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RE: Power System Security and Reliability (PSSR) Standards Review – Proposals 6 to 11

Neoen welcomes the opportunity to provide our comments on the Consultation Paper on Power System Security and Reliability Standards Review - Proposals 6 to 11, User Facility Standards for Grid Forming and Grid Following Inverters.

Neoen appreciates the need to review and update the PSSR Standards, and considers many of the changes proposed to be beneficial in supporting efficient connection of new capacity while maintaining power system security and reliability. While we support the chance to collaborate at this early stage we consider it essential that the specific formulation of new Rules be subject to future consultation. Given the highly technical nature of the changes, it is difficult to form a considered opinion and provide feedback without the full details of those proposed changes.

Detailed feedback on Proposals 6 to 11 published in the most recent Consultation Paper is provided below, noting our feedback provided in relation to the previous consultation paper provided in August 2025 remains relevant, and we look forward to the opportunity for a further holistic discussion on the Review.

General Feedback and Grid Forming (GFM) facility definition

The consultation paper introduces separate, often more onerous, requirements to the ESM Rules for grid forming inverters. With no specific incentives in the WEM to install or transition existing systems to grid forming technology, such as an inertia or grid forming capability market, the introduction of more stringent requirements has the potential to deter proponents from making additional investment and/or from adopting grid forming capability. This will only be detrimental to the power system itself. We consider that grid forming IBRs should be required to deliver enhanced capability when beneficial to the power system, but should not be required to operate differently simply because they can.

Should a decision be made to introduce separate standards for Grid Following (GFL) and GFM facilities, the recommendation to introduce a GFM definition is supported by Neoen. We encourage the Review Panel to consult further with the inverter OEMs and the industry on the suggested wording. Ambiguous terms such as 'stable' and 'rapid' have capability to unnecessarily prolong negotiations.

Further, the Paper introduces numerous new Minimum Access Standards (MAS), with highly specific requirements for GFL and GFM technologies based mainly on review of available literature rather than scientific research, studies or consultation with industry. We believe this is a move in the wrong direction that undermines the negotiation process and tuning of control system parameters suitable for the location and purpose of each facility. Minimum standards must be defined in a way that allows negotiation with the network owner and system operator while maintaining the security and reliability of the grid. Highly specific requirements should be reserved for Ideal or Automatic Access Standards only.

Proposed Requirements	Neoen feedback / recommendation
Proposal 6	
Withstand SCR	<p>We recommend highly specific minimum standards for GFL or GFM technologies be avoided. Connection standards should reflect the needs of the network. New minimum standards at low SCRs will most likely prevent generating systems, that could otherwise function in a specific network location without issues, from connecting to the network.</p> <p>There is an increasing body of research that SCR is a highly general and unrefined measure for system strength and stability.</p>
Settings used for demonstrating withstand SCR	<p>Notwithstanding the above, we strongly encourage allowing different set of settings to be established for demonstration of compliance at low SCR and compared with those implemented at a facility. The control setting applied at any facility should be developed for optimal performance considering the connection point characteristics.</p> <p>SCR is a simplistic measure of the system strength, based on a number of assumptions and does not fully reflect the network conditions at given location. As power system, stability analysis techniques and technologies evolve SCR will become less relevant. While each technology may have a set of settings suitable for low SCR, these settings are virtually guaranteed to be less than ideal for the specific connection point and system conditions prevailing at any given time/location. A requirement to apply settings that achieve required performance at minimum SCR will unnecessarily compromise performance of the project only to prove theoretical ability not needed at specific network location.</p> <p>Tuning GFM or GFL inverters to withstand very weak network conditions does not necessarily mean increased capability. As an example, it has been shown that increasing inertia coefficient of the GFM inverters, that may be required for operation in weak grid conditions, degrades their active power recovery and in fault reactive current injection. We encourage collaboration with inverter OEMs to better understand how changes to parameters required for low SCR operation impact on different areas of performance before establishing standards that will degrade overall system performance.</p> <p>A framework that allows collaborative re-tuning of facilities as the power system evolves should be developed. The ability to adjust settings throughout a project's lifetime ensures that optimal performance outcomes are delivered for the current practical application.</p>
SCR boundaries where the facility is expected to remain stable	<p>We find it unclear how relaxing the CUO requirements outside minimum boundaries is correlated with the SCR withstand. We suggest it is preferable to focus on maintaining CUO and stability within realistic operating conditions and suggest that reducing the CUO requirement does not immediately aid in meeting performance in weak network conditions.</p>

