



**NORTH CAROLINA  
PUBLIC STAFF  
UTILITIES COMMISSION**

February 16, 2022

Ms. A. Shonta Dunston, Chief Clerk  
North Carolina Utilities Commission  
4325 Mail Service Center  
Raleigh, North Carolina 27699-4300

Re: Docket No. M-100, Sub 163 – Investigation Regarding the Ability of  
Carolina's Electricity, Natural Gas, and Water/Wastewater Systems  
to Operate Reliably During Extreme Cold Weather

Dear Ms. Dunston:

Please find enclosed for filing the Public Staff's Data Request No. 2 –  
Questions on Winter Storm Elliott to Dominion Energy North Carolina.

Please do not hesitate to contact me with any questions.

Sincerely,

Electronically submitted  
/s/ Lucy E. Edmondson  
Chief Counsel, Public Staff  
[lucy.edmondson@psncuc.nc.gov](mailto:lucy.edmondson@psncuc.nc.gov)

cc: Parties of Record

Attachment

Executive Director  
(919) 733-2435

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Economic Research  
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**Dominion Energy North Carolina**  
**Docket No. M-100, Sub 163**  
**Public Staff Data Request No. 2 – Questions on Winter Storm Elliott**  
**Date Sent: February 16, 2023**  
**Requested Date Due: February 27, 2023**

**Public Staff Technical Contact:**     **Dustin Metz**  
   **Phone #: (919) 733-1513**  
   **Email: dustin.metz@psncuc.nc.gov**

**Public Staff Legal Contact:**           **Lucy Edmondson**  
   **Phone #: (919) 715-3803**  
   **Email: lucy.edmondson@psncuc.nc.gov**

**This data request is being filed in the docket. Please file your responses to this data request in the docket as well so that the Commission and other parties have access to the responses.**

**Please provide responses to this request in a searchable native electronic format (e.g., Excel, Word, or PDF files). If in Excel format, please include all working formulas. In addition, please include: (1) the name and title of the individual who has the responsibility for the subject matter addressed therein; and (2) the identity of the person making the response by name, occupation, and job title.**

**Topic: Winter planning and system preparedness**

1.     Provide a description and list of the Company's policies and procedures for routine winter preparedness.
2.     Identify and describe the Company division, department, staff, etc. responsible for completing the winter preparedness checklists.
  - a.     Please describe how the Company performs quality control and verifies through secondary or independent means that all steps are completed/reviewed and accurate.

- b. Provide each of the completed checklists (or equivalent) for each generation plant and associated infrastructure for each year from 2020 winter preparedness to present, as well as:
    - i. the date the checklist was completed;
    - ii. the party/entity who signed off on the completed checklist;
    - iii. the parties/entities who reviewed the checklist; and
    - iv. a list and description of any open or outstanding checklist items that were not completed and how the open item could impact the reliability of the equipment/component/plant.
- 3. Is the Board of Directors of the Company or Dominion Energy, Inc. (Board), any committee of the Board, or the Senior Management Committee briefed on: (1) winter preparedness; and (2) whether any open or outstanding items may impose a risk to system reliability. If so, when did the last briefing occur?
  - a. Does the Company consider or classify December 2022 as part of its 2022 winter preparedness or 2023 winter preparedness? Please explain how the Company makes this determination.
  - b. If the Board, any committee of the Board, or the Senior Management Committee was briefed in 2020 regarding its 2021 winter preparedness, in 2021 regarding its 2022 winter preparedness, and/or in 2022 regarding its 2023 winter preparedness, please provide any associated Board/committee materials (e.g., Power Point, memo, email, document, etc.) and workpapers and

supplemental information used in the creation of the Board/committee materials.

### **Storm planning and restoration from storm related outages**

4. Please describe the Company's typical actions and planning for an anticipated winter storm.
5. Please describe the Company's typical actions and planning for an anticipated high wind event. To the extent possible, please note the differences in actions and planning for a hurricane/tropical storm with high winds versus a storm with straight-line winds (e.g., the storm that occurred during December 2022, Derecho, etc.).

### **Lead-up to December 2022 cold weather event**

6. Provide a timeline, from December 19, 2022, through December 25, 2022, of the Company's actions related to the pending winter weather event for both wind, cold temperature, and potential outages. The timeline should include, at a minimum, sufficient detail of the Company's internal processes and actions taken in advance of the pending weather event.
  - a. Provide the daily weather forecasts that were produced internally by the Company and/or by vendors/contractors, including system average temperature, wind speeds, wind chills, dew points, and supporting documentation.

