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AEMC

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Iberdrola submission to 2022 Review of the Frequency Operating Standard

Iberdrola Australia welcomes the opportunity to make a submission. Iberdrola Australia delivers reliable energy to customers through a portfolio of wind capacity across New South Wales, South Australia, Victoria, and Western Australia, including both vertical integrated assets and PPAs. Iberdrola Australia also owns and operates a portfolio of firming capacity, including open cycle gas turbines, dual fuel peaking capacity, and battery storage. Our development pipeline has projects at differing stages of development covering wind, solar and batteries. This broad portfolio of assets has allowed us to retail electricity to over 400 metered sites to some of Australia's most iconic large energy users.

Iberdrola Australia is part of the global Iberdrola group. With more than 120 years of history, Iberdrola is a global energy leader, the world's number-one producer of wind power, an operator of large-scale transmission and distribution assets in three continents making it one of the world's biggest electricity utilities by market capitalisation. The group supplies energy to almost 100 million people in dozens of countries, has a workforce of more than 37,000 employees and operates energy assets worth more than €123 billion.

The FOS is an increasingly critical part of the NEM planning standards. This is an excellent opportunity for the Panel to draw together expert advice from across the NEM and ensure that the interests of consumers are being best represented. In the interest of expediency, we have provided targeted responses to a subset of questions below.

QUESTION 1: DEFINING THE REQUIREMENT FOR FREQUENCY PERFORMANCE DURING NORMAL OPERATION

- What considerations should be taken into account when defining the target for frequency performance during normal operation?
- What are stakeholders' views on the potential options for refining the target for frequency performance during normal operation?
- Are there any regionally specific issues that should be taken into consideration when setting requirements in the FOS for normal operation?
- What stakeholders' views on the costs and benefits to generators associated with power system frequency being held more closely to 50 Hz during normal operation?

Iberdrola Australia considers that the implementation of the mandatory Primary Frequency Response (mPFR) rule should have followed the implementation of the standard, not the other way around.

However, acknowledging that mPFR is in place, the Panel should therefore carefully consider the FOS settings that will determine what is acceptable frequency performance which can then guide the assessment (and settings) of mPFR and any subsequent incentive payments. It is critical that this is set now looking "through the windscreen rather than the rear window" to ensure that AEMO and investors have clear signals for operation and investment.

The Panel should not assume response can be delivered for free due to the mPFR. The *Primary frequency response incentive arrangements rule change* will be critical for incentivising new resources (including headroom and footroom) in the future. Setting this standard correctly is critical to determining required settings and total costs.

We do not consider that reference to frequency performance prior to 2015 is sufficient or appropriate for determining the appropriate distribution of frequency within the NOFB. Instead, the standard should be set so that it balances the costs and benefits of maintaining a narrow distribution. The Panel should consider:

- Surveying consumers, particularly large energy users, to determine the costs of a wider frequency distribution (but still within the current FOS). We note that very few consumer groups made submissions to the Mandatory Primary Frequency Response rule change, with none supportive, which could indicate that frequency control was not a material cost[1].
- Seeking explicit engineering and cost citations from AEMO and industry of a wider frequency distribution.

[1] https://www.aemc.gov.au/rule-changes/mandatory-primary-frequency-response

    - Iberdrola has not experienced impacts on our assets from the previous wider frequency distribution (within 50 Hz).
- What are the costs of maintaining a narrower frequency distribution?
    - The Panel should undertake modelling of the cost of maintaining a specific distribution now and in the future. A key benchmark would be the cost of delivering a narrow frequency distribution solely (or 80%, say) through batteries (calculating total warranted cycles consumed given the underlying distribution of deviations). This analysis could use the frequency indicator (FI; sum of all regulation AGC signals) as a proxy for the underlying deviations in each four second interval or other metrics discussed in the PFR rule change directions paper.
- The Panel should consider whether those costs are likely to change over time. I.e., whether it is easy to meet a tight standard today due to legacy units while future costs could be higher (for limited, and possibly declining, net benefit).
    - The Panel should not assume that the same level of response currently mandated will be available in the future as aging coal assets close. It may be more expensive to deliver mPFR in the future.
    - Similarly wear and tear on coal units will become a less relevant consideration as coal exits the market compared to the cost of maintaining a tighter frequency. It is also not clear that it is in consumers' interest to socialise these costs.
- We acknowledge that maintaining a frequency closer to 50 Hz can increase the frequency "headroom" before a contingency event. Conversely, there is a risk that contingency assets will be used to meet small deviations instead of larger ones, requiring more FCAS to be purchased. It is difficult to argue that specific historical events provide evidence for or against a narrower frequency distribution, given that extreme events are (by definition) unlikely to be replicated exactly.

To support this, the Panel should seek external advice (in addition to AEMO) that covers both economic and technical considerations.

The Panel should document best estimates of the cost and benefit of different distributions, including the relevant parties. Changes should only be made if there is material evidence for a net benefit.

QUESTION 2: THE PRIMARY FREQUENCY CONTROL BAND

- What considerations should the Panel have in relation to the setting of the PFCB?
- What are stakeholders' views on the setting of the PFCB?
- Are there any regionally specific issues that should be taken into consideration when setting for the PFCB?
- What are stakeholders' views on the potential implementation costs associated with changing the PFCB?
- What are stakeholders' views on the costs and potential savings of the PFCB being set at a narrow, moderate or wide setting, as described above?

