AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Level 12
171 Collins Street
Melbourne VIC 3000

Postal address
GPO Box 2008
Melbourne VIC 3001

T 1300 858 724
F 03 9609 8010
E info@aemo.com.au

24 January 2024

Anna Collyer
Chair
Australian Energy Market Commission
Online submission: ERC0364

Dear Ms Collyer,

Draft Determination - Clarifying mandatory PFR for bidirectional plant

AEMO appreciates the opportunity to respond to the Draft Determination on the proposal to clarify the mandatory primary frequency response (PFR) obligations for batteries under the National Electricity Rules (NER).

It is welcomed the AEMC has accepted the need for PFR obligations for scheduled bidirectional units (BDUs) upon commencement of the Integrating Energy Storage System (IESS rule), and in anticipation of the expected large-scale deployment of battery energy storage systems in the NEM.

The Draft Determination recognises the main reasons AEMO proposed a rule to mandate batteries to operate with narrow-band[i] primary frequency control settings, which were:

1. IESS Rule commencing 3 June 2024 would remove batteries' current obligation to comply when acting as a Scheduled Generator, because they would instead be classified as Bidirectional Units (BDUs); and
2. It is ideal for as many resources as possible in the NEM to operate with narrow-band primary frequency control settings, and this includes batteries when charging.

If all resources operate with narrow-band primary frequency control settings, frequency is under control, and this allows errors to be corrected through effective combination of primary, secondary response and redispatch. Recognising that only resources actively participating in the market need comply, the proposed rule had allowed for a battery to avoid operating with narrow-band primary frequency control, by making the obligation conditional on being dispatched (and paid) for an energy or ancillary service.

As a minor change to that proposed, the draft rule allows for a battery to be solely enabled for contingency Frequency Control Ancillary Service (FCAS), (that is neither dispatched for energy at 0MW, nor Regulation FCAS).

Upon inspection, if batteries solely enabled for contingency FCAS are not obligated to provide PFR, it is unlikely to be a security problem. This is because the proportion of aggregate PFR in the system, or "droop", whilst reduced, is likely to remain sufficient, because all other resources are operating with these settings.

In any case, because AEMO allows batteries to register for more contingency FCAS if they operate with narrow-band primary frequency control, (by measuring response from an applicable deadband, the Primary Frequency Control Band (PFCB), if a battery withdrew narrow-band PFR (when it is solely enabled for

contingency FCAS), capability would be measured from the normal operating frequency band, and not the PFCB, reducing the quantities of contingency FCAS it can sell, and thus materially reducing revenues. With most batteries today being high capacity, but low duration, the capacity revenues of FCAS are very important: there is a lot of capacity to sell, yet little energy.

At least today, batteries are infrequently enabled solely for contingency FCAS and very rarely are they not dispatched for any market service at all. AEMO also expects the implementation of Frequency Performance Payments (FPP) with the accompanying improvements to Regulation FCAS cost allocation will further support batteries that operate with narrow-band primary frequency control. Under the FPP reform, participants will be rewarded for plant behaviour that was helpful in controlling system frequency. It should reward these units for their excellent response in providing secondary control when enabled for Regulation FCAS.

It should be noted it is the mandatory obligation for all plant to operate with “narrow-band” primary frequency control, which places frequency under tight control. With frequency tightly controlled, a battery that operates with “narrow-band” PFR will have to do little work, because primary response on the unit is in proportion to the change in frequency, and the unit can then be registered for increased quantities of contingency FCAS (as discussed above).

Further, tight control of frequency should allow batteries to provide their excellent quality Regulation FCAS secondary response and benefit from the improvements in the design of Frequency Performance Payments as they correct the dispatch error known as the “Requirement for Corrective Response”, which is priced at the prevailing regulation FCAS price.

AEMO considers mandatory narrow-band primary frequency control improves the operation of all FCAS markets, will allow for better pricing of dispatch errors in the cost allocation of regulation FCAS, and should improve the commercial returns of the plant, like batteries, that are best able to comply with dispatch instructions, control frequency, and sell market ancillary services.

It is for these reasons, and to avoid unintended consequences and confusion, particularly with a BDU changing deadband settings dependent on the type of dispatch instruction it receives[ii], that AEMO would recommend the AEMC alter its draft rule to require a BDU to comply with the PFR Requirements (PFRR) even when it is solely dispatched for contingency FCAS.

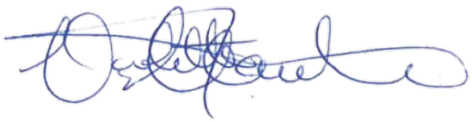
AEMO's submission to the Consultation Paper noted the need to update the PFRR under NER cl 4.4.2A(a) to include scheduled BDUs. There is only a small window after the Final Determination and the rule commencing for AEMO to consult on the PFRR. The nature of the consultation, for example whether it could be a minor consultation, may depend on the scope of the obligations applying on 3 June 2024. A short lapse in the obligation of BDUs to provide PFR is probably immaterial but should be avoided if possible. AEMO request the AEMC consider commencement of the rule once more.

Another minor matter may need clarifying in the Final Determination:

AEMO understands that a battery’s charge rate reduces as the state of charge (SOC) nears maximum charge and this may affect the quality of primary response. AEMO considers the obligation to comply with the PFRR is to operate the plant with required settings and does not obligate quality of the response, for example stored energy, headroom, or specifying a particular operating control mode. AEMO recommends the AEMC review NER cl 4.4.2A(c)(1), the purpose of which is to set out limitations on the application of the PFRR, to understand whether it adequately deals with this situation, or any other specific battery related issues.

If you have any questions please contact Kevin Ly, Group Manager – Reform Development and Insights, kevin.ly@aemo.com.au.

Yours sincerely,



Violette Mouchaileh

Executive General Manager – Reform Delivery

[i] In this submission AEMO considers "narrow-band" primary frequency response to be from the Primary Frequency Control Band (15mHz) to the edge of the Normal Operating Frequency Band (150mHz)

[ii] Batteries cannot register for different quantities of contingency FCAS depending on what deadband or droop settings it is operating with.