

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-100, SUB 173
DOCKET NO. M-100, SUB 163

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of)	
Petition for Investigation Regarding the)	
Reliability and Integrity of the Electric Grid in)	ORDER OPENING
North Carolina)	INVESTIGATION, SCHEDULING
)	TECHNICAL CONFERENCES,
In the Matter of)	REQUIRING RESPONSES, AND
Investigation Regarding the Ability of North)	ALLOWING COMMENTS AND
Carolina's Electricity, Natural Gas, and)	REPLY COMMENTS
Water/Wastewater Systems to Operate Reliably)	
During Extreme Cold Weather)	

BY THE COMMISSION: On May 18, 2021, the Public Staff filed a petition in Docket No. E-100, Sub 173 requesting that the Commission open an investigation into the reliability and integrity of the systems of North Carolina's electric utilities during extreme weather events in light of the outages and rolling blackouts experienced in Texas in February of 2021 due to Winter Storm Uri.

On May 21, 2021, the Commission issued an order in which it held the Public Staff's petition in abeyance awaiting the results from a joint inquiry into the Texas outages that was then underway by the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC).

On November 16, 2021, FERC and NERC issued The February 2021 Cold Weather Outages in Texas and the South Central United States: FERC, NERC, and Regional Entity Staff Report (the FERC/NERC Report, or simply the Report).¹

On December 17, 2021, the Public Staff filed a Motion to Lift Abeyance and Schedule Technical Conference which states that it is now appropriate for the Commission to initiate an investigation into the reliability and integrity of the systems of electric utilities in North Carolina during extreme weather events. The Public Staff requests that the Commission schedule a technical conference during which Dominion Energy North Carolina (DENC); and Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC (collectively, Duke), would present information about their efforts to address the issues that led to the outages and rolling blackouts described in the

¹ <https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and>

FERC/NERC Report as well as the Report's findings. The Public Staff's motion includes an extensive set of questions and requests that the Commission order DENC and Duke to respond to those questions at the technical conference. The Public Staff further requests that its staff be allowed to participate in the technical conference by asking questions as the Commission has allowed in several other technical conferences (see Docket No. E-100, Sub 153 and Docket No. E-100, Sub 157).

The Commission has reviewed the Public Staff's motion, the FERC/NERC Report, and NERC's progress in implementing the Report's recommendations. The Commission agrees with the Public Staff that now is the appropriate time to initiate an investigation into issues raised by the events of February 2021. Further, the Commission finds that it is appropriate for its investigation to include electric, natural gas, and water and wastewater utilities as the reliability of each type of utility was impacted by the extreme weather event in Texas during Winter Storm Uri. In addition to examining the level of preparedness of the major utilities in North Carolina, this proceeding will involve consideration of whether amendments to Commission rules are necessary to ensure preparedness, coordination, and reliable service during extreme cold weather events.

Therefore, the Commission will establish a new proceeding for this purpose in Docket No. M-100, Sub 163 and hereby makes Duke, DENC, Piedmont Natural Gas Company, Inc. (Piedmont), Public Service Company of NC, Inc. (PSNC), Frontier Natural Gas Company (Frontier), Aqua North Carolina, Inc. (Aqua), and Carolina Water Service, Inc. of North Carolina (Carolina Water) parties to the proceeding in Docket No. M-100, Sub 163.

For reasons of regulatory efficiency, the Commission's investigation will focus on topics that are not already being addressed by NERC, which recently initiated the process of addressing nine of the FERC/NERC Report's major recommendations by developing new, mandatory reliability standards for the electric utility industry.² Among the standards now under development by NERC are ones that would require generator owners to: (1) identify and protect cold-weather-critical components and systems for each generating unit; (2) design new, or retrofit existing, generating units to operate to specified ambient temperature and weather conditions; and (3) conduct annual unit-specific cold weather preparedness training. Further, generator owners that experience outages or derates due to cold weather will be required to develop and implement corrective action plans. The electric utility industry³ will be required to consider fuel contract risk in determining what generating capacity can be relied upon during cold weather. The electric utility industry will be required to protect critical natural gas infrastructure loads from firm

² See https://www.nerc.com/pa/Stand/Project202107ExtremeColdWeatherDL/2021-07%20Extreme%20Cold%20Weather%20Grid%20Operations%2c%20Preparedness%2c%20and%20Coordination%20Cold%20Weather%20SAR_112221.pdf.

