AEMC

INFORMATION

System Security Market Frameworks Review

Commencement of self-initiated review

A review is being initiated by the AEMC into the market frameworks that affect system security in the National Electricity Market.

Background

The electricity industry in Australia is undergoing fundamental change as large-scale, conventional, synchronous generation is displaced in the generation mix by smaller, distributed and more non-synchronous generation. Different approaches to maintaining system security in the National Electricity Market (NEM) may be required in this environment.

System security refers to maintaining the power system in a secure and safe operating state to manage the risk of major supply disruptions. It deals with the technical parameters of the power system such as voltage, frequency, the rate at which these might change and the ability of the system to withstand transient faults. System security is different from reliability of supply which has a consumer focus and describes the likelihood of supplying all consumer needs with the existing generation capacity and network capability.

In order to maintain the electricity system in a secure operating state, the frequency of the system must be maintained within a tight operational range. Rapid changes in frequency or large deviations from normal operating frequency can lead to instability in the system.

The ability of the power system to resist large changes in frequency arising from the loss of a generator, transmission line or large industrial load is determined by the inertia of the power system. Inertia is naturally provided by large spinning conventional generators that are synchronised to the frequency of the system.

Historically, most generation in the NEM has been synchronous and, as such, the inertia provided by these generators has not been separately valued. As the generation mix shifts to smaller and more non-synchronous generation, these parameters are not provided as a matter of course giving rise to increasing challenges in maintaining the power system in a secure state.

The shift to less conventional forms of generation has been more pronounced in some regions of the NEM than others. South Australia, in particular, has experienced a substantially faster change than other regions as an increasing volume of renewable energy is integrated. Flows on the interconnector with Victoria allow system security to be maintained. Where there is an outage of this interconnector, the risks to system security increase significantly. As the generation mix changes in a similar way across the NEM these risks may become more widespread.

Review process

The AEMC is self-initiating a review under section 45 of the National Electricity Law. The review will consider potential changes to the market frameworks that affect system security in the NEM.

The review follows and will be coordinated with ongoing technical work on these and related issues undertaken by the Australian Energy Market Operator (AEMO).AEMO, through its Power System Issues Technical Advisory Group (PSITAG), has already undertaken extensive work identifying and prioritising the technical challenges. AEMO is continuing its work advising the COAG Energy Council and may take immediate action to maintain system security under the current rules.

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The National Electricity Market is undergoing fundamental change which is creating challenges for maintaining system security

While each organisation has its own governance and accountabilities, the AEMC and AEMO will maintain close collaboration on their individual activities and cooperate, seeking to ensure that these activities deliver a coordinated package of measures to complement the increasing volume of renewable energy and maintain future power system security.

It is anticipated that rule change requests related to the subject of the review will be received by the AEMC. The review will be progressed concurrently and in coordination with the assessment of these rule change requests. Any forums, meetings and workshops held as part of the review may also be used to progress the assessment of the rule change requests, subject to the statutory rule change process requirements being met.

Stakeholders will have a range of opportunities to be involved in the Review. High level input on related system security matters will be provided by a Reference Group that will meet regularly throughout the Review. It will comprise members of the AEMC, the AER, AEMO and the Senior Committee of Officials, among others. In addition a Technical Working Group will be established to develop the detailed recommendations for consideration by the Reference Group.

A progress report will be provided to the COAG Energy Council prior to its meeting in December 2016.

The report to the COAG Energy Council will include recommendations on the best approach to maintain power system security with more non-synchronous generation, including any necessary changes to the National Electricity Law or the National Electricity Rules.

Considerations

The overall objective to be met in assessing the most appropriate solutions to the challenges is the National Electricity Objective, which requires consideration of economic efficiency and the long term interests of consumers.

In addition to meeting the requirements of the National Electricity Objective, a key consideration in approaching market design is deciding who takes responsibility for the various risks that are present. Risk will generally be allocated efficiently when the consequences of the risk occurring are avoided or lessened, or incentives are created for the management of the risk to improve over time.

Any solution identified should be able to be applied NEM-wide. While the challenges identified are currently only appearing in some jurisdictions, there is the potential for similar conditions to arise in other jurisdictions over time. Market design choices will be more robust where they can adapt to changing market conditions.

AEMO's work on the system security challenges has indicated that many of the challenges being observed are interlinked. Consideration of appropriate solutions should be holistic and take into account how changes around one technical parameter might affect other parameters. Continued technical input by and collaboration with AEMO will be critical for this.

Finally, to the extent feasible, solutions should not favour any particular technology over others. The uptake of new technologies in the NEM in recent years has highlighted how technology can change. Solutions will be more flexible if they are not linked to any particular technology.

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