- b. Explain the communication and coordination of weather forecasts with Company staff and PJM staff during the period in question.
  - b. Include key communications with fuel suppliers and fuel availability.
  - c. If not already provided in response to prior questions, identify pertinent information related to the Company's decision making based on information it received from or provided to operations/planners/management/specific generation units (e.g., changes in weather, wind speed, timing of the storm, locational impacts, load/demand impacts, etc.).
  - d. List and provide key communications from PJM to the Company regarding:
    - i. Load forecasts;
    - ii. Congestion;
    - iii. Transmission line outages;
    - iv. Generating unit availability/operating reserves;
    - v. Power transfers/sales outside PJM;
    - vi. Power transfers/sales into PJM.
7. Please explain any specific actions deemed necessary and taken because of the pending holiday weekend.
- a. Provide all general internal memos or general bulletin announcements from business unit leaders, senior managers, and vice presidents to divisions or division leads of the Company advising of the potential storm, the need for staff, and requests to work

through the holiday, voltage conservation, along with the dates of these communications.

- b. In regard to the planning, preparation, and recovery actions for the transmission and distribution system from the pending and known wind and extreme low temperature events, please explain and provide a timeline of the Company's notifications and requests for field work support from neighboring utilities, contractors, or other Company affiliates for system restoration-related work.
    - i. Provide a list of all communications in which the Company requested support from other utilities, affiliates, contractors, etc., as well as the dates and times of the communications and the parties to the communications.
    - ii. If the Company did not request supplemental or field support for storm restoration from other utilities, affiliates, contractors, etc., please explain why.
- .
8. Provide a timeline beginning when the system started to experience storm related outages and restoration through midnight December 26, 2022, in 15-minute increments, including but not limited to:
- a. number of customers without service;
  - b. number of customers restored;
  - c. estimated system load/demand that was lost due to customers being without service; and

- d. map or other locational guidance showing how the storm was impacting the overall system by circuit or by number of customers per county and state.
- 9. For the last five years, list annually by county and region the number of internal transmission and distribution craft employees (or equivalent titles and designations) that the Company has available and employed.
  - a. Please list the total number of equivalent deployable work crews.
- 10. For the last five years, list annually by county and region the number of external (contractor) transmission and distribution craft employees (or equivalent titles and designations) that the Company has utilized (represented in full time equivalent employees).
- 11. Please describe how the Company's internal transmission and distribution craft employees are deployed when a storm or winter weather event occurs, including any impacts to the total number of deployable work crews.
- 12. Please provide the work hour limits and fatigue rules in place for Company internal and external line crews, as well as the hours that may be worked consecutively, including rolling daily averages.
  - a. Describe how the Company enforces the fatigue rules.
- 13. Please describe the actions and staffing that occurs at generation plants when a known winter storm or weather event is pending.

- a. For each generation plant, how were staff notified of the pending December 2022 storm, the actions they needed to complete in advance, and staffing requirements?
14. From December 19, 2022, through December 25, 2022, list how PJM was informing the Company of the pending storm from both a wind and outage event and then followed by a cold weather event.
15. Please explain how the Company's preparation for and forecasting for cold temperatures and system responses was different than its preparation for and forecasting for the 2014 and 2015 polar vortexes including daily updates.
- a. Were the peak load predictions performed in-house?
  - b. Please describe the peak load predictive methods employed in 2014 and 2015 versus today.
  - c. Explain similarities between the December 2022 cold weather event and the 2014 and 2015 polar vortexes, including whether the prior cold weather events had both a storm component (wind event that contributed to outages) in addition to the extreme cold weather events.
  - d. Explain the complications, from a system operational standpoint, that occurred during this event compared to the 2014 and 2015 polar vortex events. Please include a discussion of the challenges of the storm restoration efforts versus load reduction efforts.



16. Please discuss how the Company was coordinating or prioritizing storm (wind) restoration efforts (both transmission and distribution) versus cold weather restoration efforts.
17. Discuss how the coordination of restoration efforts took place between the Company and PJM.

**December 2022 cold weather event**

18. Identify the hourly loads observed for December 24, 2022 (both Dominion Zonal Peak and Dominion's Load Ratio Share of the DOM Zone), and include a timeline of the long-range load forecast, the seven-day ahead forecast, the three-day ahead forecast, and the day-ahead forecast showing the loads that the Company was anticipating prior to December 23, 2022, through December 28, 2022. In the Company's response, please distinguish between retail loads, firm wholesale loads, and total balancing area loads.
19. Please provide graph(s) and supporting data that illustrate the following, at a minimum: load; aggregate Company owned generation; imports; exports; frequency; balancing, and area control error (ACE) from December 23, 2022, through December 28, 2022, with Company service area specific information in as granular periods as possible, but no less than hourly. (Note: Individual graph(s) or a composite of graph(s) may be provided to illustrate other key elements that were taking place during the period in

question.) Please provide as granular information as the historian (data recorder) allows, as ACE, frequency, and generation information will likely be more granular than hourly intervals.

