AEMC

INFORMATION

Fast frequency response market ancillary services

Final determination published for fast frequency response

The Commission has made a final 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, will 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 will further encourage innovation and technology development, and so the proposed change will also have flow on effects to reliability and security, beyond that associated with management of frequency control.

The final determination and rule

The Commission has made a final rule which is more preferable but consistent with the rule proposed by Infigen in its rule change request. The final rule introduces two new market ancillary service categories into the NER; ***very fast raise*** and ***very fast lower***.

The market arrangements for the new market ancillary services will 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.

The implementation arrangements under the final rule include:

- That AEMO revise the market ancillary services specification (MASS) within 18 months of

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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 2 years and 3 months from the date that the rule is made.

The implementation of these markets was brought forward 9 months from the 3 years proposed in the draft determination following feedback from stakeholders. The final rule has also amended AEMO's quarterly reporting on frequency performance to provide stakeholders with greater transparency on interactions between these new markets, existing FCAS and, where relevant, the level of inertia in the system.

The Commission has created new markets to financially reward very fast energy providers like batteries for reacting at short notice when the system needs frequency control to support power system security as the energy sector decarbonises.

AEMO's advice — FFR implementation options

The Commission's final determination is supported by technical advice provided by AEMO which was published alongside the 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, but FFR and inertia are different services. 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.

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.

The NER does not currently support the valuation of inertia beyond the provision of security critical inertia for each of the NEM regions. However, 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 is still required.

Coordination with the Energy Security Board post-2025 market design

The Energy Security Board (ESB) is in the process of 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.

The AEMC is working closely with the ESB, AEMO and the AER in progressing the two rule change requests related to frequency control. The first is the development of market ancillary services for faster frequency response as an immediate priority area for reform and the final rule is consistent with the ESB's long-term direction for essential system services. Through the Commission's other active frequency control rule change, *Primary frequency response incentive arrangements,* the Commission is considering enduring arrangements for primary frequency response to manage small changes in system frequency and keep the power system stable and secure.

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