



Frequency control frameworks review

Update on progress

The Australian Energy Market Commission has published a progress update on in its review into the regulatory and market frameworks that underpin frequency control in the National Electricity Market.

Background

The electricity sector in Australia is experiencing a period of change as newer types of electricity generation, such as wind and solar, connect, and conventional forms of generation, such as coal, retire. These new sources of electricity are changing the way Australia's power system works, which can have implications for power system security.

The power system is in a secure operating state if it is capable of withstanding the failure of a single network element or generating unit. System security events are caused by sudden equipment failure (often associated with extreme weather or bushfires) that results in the system operating outside of defined technical limits.

One of these technical limits is frequency. Managing frequency involves balancing the supply of electricity against customer demand on an instantaneous basis. Large deviations in frequency can occur if a generator or transmission line trips unexpectedly, and can have significant impacts on the safety and reliability of the power system. Controlling frequency is therefore critically important.

Greater variability in supply from intermittent generating technologies has the potential to make it increasingly difficult for the Australian Energy Market Operator (AEMO) to balance supply and demand. Analysis undertaken for AEMO also reflects that, in recent years, the frequency performance of the power system under normal operating conditions has deteriorated due to a reduction in the provision of frequency response from generators.

The AEMC self-initiated the *Frequency control frameworks review* to assess whether the current market and regulatory arrangements can support effective control of system frequency as the electricity system changes, and what opportunities there are for new technologies to support power system security.

Scope of the review

The *Frequency control frameworks review* is progressing a number of recommendations made by the AEMC in the *System security market frameworks review* and the *Distribution market model* project for possible changes to market arrangements that will lead to more efficient outcomes for energy consumers while delivering a secure operating system.

The review is considering the following issues:

- **Primary frequency control.** An assessment of the materiality of the degradation of frequency performance under normal operating conditions, what options are available to mitigate the risks of this and the costs/benefits of those options.
- **Frequency control ancillary services.** An exploration of the rationale for the existing frequency control ancillary services that currently exist, whether these will remain relevant in light of the changing generation mix, how fast frequency response services might be incorporated, and long term options to facilitate co-optimisation between frequency control ancillary services and inertia.
- **Distributed energy resources.** An exploration of the regulatory, technical and commercial opportunities and challenges associated with distributed energy resources providing system security services.

Stakeholders' submissions on the issues paper are available on the AEMC website.

The review will seek to identify and develop the changes to market and regulatory arrangements required to address the frequency issues highlighted by AEMO.

Nevertheless, there are trade-offs to be made between the risks and costs of meeting system security requirements. The objective of the review is to recommend the combination of changes that are necessary to provide a secure power system at the lowest cost to consumers.

The review is informed by recommendations from the Finkel Panel's *Independent review into the future security of the national electricity market*. The AEMC is also working with AEMO to coordinate the review with AEMO's work program on Future Power System Security, which it established to build its understanding of the opportunities and challenges in operating a stable and secure power system with less synchronous generation.

Issues paper and progress update

On 7 November 2017 the AEMC published an issues paper to facilitate consultation on the key issues that may be affecting frequency control in the NEM, and potential solutions.

The issues paper provides an overview of the existing frequency control framework and the drivers for consideration of frequency control arrangements in the NEM. The paper also sets out the AEMC's framework for assessing any changes to the existing arrangements for frequency control, and preliminary analysis of the issues within the scope.

Written submissions on the issues paper closed on 5 December 2017. 18 submissions were received, which are available on the AEMC website.

On 19 December 2017 the AEMC published a progress update on the review. The progress update provides:

- an overview of the three main streams of work under the review (as above)
- a summary of stakeholder views on these issues, as set out in submissions to the issues paper
- the AEMC's proposed next steps for each work stream.

The AEMC is due to publish a draft report on the review in March 2018.

The AEMC's system security work program

The *Frequency control frameworks review* forms part of the AEMC's ongoing system security work program. Specifically, it represents continued consideration of, and collaboration with stakeholders on, those aspects of the *System security market frameworks review* that relate to frequency control. In June 2017 the AEMC published its final report on the *System security market frameworks review*. The review made nine recommendations for changes to market and regulatory frameworks that enable the continued take-up of new generation technologies while maintaining power system security. Progress on these recommendations is set out in the attachment.

A number of the recommendations made in the final report relate to rule change requests that have since been completed or are under consideration. These rules seek to address risks to power system security caused by the transition from conventional generation powered by coal, gas and hydro to generation powered by renewable sources such as wind and solar.

The review also provides the means by which to further progress a recommendation made by the AEMC in the final report of the *Distribution market model* project regarding the participation of distributed energy resources in system security frameworks.

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