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2 February 2023

Mr Sebastien Henry
Director
Australian Energy Market Commission
GPO Box 2603
SYDNEY NSW 2000

Dear Sebastien

SUBMISSION ON EFFICIENT REACTIVE CURRENT ACCESS STANDARDS FOR INVERTER - BASED RESOURCES

Powerlink Queensland (Powerlink) welcomes the opportunity to provide input on the Australian Energy Market Commission's (AEMC's) draft rule for efficient reactive current access standards for inverter-based resources (draft rule). Our submission to the draft rule reflects our commitment to continue to provide safe, secure, reliable and cost-effective transmission services to our five million Queensland customers.

The AEMC has published the draft determination to support more efficient and flexible reactive current capability from inverter-based resources. Powerlink considers that the draft rule would lower the costs of inverter-based resource connections and provide greater flexibility for networks to negotiate access standards with inverter-based resources.

Our input on some specific aspects of the draft rule is provided below.

Continuous uninterrupted operation (CUO)

- The amended definition of CUO in draft rule limits the impact of *generating system* or *generating unit* on other *generating system* only. However, if there is material degradation in power system response other network users (e.g. loads) can also be impacted. Therefore, we suggest *network users* be included with generating systems in paragraph (d) of the definition.
- The draft determination (page 20) indicates that some stakeholders have interpreted the existing CUO obligation to mean 'no change in voltage with or without the project present in simulations'. In our view, this interpretation is not correct and does not constitute a need for a rule change.

Maximum Continuous Current

- Powerlink is supportive of making *maximum continuous current* a defined term.
- A typical limit of current injection during a fault is a function of the apparent power base of the generating system. By making *maximum continuous current* a defined term based on clause S5.2.5.1 (reactive power capability) capacity, it implies there is latent capability of a generating system to provide reactive current during a fault that may not be provided.
- Therefore, we suggest that the benchmark for maximum continuous current provision during a disturbance should be a function of the apparent power base of the generating system, and not clause S5.2.5.1.

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- We also note that:
 - If a load connection needs to utilise the *maximum continuous current* in its performance standard, then our suggestion is that the calculation method for *maximum continuous current* is applicable to both generating systems and loads. Clause S5.2.5.1 is applicable only to generating systems.
 - The proposed definition of *maximum continuous current* is a function of the maximum apparent power required in clause S5.2.5.1. Note that some generating systems (mainly synchronous but also some asynchronous, with reactive power limiters that are outside of the required standard), may operate continuously with a current that exceeds the *maximum continuous current* as defined in the draft Rules.

Un-faulted Phase Voltage rise

- Powerlink supports the explicit consideration of the possible effect a generating system can have to the un-faulted phase(s) during an unbalanced fault.
- We believe that there is some mismatch in the wording of the draft rule change and draft determination. The draft rule specifies that reactive current contribution must not contribute “excessively” to voltage increase, whereas the draft determination (page 36) indicates the purpose of the draft rule is to ensure generators do not tune their equipment in a way that “worsens behaviour” of the most common type of fault seen on the power system. We note that “excessively” and “worsens” have different meanings and we request the AEMC clarify the intent of the rule in the final determination. Powerlink suggests that the magnitude of the voltage rise for it to be called as ‘excessive voltage rise’ should be determined by the connecting NSP.

Minimum rise and settling time

- Powerlink supports the draft changes to minimum standard for rise and settling times.
- The new minimum standard would introduce a requirement for the reactive current response for a generating system comprised of asynchronous generating units to be “adequately controlled”. We do not argue for “adequately controlled” to be a defined term, as prudent engineering judgement is needed for assessment of the I_q response during faults. However, there may be debate between parties as to what “adequately controlled” means; therefore, we suggest that reactive current response should be adequately controlled as agreed with NSP and AEMO.
- Should draft clause S5.2.5.5(o1)(4) refer to subparagraph (o)(5) which refers to response times rather than subparagraph (o)(4) which refers to an adequately controlled response?

Minimum standard for magnitude of I_q injection

- Powerlink supports the change to the minimum standard magnitude of I_q injection (to 0% or other value as agreed with NSP and AEMO).
- We note that, as per the draft determination (page 25), section 3.1.2, this change to the minimum standard is in the absence of a change to the automatic standard and negotiating framework.

If you have any questions in relation to this submission or require further clarification, please contact Sachin Goyal.

Yours sincerely,



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