Ref. **A4710382**

16 June, 2021

Ms Anna Collyer
Chair
Australian Energy Market Commission
Level 15, 60 Castlereagh Street
SYDNEY NSW 2000

Dear Ms Collyer,

SUBMISSION ON EFFICIENT MANAGEMENT OF SYSTEM STRENGTH ON THE POWER SYSTEM (ERC0300) DRAFT DETERMINATION

Powerlink Queensland (Powerlink) welcomes the opportunity to provide input on the Australian Energy Market Commission's (AEMC's) Draft Determination on the draft Efficient Management of System Strength on the Power System (ERC0300) Rule.

Powerlink acknowledges the importance of ensuring sufficient system strength is made available to keep the power system stable and secure. This will be vital as generation resources in the national electricity market (NEM) shift as inverter-based resources, such as wind, solar generation, and batteries replace ageing thermal generators.

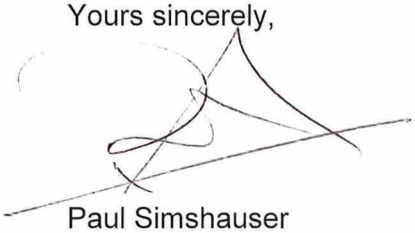
This submission focuses on aspects related to the design of arrangements to procure system strength services and various technical issues associated with the AEMC's proposal. In particular, Powerlink considers the AEMC should:

- assess the financial implications on system strength service providers (SSSPs), including transmission network service providers (TNSPs) such as Powerlink, from meeting the full costs of providing the required levels of system strength;
- provide more guidance as to how interdependencies between this Rule and the reform pathway for essential system services (ESS) outlined in the Energy Security Board's (ESB's) Post 2025 Energy Market Design Options Paper will be accommodated;
- ensure the Rule can accommodate technological innovation and reflect that there is no direct or ideal metric available to define system strength;
- consider the interaction between system strength planning requirements and generator obligations under generator performance standards;
- clarify the application of short circuit ratio requirements; and
- clarify the treatment of surplus system strength remediation provided by proponents

These matters are discussed in more detail in the attached submission.

If you have any questions regarding this submission or would like to meet with Powerlink to discuss this matter further, please contact Jennifer Harris.

Yours sincerely,



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Procuring system strength services

Under the draft Rule, SSSPs will be required to procure a portfolio of solutions to satisfy the system strength standard at each system strength node, as determined by the Australian Energy Market Operator (AEMO) Powerlink understands that SSSPs will now need to meet the full costs of providing the required levels of system strength, as opposed to meeting the minimum shortfall of system strength or providing additional levels of system strength to an efficient level

Unbundling system strength services will have significant implications for pricing these services In the long run, contracted prices for system strength services are expected to be capped at the cost of installing network equipment, as an alternative option to contracting with market participants, to address system strength requirements However, SSSPs are likely to have more limited negotiating power in procuring system strength services using non-network solutions over the first few years of these reforms

Of particular concern to TNSPs is the situation where SSSPs need to pay thermal synchronous plant for system strength services when wholesale energy market prices are low or negative Each thermal generator that is contracted may have minimum loading constraints in excess of 100 MW that will need to be compensated under low price conditions Consequently, this may impose significant costs on TNSPs to ensure generators will provide these essential system services Powerlink considers the AEMC should assess the implications of this situation, including the impact on SSSPs' working capital, before its Final Rule Determination

Integrating procurement contracts for investment timeframes with shorter-term mechanisms

The draft Rule complements and is interdependent with the reform pathway for ESS outlined in the ESB's Post 2025 Energy Market Design Options Paper The AEMC's draft Rule forms part of the reform pathway for ESS by providing a TNSP-led procurement approach to meet system strength requirements in investment timeframes Further to this, the ESB has proposed scheduling and/or short-term procurement mechanisms, via a unit commitment for security and/or system services mechanism, to accommodate system strength provision in operational timeframes