The existing PFCB was not set based on a cost-benefit calculation. It would therefore be appropriate for the Panel to review it at this time. We note that:

- The current 15 mHz deadband is amongst the tightest of international standards, and challenging for to implement. The Panel should seek advice on how participants are currently responding, and whether there are any adverse impacts (e.g., hunting, lack of controllability, tight fast oscillations due to small local frequency deviations). The AEMC's process to date has focused heavily on conventional generators, and the Panel should consider the likely technologies in the future.
- The current *Primary frequency response incentive arrangements* rule change will be the primary mechanism for incentivising future response. The Panel should seek modelling and external advice as to the cost of a narrower or wider deadband.
- Assuming this mechanism is appropriately designed, a very narrow mandatory response will no longer be required (as sufficient response will be incentivised to meet the standard set by the Panel).
- Relying on the mandatory requirement forces response from all units rather than the most efficient units. It is unlikely that the least-cost outcome to consumers is the participation of *all* existing and future units.

A conservative widening of the deadband to ~50 mHz would be reasonable in the first instance. We then recommend that the Panel review the PFCB within [2 years] of the *Primary frequency response incentive arrangements* rule change start date to consider whether a wider deadband (providing a safety net but not interfering with the market) is reasonable. (Noting that if not, the incentive mechanism may need revision to ensure sufficient resources are available in the long-term.)

QUESTION 3: DEFINING A SYSTEM STANDARD FOR ROCOF

- What should be taken into account in setting system limits for RoCoF?
- If the Panel chose to set a RoCoF standard, what format should it take?
- If the Panel chose to set a RoCoF standard, what factors should be taken into consideration?
- Would the establishment of the RoCoF standard burden stakeholders with significant adherence costs?

We see two potential arguments for introducing a RoCoF limit:

- It provides a benchmark for establishing system constraints and hence the quantity of system services to be procured by AEMO.
- It provides certainty to new generators as to market conditions. A RoCoF limit set by the Panel might help guide the setting of Generator Performance Standards, etc.

However, a RoCoF limit may not be the best tool for delivering a secure *and* efficient system. AEMO must already dispatch the system to meet the FOS and other system limits. This *may* include constraining the system to limit RoCoF, but AEMO is not *limited* to that: other tools are available if more efficient (for example, buying FFR to arrest the fall more quickly).

It is not clear how specifying a RoCoF standard[2] would, for example, translate into a quantity of FFR to purchase, or implementation of other control systems, or an incentive to reduce contingency size. A higher RoCoF and more FFR may still lead acceptable outcomes. Relying on the FOS rather than hard RoCoF limits also naturally allows for different limits for islanded regions – if islanding leads to lower inertia or fewer capable responding units, this could require (but does not force) a tighter RoCoF limit in real-time.

Similarly, it may be simpler to continue to specify RoCoF requirements in the GPS, with an appropriate consideration of the resulting costs and benefits of loosening or tightening the standard. We note that RoCoF limits for non-credible events could be very challenging given the almost unlimited scope for non-credible events.

We also note that RoCoF is mostly a problem for synchronous generators and loads, rather than the increasingly inverter connected emerging fleet. It may be more sensible to consider a “causer pays” approach to any RoCoF limits driven by unit capability (either directly or through considering in NEMDE the cost of required FCAS before dispatching a unit with a low RoCoF limit). In any case, any RoCoF limits need to carefully consider the composition of the current grid.

[2] We assume that the RoCoF standard would need to specify both the maximum RoCoF and the sustained duration (trivially, this is necessary to avoid tiny but fast fluctuations).

In our view, a RoCoF limit is a means to an end rather than a goal in and of itself, and might unnecessarily conflict with other standards in the FOS. On this basis, we suggest the Panel consider what "gaps" there are in the existing FOS and whether AEMO already has sufficient tools to limit RoCoF if that is least-cost.

QUESTION 7: MAXIMUM CONTINGENCY SIZE IN THE MAINLAND NEM

- Do stakeholders consider it beneficial to introduce a fixed generation limit in the mainland NEM? If so, how should the limit be set?
- Would the introduction of a limit incur significant costs on AEMO to maintain system security?
- Would the introduction affect the investment or operational decisions of stakeholders?

Iberdrola Australia does not support a maximum contingency size in the mainland NEM at this time. There is a risk that hard limits might constrain the otherwise efficient operation of the system. For example, AEMO might be forced to curtail otherwise low-cost resources even though the cost of purchasing additional FCAS would be lower. We also note the uncertainty around the definition of indistinct events, which raises the risk of unintended consequences (e.g., it could apply to more than just the largest single unit).

Instead of technical limits that may not keep pace with technology, the Panel could consider economic signals to ensure that incentives are correct. For example, if the cost of managing large contingencies becomes prohibitive, the Panel could suggest the AEMC alternative causer-pays mechanisms for FCAS such as runway pricing (where the causer(s) of the largest contingency pay a higher pro-rata share of costs).

QUESTION 8: ACCUMULATED TIME ERROR IN THE NEM AND TASMANIA

- What consequences or costs may arise from the relaxation or removal of the accumulated time error requirement from the FOS for the mainland NEM and for Tasmania?
- What cost do stakeholders incur, if any, of maintaining compliance with the current accumulated time error requirement?
- Are there any other comments or concerns that stakeholders wish to raise with the Panel in relation to accumulated time error?

Time error remains an important contributor to tracking frequency performance. However, Iberdrola Australia does not see material benefit in correcting time error (and significant complexity when paired with the proposed PFR incentives rule change, etc.)

We thank the Panel and the AEMC for the opportunity to engage on this review. We would be happy to provide further detail on any of the points above. Please contact Tahlia Nolan at tahlia.nolan@iberdrola.com.au for any questions.