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FERC Requires Generators to Provide Primary Frequency Response

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FERC has approved a final rule requiring generating facilities that interconnect to the grid to provide primary frequency response.[1] Primary frequency response actions are needed to stop extraordinary deviations from the grid's target frequency that could cause grid instability. The North American Electric Reliability Corporation, the group responsible for grid reliability standards, said that "(f)requency response is among the essential reliability services critical to the reliability of the bulk power system." FERC notes declining frequency response performance and the impact the evolving generation resource mix on frequency response.

Background

The reliable operation of the alternating current North American electric grid depends on maintaining a frequency near 60 Hertz (Hz). Frequency variations, however, can occur due to sudden changes in the balance between load and generation and can cause instability, and possibly load shedding, if the frequency deviates too far from 60 Hz. Frequency responsive control equipment in a generating facility can sense changes in system frequency and, through turbine-governors, autonomously adjust a generator's output to help move the system frequency back toward 60 Hz.

The final rule is aimed at two problems. First, there are indications that some generator owners and operators within the Eastern Interconnection disable or otherwise set their controls such that they provide little or no primary frequency response.

Second, synchronous generating facilities with standard governor controls have historically been the predominant sources of frequency response service. However, those generators are being replaced, in part, with non-synchronous variable energy resources such as wind and solar. FERC observes that variable energy resources have not typically had primary frequency response capabilities.

The final rule

Newly interconnecting generating facilities are required to install, maintain, and operate equipment capable of providing primary frequency response as a condition of interconnection to the grid. Accordingly, FERC is modifying the standard interconnection agreements to reflect this requirement.

The final rule adds the following obligations to the standard interconnection agreements:

- Requires generating facilities to install and operate equipment that can sense changes in system frequency and autonomously adjust the generating facility's output.

- Sets minimum uniform operating requirements for primary frequency response and prohibits generating facilities from limiting the provision of primary frequency response, except under certain conditions.

- Requires generating facilities to respond to frequency deviations immediately and sustain the response at least until system frequency returns to a value within an acceptable deviation range.

The new rule does not require generators to operate with headroom, *i.e.*, operate below their maximum operating capability so that there is additional energy to provide primary frequency response. In addition, the rule does not mandate that a generator receive compensation for providing primary frequency response. FERC observes that the cost of installing, maintaining, and operating a governor or equivalent controls is minimal but the rule does not prevent a public utility from requesting compensation.

The new interconnection agreement conditions apply to:

- Newly interconnecting generating facilities, including distributed energy resources, that execute interconnection agreements on or after the effective date of the final rule; and

- Generating facilities that already have an executed or filed interconnection agreement but that take any action request that results in an interconnection agreement filed on or after the effective date of the final rule.

The final rule provides exemptions or accommodations for the following types of generation resources:

- *Combined heat and power.* Newly interconnecting CHP facilities that are sized to serve on-site load and have no material export capability are exempt from the operating requirements of the rule but must install control equipment capable of providing primary frequency response.

- *Electric storage resources.* Interconnection agreements must include specific accommodations for storage resources and limitations regarding when they will be required to provide primary frequency response, such as identifying an operating range within which storage resources will be required to provide primary frequency response and identifying circumstances when storage resources will not be required to provide primary frequency response.

- *Nuclear facilities.* Nuclear generating facilities are exempt from the final rule due to their unique operating characteristics and the regulatory requirements of the Nuclear Regulatory Commission.

The final rule is effective 70 days from publication in *Federal Register*.

[1] This blog reported on the Commission's proposal as well as its call for additional comments to address certain issues.

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