

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

Reliability Technical Conference

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Docket No. AD17-8-000

**PLANNED TECHNICAL CONFERENCE REMARKS OF INSTITUTE OF
ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)**

IEEE provides these planned remarks in advance of the technical conference convened by the Federal Energy Regulatory Commission (“FERC” or the “Commission”) in the above-captioned docket.

IEEE submits these planned remarks in advance of the Commission’s June 22, 2017 technical conference, which will discuss policy issues related to the reliability of the Bulk-Power System.

I. Communications

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II. Background

On May 19, 2017, the Commission announced that it would hold a technical conference to discuss the policy issues related to the reliability of the Bulk Power System.¹ Commission staff seeks to discuss the state of reliability, lessons learned from recent Bulk Power System reliability issues, grid security, and IEEE standards' role in improving Bulk Power System reliability.

III. Planned Remarks

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE and its members inspire a global community to innovate for a better tomorrow through its more than 420,000 members in over 160 countries, and its highly cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted "voice" for engineering, computing, and technology information around the globe².

By developing standards, IEEE is leading the advancement of the global innovative technologies i. e. distributed energy resources (DERs), energy storage, microgrids. etc. IEEE Standards Association (IEEE-SA) brings together a broad range of individuals and organizations from a wide range of technical and geographic points of origin to facilitate standards development and standards related collaboration³. As the most active IEEE society in publishing standards, IEEE Power & Energy Society (PES) provides the world's largest forum for sharing the latest in technological developments in the electric power industry, for developing standards that guide the development and construction of equipment and systems, and for educating members of the industry and the general public.

¹ <https://www.ferc.gov/CalendarFiles/20170519164445-AD17-8-000SupplNoticeTC.pdf>

² <https://www.ieee.org/about/index.html>

³ <http://standards.ieee.org/about/ieeesa.html>

Various policies, regulations, and legislation seek to deliver environmental objectives for the power generation sector. The North American electric power system is becoming more reliant on wind, solar, natural gas, and demand response. In addition to the changing energy landscape in the wholesale market, most of the states in the U.S. have ambitious goals to deploy DERs in the retail market. Given that DER penetration, including renewable generation, is increasing rapidly in the U.S., the impact on the Bulk Power System reliability is becoming more visible⁴. In order to avoid reliability violations, supply disruptions, or extensive transmission system upgrades, DER interconnection standards need to be updated to allow DERs to support the Bulk Power System during frequency and voltage disturbances (a.k.a “ride-through” capability). Traditionally, DERs used to be considered as a passive load resource on the Bulk Power System. In areas where the penetration of DERs is increasing, this assumption will no longer be valid as the new DER technologies are capable of providing advanced grid support functionalities i. e. voltage regulation, frequency regulation, ride through, etc. As deployment of DERs on the distribution system increases, the impacts on the Bulk Power System reliability need to be addressed promptly by updating the standards that govern the technical aspects of the distribution system DER interconnections as well. Many distribution utility companies in the U.S. have adopted the IEEE 1547 standard, which provides a set of technical requirements that each DER shall meet to interconnect to the distribution electric power system (EPS).

When the IEEE 1547 standard was developed, the penetration of DER on the EPS was low. Hence, the standard did not allow DERs to participate in grid support services (i.e., voltage regulation, ride through, frequency regulation, etc.). As the impacts of the increasing level of DER penetration on the Bulk Power System reliability became apparent, the IEEE 1547 working

⁴ http://www.nerc.com/comm/Other/essntlrbltysrvcstskfrDL/Distributed_Energy_Resources_Report.pdf

group received the approval from IEEE Standards Association (IEEE-SA) to revise the standard to allow grid support functionalities. The IEEE 1547 standard working group has been working closely with NERC to ensure that Bulk Power System reliability concerns are properly addressed in the revised version of the standard. It is anticipated that the new standard will be published by approximately the end of 2017.

Given that the implementation of IEEE 1547 standard is essential to the Bulk Power System reliability, there are some major challenges associated with the implementation of the standard. The industry has a very limited time to resolve these challenges. Hence, IEEE encourages the Commission to work closely with NERC, the Independent System Operators (ISOs), and Regional Transmission Organizations to address the concerns that the distribution utilities have towards implementing the standard. Below, please find a couple of the aforementioned challenges that are considered as major concerns to the distribution utilities:

- 1) Modeling- Currently, the tools that are widely used by the distribution utilities for the DER interconnection studies are not capable of accurately modeling the DERs with the grid support functionalities (a.k.a advanced DERs). Some open-source modeling tools are currently being used by research organizations to model the advanced DERs. Some of the advanced DER characteristics are considered as proprietary information by the DER manufacturers and cannot be modeled by the open source tools in a standard format. With the lack of a standard model for the DER devices, assumptions have to be made by utilities; and the commercially available tools provide limited results for the wide area protection and load flow analyses.
- 2) Concerns related to the adverse impact of advanced DER functions on the distribution system anti-islanding protection and short circuit fault detection. Some distribution

utilities are concerned that the advanced DER functions may have adverse impact on the distribution system protection, related to the prolonged fault and island detection due to the ride through requirements.

IV. Required work ahead

As the IEEE 1547 standard is in the ballot and approval process, IEEE recommends that the Commission collaborates closely with the distribution utilities via regional ISOs to resolve the concerns associated with implementing the DER ride through requirements. This collaboration will avoid the delay to implement the IEEE 1547 standard once it is officially published.

Actions that are being taken by the Massachusetts Technical Standards Review Group (TSRG⁵) are good examples of the necessity for collaboration between ISOs and the distribution utilities to implement the IEEE 1547 standard. A newly formed subgroup under TSRG is tasked to implement the ride through concept of IEEE 1547. ISO New England (ISO-NE) and the local utilities are official members of this recently formed subgroup. In order to properly address the concerns associated with the advanced DER functions, the discussions need to start now rather than later.

New York Interconnection Technical Working Group (NY ITWG⁶) is another great example of collaboration between the utilities, state regulatory agencies, and the regional ISO. Discussions at the ITWG include the Bulk Power System reliability needs. This working group is reaching out to organizations that have experience with advanced DER implementations. Local utilities

⁵ <https://sites.google.com/site/massdgc/home/interconnection/technical-standards-review-group>

⁶ <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/DEF2BF0A236B946F85257F71006AC98E>

have been heavily involved in the discussions on how to implement the DER ride through requirements.

IEEE believes that the Commission and NERC can play a key role in directing these discussions through the regional ISOs. IEEE PES has the resources and the technical knowledge to help the Commission, NERC, and the regional ISOs to implement the industry standards related to the Bulk Power System reliability. To be proactive, IEEE PES has already hosted many technical and regulatory tutorials, webinars, seminars, etc to educate the industry on how to implement the IEEE 1547 standard.

Respectfully submitted:

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