Powerlink considers the proposed Rule, as currently drafted, does not provide sufficient guidance to SSSPs nor AEMO as to how these approaches will be integrated, should market reforms proceed as outlined in the ESB's Options Paper In particular, it is not clear how long-term contracts for system strength services may need to be structured to ensure they can be incorporated into shorter-term scheduling or procurement arrangements Powerlink would appreciate more guidance from the AEMC as to how these interdependencies will be accommodated as part of this Rule

Rules should accommodate potential technological advances

Powerlink considers the system strength Rule should accommodate technological innovation and reflect that there is no direct or ideal metric available to define system strength

Powerlink recommends that technical details are left to the System Strength Impact Assessment Guidelines, rather than included in the National Electricity Rules, to enable them to be modified as required to cater for advances in technology and as technical understanding of system strength's role in power system stability improves For example, Powerlink considers the following aspects of the proposed Rule are overly prescriptive

- clause 4 6 6(b)(1A) requires the Preliminary Impact Assessment to be based on a single machine infinite bus system model, and
- clause 4 6 6(b)(9) mandates the locational factor for pricing must use the available fault level, rather than the attenuation of fault level, at the relevant system strength node

Clause 5 3 4B(h) requires connection applicants to specify ratings of the proposed plant in MVA This specification assumes remediation can only be achieved by installing new synchronous plant when other, more cost-effective solutions may be available The removal of this specification from the proposed Rule will recognise that system strength remediation can sometimes be achieved by re-tuning inverters, as was done recently in North Queensland, or through other technological solutions

The proposed Rules need to consider interactions between system strength requirements and obligations under generator performance standards

The AEMC has previously noted it does not intend to limit the technical analysis TNSPs undertake for connection applications Powerlink is concerned that clause 5 3 4B(a2)(3)(ii) could cause confusion, as it gives the impression that detailed Electromagnetic Transient (EMT) analysis is not required if a proponent agrees to pay for the system strength charges

TNSPs will still need to conduct this detailed technical analysis to establish generator performance standards (GPS) Proponents will therefore need to provide appropriate models to support this analysis Powerlink recommends the AEMC revisit this issue to clarify the intent of this provision

Clause S5 1A 9, which specifies minimum three-phase fault levels and stability for system strength nodes, of the proposed Rule makes SSSPs responsible for planning to meet credible contingencies Powerlink recommends the AEMC clarifies how these obligations will interact with existing obligations under the GPS, given the latter requires generators to accommodate non-credible contingency events in some circumstances For example, clause S5 2 5 5 requires all generators to remain operating under a circuit breaker fail event

Amendments to short circuit ratio requirements

As currently drafted, the minimum access standard (clauses S5 2 5 15(b) and S5 3 11(b)) only requires the design capability of generating systems to remain stable during steady-state operation Short circuit ratio (SCR) requirements relate to a generator's capability to stay connected in short periods of lower network voltage (i e fault ride through) and during steady-state operations For clarity, Powerlink recommends the AEMC remove reference to "during steady state operation" from the abovementioned clauses

Powerlink considers that the Rules should clarify that the SCR requirements relate to the point of connection, rather than at the equipment terminal This is consistent with the different specifications in licensing requirements across jurisdictions in the NEM

Treatment of surplus system strength remediation provided by proponents

The draft Rule establishes a framework where a new inverter-based resource connecting to the network can choose whether to pay a prescribed charge for their assessed consumption of system strength, or to remediate their system strength impact themselves The AEMC considers that proponents will have financial incentives to pay the prescribed charge except where they are located electrically remote from a system strength node This is due to the attenuation of system strength with electrical distance from the system strength node

In circumstances where a proponent elects to remediate their system strength impact themselves, they may elect to over-provide system strength with a view to future expansion In these circumstances, there needs to be a clear mechanism for the proponent to reserve this surplus system strength for their future use and not have it absorbed into the general levels of system strength that exist on the power system