

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-100, SUB 101
DOCKET NO. E-100, SUB 101B

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, SUB 101)	
)	
In the Matter of)	
Petition for Approval of Revisions to)	ORDER REQUIRING REPORTS
Generator Interconnection Standards)	AND SCHEDULING
)	PRESENTATION
DOCKET NO. E-100, SUB 101B)	
)	
In the Matter of)	
Implementation of IEEE Standard 1547)	

BY THE COMMISSION: On June 14, 2019, the Commission issued an Order Approving Revised Interconnection Standard and Requiring Reports and Testimony in Docket No. E-100, Sub 101 (2019 Order) in which, among other things, it required the electric utilities to host stakeholder meetings on IEEE Standard 1547-2018 and file a report with the Commission by April 1, 2020. The 2019 Order provided that parties could file comments on that report by June 1, 2020.

On April 1, 2020, Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC (jointly, Duke), filed the required report. On May 29, 2020, the North Carolina Clean Energy Business Association (NCCEBA) filed a request for a 15-day extension to file comments, which the Commission granted. On June 16, 2020, NCCEBA filed comments.

IEEE Standard 1547 is a technical standard that is published by the Institute of Electrical and Electronics Engineers (IEEE) for the uniform interconnecting and interoperability of distributed energy resources (DER) with electric power systems.¹ In its 2019 Order the Commission found that the 2018 version offers technical standards that, if implemented, could allow for higher penetrations of DER on the distribution grid.

¹Attachment 5-A of the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Generator Interconnections lists the codes and standards with which generators are required to comply; that list includes IEEE Standard 1547.

Summary of Duke's Filing

Duke provided its initial "Implementation of IEEE Standard 1547-2018 Guidelines" (Implementation Guidelines) which were developed with stakeholder input via the Technical Standards Review Group (TSRG). The Implementation Guidelines state that Duke seeks to implement smart inverter technical specifications and requirements as contained in the standard. The document focuses on DERs that are connected to Duke's distribution system, not those that are connected to Duke's transmission system. Duke and the TSRG participants agree to focus their initial implementation efforts on those provisions that could potentially increase the amount of DER that can be interconnected with minimal feeder upgrades. Further, Duke's Implementation Guidelines state that these efforts will focus on utility scale DER because North Carolina has a significant number of such installations. Three provisions in IEEE Standard 1547-2018 could increase the amount of DER capacity that can interconnect with minimal feeder upgrades, and these are the provisions that Duke has given a high priority for review:

- 4.6.2 Capability to limit active power
- 5.3 Voltage and reactive power control
- 5.4 Voltage and active power control

In addition, Duke is prioritizing those sections of IEEE Standard 1547-2018 that could provide support for the bulk power system, specifically those that address DER "ride-through" capability.

Duke also filed a separate report by Navigant entitled "Impact of Enabling Inverter Based Resource Reactive Power Controls." The Navigant report is an evaluation of voltage-reactive power and voltage-active power controls on six Duke feeders, three in DEC's territory and three in DEP's territory.

NCCEBA's Comments

NCCEBA participated in the stakeholder meetings and states that it supports Duke's overall approach to IEEE Standard 1547-2018 implementation including the use of the TSRG as the forum for addressing implementation. In light of the volume of standard provisions and their complexity, NCCEBA recommends that a separate TSRG subcommittee be established to specifically consider IEEE Standard 1547-2018 implementation. NCCEBA cites three situations that underscore the importance of this effort, including the need to retrofit inverter settings on DERs in Germany, confusion as to the configuration of the utility/DER interface as it relates to grounding, and voltage control problems. Finally, NCCEBA recommends that the TSRG subcommittee include representatives of utility-, commercial-, and residential-scale DER, as well as Dominion Energy North Carolina (DENC) and the North Carolina Electric Membership Corporation (NCEMC).

Discussion and Conclusions

The Commission appreciates the effort that Duke and the stakeholders have expended in initiating the implementation of IEEE Standard 1547-2018. As NCCEBA notes, the issues are numerous and complex. The Commission would like to stay informed of IEEE Standard 1547-2018 implementation efforts in North Carolina. Therefore, the Commission will require Duke to annually file the most recent version of IEEE Standard 1547, its Implementation Guidelines, and a narrative explanation of any stakeholder meetings that have occurred since its previous filing. The first such filing shall be made on or before March 15, 2021. Similarly, DENC shall be required to file a description of its IEEE Standard 1547-2018 implementation efforts by March 15, 2021. These items shall be filed in Docket No. E-100, Sub 101B.

Following the filing described above, Duke shall appear before the Commission to make a presentation that shall include: 1) a brief overview of IEEE Standard 1547-2018; 2) a discussion of the standard provisions that Duke has prioritized in order to increase the amount of DER capacity that can interconnect with minimal feeder upgrades, and the status of implementing those provisions; 3) a discussion of the standard provisions that would help secure the bulk power system by addressing DER ride-through capability, and the status of those provisions;² 4) an overview of those IEEE Standard 1547-2018 provisions that are anticipated to require Commission decision-making; and 5) any recommendations Duke might have for future stakeholder engagement efforts. The Commission will allow NCCEBA, the Public Staff, NCEMC, Electricities of North Carolina, Inc. (Electricities), and DENC to provide brief responsive comments at the presentation.

IT IS, THEREFORE, ORDERED as follows:

1. That Duke shall file the most recent version of its Implementation Guidelines in Docket No. E-100, Sub 101B by March 15, 2021, and annually thereafter on or before March 15, and that DENC shall similarly make an annual filing in that docket explaining the status of its IEEE Standard 1547-2018 implementation efforts;
2. That Duke shall make a presentation before the Commission as described above on Monday, April 12, 2021, at 1:30 p.m.;
3. That the Chief Clerk shall serve a copy of this Order on NCEMC and Electricities; and
4. That the April 12, 2021 presentation shall be conducted remotely via Webex. A link to view the presentation will be available at the Commission's website: www.ncuc.net. On or before March 29, 2021, Duke, NCCEBA, the Public Staff, NCEMC,

²At the June 20, 2019 meeting of the North Carolina Transmission Planning Collaborative Transmission Advisory Group, Duke discussed a disturbance on its transmission system that caused distribution-connected solar facilities to drop offline. This event, and whether it could have been mitigated by IEEE Standard 1547-2018, should be included in Duke's presentation to the Commission. (For more information go to www.nctpc.org.)

ElectriCities, and DENC shall send the name, phone number, and email addresses of presentation participants to the Commission via email at ncucwebex@ncuc.net.

ISSUED BY ORDER OF THE COMMISSION.

This the 2nd day of March, 2021.

NORTH CAROLINA UTILITIES COMMISSION

A handwritten signature in cursive script, appearing to read "Joann R. Snyder".

Joann R. Snyder, Deputy Clerk