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28 June 2024

Ms Anna Collyer
Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000
Ref: ERC03089

Dear Ms Collyer,

Submission on Exempting Scheduled Bi-directional Units from the RRO

AEMO appreciates the opportunity to respond to the AEMC's consultation paper on exempting scheduled bi-directional units (BDUs) from the Retailer Reliability Obligation (RRO). Through its membership of the Energy Security Board AEMO played a significant role in the development of the RRO and its implementation in the National Electricity Rules (NER) in July 2019.

The policy intent of the RRO was to promote investment by *retailers* in resources that would help to address an impending reliability gap. It was envisioned that if a gap was well-telegraphed retailers would enter into financial contracts with new firming resources such as generation, batteries and pumped hydro to underpin their development and remediate the gap. The financial contracts would be used by the retailer to hedge its retail load and be disclosed to the AER at T-1 to manage its liability under the RRO.

Given that "retailer" is not a participant category in the NER (and to pick up large standalone pool customers) the obligation was placed on *market customers* but only if they consumed more than 10 GWh per year. At the time grid-scale batteries were starting to emerge and were implemented in dispatch as a scheduled generator/scheduled load pair with the load being a market customer. It was recognised that this would scope into the RRO the charging load of batteries greater than 10 GWh.

In August 2019 AEMO submitted its Integrating Energy Storage Systems (IESS) rule change proposal and saw an opportunity to rectify this anomaly and proposed that the new participant category covering batteries (and pumped hydro) be excluded from the RRO. The AEMC consulted on this issue and AEMO submitted a response advocating for their exclusion which was supported by a majority of the stakeholders who addressed this question. However, the AEMC decided to take a technology-neutral approach and to leave batteries in the RRO. Part of the reason for this was that the AEMC did not consider that being a liable load would materially affect the way they would operate in the market.[1]

In October 2022 the AER made a T-1 instrument for the first time covering a forecast reliability gap for South Australia for defined trading intervals during Jan-Feb 2024. In the immediate lead-up to this period it became clear that some grid-scale batteries were seeking to comply with the RRO by limiting or not providing certain power system services related to consuming energy. These included energy

[1] AEMC, 2021 Integrating energy storage systems into the NEM – Draft Determination, page 18 - https://www.aemc.gov.au/sites/default/files/2021-07/integrating_energy_storage_systems_into_the_nem_-_erc0280_-_draft_determination.pdf

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charging, lower regulation, and lower contingency frequency control ancillary services (FCAS) and primary frequency response (PFR).

AEMO was extremely concerned by this possibility given the vital importance of batteries in operating and maintaining a power system with a high penetration of wind and solar. Batteries play a critical role in managing the balance of supply and demand by participating in all 10 FCAS markets: fast frequency response, regulation, and contingency raise/lower services. Batteries as a technology are particularly good at providing these services as they are very controllable, fast and precise. These services are not well suited to being provided by wind and solar generators.

Batteries are also excellent providers of PFR which is a response originating from the batteries to raise or lower energy output to maintain the power system close to 50 Hz. This enables the regulation FCAS (secondary response) to be effective.

In South Australia batteries are the main providers of all frequency control and FCAS services. Operating and managing a system where a battery cannot utilise its full range if needed has many risks. Under certain circumstances these risks could result in significant load shedding or even cascading failures leading to a system-black. This is exacerbated by the scenario occurring when the system is highly loaded and under the most stress. This for AEMO is operationally a concern as the system requires having responses from batteries across their full range.

During high demand periods, frequency still goes up and down. The ability to have the batteries to "buffer" the frequency deviations is a premise on which the system is designed and operated. Reducing the "lower" capability is a risk to frequency control that can cause large undesirable deviations e.g., across the SA-VIC interconnector in certain conditions.

Whilst on this occasion AEMO was able to work with the AER and the relevant participants to ensure that the batteries could comply with the RRO without limiting provision of important power system services this event highlighted the unintended consequence of applying the RRO to batteries. Therefore, AEMO supports the rule change to exempt scheduled bi-directional units from the RRO.

In terms of implementation of this rule change there are a few issues for the AEMC to consider which are addressed in more detail in the attachment.

