STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1341

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Application of Duke Energy Progress, LLC Pursuant to G.S. 62-133.2 and NCUC Rule R8-55 Relating to Fuel and Fuel-Related Charge Adjustments for Electric Utilities	)))))	**DIRECT TESTIMONY OF** **TOM SIMRIL FOR** **DUKE ENERGY PROGRESS, LLC**

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Tom Simril, and my business address is 4800 Concord Road, York, South Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am Senior Vice President of Nuclear Operations for Duke Energy Corporation ("Duke Energy") with direct executive accountability for Duke Energy's North Carolina nuclear stations, including Duke Energy Progress, LLC's ("DEP" or the "Company") Brunswick Nuclear Plant ("Brunswick") in Brunswick County, North Carolina; the Harris Nuclear Plant ("Harris") in Wake County, North Carolina; and Duke Energy Carolinas, LLC's McGuire Nuclear Station, located in Mecklenburg County, North Carolina.

Q. WHAT ARE YOUR RESPONSIBILITIES AS SENIOR VICE PRESIDENT OF NUCLEAR OPERATIONS?

A. As Senior Vice President of Nuclear Operations, I am responsible for providing oversight for the safe and reliable operation of Duke Energy's nuclear stations in North Carolina. I am also involved in the operations of Duke Energy's other nuclear stations, including DEP's Robinson Nuclear Plant ("Robinson") located in Darlington County, South Carolina.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor of Science degree in mechanical engineering from Clemson University and received a senior reactor operator license from Duke Energy's Catawba Nuclear Station. My career in the nuclear power industry spans over 38

years. I began my nuclear career as an engineer at Catawba Nuclear Station. From 1998 to 2007, I served in a variety of leadership positions at Catawba in operations and engineering. In 2007, I joined the McGuire Nuclear Station team as the operations superintendent before being transferred to serve as the operations manager at Catawba from 2010 to 2013. In 2013, I was named the plant manager at Catawba and served in this role until being promoted as the site vice president for Catawba in 2016. I held that position until January 2023 when I assumed my current role.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION IN ANY PRIOR PROCEEDINGS?

A. Yes. I provided testimony in DEP's fuel and fuel related cost recovery proceeding in Docket No. E-2, Sub 1321.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to describe the performance of the Brunswick, Harris, and Robinson nuclear plants during the period of April 1, 2023 through March 31, 2024 (the "test period"). I will provide information regarding scheduled refueling outages and discuss the nuclear capacity factor being proposed by the Company in determining the fuel factor to be reflected in customer rates during the billing period of December 1, 2024 through November 30, 2025 ("billing period").

Q. PLEASE DESCRIBE SIMRIL EXHIBIT 1 INCLUDED WITH YOUR TESTIMONY.

A. Simril Exhibit 1 is a confidential exhibit outlining the planned schedule for refueling outages for DEP's nuclear units for the period of April 1, 2024 through November 30,

2025. This exhibit represents DEP's current plan, which is subject to adjustment due to changes in operational and maintenance requirements.

Q. PLEASE DESCRIBE DEP'S NUCLEAR GENERATION PORTFOLIO.

A. The Company's nuclear generation portfolio consists of approximately 3,593[1] megawatts ("MWs") of generating capacity, made up as follows:

Brunswick - 1,870 MWs

Harris - 964 MWs

Robinson - 759 MWs

Q. PLEASE PROVIDE A GENERAL DESCRIPTION OF DEP'S NUCLEAR GENERATION ASSETS.

A. DEP's nuclear fleet consists of three generating stations and a total of four units. Brunswick is a boiling water reactor facility with two units and was the first nuclear plant built in North Carolina. Unit 2 began commercial operation in 1975, followed by Unit 1 in 1977. The operating licenses for Brunswick were renewed in 2006 by the Nuclear Regulatory Commission ("NRC"), extending operations up to 2036 and 2034 for Units 1 and 2, respectively. Harris is a single unit pressurized water reactor that began commercial operation in 1987. The NRC issued a renewed license for Harris in 2008, extending operation up to 2046. Robinson is also a single unit pressurized water reactor that began commercial operation in 1971. The license renewal for Robinson Unit 2 was issued by the NRC in 2004, extending operation up to 2030.

On March 24, 2023, the Company notified the NRC and this Commission of its intent to seek subsequent license renewal ("SLR") for Robinson. The Company

[1] As of January 1, 2024.

plans to file the application with the NRC in the second quarter of 2025. If the license renewal is granted by the NRC, the Company would be authorized to operate Robinson for an additional 20-year period. As communicated in prior filings with the Commission, Duke Energy believes its nuclear plants are good candidates for SLR and intends to seek SLR for all nuclear units in the fleet.

