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June 16, 2020

Ms. Kimberley A. Campbell, Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street
Raleigh, NC 27603

***RE: Petition for Approval of Revisions to Generator Interconnection Standards
Comments of North Carolina Clean Energy Business Alliance re Duke Energy's Initial Implementation of IEEE 1547-2018 Guidelines and Report
NCUC Docket No. E-100, Sub 101***

Dear Ms. Campbell:

On behalf of North Carolina Clean Energy Business Alliance, we submit the attached **Comments of North Carolina Clean Energy Business Alliance regarding Duke Energy's Initial Implementation of IEEE 1547-2018 Guidelines and Report** in the above-referenced docket.

Should you have any questions concerning this filing, please do not hesitate to contact me.

Sincerely,

/s/ Karen M. Kemerait

Karen M. Kemerait

Skb

cc: All parties of record

Enclosure

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-100 SUB 101

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of

Petition for Approval of Revisions to
Generator Interconnection Standards

**COMMENTS OF NORTH CAROLINA
CLEAN ENERGY BUSINESS ALLIANCE**

NOW COMES the North Carolina Clean Energy Business Alliance (“NCCEBA”), by and through counsel, and respectfully submits the following comments regarding Duke Energy Carolinas, LLC’s and Duke Energy Progress, LLC’s (together, “Duke Energy” or “Duke”) Initial Implementation of IEEE 1547-2018 Guidelines (“Implementation Guidelines”) and Report entitled “Impact of Enabling Inverter Based Resource Reactive Power Controls” (“Reactive Power Control Report”) filed in this docket on April 1, 2020.

I. NCCEBA’S COMMENTS

As background, the IEEE Standard 1547-2018 (IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces) was published in April 2018. IEEE Standard 1547-2018 requires Distributed Energy Resources (“DER”) to have new grid-support functionalities and interoperability features. The accompanying test standard—IEEE Standard 1547.1-2020, Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces—was approved by the IEEE Standards Association Standards Board (“IEEE SASB”) in March 2020; but it has not yet been published. This test standard defines the conformance test procedures for DER systems that are required to be compliant with IEEE 1547-2018.

NCCEBA participated in the stakeholder meetings that Duke Energy hosted in 2020 to consider how to address IEEE Standard 1547-2018 in the North Carolina Interconnection Standard, including the use of software-based controls for limiting a generator's output. NCCEBA believes that the stakeholder meetings were useful, and appreciates Duke Energy's April 1, 2020 filing to address IEEE Standard 1547-2018 implementation. NCCEBA supports a proactive approach to addressing IEEE Standard 1547-2018 implementation in which Duke Energy and DER stakeholders are engaged in active and continuous communications. NCCEBA supports Duke Energy's overall approach to IEEE Standard 1547-2018 implementation, and also supports the Technical Standards Review Group ("TSRG") as the forum for addressing IEEE Standard 1547-2018 implementation.

NCCEBA recognizes that the individual elements of IEEE Standard 1547-2018 are voluminous in number, and that the potential impacts of many of them are significant to both Duke and DER representatives. In light of this volume and complexity, NCCEBA recommends that a separate IEEE 1547-2018 TSRG implementation subcommittee be established to specifically consider IEEE 1547-2018, with its own set of scheduled meetings that are separate from the general TSRG meetings. As part of the work product of the TSRG subcommittee, NCCEBA believes that Duke should consider both the State of Massachusetts' "Common Technical Standards Manual" and the State of Minnesota's "TIIR/Technical Interconnection and Interoperability Requirements" as examples for the structural documentation of IEEE Standard 1547-2018 implementation in North Carolina. The TSRG is currently tackling other important issues, including the proposed self-inspection program, the Fast Track process and other interconnection study

matters, and transmission-connected DER. Without an IEEE 1547-2018 implementation subcommittee, Duke Energy and DER representatives face real risk of misunderstandings, which could result in either degraded reliability or power quality for retail utility customers or DER customers, or as future incurred yet avoidable costs for either Duke Energy and its ratepayers or DER customers.