- a. To the extent that the information is readily accessible from the Company, please provide the ACE and frequency from PJM during the same time period.
  - b. Please provide any other key values the Company believes appropriate to illustrate system conditions and monitoring related to the real time operations and balancing of the BES, include supporting data from the Company's system as well as PJM.
20. For the period December 23, 2022, through December 26, 2022, provide a timeline in 5-minute increments showing changes in, but not limited to: (1) day ahead and hourly load forecasts; (2) notifications to other utilities or other regulatory agencies, as well as PJM; (3) unit generation availability; (4) power purchases; power sales; firm or non-firm purchases/sales; (5) fuel source availability, notifications from fuel source suppliers or shippers of fuel constraints or fuel deliverability restrictions; (6) transmission system constraints; (7) curtailment, notification to interruptible customers; (8) notifications of blackouts (actual notifications that blackouts were in process, not that they were a possibility); (9) voltage control activation, DSM activation; (10) power flows to and from the Company's service area; and/or (11) any other topic that would provide context to how the Company was informed throughout the time period.

21. Explain the process by which PJM coordinates and provides generation schedules for the Company.
22. For the period December 23, 2022, through December 26, 2022, provide a detailed list of what Dominion generation units PJM called on to operate/dispatch and how the units performed to PJM dispatch.
  - a. Explain any actions that the Company or PJM may have taken to potentially disable the ability to perform. For example, did PJM require the Company's pumped hydro units to run in such a manner that would have depleted their ability to perform the next day?
23. In regard to generation unit availability, unit tripping, load shedding, and load exceeding predicted demand, please provide dates and times of meetings, emails, discussions, and other communications in which the Company made decisions, as well as a list of all persons participating in decision making, including their job titles.
24. From December 23, 2022, through December 26, 2022, please provide generation from each Company asset, purchase, and aggregated QFs in five-minute intervals.
  - a. Please include the primary fuel source used for each unit's generation in each time interval. To the extent the fuel source used from power purchases is unknown, please provide the Company's base assumption of fuel use.

25. Please provide the following unit outage information:
- a. A list of units that that were known to be unavailable prior to December 23, 2022.
  - b. A list of units that were expected to be online or available but failed to respond when called upon from December 23, 2022, through December 28, 2022.
  - c. A list of units that underperformed or were derated (energy production below expected output) from December 23, 2022, through December 28, 2022.
    - i. A list of the de-rate amount in MWs and the dates and hours for each unit and or power purchase.
26. For all load reduction programs, please provide:
- a. A list of programs and their respective MW reduction that were called upon from December 23, 2022, through December 28, 2022. Include the date, hour(s) of activation, and MW reduction;
  - b. List what entity called on the programs. Was it Dominion and/or PJM.
  - c. A list of programs and their respective MW reduction amounts that were expected to be online or available, but failed to respond when called upon from December 23, 2022, through December 28, 2022; and
  - d. A list of programs that underperformed.
    - i. The underperformance amount in MWs and the hours impacted for program.

27. For all units/resources/programs that failed to perform, perform as expected, or perform at full nameplate potential from December 23, 2022, through December 28, 2022, please provide: (a) the time at which they failed/tripped/derated; (b) period of time associated therewith; (c) the root cause of the failure/trip/derate or most likely suspected cause; and (d) amount of lost generation at each unit.
28. Fuel and Fuel supply from December 23, 2022, through December 28, 2022:
- a. Describe the Company's understanding of the status of the natural gas supply before and during the event period for: (a) Transco; (b) suppliers/marketers; and (c) LDCs.
  - b. Please explain any natural gas supply or pressure issues.
  - c. Provide a map that outlines the gas line route and interconnection back to Transco for Greenville, Brunswick, and Warren Combined Cycle plants.
  - d. Was the Company notified by natural gas LDCs, Transco, suppliers/marketers, etc., of potential natural gas supply or pressure issues? If so, please provide a timeline of the notifications and what the Company did in reaction to the notifications.
  - e. For each of the Company's natural gas generators, please provide a sub hourly log of the incoming natural gas pressures and the limits/tolerances of natural gas supply pressure. (Note: The

Company may provide more granular time series to illustrate if any pressure issues or pressure variations occurred.)

