



Primary frequency response requirement and incentives

Draft determination for enduring primary frequency response arrangements

The Commission has made a draft rule for enduring arrangements to support the control of power system frequency and incentivise plant behaviour that reduces the overall costs to consumers of frequency control. It does this through the combined action of mandated regulatory requirements and behavioural incentives.

Establishment of double-sided performance incentives

Stable frequency is an important part of maintaining a secure power system. Frequency varies whenever electricity supply does not exactly match consumer demand. To avoid unplanned system outages, power system frequency must be controlled within a narrow range around 50Hz.

The energy balance in the power system is maintained through dispatch of generation to meet forecast demand and by procurement of Frequency control ancillary services (FCAS) to provide reserve capacity to help control frequency during normal operating conditions (regulation services) and following sudden failures (contingency services).

The power system is in the process of transitioning from a system dominated by centralised coal- and gas-fired thermal generation to a system comprised of a diverse portfolio of behind-the-meter and grid-scale inverter-based energy resources as well as a more flexible demand side. This transition is leading to increased variability of generation and load, which is expected to drive the need for increased levels of regulation FCAS.

The draft rule will help control power system frequency and reduce the cost of frequency control ancillary services over time, while providing economic signals that reflect the need for these services. It will achieve this through the combined action of mandated regulatory requirements and behavioural incentives. The combination of these two elements will lower the costs to consumers, with the incentive arrangements driving behavioural change for participants resulting in more efficient ways of controlling frequency.

The key elements of the draft rule include:

- confirmation of the mandatory primary frequency response (PFR) arrangements, as enduring beyond the sunset date on 4 June 2023 i.e. going forward all scheduled and semi-scheduled generators will be required to provide primary frequency response
- introduction of incentives, through frequency performance payments, for market participants to operate their plant in a way that helps to control power system frequency
- improvements to the cost recovery for regulation FCAS by making them more transparent and better aligning incentives with the real time need for frequency control
- additional reporting requirements for AEMO and the AER in relation to frequency performance and the costs of frequency performance payments.

Expert supporting advice

The Commission's draft determination is informed by expert advice from AEMO and independent advice from GHD Strategic Consulting.

AEMO's expert advice is that a high level of aggregate frequency responsiveness is required to support effective frequency control and, that this is best provided through a universal requirement for generators to operate in a way that is responsive to small changes in system frequency.

The draft rule would confirm the mandatory primary frequency response requirement as enduring and introduce double-sided incentives for plant behaviour that impacts system frequency.

AEMO also recommends the implementation of complementary arrangements to incentivise behaviour of power system plant that reduces variability and helps to control power system frequency. AEMO considers that this combination will provide sufficient aggregate frequency response under foreseeable normal operating conditions.

GHD's independent advice supports the confirmation of the existing mandatory PFR arrangements as enduring along with the implementation of complementary arrangements to incentivise helpful plant behaviour. Over the longer term, GHD considers that there will be increasing periods of time where the traditional providers of PFR, such as large coal-fired thermal generation, will be displaced by variable renewable and distribution connected generation. GHD considers that this shift may necessitate the development of stronger procurement arrangements to deliver sufficient levels of PFR.

Confirmation of the mandatory PFR arrangements as enduring

The Commission made a change to the NER in March 2020 to require that scheduled and semi-scheduled generators automatically respond to small changes in power system frequency. The implementation of this mandatory PFR arrangement has delivered a marked improvement in power system frequency performance without introducing significant additional costs on affected generators. This has been supported through AEMO's monitoring of the introduction of these requirements, as well as advice the AEMC obtained through the preparation of this draft determination. The determination is therefore supported by this real-world evidence.

The mandatory PFR arrangement is currently scheduled to sunset on 4 June 2023. However, in line with expert advice from AEMO and independent advice from GHD, the draft rule would revoke the sunset arrangements and confirm that the mandatory arrangements would endure.

Frequency performance payments and allocation of regulation service costs

However, the Commission does not consider the mandatory arrangements on their own to be enduring arrangements. There needs to be accompanying arrangements to better incentivise the provision of primary frequency response.

Under the existing arrangements, the costs of regulation services are allocated to market participants that contribute to the need for those services, and had a negative impact on power system frequency. While it is possible to have a positive impact, and reduce the need for regulation services, the current arrangements do not allow for payments to be made to value these positive contributions.

The draft rule would:

- establish a framework for frequency performance payments to be made to market participants that reduce the need for regulation services.
- align the period for measurement of plant performance with the trading interval in which plant performance is measured.
- improve the transparency of the participant contribution factors process.

Implementation

AEMO would be required to consult on and publish a new *Frequency contribution factors procedure* within nine months of the rule being made. The new process for frequency performance payments and regulation cost allocation would commence from a date that is two years and three months from the date the rule is made (i.e. in March 2024).

Under the NER, AEMO is required to consult on and publish a final *Primary frequency response requirements (PFRR)* to replace the *Interim Primary frequency response requirements* that currently specifies the performance requirements for generation that are required to provide mandatory PFR. In recognition of the interactions between this rule change and AEMO's consultation on the *PFRR*, the draft rule would extend the date by which AEMO is required to publish the final *PFRR* from 6 December 2021, to a date which is six months from the date the rule is made.

Submissions on this draft rule determination should be made to the AEMC by 28 October 2021

Coordination with the Energy Security Board post-2025 market design

The Energy Security Board (ESB) recently completed its post-2025 market design project, providing advice on a long-term, fit-for purpose market framework to support the future security and reliability of the electricity system beyond 2025. Frequency control is one of the four key essential system services that the ESB considered through this work. The draft rule is consistent with the ESB's long-term direction for essential system services.

Consultation

Submissions on this draft determination and draft rule, are due by **28 October 2021**.

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