



INFORMATION

AUSTRALIAN ENERGY MARKET COMMISSION LEVEL 15, 60 CASTLEREAGH STREET SYDNEY NSW 2000
T: 02 8296 7800 E: AEMC@AEMC.GOV.AU W: WWW.AEMC.GOV.AU

Final rule for primary frequency response incentive arrangements

Final determination for enduring arrangements that support the control of power system frequency and maintain grid stability

The Commission has made a final rule which builds on previous reforms to establish an enduring framework for the control of power system frequency by confirming the mandated regulatory requirements, introducing a new incentive framework, and placing additional reporting obligations on AEMO and the AER.

Frequency varies whenever electricity supply does not exactly match consumer demand and uncontrolled changes in frequency can cause blackouts. Primary frequency response (PFR) is an essential system service that helps to control system frequency close to 50Hz. It is delivered through an automatic change in the generation or consumption of electricity from a generator or load in response to changes in system frequency.

The ability to provide frequency response to keep the grid stable is becoming increasingly important, as lower cost, variable inverter connected generation such as batteries, wind and solar displace thermal generators in the system.

The AEMC has made a final determination and a final rule to introduce new incentive arrangements that will reward generation and load that help to control power system frequency. The new incentive arrangements will complement the existing obligation for large generators to support the secure operation of the power system by responding automatically to changes in power system frequency.

This final rule is a key milestone for the ESB's post 2025 [Essential System Services recommendations](#) and complements other reforms currently being implemented in relation to system strength and fast frequency response. It is the culmination of many years of investigations and consultation on enduring frequency control arrangements, stemming back to the AEMC's 2018 [Frequency control frameworks review](#).

The core elements of the final rule are largely the same as the draft rule, but the details have been refined following further analysis and stakeholder feedback

The core elements of the final rule are:

- Confirmation that the [mandatory PFR](#) arrangements will continue beyond the sunset date on 4 June 2023. This will mean that all scheduled and semi-scheduled generators will continue to be required to respond automatically to changes in power system frequency.
- Introduction of a new double-sided **frequency performance payments** process to encourage plant behaviour that helps to control power system frequency. These arrangements will value helpful frequency response from any eligible unit of generation or load with appropriate metering to measure its impact on system frequency.
- **New reporting obligations** for the Australian Energy Market Operator (AEMO) and the Australian Energy Regulator (AER) in relation to the levels of aggregate frequency responsiveness in the power system and the costs of frequency performance payments.

The Commission considers that these reforms will provide AEMO with the tools it needs to manage the secure operation of the power system in accordance with the technical limits specified in the Frequency operating standard (FOS). At the same time, the final rule will encourage more efficient operation of power system plant along with innovation and investment in new frequency control capability, thereby lowering costs for consumers over the long term.

The new frequency performance payments process will commence on 8 June 2025.

AEMO will develop the frequency contribution factor procedure by 8 June 2023.

Confirmation of mandatory PFR as enduring

The final rule confirms that all scheduled and semi-scheduled generators will continue to be required to support the secure operation of the power system by responding automatically to changes in power system frequency.

The mandatory PFR requirement was introduced in March 2020 to address an immediate need to restore effective frequency control in the NEM. However, the Commission's view is that it is not a complete solution for the long term. Therefore, the mandatory PFR rule was designed to sunset after three years, on 4 June 2023.

The Commission considers that a continuation of the mandatory arrangements is warranted as a complement to the new frequency performance payment arrangements. The implementation of Mandatory PFR has been particularly effective in improving the control of power system frequency in the NEM, given the current generation mix. This has been evidenced through data showing improvements in frequency performance since the implementation of control system changes on large-scale centralised generation in accordance with the Mandatory PFR rule. Expert advice received from AEMO and independent advice received from GHD also supports the continuation of mandatory PFR as necessary to support the secure operation of the power system.

The Reliability Panel is reviewing the FOS and the settings for mandatory PFR

The Commission notes stakeholder views that consider that the sensitivity of the mandatory PFR arrangements should be reviewed at a future date, following a suitable period of operational experience with the new frequency performance payments arrangements in place. This potential future will be further considered by the Reliability Panel which is currently reviewing the FOS, including the Primary frequency control band (PFCB) that sets the sensitivity for mandatory PFR.

The Commission expects that the Reliability Panel will also recommend the timing for a subsequent future review of the FOS to allow the settings in the FOS for normal operation, including the PFCB, to be further reviewed at a later date.

New framework for double-sided frequency performance payments

The key reform in the final rule is the introduction of double-sided frequency performance payments for all eligible units of generation and load. These new arrangements build on the existing 'causer pays' arrangements for the allocation of regulation FCAS costs. They are designed to deliver improved valuation and pricing of plant behaviour that impacts on power system frequency.

The final rule includes new transactions to support frequency performance payments to market participants who obtain positive contribution factors in a trading interval. The costs of frequency performance payments will be allocated to market participants who obtain negative contribution factors for that trading interval. Contribution factors reflect the impact of power system equipment (generation and load) on system frequency.

- A positive contribution factor represents plant behaviour that helps to control system frequency and reduce a frequency deviation (from 50Hz).
- A negative contribution factor represents plant behaviour that contributes to the deviation of system frequency.

At the same time, the arrangements for the allocation of costs for the enablement of regulation services will be modified to be more transparent and more reflective of the real time use of regulation services.

AEMO will develop a new frequency contribution factor procedure

AEMO will be required to consult on and publish a new frequency contribution factors procedure. The procedure sets out the process that AEMO will use to calculate contribution factors that will apply under the new frequency performance payments process and for the allocation of costs of regulation services.

The final rule includes clear principles and requirements to guide AEMO in the development of the procedure and for the publication of related data.

Next steps following this final determination

Practical implementation of the changes under the final rule will occur in stages:

- from **8 September 2022**, AEMO is required to report on aggregate frequency responsiveness as part of its [quarterly frequency monitoring reports](#)
- by **8 May 2023**, AEMO is required to consult on and publish the [Primary frequency response requirements](#) that specify the technical requirements for mandatory PFR.
- by **8 June 2023**, AEMO is required to consult on and publish the Frequency contribution factor procedure.
- **8 June 2025**, Commencement of the new frequency performance payments process and the obligation for the AER to report on the costs of frequency performance payments.

For information contact:

Director, **Sebastien Henry** (02) 8296 7833

Senior Adviser, **Ben Hiron** (02) 8296 7855

Media enquiries: media@aemc.gov.au

8 September 2022