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31 August 2023

Mr Victor Stollman
Reference: ERC0364

Akaysha Energy submission to “Clarifying Mandatory PFR Obligations for Bidirectional Plant”
- Uploaded to AEMC Website

Dear Victor,

Akaysha Energy appreciates the opportunity to provide our response to the Australian Energy Market Commission's draft rule determination titled "Clarifying mandatory primary frequency response obligations for bi-directional plant."

Akaysha Energy is an Australian-based company that specializes in the ownership, operation, and development of utility-scale renewable energy projects. Our focus lies in the deployment of large-scale Battery Energy Storage Systems (BESSs), and we are currently engaged in a significant project, the Waratah Super Battery (WSB), which involves the installation of an 850 MW BESS in NSW to bolster the energy transition by providing dispatchable capacity and security services.

In essence, we support the proposed rule change as it serves to clarify the obligations of batteries to provide primary frequency response (PFR), a service that batteries inherently fulfill and provide when available. It is important to note, however, that while this clarification is welcomed, it should not serve as a precedent for imposing further mandates on batteries or introducing battery-specific rule changes without adequate compensation. In this instance, the rule change "Primary frequency response incentive arrangements" satisfies this requirement.

Akaysha Energy recognizes the proficiency of battery technology in frequency control, which surpasses that of other dispatchable technologies currently operating within the National Electricity Market (NEM). Given this advantage, batteries should contribute their services in accordance with their technical capabilities. Such an approach would lead to an enhanced efficiency of the overall electricity system. We acknowledge the AEMC's ongoing efforts to adapt the National Electricity Rules (NER) to accommodate emerging technologies like BESSs. We are in favour of these changes, provided that new services are duly acknowledged and compensated.

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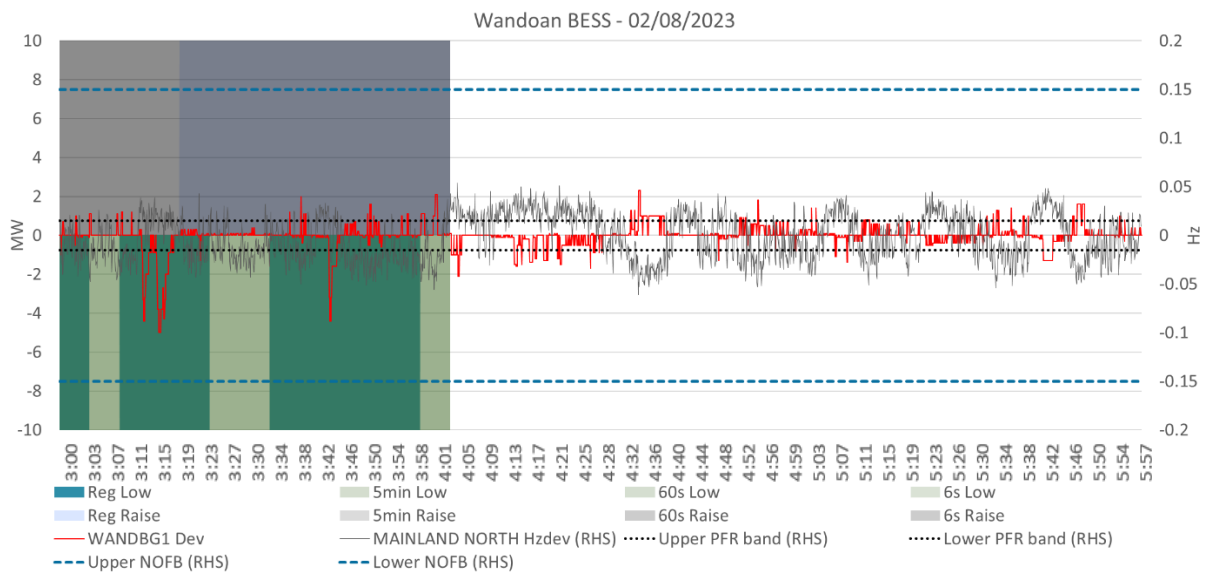
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In compliance with Schedule 5.2.5.11 of the NER, all generators (including BESSs) are mandated to provide an active power to frequency change droop response. PFR extends upon this and in fact overlaps the droop requirement with the preferred droop of 2-5% within the NOFB. The maximum AEMO accepted 1.7% droop is typically adopted by BESS, upon FCAS verification and GPS assessment, to maximise FCAS capability.

