AEMC

INFORMATION

Fast frequency response market ancillary services

Draft determination published for fast frequency response

The Commission has made a draft rule to introduce two new market ancillary services to help control system frequency and keep the future electricity system secure. The new services will foster innovation in faster responding technologies and deliver lower costs for consumers.

Realising the benefits of faster acting reserves

Stable frequency is an important part of maintaining a secure power system. Frequency varies whenever electricity supply does not exactly match consumer demand. Contingency frequency control ancillary services(FCAS) provide reserve capacity to automatically respond to events that cause a sudden change in the balance of supply and demand for electricity in the power system.

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 a reduction in inertia which presents operational challenges associated with maintaining a secure power system and controlling system frequency following contingency events.

At lower operating levels of inertia, increased volumes or faster acting frequency control services are required to arrest and stabilise the system frequency within the existing system operating standards. This could lead to a significant increase in the costs for fast six-second FCAS, which could be partially mitigated by the procurement of faster responding services.

Fast frequency response (FFR) refers to the delivery of a rapid active power increase or decrease by generation or load in a time frame of two seconds or less, to correct a supply-demand imbalance and assist in managing power system frequency. FFR is a relatively new service that can be offered by inverter-based technologies such as wind, solar photovoltaics (PV), batteries and demand-side resources.

The introduction of FFR services, which operate more rapidly than the existing frequency control services, would provide an additional frequency control option thereby reducing the overall costs of managing power system frequency relative to the status quo or other alternative arrangements.

The introduction of these new markets would further encourage innovation and technology development, and so the proposed change would also have flow on effects to reliability and security, beyond that associated with management of frequency control.

The draft determination and rule

The Commission's draft rule is consistent with the rule proposed by Infigen in its rule change request. The draft rule introduces two new market ancillary service categories into the NER for:

- the very fast raise service
- the very fast lower service

The market arrangements for the new market ancillary services would be the same as those for the existing fast raise and fast lower services. This includes the arrangements for registration, scheduling, dispatch, pricing, settlement and cost allocation.

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Submissions on this draft rule determination should be provided to the AEMC by 3 June 2021.

The implementation and transitional arrangements under the draft rule include:

- That AEMO revise the market ancillary services specification (MASS) within 18 months of the date that the rule is made, to specify the detailed description and performance parameters for the very fast raise service and the very fast lower service.
- That the FFR market ancillary service arrangements commence 3 years from the date that the rule is made.

These time-frames may be bought forward as a result of further planning associated with the ESB post-2025 work program and stakeholder feedback on the FFR draft rule.

AEMO's advice — FFR implementation options

The Commission's draft determination is supported by technical advice provided by AEMO which is published alongside this draft determination. It sets out AEMO's analysis of technical considerations and preliminary market analysis to inform the design of FFR market arrangements. AEMO's advice concludes that market ancillary service arrangements for FFR services should be developed to help efficiently manage system frequency during interconnected power system operation.

Relationship between inertia and FFR

There is a close interaction between the market arrangements for FFR services and the valuation of inertia. Inertia acts to resist changes in frequency due to sudden changes in supply and demand. It is provided inherently by large spinning machinery associated with synchronous generators such as coal, hydro and gas-fired power stations.

FFR and inertia are different services. Although FFR has the potential to assist with frequency management at lower levels of system inertia, FFR and inertia are delivered via different physical mechanisms, and play roles that are not directly interchangeable. FFR is not a direct substitute for synchronous inertia. The Commission expects that a minimum quantity of synchronous inertia will continue to be required over at least the medium term.

Currently, the NER includes an inertia framework that supports the provision of security critical inertia for each of the NEM regions. However, the NER does not support the full valuation of inertia above these minimum levels. The introduction of new FFR markets would likely address much of the system needs under low inertia conditions for the immediate future, but further needs may emerge over time. The consideration of reforms to value inertia services in the longer term is being considered by the ESB. Detailed investigation on inertia in order to understand the technical aspects of it are still required.

Coordination with the Energy Security Board post-2025 market design

The Energy Security Board (ESB) is in the process or developing 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 is considering through this work and the development of market ancillary services for faster frequency response are an immediate priority area for reform. The draft rule is consistent with the ESB's long-term direction for essential system services.

The AEMC is working closely with the ESB, AEMO and the AER in progressing the two rule change requests related to frequency control. Through the other active frequency control rule change, *Primary frequency response incentive arrangements,* the Commission is developing enduring arrangements for primary frequency response to manage small changes in system frequency and keep the power system stable and secure.

Consultation

Submissions on this draft determination and draft rule, should be made by **3 June 2021**.

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