

31 August 2023

Anna Collyer  
Chair  
Australian Energy Market Commission  
Sydney South NSW 1235  
Submitted online: ERC0364

Dear Anna,

### Consultation paper - Clarifying mandatory PFR for bidirectional plant

AEMO appreciates the opportunity to respond to the AEMC consultation paper on AEMO's amendment proposal to clarify the mandatory primary frequency response (PFR) obligations for batteries under the National Electricity Rules (NER).

This submission is structured in response to the consultation questions and should be read in conjunction with them. It is also supported by the content of the AEMO proposal.

Today, grid-scale battery capacity is slightly greater than 1 gigawatt (GW), but accounts for approximately 20 per cent of proposed projects in the National Electricity Market. This technology will complement the NEM's rapidly growing renewable energy portfolio, supplying energy and contributing to power system security, while also supporting a two-way grid and market.

AEMO's rule change proposal identifies a need to confirm and clarify the application of PFR obligations to scheduled bidirectional units (BDUs) in light of the recent Integrating Energy Storage System (IESS rule) and the expected large-scale deployment of battery energy storage systems in the NEM. AEMO considers the proposed changes will promote power system security by ensuring that an adequate level of PFR is available to effectively control power system frequency.

The growing number and scale of grid-scale batteries can contribute to maintaining good frequency control via the provision of PFR, which will become increasingly critical with the retirement of more large thermal generating units. The provision of PFR will work together with new arrangements providing market-based incentives via the frequency performance payment rule change.

AEMO's rule change proposal seeks firstly to correct the unintended exclusion of Integrated Resource Providers from the need to provide PFR, which occurred through the IESS Rule.

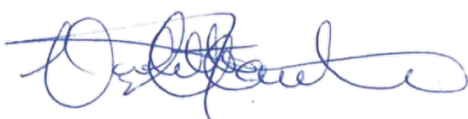
Secondly, the proposal seeks to limit the obligation to provide PFR **only** when dispatched (that is, in accordance with a cleared commercial bid) in the energy or ancillary services markets.

AEMO has some concerns about the potential consequences of not applying the PFR obligation when units are solely enabled for a Frequency Control Ancillary Service (FCAS), which are explained in the attached detailed response.

Nevertheless, AEMO understands that this element of the proposal must be supported by a rigorous cost-benefit analysis to proceed, and notes that the AEMC has requested evidence on the associated compliance costs for scheduled BDUs. The immediate priority to adequately support the power system is for scheduled BDUs to comply with the PFR when either charging or discharging. FCAS is presently a secondary matter, although this may change as the transition continues.

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

Yours sincerely,



Violette Mouchaileh

**Executive General Manager – Reform Delivery**

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## **Attachment: Detailed Response**

### **Questions 1-3 - Including scheduled bidirectional units in mandatory PFR obligations**

As explained in its rule change proposal, AEMO considers the exclusion of bidirectional units (BDUs) and Integrated Resource Providers (IRPs) from the obligation to provide PFR was an inadvertent omission from the PFR incentive arrangements rule. Including scheduled BDUs in this requirement is entirely consistent with previous AEMC determinations.

AEMO welcomes and agrees with the Commission's preliminary view that it would be consistent with the outcome of the mandatory PFR and PFR incentive arrangements rules for the obligation to comply with the primary frequency response requirements (PFRR) to apply to scheduled BDUs as it does to scheduled or semi-scheduled generators.

### **Question 4 – Provision of PFR by scheduled BDUs when charging (consuming)**

AEMO considers the basis for the IESS Rule also supports the obligation for batteries to be obligated to comply with the PFRR when charging. That rule will introduce distinct performance standards designed for application to units of plant that participate in the market with the same technical capabilities when generating or consuming.

### **Question 5 – Provision of PFR by scheduled BDUs when enabled (only) for a market ancillary service**

The mandatory PFR rule in 2020 attempted to deal with the special case for batteries being “always available” and, unlike other generators able to comply with the PFRR when not dispatched for energy or FCAS. AEMO accepts this is a problem because, if traders are required to provide PFR at times when they are unable to recover the associated cost by pricing it into their market bids and being dispatched, they may be encouraged to withdraw offers, making the unit unavailable, or disconnecting.

AEMO notes the inconsistency between the “always available” problem and the current relief from complying with the PFRR if a scheduled or semi-scheduled generator is only enabled for FCAS.

