

1 June 2022



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Dear Sir/Madam,

Ausgrid's Submission - Amendments to AEMO instruments for Efficient Management of System Strength Rule

Thank you for the opportunity to provide feedback on AEMO's response to the rule change by the Australian Energy Market Commission (AEMC), which seeks to alter the system strength instruments to facilitate more efficient and timely provision of system strength for the National Electricity Market (NEM).

As a key participant in the energy transformation of the NEM, Ausgrid is supportive of the need to act and welcomes AEMO's leadership in this area. We are acutely aware of the challenges of supporting stable operation of existing equipment and hosting further inverter-based resources (IBR), while levels of system strength are reducing because of declining minimum operational demand, the retirement of synchronous generation and the rapid uptake of renewable energy resources.

Following consideration of the proposed approach, we have outlined some practical aspects and concerns below, which we believe require further consideration as AEMO's approach to management of system strength is finalised.

Summary of Key Issues for Amending the System Strength Requirements Methodology (SSRM)

Minimum Fault Level Requirements

Ausgrid broadly supports the proposed approach for determining minimum fault level requirements. However, we recommend that AEMO develop a consultation framework to drive consistency in how the methodologies and standards specified for minimum fault level calculation are developed and applied across AEMO and TNSP's/DNSP's.

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Protection System Operation

Ausgrid has several 132kV circuits which do not meet contemporary NER primary or backup clearing time requirements, where the existing protection schemes have been grandfathered since commencement of the NER. Compliance with these criteria was not required as these protection systems were in place prior to the inception of the NER and assessed as not posing a power system security risk at the time.

With the expected reduction of three phase fault levels, adequacy of these historic protection schemes to meet critical clearing times needs to be determined to understand whether this will pose an unacceptable power system security risk.

Ausgrid may need to engage with AEMO/Transgrid to determine critical clearing time requirements on the 132kV system and resolve any change which may be necessary to the grandfathering arrangements.

Shunt Reactive Plant Switching

Ausgrid operates a fleet of shunt reactive plant, primarily for managing power system voltage within required limits. The switching of reactive plant results in rapid voltage change which is related to three phase fault level. Ausgrid has reactive plant of significant size which will require minimum three phase fault levels to maintain compliance with the rapid voltage change criteria in Australian standards.

Ausgrid and other DNSPs need to be actively involved in the review of system strength (ie fault levels) to minimise the risk of undesirable consequences relating to plant of this nature on our network.

Planning for Critical Outages

Critical outages which may affect power system operation due to decreasing three phase fault levels are a key parameter in determining minimum three phase fault level requirements. Flexible power system operation is needed for maintenance and augmentation of the network and it may be constrained by minimum fault levels as critical outages may prevent network access when needed.

Ausgrid and other DNSPs need to be actively involved in the review of system strength to minimise the risk of system strength changes unduly limiting DNSP switching flexibility – avoiding to security and reliability risks to customer.

Locating System Strength Nodes

We support the establishment of system strength nodes but believe that the approach must further consider suitable locations within DNSP networks, in addition to the number and choice of locations on TNSP networks.

System strength has strongly locational characteristics. The establishment of system strength nodes at suitable locations will signal system strength to NSPs and generation / storage proponents as well as supporting overall system strength analysis. Their number and location must be carefully chosen to provide appropriate signals which lead to efficient investments in system strength. If there are insufficient nodes or they are inappropriately placed, they may lead to perverse decisions regarding the placement of system strength remediation.

While there will clearly be investments in the transmission network, in some cases system strength remediation may be most effectively and efficiently delivered from within a DNSP's network. This may include the efficient utilisation of investment by generators/intending participants within distribution networks as well as investment by DNSPs to manage system strength.

There is a strong risk that more electrically remote nodes on the transmission network will send incorrect signals to distribution connected generators and/or DNSPs with an increased risk of inappropriately rendering system strength investments non-viable.

Summary of Key Issues for Amending the System Strength Impact Assessment Guidelines (SSIAG)

Preliminary Assessment of System Strength Impact

As it stands the Preliminary Impact Assessment (PIA) is carried out as under S5.4A, in response to a Preliminary Enquiry (PE) from an intending participant. Noting that DNSP's are not able to charge for a preliminary response under the existing NER rule, any further assessment carried out by the DNSP's during these early stages, such as the requirements for model assessments for a PIA, will have implications upon response timeframes on an already constrained resource and additional costs to be born by the DNSP.

At the early stages of these projects the proponents have very limited information on their development, with most only able to provide the bare minimum required under S5.4A. The requirement to provide a PSCAD (Power Systems Computer Aided Design) model at these early stages to form part of the PIA assessment will add little value given the limited information available at the preliminary enquiry stage and only serve to add to the ever-increasing costs for generator assessments.

The timing for the additional information to be provided by the DNSPs as a part of the new requirements of the PIA (i.e. PSCAD model) may be better during the detailed assessment phase of the project, as opposed to upfront as a part to the proponents PE submission. Under the current Chapter 5.3.4 process Ausgrid would capture any system strength remediation requirements if a proposed generator pose an impact upon system strength to the network.

Full Impact Assessments (FIA) and Stability Assessments for System Strength Impact

It is not clear what the differences are between the FIA and the Stability Assessment. There appear to be multiple pathways available to proponents:

- 1) pay the system strength charge and avoid the full impact assessment and complete only the stability study;
- 2) complete the full impact assessment and provide their system strength remediation scheme;
- 3) complete the determined system strength connection works when required.

Clarification is sought to map out the pathway the proponent will be required to follow.

Thankyou once again for the the opportunity to provide response to the consultation paper. We would be happy to work further with AEMO to resolve the issues we have raised. If you have any questions about our response, please contact Matt Webb, Head of Asset Investment at mwebb@ausgrid.com.au or Ping Tan, Asset Investment Planning Manager – Transmission at ptan@ausgrid.com.au

Yours sincerely,

Matt Webb

Head of Asset Investment