- If the RRO is triggered prior to mid-2025 the 10 GWh threshold will need to be applied to a period when batteries changed from being a market customer to a BDU. Given that a liable legal entity may contain a battery and other market customers there is a risk that the battery load prior to its transition could be included in the 10 GWh calculation and could cause the entity as a whole to demonstrate compliance. This can be addressed by excluding the battery load prior to its transition from the 10 GWh calculation.
- Hybrid installations can contain a scheduled BDU along with other combinations of generation and load. Whilst each resource that participates in central dispatch will have its own dispatchable unit (DUID) and SCADA data these are not separately identifiable in settlements if there is only one NMI. This means that it may not be possible to isolate the metered energy associated with the BDU and treat it differently to the rest of the load at the hybrid installation. This could affect

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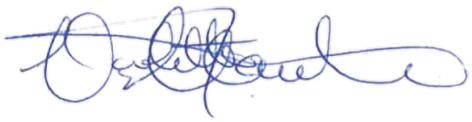
the application of the 10 GWh threshold and the calculation of the POLR liable share. A possible approach to this issue is outlined in the attachment.

- The cost of implementation of this rule change is expected to be negligible. All that is required from AEMO's perspective is to exclude bi-directional units from the POLR calculations and to update the relevant procedures.

Should you wish to discuss any aspects of this submission please feel to reach out to myself or to Paul Austin.

Yours sincerely,



Violette Mouchaileh

Executive General Manager – Reform Delivery

Attachment 1: Detailed submission

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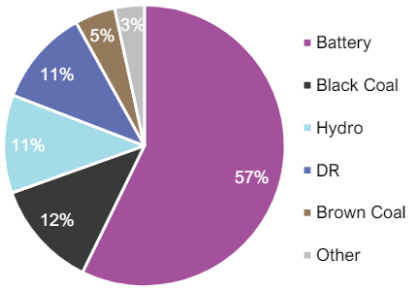
Attachment 1 – Detailed submission

Q1 Power system impacts from RRO obligations on batteries

AEMO supports and agrees with the proponents' assessment of the risks associated with the RRO liability continuing to be being applied to batteries. Batteries are essential to providing FCAS and frequency control services in the NEM and the loss or limitation of provision of lower services from battery charging during RRO periods will significantly increase the risk to power system security, as well as increase the costs of FCAS borne by consumers.

Batteries are the predominant supplier of FCAS services in the NEM and continue to increase in market share across all 10 FCAS markets. The figure from the QED below presents the FCAS volume market share by technology type as 57% for Q1 2024.[2] This is an increase from 50% volume share in the previous quarter Q4 2023 and from 38% in Q1 2023. As coal generation continues to retire, any removal of batteries as FCAS providers creates operational gaps in the market for essential security services. This is particularly critical in in very fast FCAS markets where batteries made up 75% of the combined enablement for R1SE and L1SE services in Q1 2024.

Figure 76 Batteries further grew FCAS market share
FCAS volume market share by technology – Q1 2024



As set out in the rule change proposal, the South Australian T-1 instrument covering 8 January to 29 February 2024 and the initial response by batteries demonstrates the unintended consequences of applying an obligation that limits battery performance.

If batteries were to respond to the RRO obligation by limiting charging during RRO periods (e.g., 5 PM to 9 PM in the recent T-1), this would reduce the provision of FCAS and PFR at a time when the power system is most vulnerable with a consequent increase in the risk of load shedding and FCAS costs. In practice, AEMO would need to assess these risks and constrain the system accordingly. For South Australia, this would likely include curtailment on Heywood to meet RoCoF requirements.

In addition to the security risks limiting battery charging can impact the reliability of the system where a battery does not have sufficient state of charge to be able to generate energy over an extended period

[2] AEMO, Quarterly Energy Dynamics Q1 2024, page 47 - https://aemo.com.au/-/media/files/major-publications/qed/2024/qed-q1-2024.pdf?la=en&hash=CDAE3D2A5BA31DD3BF03A1EA39840F34

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of high demand. This would increase the likelihood of AEMO having to call on reserves such as RERT or even trigger load shedding to balance supply and demand.

Hence, as portrayed in the rule change proposal, AEMO agrees this could worsen security and reliability outcomes and increase energy costs to consumers.

Q2 Barriers to batteries providing system security benefits or reasons to keep RRO technology-neutral

Batteries are well suited to providing power system security services and do so via FCAS markets as well as contracts for security services including System Integrity Protection Schemes (SIPS) and Wide Areas Protection Scheme (WAPS). AEMO agrees that limiting charging for RRO compliance is an unintended outcome that reduces the ability for batteries to provide security benefits and affects both battery operations during RRO periods, and the long-term investment case for batteries via additional compliance or contract costs.