The droop setting is typically implemented in a site Power Plant Controller (PPC) firmware and remain active irrespective of a battery's engagement with energy targets or participation in Frequency Control Ancillary Services (FCAS) through the NEM Dispatch Engine (NEMDE). Although, we have not yet commenced operations within the NEM, we meticulously monitor publicly available data from other bi-directional units. Our analysis shows that BESSs across the NEM consistently deliver PFR, irrespective of their energy targets or FCAS participation. This aligns with our understanding that the unit's PFR active power response is innately provided by NEM BESSs that comply with its GPS, and the PFR contribution is independent of the BESS's commitment to wholesale or FCAS markets.

As an illustration, the chart below portrays, on the left axis, the FCAS enablement of the Wandoan BESS, along with the deviations in generation and load, both in MW (n.b. the battery was not participating in wholesale). On the right-hand side axis, the local frequency deviation is compared against the PFR band and NOFB. Notably, after 4:00, the battery ceases to participate in both FCAS and wholesale markets, effectively remaining in an "idle" state. However, its PFR contribution persists and counteracts the frequency deviation.



In this example, Lake Bonney BESS was not participating in FCAS or wholesale, yet still providing PFR. Not providing PFR, even technically possible, might necessitate dynamic



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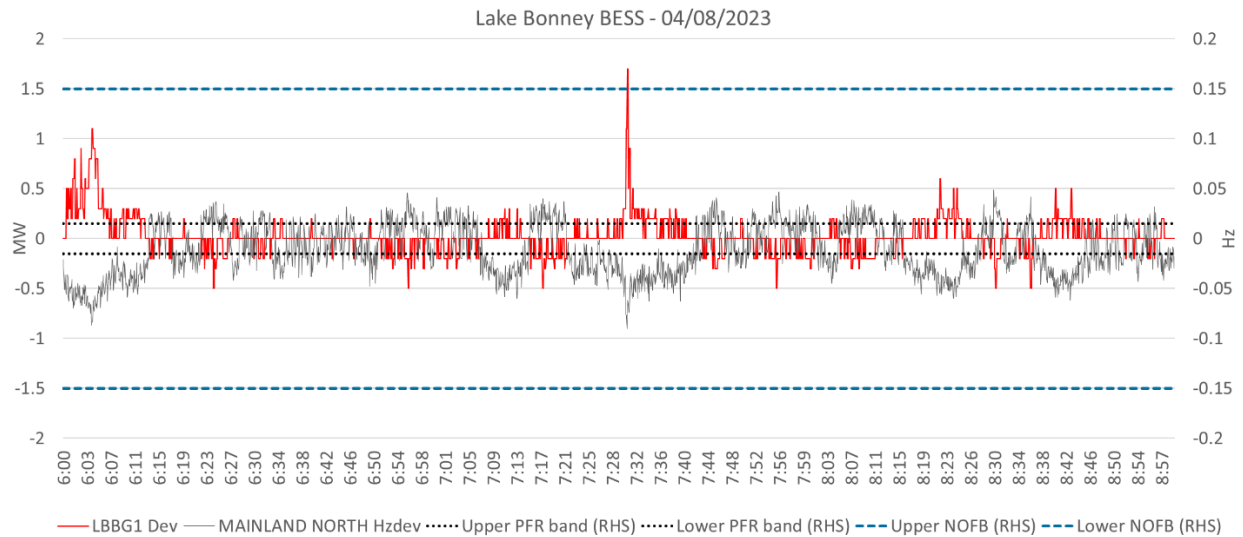
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droop settings, an option that is currently constrained by the existing configuration of the energy system and the NER.



In summary, we understand that this rule clarification aims to rectify PFR provision rules to align with the intended technical frequency response framework and with the BESS technical capabilities. Batteries are exceptionally versatile assets, and within the bounds of technical feasibility, they should retain the flexibility to operate in a manner that optimizes economic and system benefits. This approach closely mirrors the optimal solution for minimizing system costs. Nevertheless, it is important that this rule change does not establish a precedent for imposing additional or specific rules on batteries without adequate compensation.

Thank you for considering our input on this matter. We remain available for further discussions or clarifications should the need arise.

Sincerely,

Nick Carter
CEO
Akaysha Energy