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Dec 22 2021

December 22, 2021

**VIA Electronic Filing**

Ms. Shonta Dunston, Chief Clerk  
North Carolina Utilities Commission  
Dobbs Building  
430 North Salisbury Street  
Raleigh, North Carolina 27603

*Re: Dominion Energy North Carolina's Responses to Commission Questions  
Docket No. E-100, Sub 101*

Dear Ms. Dunston:

Enclosed for filing on behalf of Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina (the "Company"), is *Dominion Energy North Carolina's Responses to Commission Questions Regarding Risks Posed by Inverter-Based Resources*.

Thank you for your assistance with this matter. Feel free to contact me should you have any questions.

Very truly yours,

/s/Andrea R. Kells

ARK:kjg

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	) ) ) ) )	DOMINION ENERGY NORTH CAROLINA’S RESPONSES TO COMMISSION QUESTIONS REGARDING RISKS POSED BY INVERTER-BASED RESOURCES
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NOW COMES Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina (“DENC” or the “Company”), to file responses to the North Carolina Utilities Commission’s (“Commission”) November 22, 2021 *Order Requiring Comments and Filings Regarding Risks Posed by Inverter-Based Resources* (“Order”). Specifically, the Company provides the following responses to the Commission’s questions referenced in Ordering Paragraph 1 of the Order.

The Order references the North American Electric Reliability Corporation’s (“NERC”) Joint NERC and Texas RE Staff Report entitled “Odessa Disturbance” (“Report”), which analyzed two disturbances that occurred on the bulk power system in Texas during the summer of 2021. After summarizing the Report’s analysis, the Order requests the electric utilities to file comments on four questions by December 22, 2021.<sup>1</sup> The questions are listed below, each followed by the Company’s response.

**Question 1:** *Do North Carolina’s state-jurisdictional generation interconnection standards and agreements adequately address the issue of generator ride-through, EMT modeling, and the on-going monitoring of inverter-based resources?*

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<sup>1</sup> See *Order Granting Extension to File Comments and Filings Regarding Risks Posed by Inverter Based Resources*, Docket No. E-100, Sub 101 (Dec. 15, 2021).

Yes, the Company believes that the North Carolina state jurisdictional interconnection standards and agreements (“NCIP”) adequately address these issues from a utility distribution perspective at the present time.

Ride-through is defined by the Institute of Electrical and Electronics Engineers (“IEEE”) Standard 1547-2018 as the ability of a distributed energy resource (“DER”) “to withstand voltage or frequency disturbances inside defined limits and to continue operating as specified.” In other words, ride-through is a DER capability requirement and not a utility requirement. Ride-through is not typically utilized or permitted for distribution-level interconnections, and it is not needed given the low level of DER penetration and limited impact a distribution level inverter-based resource can have on the Bulk Electric System (“BES”).

Regarding EMT modeling, the NCIP only require data from Interconnection Customers for short circuit and voltage study needs. The standards do not specify requirements for EMT models for distribution-level DERs. Furthermore, distribution-level interconnections are not commonly modeled using EMT software due to the limited impact and isolated inverter-based resources can have on the BES. DERs are instead modeled using steady state software, which provides sufficient information on the potential impact of DERs on the Electric Power System (“EPS”). The use of EMT software would represent a departure from current process and would add more complexity to the interconnection study process. It would also require major changes to existing study methodologies, requirements, and timelines, and is unlikely to bring added benefit given the low level of DER penetration and the distributed nature of DERs connected to the distribution system.

Finally, with respect to on-going monitoring of inverter-based resources, the NCIP do not address monitoring of DERs specifically. However, the standard is written with the expectation that Good Utility Practice will be utilized by both the EPS owner and DER owner/developer. DENC’s interpretation of Good Utility Practice in this instance is to properly build and operate both the power system and DER sites to ensure safety and reliability is maintained. As such, the Company has made it a requirement to have monitoring devices installed at DERs’ Point of Interconnection (“POI”) and at various locations within the power system including the substations associated with distribution circuits with DER interconnections to provide proper visibility of DERs to assist with quantifying to impact on the safety and reliability of the EPS.

**Question 2:** *Are generators providing accurate EMT models of their inverters during the interconnection process so that the subsequent utility interconnection studies are accurate predictors of the inverters’ behavior after interconnection?*

As discussed in the response to Question 1 above, the NCIP do not require Interconnection Customers to provide EMT models of their inverters. Consequently, distribution-level Interconnection Customers do not supply EMT models to DENC. If the Commission requires Interconnection Customers to provide EMT models in their Interconnection Requests, the Company agrees with the Commission that these models

will need to be an accurate representation of the inverter and cumulative plant-to-plant-to-grid interaction, and will require validation by a third party when available in the United States. Currently, however, there is no formalized certification process and no neutral third party entity that has been approved to test and certify the accuracy of EMT models. There is also no established or industry standard that defines or provides guidance on how a third party would perform such a critical role on a national scale.

It is important to note that if these EMT models were provided by Interconnection Customers, the Company would also face resource restrictions in maintaining those models. With the previously noted shortcomings and gaps with EMT models, the Company believes the risks and liabilities associated with verifying the accuracy, validating, and maintaining EMT models will fall on EPS owners and operators.

**Question 3:** *Should electric utilities be required to adopt the NERC guidelines that were cited earlier in this order, and should the Commission make them part of the NC Interconnection Procedures?*

The NERC Guidelines and IEEE Standard P2800 are more applicable to the BES than to distribution-level interconnections. Accordingly, because the NERC guidelines governing transmission-level interconnections are not universally applicable to distribution-level interconnections, and because distribution level interconnections are already governed by IEEE Standard 1547—the national standard for interconnection of DERs on the distribution level—the Company does not believe that it would be appropriate to integrate these NERC guidelines into the NCIP at this time. Additionally, as discussed in the response to Question 1, DENC does not currently see the need for the addition of ride-through requirements at the distribution level at this time. The Company believes the decision to enable such capability should be at the discretion of the EPS owner and operator and ultimately based on system reliability, safety needs, and Good Utility Practice. If, in the EPS' discretion, DERs can deliver ride-through without adversely impacting the EPS and the EPS owner can accurately model the impact of ride-through functions on the EPS, Good Utility Practice will drive EPS owner toward implementation. The Company would not object to the NCIP being updated to allow for enabling such capability at the EPS' discretion.

**Question 4:** *Should electric utilities be required to monitor for the impacts of system faults on inverter-based resources?*

As discussed in the response to Question 1 above, the Company has already implemented distribution and substation devices that generally monitor the impact of DERs on the EPS. DENC does not believe that the additional requirement of monitoring for system faults specifically is necessary for distribution level interconnections. This level of monitoring DERs on the distribution system is not required due to the inability of these DERs to contribute to widespread electromagnetic transients on the BES as described in the NERC report documenting the Odessa Disturbance.

Respectfully submitted, this the 22<sup>nd</sup> day of December, 2021.

/s/Andrea R. Kells

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**CERTIFICATE OF SERVICE**

I hereby certify that a copy of the foregoing Dominion Energy North Carolina's Responses to Commission Questions Regarding Risks Posed by Inverter-Based Resources, filed in Docket No. E-100, Sub 101, was served upon all parties of record electronically or via U.S. mail, first-class postage prepaid.

This the 22<sup>nd</sup> day of December, 2021.

/s/Andrea R. Kells

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