Akin®

FERC Proposes to Update NERC Reliability Standards for Renewable Resources and Energy Storage

Nov 30, 2022

Reading Time : **8 min**

By: Stephen J. Hug, Scott Daniel Johnson, Sam Prasad (Environmental Specialist)

On November 17, 2022, the Federal Energy Regulatory Commission (FERC or the "Commission") issued three orders (available here, here and here) with the objective of updating North American Electric Reliability Corporation (NERC) Reliability Standards to account for the increase in inverter-based resources (IBRs) (i.e., solar, wind and battery storage) and growing recognition of the potential impact of such resources on system reliability. In order to address the potential impact of IBRs, the Commission issued a series of orders that would:

- Broaden the scope of IBRs that would be required to register with NERC and comply with NERC Reliability Standards.
- Modify existing Reliability Standards to provide registered entities with planning and operational authority the information necessary to more accurately model and plan for the impact of IBRs.
- Establish more uniform guidance regarding the types of changes to IBRs and other facilities that would require evaluation and approval through a transmission provider's interconnection process, including changes to certain control settings.

The orders are a response to a series of NERC reports and white papers that determined that IBRs had exacerbated reliability events by tripping or ceasing production in response to line losses and other system contingencies. For instance, in issuing these orders, the Commission acknowledged that NERC had identified 12 events during which an average of 1,000 megawatts (MW) of IBRs entered into momentary cessation or tripped in response to transmission line faults, thereby exacerbating the potential reliability impact of these events.

Below we provide an overview of FERC's orders and proposals. If implemented, the changes outlined by FERC would extend the application of the NERC Reliability Standards to IBRs that currently are not required to register under NERC's rules, and tailor these standards to better account for the characteristics of IBRs.

I. Registration of IBRs

In recognition that certain IBRs are currently not required to register with NERC or comply with NERC Reliability Standards, the Commission issued an order directing NERC to take steps to modify its registration criteria to account for the growing impact of IBRs.[1]

FERC's regulations require each user, owner and operator of the Bulk-Power System to be registered with NERC and to comply with applicable NERC Reliability Standards. In order to implement this requirement, NERC has adopted registration criteria that are intended to ensure that those entities that have a material impact on grid reliability register with NERC and comply with NERC Reliability Standards. As a general matter, generation resources are required to register with NERC if (i) the generator is connected at a voltage of 100 kilovolts (kV) or above with an individual nameplate rating greater than 20 megavolt amperes (MVA) or an aggregate nameplate rating greater than 75 MVA or (ii) they are dispersed power producing resources that aggregate to a total capacity greater than 75 MVA.

The Commission noted that NERC's existing registration criteria currently exclude many IBRs, as these resources often are smaller than conventional generation resources and are connected at voltages of less than 100 kV. And while NERC has the discretion to require entities to register with NERC if they are determined to have a material impact on system reliability—even when they do not meet applicable criteria—NERC historically has not applied this authority to require the registration of IBRs that, in the aggregate, can have a material impact on the reliable operation of the grid. As a result, the Commission's order concludes that the current registration criteria do not address the "potential impacts to the reliability of the Bulk-Power System of the increasing numbers of small non-BES Bulk-Power System-connected IBRs."[2]

To close this gap, the order directs NERC to develop and file a work plan for FERC approval within 90 days of the date of the Commission's order explaining how it will identify and register IBRs, "regardless of size and transmission or sub-transmission voltage, that in the aggregate have a material impact on Bulk-Power System performance."[3] The order states that

the work plan must outline how NERC will modify its processes to account for unregistered IBRs within 12 months of approval of the work plan. FERC's order also directs NERC to include implementation milestones ensuring that IBR owners and operators meeting the new registration criteria are identified within 24 months and registered within 36 months of the Commission's approval of the work plan.

While directing NERC to take steps to register IBRs, the Commission's order also acknowledges that NERC should have flexibility in determining what Reliability Standards should apply to IBRs given the characteristics of these resources. Specifically, the Commission explained that "NERC may determine that the full set of Reliability Standard Requirements otherwise applicable to generator owners and operators need not apply to currently unregistered IBR generator owners and operators when they are registered."[4] Thus, NERC may determine that IBRs that are registered by NERC under its expanded criteria need to comply with the full range of requirements that typically apply to generation owners and operators.

II. NOPR on Reliability Standards for IBRs

The Commission concurrently issued a Notice of Proposed Rulemaking (NOPR) proposing to direct NERC to submit new or modified Reliability Standards that the Commission believes are necessary to address reliability gaps pertaining to IBRs, including IBRs interconnected to distribution networks that can have a material impact on reliability in the aggregate.[5] More specifically, the NOPR proposes to require NERC to revise the Reliability Standards to address gaps in four areas: data sharing; data and model validation; planning and operational studies; and performance requirements. Comments on the NOPR will be due 60 days after publication in the *Federal Register*.