³ The FERC/NERC Report distinguishes among various entities in the electric utility industry, such as Generator Owners, Generator Operators, Distribution Operators, Balancing Authorities, Transmission Owners, Transmission Operators, and Reliability Coordinators. Since Duke plays all of these roles in most of the State, the Commission sees no need to make such distinctions in this order and will refer simply to the "electric utility industry" in recounting the FERC/NERC Report's findings and recommendations.

load shed and prohibit the use of such load for demand response. In addition to the new standards that are under development, on August 24, 2021, the FERC approved a new standard requiring that electric utilities develop cold weather preparedness plans. This new, mandatory standard takes effect April 1, 2023.⁴

Given these efforts by NERC and FERC to develop new, mandatory reliability standards for the electric utility industry in response to the February 2021 outages in Texas, the Commission will focus its investigation on other issues raised by the FERC/NERC Report as discussed below.

Water and Wastewater Utility Preparedness

The FERC/NERC Report details the difficult impacts that the February 2021 outages posed for water utility customers. It states that more than 14 million people were ordered to boil water for drinking and cooking. Broken pipes and power outages caused water pressure to be reduced, put pumping stations out of commission, and ultimately prevented water utilities from providing safe drinking water to many of their customers. (See FERC/NERC Rep. p. 10) Given the limitations of FERC/NERC jurisdiction, the FERC/NERC Report does not make recommendations on issues related to water and wastewater. However, in light of the issues raised in the FERC/NERC Report, the Commission will investigate the preparedness of the major jurisdictional water and wastewater utilities in North Carolina for extreme cold weather events. The Commission will, therefore, require Aqua and Carolina Water to file and present information about their extreme cold weather emergency plans and will assess whether amendments to Commission rules are necessary to ensure the provision of safe, reliable service by the water and wastewater utilities during extreme cold weather events.

Natural Gas Utility Preparedness

The FERC/NERC Report recommends that regulatory agencies require natural gas infrastructure facilities to implement and maintain cold weather preparedness plans and provides extensive recommendations on measures that should be implemented to protect natural gas infrastructure during extreme cold weather events. (See FERC/NERC Rep. pp. 193-94) The Commission will investigate the preparedness of the jurisdictional natural gas local distribution companies in North Carolina for extreme cold weather events and will assess whether amendments to Commission rules are necessary to ensure the provision of safe, reliable service by the natural gas utilities during extreme cold weather events.

Weather and Load Forecasting

The FERC/NERC Report notes that “[w]eather forecasts failed to appreciate the severity of the storm. Weather models were unable to accurately forecast the timing ... and severity of extreme cold weather....” The Report recommends that the electric utility industry “broaden the scope of their near-term load forecasts to include multiple models

⁴ See FERC Docket No. RD21-5-000.

and sources of meteorological information” to increase accuracy. The Report also states that utility load forecasts were not able to accurately translate weather forecasts into load forecasts. Consumers’ reliance on electric heat pumps, which had to be augmented with auxiliary electric heat due to the extreme cold, were not anticipated in the utility load forecasts. The FERC/NERC Report recommends that the industry employ “staff with specialized knowledge of how weather impacts load, including the effects of heat pump backup heating and other supplemental heating.” (FERC/NERC Rep. p. 224, App. H pp. 30-31) The Public Staff’s motion includes questions on the topic of weather forecasts, and the Commission agrees that the issues of weather and load forecasts by electric utilities merit attention in this investigation. In addition, however, the Commission would like this investigation to explore the practices that natural gas and water utilities use to forecast extreme cold weather and the customer use that results from that cold weather.

Import Capabilities

The FERC/NERC Report recommends that the electric utility industry conduct bi-directional seasonal transfer studies that model their systems at high transfers during high seasonal load conditions and determine at what point transmission constraints cannot be alleviated without emergency measures. The Report states that these studies should be used to develop new operating procedures for abnormal flows and incorporated into system operator drills. (See FERC/NERC Rep. pp. 227-28) The Commission is aware that the North Carolina Transmission Planning Collaborative periodically conducts transfer studies, and that Duke and DENC participate in reserve sharing groups. This investigation will, therefore, consider the ability of the North Carolina electric transmission grid to import power during cold weather emergencies.

