



Managing power system fault levels

Draft determination released for consultation

The Australian Energy Market Commission has made a draft rule to allocate responsibility for managing power system fault levels, also known as system strength, in the National Electricity Market (NEM). The draft determination and accompanying draft rule has been made in response to a rule change request from the South Australian Minister for Mineral Resources and Energy and accompanies the Commission's final report on the *System security market frameworks review*.

The Commission's draft rule

The draft rule amends the National Electricity Rules (NER) to address issues associated with reducing system strength. It does so by allocating responsibility for maintaining system strength in a manner that maintains system security, while providing appropriate incentives and efficiently allocating risk to the extent possible.

The draft rule:

- provides an enhanced framework that requires network service providers (NSPs) to maintain the system strength at generating system connection points above agreed minimum levels under a defined range of conditions
- introduces a process for the generator (or market network service provider), the relevant NSP and the Australian Energy Market Operator (AEMO) to agree and register a minimum short circuit requirement during the connection process
- introduces a requirement for new connecting generators to 'do no harm' to the minimum level of system strength being provided at the time of the connection to any nearby generating system
- includes a transitional process for existing generators, NSPs and AEMO to agree and register the level of system strength that the relevant NSP will maintain for existing generators on an on-going basis.

What is system strength?

System strength is a characteristic of electrical power systems that relates to the size of the change in voltage for a change to the load or generation at a connection point. The system strength at the connection point of a particular generating system can be referred to as the short circuit ratio, which is the ratio of the system strength in MVA, to the capacity of the generating unit in MW.

The exit of large thermal synchronous generation, together with an increasing proportion of non-synchronous generation like wind and solar, has contributed to decreases in system strength in some areas of the power system.

A reduction in system strength in certain areas of the network may mean that generators are no longer able to meet their technical performance standards and may be unable to remain connected to the system at certain times. It may also lead to voltage instability and a reduction in the effectiveness of the protection systems used by network businesses, generators and large customers. If not addressed, these effects could lead to system instability and potential major supply interruptions.

The Commission is seeking stakeholder feedback on the draft determination. Submissions are due by 8 August 2017.

NSPs maintaining system strength

The draft rule requires each NSP to plan and operate its network to maintain the short circuit ratio at the connection point for each generating system connected to its network to a level that is above the generating system's agreed minimum short circuit ratio. This obligation requires the NSP to use existing planning and regulatory arrangements when acquiring or providing these services.

New connecting generators should 'do no harm'

The draft rule introduces a requirement on new connecting generators to 'do no harm' to the minimum level of system strength at the connection points of existing generating systems. When negotiating its connection with the NSP, the new generator would have to agree with AEMO, in its role in maintaining power system security, and the NSP:

- the minimum short circuit ratio to be provided by the NSP, which would be registered with AEMO
- the extent to which the new connecting generator impacts on the minimum short circuit ratios being provided to existing generators.

The new connecting generator would be required to fund the costs associated with the provision of any required system strength services to accommodate its connection.

Transitional arrangements

The draft establishes a process for each existing generator, the relevant NSP and AEMO to agree the minimum short circuit ratio for existing generating systems, and to register this with AEMO. This will enable the NSPs to then be able to maintain the necessary system strength. The agreed minimum short circuit ratios would be required to be registered with AEMO by 1 July 2018 which is when the NSPs' obligations commence.

Consultation and next steps

This draft determination forms part of the work program of the *System security market frameworks review*. This review supports the continuing transformation of the NEM by considering the regulatory frameworks that affect system security in the NEM, in particular, the management of frequency and of system strength in a power system with reduced levels of synchronous generation.

Under its system security work program, the Commission has been assessing five rule change requests that relate to system security concurrently and in coordination with the review, including the rule change request proposing management of system strength in the NEM. In addition to this draft rule and determination, a final report for the *System security market frameworks review*, and a draft determination and draft rule on the *Managing the rate of change of power system frequency* have been published. The Commission has previously made two final rules, with new arrangement for under- and over-frequency control schemes being introduced on 6 April 2017.

The determinations and rules published as part of the system security work program, and the final report of the *System security market frameworks review* are available on the Commission's website.

The Commission is seeking stakeholder feedback on this draft rule and draft determination. We invite stakeholders to provide written submissions by 8 August 2017.

Stakeholders wishing to meet with the AEMC should contact Julian Eggleston at 02 8296 7820 or Julian.Eggleston@aemc.gov.au.

For information contact:

Director, **Julian Eggleston** (02) 8296 7820

Senior Director, **Suzanne Falvi** (02) 8296 7883

Media: Communication Director, Prudence Anderson 0404 821 935 or (02) 8296 7817

27 June 2017