

3 February 2023

Ms Anna Collyer
Australian Energy Market Commission
GPO Box 2603
Sydney NSW 2000

Via online submission

Dear Ms Collyer

RE Efficient Reactive Current Access Standards for Inverter-based Resources – Draft Determination

TasNetworks welcomes the opportunity to respond to the Australian Energy Market Commission's (**AEMC's**) draft determination on Efficient Reactive Current Access Standards for Inverter-based Resources (**IBR**).

TasNetworks is the Transmission Network Service Provider (**TNSP**), Distribution Network Service Provider (**DNSP**) and Jurisdictional Planner in Tasmania. The focus of these roles is to deliver safe, secure and reliable electricity network services to Tasmanian and National Electricity Market (**NEM**) customers at the lowest sustainable prices. TasNetworks recognises the important role renewable generation, including IBR, will play in the energy transition and is supportive of any changes that support their connection while maintaining a secure power system.

TasNetworks would like to challenge the premise of this rule change, that being there are challenges with efficiently connecting IBR to the network. This is not the experience of TasNetworks. While proponents are legitimately seeking opportunities to reduce costs, in some circumstances this has included exploring options to reduce the capability of their plant under the assumption that others, especially the TNSP, will meet any additional requirements to maintain voltage stability. Often this may be possible, and the proposed rule changes in the draft determination will ensure proponents of IBR can connect efficiently. However, there is no justification to reduce the Minimum Access Standards (**MAS**) as proposed due to the increased risk to power system security that would result.

One concern raised by the rule change proponent was that it was often difficult to meet the reactive current access standard at the connection point due to the distance from the

connection point to actual generating units. While this can be an issue the current rules provide for a means to measure the reactive current contribution at a point other than the connection point (see S5.2.5.5(u)(2)).

The decisions to amend clause S5.2.5.5(n)(1) from requiring a response of 2% of a generating system's maximum continuous current per 1% change in voltage to; 0% per 1% change in voltage at the connection point seems based on studies undertaken on Type 3 wind turbine generators (**WTG**) by Aurecon. The National Electricity Rules (**NER**) standard shouldn't be lowered simply to allow a specific IBR technology type to be connected. By lowering the MAS, the NER would remove the incentive for proponents to install the most up-to-date equipment, equipment which ultimately provide lower costs for end use customers. Previously, there would be a trade-off between purchase of Type 3 and Type 4 wind turbines. Proponents with Type 4s could face a higher upfront cost, with the ability to achieve greater latent reactive current injection capability. However, for Type 3, it could be a lower cost per turbine with the expectation that it would generally require additional dynamic reactive capability plant to support the connection to meet S5.2.5.5.

This is highlighted by the submission from Ergon/Energex, that in its experience all connecting IBR have been able to meet the existing MAS by optimising their reticulation and balance of plant design, and therefore there isn't a need to reduce the MAS.

It is clear from the Australian Energy Market Operator's (**AEMO's**) submission that most network service providers (**NSPs**) are amenable to lowering the standard from 2% to 1%, with the Connections Reform Initiative (**CRI**) technical paper highlighting "...that the reactive capability be set at a level that NSPs and generators agree, but be greater than 0%". This demonstrates that NSPs/AEMO understand the challenge with this standard and are open to lowering it to 1%, with a negotiation between 0 and 1%.

TasNetworks disagrees with the option to allow "a lower level of capability that is agreed by NSPs and AEMO on a case by case basis". AEMO or the NSP should never accept less than 0% reactive current injection per 1% voltage reduction (i.e. absorbing reactive current during a fault). This would suggest that it is acceptable for an IBR to actively reduce the network voltage and needlessly exacerbate the impact of a network disturbance. The MAS for reactive current are in the NER to protect customers from a fault causing voltage collapse. The economic impact to the community from a widespread outage caused by voltage collapse are outweighed by any benefit from reducing reactive current injection below 0%.

Transparent communication on the capabilities of the proponent's IBR technology and the risks to system security should be encouraged. This will ensure the best balance between releasing latent reactive current injection capability and the level of investment in generation. This in turn will ensure a stable power system now and for future users. The draft determination is eroding the premise that the responsibility for ensuring a stable power system is a shared responsibility between NSPs and generators. Instead it seems to be placing this responsibility solely on the NSP.

It is stated in the draft determination that "Grid-forming inverters seek to mimic the behaviour of governors on synchronous machines. This means that they are continuously controlling reactive current to ensure the voltage at the connection point to remain stable". This seems to miss the fact that governors do not control reactive current. This task is performed by a generating unit's excitation system. Automatic voltage regulators (**AVR**) control the magnitude of excitation current through to the rotor field winding to regulate the unit's

terminal voltage and hence control reactive current. We recommend updating this in the final determination to avoid perpetuating this misconception.

TasNetworks remains of the opinion that to fully address the issues put forward in this rule change request a review of the original intent of the performance requirements specified in S5.2.5.5(f) and (n) should be undertaken. TasNetworks cannot support the proposed rule change without the review having occurred.

Should you have any questions, please contact Tim Astley, Network Reform and Regulatory Compliance Team Leader, via email (tim.astley@tasnetworks.com.au).

Yours sincerely

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Chantal Hopwood

Head of Regulation