Electric and Gas System Operator Training and Coordination

The FERC/NERC Report recommends that electric utilities at least annually perform simulations of emergency load shed scenarios and ensure that system operators are trained to administer rotating load sheds, avoid cascading outages and system collapse, and protect critical natural gas infrastructure customers. (See FERC/NERC Rep. pp. 228-29) This investigation will consider whether such training is currently occurring, both for electric utilities and natural gas utilities. This investigation will also explore whether critical water and wastewater infrastructure would be protected from load shedding during an emergency. In addition, this investigation will address the curtailment plans that gas utilities would implement during cold weather emergencies and the necessary coordination with electric utilities that must occur during any such curtailment.

In order to investigate these issues, the Commission will require the noted utilities made parties hereto to file responses in Docket No. M-100, Sub 163 to the indicated questions in Appendix A by February 23, 2022. The Commission will also conduct two technical conferences where utility representatives will present this information to the Commission and where the Commission and the Public Staff will be able to ask questions of the utilities. During the first technical conference, the water and wastewater utilities will present information regarding extreme cold weather emergency preparedness. During

the second technical conference, electric and natural gas utilities will present information about weather and load forecasting, import capabilities, and system operations.

Following the technical conferences, the Commission will establish a schedule for the filing of comments and reply comments from the parties recommending any amendments to Commission rules resulting from the Commission's investigation.

IT IS, THEREFORE, ORDERED as follows:

1. That Duke, DENC, Piedmont, PSNC, Frontier, Aqua, and Carolina Water are made parties to the proceeding in Docket No. M-100, Sub 163;
2. That Duke, DENC, Piedmont, PSNC, Frontier, Aqua, and Carolina Water shall file responses to the indicated questions in Appendix A of this Order on or before February 23, 2022;
3. That representatives of Aqua and Carolina Water shall present their responses and answer Commission and Public Staff questions at a technical conference to be held on March 15, 2022, starting at 9:30 a.m., in Commission Hearing Room 2115;
4. That representatives of Duke, DENC, Piedmont, PSNC, and Frontier shall present their responses and answer Commission and Public Staff questions at a technical conference to be held on April 19, 2022, starting at 9:30 a.m., in Commission Hearing Room 2115;
5. That following the technical conferences the Commission will establish a schedule so that parties may file comments and reply comments in Docket No. M-100, Sub 163 detailing any new Commission rules or rule amendments that are needed in order to assure reliable electric, natural gas, water, and wastewater service during extreme cold weather; and
6. That, in addition to the utilities listed in paragraph 1 above, the Chief Clerk shall serve a copy of this order on all regulated electric, natural gas, and water/wastewater utilities, and such utilities may file responses and comments at their discretion

ISSUED BY ORDER OF THE COMMISSION.

This the 26th day of January, 2022.

NORTH CAROLINA UTILITIES COMMISSION



Joann R. Snyder, Deputy Clerk

Questions for Electric Utilities

General:

1. What changes if any has your utility implemented due to lessons learned from the February 2021 outages in Texas and the South-Central U.S.?
2. What changes will your utility be making to comply with NERC's new cold weather preparedness standards that FERC approved August 24, 2021, and that take effect April 1, 2023?

Weather and Load Forecasting:

3. Explain how your utility forecasts weather and/or acquires weather forecasts. Describe the frequency and robustness of the forecasts. Include information about whether the utility develops discrete forecasts for groups of power plants or parts of its service area.
4. Explain how, when extreme cold weather is forecasted, the utility forecasts customer load.
5. For the last three winter peaks, how accurate were the Company's weather forecasts three days before the peak? The day before the peak? How accurate was the Company's load forecast three days before the peak? The day before the peak? Ultimately, how accurate was the peak load forecast?
6. Are any changes contemplated to improve the accuracy of the Company's cold weather forecasts or winter peak load forecasts?

Power Plant Performance:

7. During the last three winter peaks, what generating units were unable to operate due to the cold weather or weather-related fuel constraints, and what action has the utility taken to address the problem?
8. Under what circumstances would the utility's gas-burning plants be subject to gas curtailment during extreme cold weather? How many megawatts of capacity are

subject to this curtailment risk? How much of that capacity can use an alternate fuel, such as oil? For how long?