Proposal 7	
<p>Voltage phase angle jump response</p>	<p>The purpose of phase angle jump withstand and response needs to be more clearly articulated. Understanding the source of many phase angle jumps (i.e. faults) gives better understanding that these requirements might substantially be already covered by disturbance ride-through criteria.</p> <p>It is agreed that there needs to be provision to limit the use of vector shift relays which can cause unnecessary tripping of facilities. We recommend to replace the withstand requirement with a requirement for vector shift protection not operating for an angle shift less than 30 degrees, similar to NER Clause S5.2.5.8 (b6) from version 227, as a much more practical approach, noting a larger angle should be applied in the SWIS compared with the NEM. We also recommend that the requirement for anti-islanding protection under A12.13.3.3 be reviewed to ensure that this does not encourage the use of protection schemes that risk CUO without providing material protective function.</p> <p>We note the comparison made to AS4777.2 in the discussion regarding this requirement. It is important to understand that AS4777.2 has been developed specifically to accommodate the connection of significant magnitudes of retail-scale inverters to low voltage distribution networks. Performance and operation of utility-scale facilities to high voltage transmission networks needs separate and specific consideration.</p> <p>We consider that a requirement to withstand specific phase angle shift fails to add specific value and adds unnecessary burden in engineering assessment, without recognising the conditions that might drive such “jumps”. A phase angle jump of meaningful magnitude would generally be driven by a particular kind of fault, which is already covered in assessments under multiple disturbance ride-through conditions.</p> <p>Further clarity is also required in relation to the requirement for GFM to “suppress” phase angle jumps as it is currently unclear how that would be interpreted and demonstrated.</p>
Proposal 8	
<p>Reactive current commencement and rise time during contingencies</p>	<p>This proposal is largely consistent with what is needed to accommodate grid forming technology.</p> <p>We recommend introducing requirements for specific rise time and commencement time as a minimum standard be avoided. As proposed, a rise time and commencement time of 80 and 40ms respectively should be achievable for IBRs, however, the specific timeframes may vary and require adjustment according to the connection point and use-case. Introducing such specific requirements in a minimum standard prevents negotiation and undermines the concept of a minimum standard.</p>

<p>Fast opposition of voltage magnitude changes</p>	<p>It is unclear how a specific requirement for fast opposition of voltage magnitude changes differs to reactive current injection or voltage control requirements. We suggest that if such requirements are demonstrated as necessary and do make a different and positive contribution to power system security and stability, they should be integrated into A12.9.2.5.</p> <p>As there is no proposed rule drafting it is not possible to provide detailed feedback. Proposed drafting of the rule is essential to comment further on this matter.</p> <p>The discussion on requirement validation appears to rely solely on modelling and studies. Generator Performance Standards are a record of a plant’s real performance and all of that performance should be able to be observed in real operation. The role of modelling is to support the performance negotiations – modelling outputs should not drive performance specifications. If the proposed performance cannot be observed in real operation it should be discarded, and should not form a baseline for performance by being inserted into a minimum requirement.</p>
<p>Fault ride through activation thresholds</p>	<p>We recommend a range for Fault Ride Through (FRT) activation threshold is maintained. As the FRT is activated at inverter level and not the point of connection the selection of the FRT threshold cannot be precise as the voltage difference between the two locations varies based on operational levels of active and reactive power. We also note that many GFM inverters do not have a specific FRT threshold setting and instead respond to changes in network conditions based on their grid forming parameters throughout the entire voltage range. It is unclear how a discreet FRT threshold for the GFM technology will be established and verified.</p> <p>We do not agree that simpler specification and conduct of connection studies is a valid reason for changed performance specifications. We encourage that performance requirements be focussed on real-world outcomes and not ease of modelling assessment.</p>
<p>The use of total current during contingencies</p>	<p>Supportive of using total current during instead of focussing on reactive current only.</p> <p>Recommend rewording of existing requirements to accommodate this proposal instead of introducing a new standard. Neoen also agrees with introducing flexibility and avoiding specific numerical thresholds in requirements for reactive current sustainment. At the same time we encourage the Review Panel to word the requirement carefully without introduction of ambiguous words such as “substantially”. Circumstances for when and how reduction may occur need to be outlined and understood clearly.</p>
<p>Instability detection mechanism</p>	
<p>Neoen is supportive of implementing measures to increase monitoring and detection of unwanted and unexpected behaviour.</p> <p>NEM experience shows that this is difficult to realise in practice with the currently available oscillation monitoring (OSM) equipment. Engaging with participants and providing clear requirements for OSM devices, within capabilities of current technologies, could encourage investment in this space and development of suitable devices for the WEM and NEM. Western Power and AEMO WA are particularly well placed to lead this developing area of the market and set an example for other Network Service Providers.</p> <p>We note the significant international research into this topic, and encourage that any requirements are broad end flexible enough to ensure that best practice approaches are able to be integrated and the requirements are not grounded in what is available today. The power system requires a whole-of-environment instability detection arrangement and there needs to be integration across facilities and the power system in general to monitor and manage oscillations.</p>	

Transitional arrangements
Neoen is supportive of establishing transitional arrangements – it is important to have a clear understanding of how changes in the Rules impact projects at different stages of development.

Should you need further information or clarification on any aspect of our submission, please do not hesitate to contact us.

Regards,



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Neoen Australia