A. Data Sharing

The Commission explains that existing Reliability Standards fail to ensure that registered entities with planning and operating authority (e.g., transmission planners and balancing authorities) receive accurate and complete information on the location and characteristics of IBRs necessary to properly anticipate and respond to the behaviors of IBRs on their systems. Thus, the Commission proposes to direct NERC to develop new or modified standards that:

- Require identified registered entities to provide data on all IBRs (whether registered with NERC or not), establish minimum categories of data that must be provided and establish a schedule for the sharing of IBR data needed for modeling, operations and disturbance analysis.

- Require owners or operators of registered IBRs to provide registered IBR-specific modeling data and parameters (e.g., control settings) to registered entities with planning and operating authority.
- Require transmission owners to share modeling data and parameters for unregistered IBRs in their transmission owner areas.
- Require distribution providers to share modeling data and parameters for distribution-interconnected IBRs in their distribution provider areas.

B. Data and Model Validation

The Commission also concludes that existing Reliability Standards fail to ensure that planning and operating authorities have models that accurately represent the performance of all generation resources, including registered and unregistered IBRs, and that these models are validated and updated based on actual operational behavior. FERC proposes to close this gap by requiring NERC to amend the Reliability Standards to require that generator owners, transmission owners and distribution providers provide planning coordinators with validated models that account for the dynamic behavior of these resources, including during disturbance events. The Commission further proposes to require entities with planning and operating authority to compare their data and models against the operation of these resources during actual system conditions.

C. Planning and Operational Studies

The Commission also proposes to require NERC to modify its Reliability Standards to ensure that planning coordinators and transmission planners account for the individual and aggregate behavior of all IBRs, whether registered or not, in their planning areas. The Commission states that these assessments should focus in particular on "ride through" performance of such resources during grid disturbances, as inability to ride through is the primary source of currently-unaddressed IBR instability. On the operational side, NERC must ensure that reliability coordinators, transmission operators, and balancing authorities also include the same individual and, more importantly, aggregate performance of these same IBR resources.

D. Performance Requirements

The Commission also proposes to require NERC to subject IBRs to new performance requirements to ensure that these resources ride through system frequency and voltage disturbances, including:

- Requiring IBRs to use appropriate settings that will assure frequency ride through during system disturbances and limit resource tripping.
- Preventing IBRs from artificially restricting their ramp rates and requiring them to communicate ramp rates to certain registered planning and operational authorities.
- Maintain voltage phase angle synchronization with the grid during a system disturbance.

FERC acknowledges that some IBRs, including those currently registered, may not be able to meet the requirements above, and proposes to require NERC to impose an obligation on transmission planners and operators to implement appropriate mitigation measures to account for potential instability associated with existing IBRs.

III. Order Approving NERC Reliability Changes to Clarify Changes to IBRs Requiring Transmission Planner and Planning Coordinator Review

FERC rounded out its trio of actions with an order that approved changes that NERC had proposed to the Facilities Design, Connections and Maintenance (FAC) Reliability Standards to clarify the types of changes to an existing, interconnected resource or facility that must be evaluated through the interconnection process as recommended by NERC's Inverter-Based Resource Performance Task Force (IBPTF).[6] Currently, NERC's FAC Reliability Standards require each transmission owner to maintain interconnection procedures that provide for the study and prior approval of material modifications to existing generation resources, but fail to specify any one entity responsible for determining what constitutes a material modification. This led the IBPTF to express concern that the existing standards created a risk that the owner of an IBR may not seek approval for changes that affect the electrical characteristics of its resource, such as a change to a resource's control system software.

In order to resolve this uncertainty, the revised FAC Reliability Standards approved by FERC would replace the term "material modification" with "qualified change" and require planning coordinators to identify and publish a list of the types of changes to existing, interconnected-facilities that should be studied. While the revised FAC Reliability Standards leave it to planning coordinators to define "qualified change," guidance developed by the NERC standards drafting team acknowledges that a "qualified change" typically would include a change in the control settings of an IBR that results in differences in the frequency or voltage support provided by the IBR or in how the resource injects electricity into the grid.

Under the implementation plan approved by FERC, the new FAC standards will become effective on the first day of the first calendar quarter 12 months after regulatory approval—i.e., January 1, 2024. The implementation timeline is intended to provide planning coordinators with the time necessary to develop a definition of "qualified change" for their respective areas. To the extent that a transmission provider's interconnection procedures do not already require evaluation and approval of changes identified by its planning coordinator as a "qualified change," the implementation plan provides transmission owners with an additional 12 months after the effective date of the standards to make any modifications necessary to ensure compliance with the revised standards.

---

[1] *Registration of Inverter-based Res.*, 181 FERC ¶ 61,124 (2022).

[2] Id. at P 33.

[3] Id. at PP 1, 5.

[4] Id. at P 34.

[5] *Reliability Standards to Address Inverter-Based Res.*, 181 FERC ¶ 61,125 (2022).

[6] *N. Am. Elec. Reliability Corp.*, 181 FERC ¶ 61,126 (2022).

Categories

Transmission | Smart Grid/Energy Storage | Power | Renewable Energy | North America | FERC/Regulatory