacy wind farms that have been required to upgrade their generator models at significant additional cost.

While this additional modelling may come at some expense for operators of legacy thermal units, this must be weighed against the potentially significant costs imposed on market participants if AEMO must procure additional volumes of inertia to manage uncertainty around systemic RoCoF risk.

The Reliability Panel should therefore direct AEMO to explain how it will work with operators of legacy thermal units to remove this uncertainty – for example, by ensuring that these uncertainties with legacy thermal generating units are considered by AEMO in its current review of the [Power System Model Guidelines](#) (see section 3.3.4).

Similarly, further analysis must be undertaken to understand whether any new connected synchronous thermal units will display similar vulnerabilities to system RoCoF values greater than 1Hz/s. Noting that the current NER clause 5.2.5.3 minimum access standard for RoCoF withstand sits at 1Hz/s, there is some risk that new synchronous thermal units may be connected with RoCoF capabilities at the minimum, and therefore create further requirements for additional inertia volumes. Again, this may come at significant costs to market participants.

The Panel should direct AEMO to provide greater clarity as how this risk can be managed through the connection process generally, as well as potentially through the ongoing review of the generator access standards.

Finally, the Panel should consider how the RoCoF standard may affect the volumes and sources of pre-contingent inertia procured by AEMO. It would be sadly ironic if systemic RoCoF risks, which are partially created by the dispatch of some synchronous thermal units, are then managed by paying those same synchronous thermal units for the provision of inertia services.

A more efficient approach would be to utilise non-thermal assets, such as synchronous hydro, syncons and batteries to provide inertia services (with the advantage that the latter can also provide FFR). This approach would reduce the overall systemic RoCoF risk by reducing the dispatch of RoCoF vulnerable synchronous thermal units, while providing zero carbon sources of inertial response services.

The CEC acknowledges that some of the above issues may be addressed through separate work programs, in particular AEMO's ongoing work exploring 'system hold points' in the Engineering Framework, as well as the AEMC's development of the Operational Security Mechanism and the Inertia Services Market. However, the Panel should nevertheless undertake more work to explore these implications of its decision to introduce a RoCoF standard. At the least, this should include setting out a list of issues and considerations to be factored into these subsequent work programs.

Ideally, the Panel would also direct AEMO to provide more guidance as to how it intends to operationalise the RoCoF standard, particularly in regards to how it will avoid the perverse outcome described above, where the synchronous thermal causers of the systemic RoCoF risk are then remunerated for the provision of the additional volumes of inertia services they have necessitated.

AEMO should also be required to provide further guidance on how the implementation of the system strength frameworks can be expected to provide additional inertial stability, and what this will mean for meeting systemic RoCoF requirements.

The Panel should direct AEMO to regularly reassess the magnitude of the systemic RoCoF risk, particularly when key thermal synchronous units are retired or enter reduced operational states such as mothballing or seasonal operation.

AEMO should also be required to regularly report on measures it is taking to address the systemic RoCoF risk in a sustainable manner, particularly how it is transitioning to use of zero-carbon sources of inertia, which is consistent with the inclusion of an emissions reduction objective in the NEO.

Notwithstanding the importance of pre-emptive analysis of how the RoCoF standard should factor into upcoming regulatory reform processes, we are supportive of the Panel undertaking further ex-post analysis of the RoCoF standard, once the relevant reforms such as Inertia Markets, Operational Security Mechanism and System Strength Frameworks have been implemented. Noting the latter two frameworks will not be operationalised until 2025, a review in 2026/27 seems a reasonable timeframe.

As always, the CEC welcomes further engagement from the AEMC and AEMO on this reform. Further queries can be directed to Christiaan Zuur at the CEC on czuur@cleanenergycouncil.org.au

Kind regards

Christiaan Zuur
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