9. During an extended cold weather period, one that lasts several days, how would solar and wind facilities likely perform? Would they present any special challenges?

Load Shedding / Curtailment Planning:

10. To what extent would critical natural gas infrastructure sites be exempted from emergency load shedding / rotating blackouts? Are any critical natural gas facilities on interruptible rates?
11. To what extent would water pumping stations or wastewater treatment facilities be exempted from emergency load shedding / rotating blackouts?
12. How often do you conduct simulation training of a load shedding event for control room operators?
13. What is your plan for communicating with customers if emergency load shedding were necessary in the winter? What mechanisms / media would be used, and what would the key messages be?

Energy Transfers / Reserve Sharing

14. Has your utility conducted the energy transfer studies that the FERC/NERC Report recommends on pages 227-228? Explain whether this would be useful.
15. Describe the transfer capability of North Carolina's transmission system.
16. Describe any reserve sharing agreements that your utility has in place with neighboring Balancing Areas. (For example, explain the VACAR reserve sharing group and provide a copy of any related agreements.) Could it/they be relied upon if the parties to the agreements all experienced cold weather at the same time?
17. During the last three winter peaks, did any neighboring Balancing Areas (or, for DENC, the rest of PJM) also experience cold weather at the same time one of your Balancing Areas did?
18. During the last three winter peaks, did your utility experience any frequency drops below the allowable range? If so, explain.
19. For Duke, explain specifically whether the DEC/DEP Joint Dispatch Agreement has any bearing on extreme cold weather operations.

Questions for Natural Gas Utilities

General:

1. What changes if any has your utility implemented due to lessons learned from the February 2021 outages in Texas and the South-Central U.S.?

Weather and Load Forecasting:

2. Explain how your utility forecasts weather and/or acquires weather forecasts. Describe the frequency and robustness of the forecasts. Include information about whether the utility develops discrete forecasts for different parts of its service area.
3. Explain how, when extreme cold weather is forecasted, the utility forecasts customer load.
4. For the last three winter peaks, how accurate were the Company's weather forecasts three days before the peak? The day before the peak? How accurate was the Company's load forecast three days before the peak? The day before the peak? Ultimately, how accurate was the peak load forecast?
5. Are any changes contemplated to improve the accuracy of the Company's cold weather forecasts or winter peak load forecasts?
6. Describe the "design day" to which you plan your system.

Load Shedding / Curtailment Planning:

7. How do your utility's gas curtailment emergency plans account for electric generators that rely on gas? Do you communicate with them as to whether they are able to switch to an alternate fuel? Or whether they have alternative sources of generation available?
8. Describe your plans for curtailing service generally. At what point would residential customers be impacted?
9. How often do you conduct simulation training of a load shedding event for control room operators?
10. What is your plan for communicating with customers if emergency curtailments were necessary in the winter? What mechanisms / media would be used, and what would the key messages be?
11. Describe the process of restoring service if you had to curtail residential customers. What staffing plans are in place for such as event?

Plant Performance:

12. During the last three winter peaks, did your utility experience any infrastructure failures, curtailments, or restrictions due to cold weather? Explain fully.
13. Explain whether any of the recommendations on pages 193-194 of the Report are appropriate for your utility.

Questions for Water/Wastewater Utilities

1. What changes if any has your utility implemented due to lessons learned from the February 2021 events in Texas and the South-Central U.S.?
2. Does your utility forecast usage due to weather? Does customer water use change during extremely cold weather?
3. What is the coldest ambient air temperature that your system (pipes, pumping stations, critical facilities, etc.) is designed to operate in?
4. Do your pumping stations or other critical facilities participate in demand response or interruptible pricing tariffs that could result in them being curtailed during extremely cold weather? Does your utility have a backup plan in place when there is a power outage, especially an extended power outage?
5. During a cold weather event, from an operations standpoint, do you do anything differently? How do you monitor water supplies during cold weather events? How do you prepare for extremely cold weather?
6. Please describe your emergency plans, specifically what do you do if the water you provide becomes unsafe to drink? What do you do if you are unable to provide water at all? How would you communicate with customers? Government? And what would the key messages be?
7. During the last three winters, did your utility experience any operational problems due to cold weather? If yes, please explain fully. If yes, has the Company made any changes as a result?