

HEADLINES

Joint Presentation of Items E-1 | Registration of Inverter-Based Resources and E-2 | Reliability Standards to Address Inverter-Based Resources

November 17, 2022

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Good morning, Chairman Glick and Commissioners,

Items E-1 and E-2, a draft order and a draft notice of proposed rulemaking, contain directives and proposed directives to the North American Electric Reliability Corporation, or NERC, to account for the increasing number of inverter-based resources, or IBRs, in the Nation's resource mix. IBRs connect to the electric power system using power electronic devices that change direct current power produced by a resource to alternating current power compatible with transmission and distribution systems. Examples of IBRs include solar photovoltaic, wind, and battery storage.

Until recently, the Bulk-Power System generation fleet was composed almost exclusively of synchronous generation, such as hydro-power, nuclear, coal, or natural gas fired resources. As such, most of the Commission-approved Reliability Standards were developed with synchronous generation in mind. Now, however, IBRs are being increasingly incorporated into the Bulk-Power System and distribution grids. According to NERC, the rapid integration of IBRs is "the most significant driver of grid transformation" on the Bulk-Power System. Further, NERC has reported that solar and wind IBR projects in all stages of development may total upwards of 860 gigawatts of added nameplate capacity over the next decade.

In certain circumstances, IBRs can behave differently than synchronous generation. While IBRs produce power like synchronous generators, they do not react to disturbances on the Bulk-Power System in the same way. For example, where synchronous resources not connected to a fault would automatically ride through a disturbance, IBRs must be programmed to do so. There have been at least 12 events on the Bulk-Power System – with an average loss of approximately 1,000 MW of IBRs – which have demonstrated common mode failures of IBRs acting together unexpectedly in response to normally cleared transmission line faults on the

Bulk-Power System. Such common mode failures of IBRs exacerbated the reliability impacts of the underlying disturbances.

The NERC-documented events demonstrate that the potential for IBRs to have a material impact on the Bulk-Power System is not limited to larger IBRs that are typically required to register with NERC; and demonstrate the challenges to transmission planning and operations posed by IBRs that may not currently be required to register with NERC. Further, these events demonstrate the challenges to planning and operating the Bulk-Power System posed by gaps in the Reliability Standards specific to IBRs.

The directives in the draft order, and proposed directives in the draft notice of proposed rulemaking, are supported by at least seven NERC event reports, two NERC Alerts, three NERC-issued reliability guidelines, and multiple other various technical reports and white papers – all pertaining to the effects of IBRs on the reliability of the Bulk-Power System.

Together, E-1 and E-2 would address observed and future impacts of IBRs on the reliable operation of the Bulk-Power System.

Item E-1 is a draft order directing NERC to submit within 90 days a work plan for Commission approval describing, in detail, how NERC plans to identify and register owners and operators of Bulk-Power System-connected IBRs that are not currently required to register with NERC under the bulk electric system definition but that in the aggregate have a material impact on the reliable operation of the Bulk-Power System. Many IBRs connecting to the Bulk-Power System do not individually meet the current bulk electric system definition and, thus, are not registered with NERC. NERC's Commission-approved bulk electric system definition defines the scope of the Reliability Standards and the entities subject to NERC compliance. This means that those IBRs are not required to comply with mandatory Reliability Standards or respond to NERC Alerts.

The draft order directs NERC to do three things. First, to complete modifications to its registration processes no later than 12 months after Commission approval of the work plan. Second, to identify all owners and operators of Bulk-Power System-connected IBRs that in the aggregate affect the reliable operation of the Bulk-Power System no later than 24 months of Commission approval of the work plan. And third, to register owners and operators of Bulk-Power System-connected IBRs that in the aggregate have a material impact on the reliable operation of the Bulk-Power System no later than 36 months after Commission approval of the work plan. The draft order recognizes that smaller Bulk-Power System-connected IBRs may not present the same reliability impact in all circumstances as generation that has historically been registered. Accordingly, the draft order acknowledges that NERC may determine that the full set of Reliability Standard Requirements otherwise applicable to generator owners and

operators need not apply to all newly registered Bulk-Power System-connected IBR generator owners or operators.

Item E-2 is a draft notice of proposed rulemaking preliminarily finding that the Reliability Standards do not fully address the impacts of IBRs on the reliable operation of the Bulk-Power System. The draft notice of proposed rulemaking proposes to direct NERC to develop new or modified Reliability Standards that address four reliability gaps related to IBRs. First, data sharing: currently, IBR owners and operators do not consistently share IBR planning and operational data, and the information that is shared is often inaccurate or incomplete. Second, model validation: once planners have IBR data, they must ensure the accuracy of such data to create valid system models. Third, planning and operational studies: once planners and operators validate system models, they must include those models in planning and operational studies to assess the reliability impacts—both of individual and collective IBRs—on Bulk-Power System performance. And finally, performance requirements, such as IBRs' ability to ride through system disturbances. The draft notice of proposed rulemaking proposes to direct NERC to submit a compliance filing within 90 days of the effective date of the final rule detailing a comprehensive standards development and implementation plan explaining how NERC will prioritize the development and implementation of new or modified Reliability Standards to address these four reliability gaps. The draft notice of proposed rulemaking explains that NERC's plan should take into account the risks posed to the reliable operation of the Bulk-Power System, standard development projects already underway, resource constraints, and other factors as necessary. Comments in response to the draft proposed rule would be due 60 days after the date of publication in the Federal Register, with reply comments due 30 days later.

This concludes our presentation. We are happy to take any questions you may have.

This page was last updated on November 18, 2022