AEMO is aware stakeholders could easily misconstrue when a BDU must comply with the PFRR under the proposed rule. It is important stakeholders do not construe the proposed obligation as always applying when a BDU is made available.

To be clear, AEMO does not suggest PFR must be provided all the time a unit is made available for dispatch in the energy and FCAS markets. Under AEMO's proposed drafting, the obligation will only apply in periods when the unit is actually dispatched to produce or consume electricity at a level other than zero, or is enabled for a market ancillary service. In other words, the BDU bid needs to be cleared in either of the energy or FCAS markets for the obligation to apply. AEMO considers this addresses the “always available” problem, allowing the trader to price their bids for market services in a way that recognises their costs.

AEMO also has some concerns that applying relief for batteries when solely enabled for FCAS could result in this becoming the de-facto way that these markets are supplied. For example, it could lead to a marginal disincentive for batteries to be dispatched in the energy market and instead remain enabled solely in the FCAS market. It may encourage battery operators to reduce their FCAS offers and marginally decrease their bids to charge and offers to generate, thus having the effect of it being more likely FCAS is supplied by batteries not providing primary response.

Imagining the FCAS markets being fully subscribed this way, (by BDUs selling FCAS but not dispatched in the energy market), the quantity of primary frequency controllers would rely on the number of resources that are dispatched in the energy markets that have to comply with the PFRR – as long as all scheduled units, including BDUs are required to comply when dispatched in the energy market, and including when a BDU bid is cleared to charge, one would expect there should be sufficient primary control, (unless supply is dominated by residential PV and batteries), but in this hypothetical example, the narrow band primary control would only be provided by the units that are not enabled for FCAS.

All that being said, AEMO notes that the AEMC has requested submissions on the costs of batteries complying with the PFRR obligation when only enabled for FCAS. Clearly this is critical for the AEMC's cost-benefit analysis and AEMO has no reliable evidence of the potential long-term costs of compliance. AEMO accepts that if the balance of costs does not support this element of the proposal, it should not proceed. The immediate priority to adequately support the power system is for scheduled BDUs to comply with the PFRR when both charging and discharging, with FCAS presently a secondary matter.

#### **Question 6 - Other proposed changes to promote the long-term provision of PFR**

The consultation paper describes two additional NER changes the AEMC is considering. These are: voluntary registration of frequency response settings to benefit from the incentive arrangements; and revisions to the rules to require semi-scheduled generators seek AEMO approval prior to changing frequency response mode.

AEMO notes the executive summary, section 14, page iii, suggests these may be 'alternatives' to the proposal. AEMO would disagree with that approach, and the observations below are made on the assumption that these proposals are intended to complement additional obligations for scheduled BDUs to provide PFR.

With respect to the proposal to place the condition on non-scheduled plant of voluntarily registering frequency response settings to benefit from the incentive arrangements, the revisions to the Frequency Performance Payments and Frequency Contribution Factors Procedure, section 3, p9, already allows for non-scheduled elements to be included and sets out what is appropriate metering to participate. These non-scheduled eligible units include large loads like smelters, that don't provide PFR, and the current procedure measures deviations against an assumed flat trajectory.

It may be wise for non-scheduled facilities to participate irrespective of whether they can provide primary control. They may simply benefit from an individual contribution factor by being well controlled and not "causing" a need for response. In time the procedure may be updated to contemplate non-scheduled plant, that could provide PFR and/or possibly provide a trajectory for AEMO to include in its dispatch forecast and for the calculation of 4-sec deviations.

With respect to the proposal to require semi-scheduled generators to seek AEMO approval prior to changing frequency response mode, AEMO considers this to be sensible. As currently drafted, the PFRR<sup>1</sup> refers to clause 4.9.4(e) and given affected generators include semi-scheduled plant it seems sensible to update the clause to align with PFRR obligations.

#### **Question 7 – Implementation considerations**

The consultation paper notes that AEMO would be required to update the PFRR to reflect any additional obligations on scheduled BDUs. While the extent of PFRR changes will depend on the content of the final rule, AEMO does not currently expect the cost of consultation to be material. With respect to timing, however, AEMO asks the AEMC to consider explicitly providing for a PFRR consultation process that will be achievable between the date of the final rule and 3 June 2024.

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<sup>1</sup>P6 PFRR, section 2.4 - [primary-frequency-response-requirements.pdf \(aemo.com.au\)](https://aemo.com.au/primary-frequency-response-requirements.pdf)