As set out above, AEMO has previously advocated for bidirectional units to be excluded from the RRO and did not support the IESS decision to prioritise technology neutrality to keep bidirectional units liable. Batteries are very different to retailer and large industrial loads and their contribution to power system security and reliability means that they should be treated differently.

Q3 Pumped hydro

AEMO agrees that pumped hydro should also be excluded from the RRO. While not as flexible as batteries, pumped hydro facilities are the sort of investment that retailers should be incentivised to underwrite to address an impending reliability gap. They can also provide security services and can flexibly switch between operating modes as required to maintain supply through high demand periods. As the policy intent of the RRO is to incentivise contracting with dispatchable capacity, not to elicit an operational response (which is the role of the pool price), AEMO supports excluding pumped hydro from the RRO.

To implement an exemption on pumped hydro units, the AEMC will need to consider the current registration classification for pumped hydro units. While the IESS Rule Change allows pumped hydro units to classify as a *bidirectional unit* within the *Integrated Resource Provider* registration category, NER 2.2.2 (b2) and NER 2.3.4A (b) requires units to continue to be classified as a *scheduled generating unit* and *scheduled load* if the unit is not capable of transitioning linearly from consuming to producing electricity and vice versa[3]. All existing pumped hydro units are not technically capable of this as they require a short (seconds) shut down to zero when switching between operating modes. Additional NER drafting should be considered to exclude all pumped hydro units within the Rules.

Q4 Costs and benefits of proposed exemption

AEMO considers the costs of the proposed exemption are negligible. From AEMO's perspective this would only involve updating POLR calculations and the required procedures.

[3] NER 2.2.2 (b2)(1)

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AEMO agrees with the proponent that the benefits of the exemption are significant as bidirectional units are vital to securely operating the power system. Removing RRO liability would positively contribute to the following:

- Provision of security services including essential load services required for secure operations during high demand periods – lower FCAS, PFR, contracted services including SIPs.
- Enhanced reliability and decreased costs to consumers by enabling charging where economically efficient and if required for later high demand periods.
- Supporting the battery investment case by removing contracting costs or RRO penalties and allowing batteries to maximise value for their services.
- Unlocking increased amounts of VRE and associated emissions reductions through the provision of required firming capacity.

Q5 Implementation issues

Hybrid installations

As set out above, the implementation of exemptions for bidirectional units will need to include consideration of hybrid installations that include a battery. As it is not possible to separately meter energy attributable to the BDU from the rest of the hybrid installation, a possible approach is set out below:

1) *Exempt all load at a hybrid connection point where there is a scheduled bidirectional unit*: This approach would ensure that all scheduled BDUs are able to operate to support power system security and reliability, while not impacting the effectiveness of the RRO. To minimise the risk of large loads installing a small BDU purely for the purposes of becoming exempt from RRO liability, it may be appropriate to include an exemption threshold for any collocated load.

   This could take the form of:

   a. all load at a hybrid connection point where there is a scheduled BDU is exempt from the RRO, unless the collocated load is greater than say 10 GWh annual consumption.

   b. If there is a collocated load above 10 GWh then all load would be included in the RRO including the scheduled BDU.

   In practice this issue is unlikely to apply to many hybrid installations in the short term. AEMO therefore considers this approach appropriately balances maintaining RRO liability where required, whilst enabling BDUs to operate in the market.

2) *(Longer-term) Separately measure loads behind the hybrid connection point*: In the longer term, it would be preferrable to separately measure the BDU and load behind a hybrid connection point. This would allow an exemption to only apply to the BDU consumption. Such an approach of is currently under consideration in the Unlocking CER benefits through flexible trading (FTA) rule for application to CER. AEMO considers the FTA model of secondary settlement points could be extended to hybrids and this would be worthwhile considering as a longer-term solution once the FTA rule change is finalised.

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Q6 Alternative to excluding batteries

AEMO does not consider any alternatives to excluding BDUs from the RRO are appropriate. The inclusion of batteries as liable entities is an unintended consequence of the RRO and should be rectified in the Rules.

Q7 Assessment criteria

AEMO finds the assessment criteria appropriate.