There are a number of examples that demonstrate the need for the IEEE 1547-2018 effort to receive necessary and appropriate attention from the TSRG, including:

1. Inverter settings (e.g. frequency). As was seen in Germany in 2011, in what became known as the “50.2 Hz problem”¹, the lack of properly established “grid codes,” in terms of inverter over-frequency settings, resulted in great effort and expense at that time in retrofitting many existing DER to be able to use settings which allowed a high penetration of DER to be compatible with the bulk electric system. Without this effort, the bulk electric system would have been exposed to unacceptable reliability risk. With what is known today, adequately addressing these concerns in a deliberate fashion between the utility and the DER will allow proper implementation and in the right timeframe in order to assure no impact to bulk electric system reliability.

2. Reference Point of Applicability (“RPA”) and grounding. One of the major efforts in IEEE 1547-2018 was to attempt to resolve confusion surrounding the utility/DER interface and how to assure compatibility of the DER design with the utility system. Figure 2 in IEEE 1547-2018 (“Relationship of interconnection terms”) demonstrates the nature of the complexity around different types and arrangements of DER, the Point of Common Coupling (“PCC”), and the Point of Connection (“PoC”).

¹ NREL, November 2014, “Advanced Inverter Functions To Support High Levels of Distributed Solar – Policy and Regulatory Considerations,” NREL/BR-6A20-62612.

Much has been learned in the past decade in regard to what makes sense for both the utility and the DER around grounding and general interconnection compatibility. Discussions around typical designs on both sides of the interface will be extremely valuable to this effort.

3. Voltage control by inverters. NCCEBA is appreciative of Duke's studies that are already taking place in regard to this issue. The DER industry is aware that for transmission interconnections, voltage control and reactive power remain a point of occasional confusion for both Duke and the DER industry, even though one might assume this should be well-established in the transmission arena. With the nature of radial distribution system classically regulated by the distribution system operator only, it is clear that any improper coordination here could result in power quality problems (voltage) or could result in wasted expense and effort if not studied and implemented properly.

NCCEBA believes that the above examples demonstrate the need for a specific TSRG 1547-2018 subcommittee.

In summary, NCCEBA appreciates the IEEE Standard 1547-2018 stakeholder meetings that have already taken place. In light of the volume and complexity of the elements of IEEE Standard 1547-2018, NCCEBA recommends the following: (1) that a separate IEEE 1547-2018 TSRG implementation subcommittee be established to specifically consider implementation of IEEE 1547-2018; (2) that the TSRG subcommittee be open to Duke, utility-scale and commercial/residential DER representatives, Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina ("Dominion"), and the NC Electric Membership Corporation ("NCEMC"), and

that Duke should provide notice to NCCEBA, Dominion, and the NCEMC about the establishment of the TSRG subcommittee and the meeting schedule; (3) on or before July 15, 2020, Duke should schedule an initial meeting between Duke and NCCEBA to establish the proper structure for the TSRG subcommittee to ensure that it will be open to all interested parties; (4) that the TSRG subcommittee should have its first regularly scheduled meeting on or before September 1, 2020; and (5) that Duke should file an initial draft of IEEE Standard 1547-2018 implementation in this docket on or before January 1, 2021 and a final report of IEEE Standard 1547-2018 implementation within thirty days of completion of the work of the TSRG subcommittee.

II. CONCLUSION

WHEREFORE, NCCEBA respectfully requests that the Commission direct Duke to implement NCCEBA's recommendations.

Respectfully submitted this the 16th day of June, 2020.

FOX ROTHSCHILD LLP

/s/ Karen M. Kemerait

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Attorney for NCCEBA

CERTIFICATE OF SERVICE

I hereby certify that a true and exact copy of the foregoing COMMENTS OF NORTH CAROLINA CLEAN ENERGY BUSINESS ALLIANCE has been duly served upon counsel of record for all parties to this docket by either depositing a true and exact copy of same in a depository of the United States Postal Service, first-class postage prepaid, and/or by electronic delivery.

This the 16th day of June, 2020.

/s/ Karen M. Kemerait

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