

3rd February 2023

Ashok Kaniyal
Senior Advisor
Australian Energy Market Commission (AEMC)
Level 15/60 Castlereagh St, Sydney NSW 2000

Re: Efficient reactive current access standards for inverter-based resources (ERC0272) – response to draft determination

Dear Mr. Kaniyal,

gridmo welcomes the opportunity to provide comments on the Commission's draft determination for *Efficient reactive current access standards for inverter-based resources* (ERC0272).

gridmo is a software platform that provides engineers with access to fast and accurate power system studies. These studies use industry-standard modelling tools and align with the latest grid code requirements. gridmo was founded by two senior grid connection engineers ([myself](#) and [Jarman Stephens](#)) who have led several hundred MWs of grid connections in the NEM.

We support the pragmatic approach offered by the Commission & the technical working group to amend the reactive current injection requirements under S5.2.5.5 of the Rules.

We commend the efforts of the Commission and the industry on the hard work and time invested, so the NER can continue to evolve to meet the needs of the rapidly changing Australian electricity network.

Please refer overleaf for our commentary on the draft rule.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'D. Vermeer'.

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1. NSPs have no obligation to accept the lowered MAS

1.1 Goals of the rule change

We believe, in our reading of the rule change request and subsequent draft determination, that there are two core goals the Commission is addressing:

1. Prevent unnecessary investment in auxiliary dynamic plant, such as STATCOMs¹, purely to achieve the minimum access standard (MAS) of 2 %/ %².
2. Allow flexibility to relax the MAS of 2 %/ % to cater for very low system strength, very large generating systems – or both – where the minimum mandated reactive current injection of 2 %/ % may lead to system instability.

1.2 Summary of the proposed change

The Commission is proposing to lower the MAS threshold from 2% to 0%, for both LVRT and HVRT modes. The automatic access standard (AAS) remains unchanged at 4% and 6% respectively.

1.3 Feedback on goal #1

The Commission has clarified that they believe the responsibility of maintaining voltage levels during steady-state conditions and adequate reactive power reserve margins to respond to faults is the responsibility of AEMO and/or the NSP(s)³.

When a Proponent submits a connection application, any negotiated access standards (NAS) submitted are reviewed and accepted by AEMO and/or the NSP(s).

If AEMO and/or the NSP(s) do not accept the proposed NAS, which is lower than the AAS they are “entitled to”⁴, they then become responsible any unforeseen or emerging reactive current shortfall.

Under these circumstances, it seems unlikely that AEMO and/or the NSP(s) will accept such a lower reactive current contribution.

We therefore believe that lowering the MAS will not have a significant impact on reducing the amount of unnecessary investment in auxiliary plant.

1.4 Feedback on goal #2

We acknowledge that there are circumstances, especially for very large generators or very low system strengths, where the MAS of 2 %/ % could lead to excessive voltage(s) or disturbances. Under these circumstances, this would be a clear NAS as it would likely fit the definition of 5.3.4A(b1)(2)⁵ – however the lower limit of 2 %/ % means that AEMO and the NSP cannot accept any lower performance.

We support the flexibility offered by the Commission by lowering the MAS from 2% to 0% for such a circumstance.

¹ Draft determination for this rule change. Summary, paragraph 6, page i.

² As per S5.2.5.5, we define a reactive current gain of 2 %/ % as that there is a 2% change of the maximum continuous current for a generating system for a 1% change in voltage above/below a trigger level.

³ Draft determination for this rule change. Summary, paragraph 10, page ii.

⁴ There is no entitlement as such to our reading of the Rules, but Clause 5.3.4A(b1) implies that a connecting generator must provide performance as close as practical to the AAS. The MAS, of which the bar is being lowered, has performance as far as possible from the AAS. There may not be a technical reason as to why additional reactive support cannot be provided to improve the performance closer to the AAS.

⁵ Clause 5.3.4A(b1)(2): “power system conditions at the location of the proposed connection” - one of the NAS conditions.

2. New terms are being added to the Rules without definition

2.1 Goal of the rule change

To our reading, the Commission has identified some aspects of the S5.2.5.5 MAS may be overly restrictive, especially in “edge cases”⁶.

2.2 Summary of the proposed change

The Commission is proposing to loosen and/or provide a framework for generators to negotiate lower than MAS performance for S5.2.5.5 in some limited capacity, subject to the agreement of the connecting generator, AEMO and NSPs.

2.3 Our concern

The Commission has identified in this rule change that there is no definition of maximum continuous current and *“defining it in the rules would result in all parties having a common understanding... throughout the rule change process. This would result in less delays and iterations of modelling, due to the shared understanding.”*⁷

However, the following terms introduced in this draft rule, which are related to the new framework to allow lower than MAS performance, are not defined in Chapter 10:

- **Adequately controlled**, draft rule S5.2.5.5(o)(4)
- **Must not contribute excessively**, draft rule S5.2.5.5(u)(1A)

We reasonably believe the lack of definitions of these new terms, or the intent of these terms, may result in disagreements between proponent(s), NSP(s) and/or AEMO which may lead to delays to the grid connection process.

This will likely increase the cost to end users of electricity and thus in direct objection to the National Electricity Objective (NEO).

2.4 Our thoughts

We encourage the Commission to include, preferably within Chapter 10 of the Rules, the intended definition of the above new terms.

We highlight the work the Commission has completed (Appendix D.6) as likely being suitable for formal definition of the above terms.

⁶ Draft determination for this rule change. Summary, paragraph 18, page iii.

⁷ Draft determination for this rule change. Section 2.3.3, page 20.