Australian Energy Market Operator (AEMO)

Submitted online via PSMGReview@aemo.com.au

19 May 2023

Dear AEMO Power System Modelling team

Re: AEMO PSMG Draft report and PSMG 2023 Draft marked-up

Tesla Motors Australia, Pty Ltd (Tesla) welcomes the opportunity to provide the Australian Energy Market Operator (AEMO) with a response to the AEMO PSMG Draft report and PSMG 2023 Draft marked-up. This follows on from our earlier feedback on the PSMG Consultation Paper.

Tesla wishes to highlight four key concerns and/or areas of clarification we request from AEMO.

1. **Confirmation of approach in respect of snapshot feature**

Tesla's understanding is that the snapshot feature does not need to be native to the PSCAD model, provided it is PSCAD compatible. The model can manage the snapshot of internal state variable in an external snapshot file if the model doesn't pass all internal variables to back to PSCAD.

Reference to the B4.82/IEEE seems to be new to the Draft report. We would request that AEMO publish more information publicly as to what the specific requests coming from that group are and how the proposed "memory copying" approach works. Currently, the B4.82 standard is limited to the CIGRE B4 study committee, posing challenges for OEMs in obtaining access to the standard. There is no public information on how this can be implemented, and it appears to be critical to successfully implementing the snapshot feature.

It is imperative for AEMO to publish a working example code of a simple inverter with the B4.82/IEEE wrapper and snapshot feature.

2. **Model speed will be a lot slower.**

Tesla is concerned that the proposed approach will have an adverse impact on model speed and result in increased modelling delays. A significant amount of renewable energy and storage capacity will be connected in the next decade, and we are concerned that slower model speeds will impact on the rate of connection that needs to happen.

3. **Small signal modelling**

We believe that there's already AEMO specific software - including Power Factory PSSE and PSCAD – that provides the same functionality as small signal modelling. Our preference is to use existing software and avoid redundancies in software used. Tesla also suggests that AEMO should enhance the level of detail in the PSMG by explicitly defining the necessary information deemed sufficient for NSP to develop a small signal model. For example, details on phase-locked loop (PLL) and current control in s-domain representation should be adequate.

4. Functional block diagram requirement

As noted in our earlier submission, we also recommend that AEMO remove the need to submit functional block diagram under 5 Model documentation. If an OEM choose to develop all models, and no reason for AEMO to receive functional block diagrams

If the OEMs meet the modelling interface and library requirements for PSCAD, PSSE, and SSAT models, there should be no requirements for providing an open box model, model source code or detailed controls block diagrams.

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