Mr Benn Barr
Chief Executive
Australian Energy Market Commission
Level 15, 60 Castlereagh St
Sydney NSW 2000

Submitted via the AEMC Online Submissions Form

Efficient Management of System Strength on the Power System

21 June 2021

Dear Mr Barr,

Aurizon Network welcomes the opportunity to make a submission to the Australian Energy Market Commission's (**AEMC**) Draft Rule Determination for the proposed rule change on the Efficient Management of System Strength on the Power System.

Aurizon owns and operates the regulated open access Central Queensland Coal Network (**CQCN**). Approximately 2,000 kilometres of the CQCN is electrified allowing trains to use electricity or diesel fuel as their source of traction power. This electric traction network represents a significant proportion of Queensland's regional and total energy demand and provides a critical supply chain link for Queensland's quality metallurgical and thermal coal exports.

Transmission and wholesale electricity costs together with energy security and reliability are critical to the future competitiveness of electric traction. Our customers have a technically feasible and readily accessible alternative to electric trains in the form of diesel locomotives. If customers decided to substitute electric trains for diesel, this would result in a significant reduction in electricity demand in regional Queensland.

Aurizon Network recognises the importance of maintaining system strength as the power system transitions in response to fast rising levels of more variable, invertor-based resources (**IBR**) like batteries, wind and solar. Aurizon Network is therefore supportive of the proposed reforms outlined in the draft determination. However, these reforms should also consider how existing Identified User Shared Assets (**IUSAs**) are providing, or could further provide, system strength services. Therefore, Aurizon Network recommends that AEMC also review:

- how latent capability or capacity in transmission assets providing negotiated transmission services are currently providing the proposed prescribed system security services and reducing costs for IBR connections; and
- the mechanisms in which latent capability or capacity in those assets can further contribute to reducing connection costs for IBR connections.

IUSAs Providing System Strength Services

The draft determination recognises that voltage control represents a critical component of system strength. There are also a range of technologies which can provide voltage control services such as static synchronous condensers (**STATCOMs**) or static var compensators (**SVCs**).

For example, the proponent for the proposed rule, Transgrid, notes in its 2020 Transmission Annual Planning Report (**TAPR**) that:

> *Voltage control is provided by generators and network assets such as transformer tap changers, capacitor banks, reactors and Static VAr Compensators (SVCs). Additional voltage control issues are however emerging in the south west NSW network due to increased power transfers as a result of high levels of renewable generation in the area.*[1]
>
> *The application of SVCs has had a considerable impact on the power transfer capabilities of parts of the main grid, and in the past has deferred or removed the need for higher cost transmission line developments.*[2]

In this regard, of the 18 direct connections that Aurizon Network has with a Transmission Network Service Provider (**TNSP**), six of those are negotiated transmission services in Central Queensland which include an SVC as listed below:

- Alligator Creek
- Wotonga
- Raglan
- Wycarbah
- Dauringa
- Bluff

Static Var Compensators can be characterised as Identified User Shared Assets (**IUSA**) under the NER as they are generally:

- used for the purpose of connecting one or more identified user groups to an existing transmission network;
- not used exclusively by the relevant identified user groups; and
- under normal operating conditions, cannot be electrically isolated from the transmission network without affecting the provision of shared transmission services to persons who are not members of the relevant identified user groups.

While these assets may not be used exclusively by Aurizon Network the costs associated with their use are recovered solely by Aurizon Network under negotiated transmission charges. However, it is also possible that these IUSA's may also be providing additional system strength

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[1] Transgrid (2020) New South Wales Annual Transmission Planning Report 2020. June. p. 80 https://transgrid.com.au/what-we-do/Business-Planning/transmission-annual-planning/Documents/2020%20Transmission%20Annual%20Planning%20Report.pdf

[2] Ibid. p. 114.

services which are reducing the connection costs for IBRs as suggested in Powerlink's 2020 TAPR[3]:

> *Powerlink has redesigned and commissioned changes to the voltage controller at nine SVCs in North and Central Queensland (CQ). In some cases **the structure of the voltage control itself was modified** to allow the existing plant to support more VRE generation.*
>
> *In other cases, **the gain of the voltage controller was changed to minimise the control interactions**. These changes have materially increased the renewable energy hosting capacity of the network.*
>
> *This has **reduced proponent's connection costs** that would have otherwise been required to provide system strength remediation.*

The prospect that IBR connections may obtain benefits from existing transmission infrastructure is noted by the AEMC:

> *Firstly, some connecting IBR parties may not be required to remediate (because they are not judged to have caused an adverse impact on the minimum level of system strength) but will nevertheless impose marginal costs on the system (as they are 'using up' some of the available system strength) — including bringing forward the cost of future investments to provide system strength. Under the current arrangements they do not bear these costs[4].*

Aurizon Network agrees with this observation but notes that the AEMC does not contemplate a scenario where the costs of that 'available system strength' are being funded by a dedicated negotiated transmission connection. As a consequence, connecting IBRs that have not made relevant private investment are not bearing the marginal costs as these costs are being borne by existing network users.

This available system strength associated with latent capability or capacity within SVCs fully funded through negotiated transmission service charges may arise due to:

- As previously noted by the AEMC, '*a TNSP may wish to design a larger identified user shared asset to help it meet its reliability standards or to maximise market benefits, and should not be prevented from doing so provided that it recovers difference between what is required for connection and what is to meet an identified need in the provision of prescribed transmission services in accordance with the cost allocation principles in the NER*'[5]; or
- The original design standards will have been informed by the maximum contracted demand and the customer's current and forecast demand may be materially lower than the contracted expected maximum demand when the connection agreement was negotiated.

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[3] Powerlink (2020) 2020 Annual Transmission Planning Report: Managing System Strength During the Transition to Renewables, May, p. 202

[4] AEMC (2021) Draft Determination: Efficient Management of System Strength on the Power System, April, p.37

[5] Australian Energy Market Commission (2017) Rule Determination. National Electricity Amendment (Transmission Connection and Planning Arrangements) Rule 2017, May. P.169

Similarly, further reduction in Aurizon Network's energy demand because of rail operator energy substitution from uncompetitive network charges may release additional latent capacity or capability within these SVCs.

Application of the Rule Change to IUSAs Providing Voltage Control

The draft determination also proposes that system strength services should be provided as a prescribed transmission service by the TNSP in the relevant region responsible for jurisdictional planning. The costs of these system strength services are to be part of prescribed TUOS services and recovered by a system strength charge for those who 'consume' system strength.

As system strength services are to be provided as prescribed transmission service this raises additional complex issues regarding cost allocation between negotiated transmission services, prescribed exit services (with dedicated SVCs) and prescribed system strength services.

Aurizon Network notes that there are significant information asymmetries which preclude a directly connected customer determining whether the costs of IUSAs, which are solely funded by negotiated transmission charges, from assessing the extent which those assets are providing benefits to other network users. Similarly, a TNSP may have strong commercial incentives not to disclose that information. For example, a customer to negotiated connection agreement may be willing to renegotiate its maximum contracted demand and service to provide additional system strength services from existing infrastructure.

Therefore, the directly connected customer may not be able to verify or challenge the extent to which the costs of the transmission infrastructure assets it is bearing are providing additional prescribed transmission services, including system strength services.

Aurizon Network therefore seeks further guidance from the AEMC as to how IUSAs that provide existing system strength services will be classified under the proposed rule.

To the extent that further reductions in energy demand, as a derived demand from the demand for rail transportation services, increases the available system strength services to the NEM it will be consistent with the long term interests of consumers for Aurizon Network to have those benefits reflected in its transmission charges. Alternatively, given the relative fixed nature of those charges it may be necessary to terminate those connections and, subject to the TNSP meeting its reliability obligations under the National Electricity Objective, the full amount of those costs may be fully borne by consumers.

Aurizon Network would welcome further engagement with the AEMC on how these matters might be impacted, or addressed by, the preferred rule change in the draft determination.

Should you have any questions in relation to this submission please contact Dean Gannaway via email at dean.gannaway@aurizon.com.au.

Kind regards,

Claire Hemphill
Head of Network Customers