- f. Provide the commodity prices being used during this period and supporting information from source data. Values should be expressed in \$/MMBTU or equivalent \$/MWh with specific unit heat rates applied.
- g. Provide a summary of how Company-owned solar facilities operated during the event period, as well as forecasted-day-ahead estimates and real-time data (in increments no less than 30 minutes).
  - i. Were any of the Company-owned solar units in an outage status during the event period? If so, please describe.
- h. Provide a summary of how the Company's QFs (non-utility-owned solar and non-solar) operated, as well as forecasted-day-ahead estimates and real-time data (in increments no less than 30 minutes).
  - i. Was the Company made aware of any units being in an outage during the event period? If so, please describe.
  - ii. Based on post-event analysis, provide a description of whether all non-utility-owned generation (solar and non-solar) operated as expected given the weather conditions during the event period in question.
  - iii. Did the Company call for any non-utility-QF generation to be curtailed during the event period in question? If so, why?

- i. Did the Company have any issues with coal pile freeze up? If so, please describe when the event occurred, what preventative actions were taken, why those actions did not prevent the freeze up, and how it impacted unit availability.
  - j. Did the Company switch to back-up fuel oil at any generation units?  
If so:
    - i. Explain why.
    - ii. Provide a timeline of the switch to back-up fuel oil and then the transition off the back-up fuel oil during the event.
    - iii. Was the transition related to economic dispatch, fuel availability, or a combination? Please explain how the Company determines whether to switch between fuel source due to economic or uneconomic dispatch.
      - 1. Describe if PJM required the Company to shift to back-up fuel oil or if it was a Company decision.
    - iv. Were there any unit performance issues related to switching to back-up fuel oil or switching off back-up fuel oil? If so, please identify the units and associated problems/issues.
  - k. Please describe any other fuel issues that occurred.
29. The following questions are specific to rolling outages and load curtailment.
- a. Describe the Company's process for determining location and timing for rolling outages.

- b. Explain if the Company or PJM initiated any rolling outages in Dominion's service territory?
- c. If the Company did not have any rolling outages during this event, please describe how close the Company came to potentially needing to perform rolling outages to maintain system reliability.
  - i. Has the Company ever had rolling outages due to insufficient generation to supply load?
    - 1. If so, when was the last time?
    - 2. How much load was shed and how many customers were impacted?
- d. Describe the coordination of rolling outages and load curtailment between the Company and PJM.
  - i. Describe if Dominion can have rolling outages or load curtailment without notification from PJM.
  - ii. Describe if PJM can initiate rolling outages or load curtailment in Company's territory without requesting Company's approval prior to the event.
  - iii. Describe how much notice PJM is required to provide to the Company prior to load curtailment.
- e. In regard to automation being used to activate rolling outages or demand reduction programs:
  - i. Please describe the automation.



- ii. Please discuss whether the Company's automation for rolling demand reduction performed as planned.
  - iii. If the Company could not use the automated process and was relegated to using a manual process, please provide an explanation and timeline of events.
  - iv. Please describe how the Company has tested the actions of the automation in simulations and other testing.
- f. Please explain how a system operator determines that a rolling outage is needed, the process for automation of circuit outage or, if necessary, the manual process in which the operators select the lines and outage durations.
- g. In the event of rolling outages or load shedding, please provide the Company's communications plan prior to and during an outage including a list of the main steps of public engagement and notification.
- h. Provide all mass communications to retail and wholesale customers that occurred prior to and during the demand reductions.
- i. Provide all communications the Company had with the NCUC, Virginia State Corporation Commission, and NC Public Staff.
- i. Prior to event.
  - ii. Real time during event.
  - iii. Subsequent to event, up to December 28, 2022.

30. Provide a timeline of the Company's Grid Status changes from December 23, 2022, through December 28, 2022.
  - a. Provide a timeline of PJM's Grid Status changes from December 23, 2022, through December 28, 2022.
31. Provide a timeline of the Company's and PJM's NERC EEA status and changes from December 23, 2022, through December 28, 2022.
32. To the extent that it is known, please provide the NERC EEA status of adjacent utilities and a timeline of changes to their status from December 23, 2022, through December 28, 2022.
33. Provide any notifications, request for relief, or emergency operations to or from the Department of Energy from December 23, 2022, through December 28, 2022.
34. Did the Company reduce or derate nuclear generation at any time from December 23, 2022, through December 28, 2022? If so, please describe the event, cause, and what other exhaustive actions had taken place prior to the reduction.
35. In regard to maintaining ACE near zero and the stability of the Company's system from December 23, 2022, through December 30, 2022, please explain how the Company and PJM considered ramping, managing the lowest reliability operating limit (LROL), afternoon peaks, low load conditions as the temperatures increased, additional stressors of the

system other than the morning peak, unit start-up time requirements, minimum loading, etc., and provide any additional information for each day, which the Company believes is important for a complete understanding or to highlight.