Q. WERE THERE ANY CAPACITY CHANGES WITHIN DEP'S NUCLEAR PORTFOLIO DURING THE TEST PERIOD?

A. No.

Q. WHAT ARE DEP'S OBJECTIVES IN THE OPERATION OF ITS NUCLEAR GENERATION ASSETS?

A. The primary objective of DEP's nuclear generation department is to safely provide reliable and cost-effective electricity to DEP's customers in North and South Carolina. The Company achieves this objective by focusing on a number of key areas. Operations personnel and other station employees receive extensive, comprehensive training and execute their responsibilities to the highest standards in accordance with detailed procedures that are continually updated to ensure best practices. The Company maintains station equipment and systems reliably and ensures timely implementation of work plans and projects that enhance the performance of systems, equipment, and personnel. Station refueling and maintenance outages are conducted through the execution of well-planned, well-executed, and high-quality work activities, which effectively ready the plant for operation until the next planned outage.

Q. PLEASE DISCUSS THE PERFORMANCE OF DEP'S NUCLEAR FLEET DURING THE TEST PERIOD.

A. The Company operated its nuclear stations in a reasonable and prudent manner during the test period, providing approximately 51.4% of the total power generated by DEP. During the test period, DEP's four nuclear units collectively achieved a fleet capacity factor of 98.47%, which included one refueling outage. In 2023 the DEP nuclear fleet established a new annual net generation record with Brunswick Unit 1, Harris Unit 1, and Robinson Unit 2 also establishing new annual net generation records.

The performance results discussed in my testimony demonstrate DEP's continued commitment to achieving high performance without compromising safety and reliability.

Q. HOW DOES THE PERFORMANCE OF DEP'S NUCLEAR FLEET COMPARE TO INDUSTRY AVERAGES?

A. The Company's nuclear fleet has a history of strong operational performance that has historically exceeded industry averages. The most recently published North American Electric Reliability Council's ("NERC") Generating Unit Statistical Brochure ("NERC Brochure") indicates an average capacity factor of 93.65% for the five-year period of 2018 through 2022 for comparable units. The Company's test period capacity factor of 98.47% and 2-year average[2] capacity factor of 95.30% both exceed the NERC average of 93.65%.

[2] This represents the simple average for the current test period and prior test period of 12 months ended March 2023 for the DEP nuclear fleet.

Q. WHAT IMPACTS A UNIT'S AVAILABILITY AND WHAT IS DEP'S PHILOSOPHY FOR SCHEDULING REFUELING AND MAINTENANCE OUTAGES?

A. In general, refueling, maintenance, and NRC required testing and inspections impact the availability of DEP's nuclear system.

Prior to a planned outage, DEP develops a detailed schedule for the outage and for major tasks to be performed, including sub-schedules for particular activities. The Company's scheduling philosophy is to plan for a best possible outcome for each outage activity within the outage plan. For example, if the "best ever" time a particular outage task was performed is 10 days, then 10 days or less becomes the goal for that task in subsequent outages barring known conflicts. Those individual aspirational goals are incorporated into an overall outage schedule. The Company then aggressively works to meet, and measures itself against, that aspirational schedule. To minimize potential impacts to outage schedules, "discovery items" (walk-downs, inspections, etc.) are scheduled at the earliest opportunities so that any maintenance or repairs identified through those activities can be promptly incorporated into the outage plan. Those discovery activities also have pre-planned contingency actions to ensure that, when incorporated into the schedule, the activities required for appropriate repair can be performed as efficiently as possible.

As noted, the schedule is utilized for measuring outage preparation and execution and driving continuous improvement. However, for planning purposes, particularly with the dispatch and system operating center functions, DEP also develops an allocation of outage time, which incorporates reasonable schedule losses.

The development of each outage allocation is dependent on maintenance and repair activities included in the outage, as well as major projects to be implemented during the outage. Both schedule and allocation are set aggressively to drive continuous improvement in outage planning and execution.

Q. HOW OFTEN DO NUCLEAR REFUELING OUTAGES OCCUR?

A. Refueling outages for the Company's nuclear plants occur every 18 to 24 months. The two Brunswick units and the Robinson unit operate on a 24-month refueling cycle, and the Harris unit operates on an 18-month refueling cycle. During refueling outages, a nuclear unit replaces approximately one-third of the used fuel assemblies and performs maintenance, inspections, and testing that cannot be done while online.

Q. HOW DOES DEP HANDLE OUTAGE EXTENSIONS AND FORCED OUTAGES?

A. If an unanticipated issue that has the potential to become an on-line reliability challenge is discovered while a unit is off-line for a scheduled outage and repair cannot be completed within the planned work window, the outage is extended when in the best interest of customers to perform necessary maintenance or repairs prior to returning the unit to service. The decision to extend an outage is based on numerous factors, including reliability risk assessments, system power demands, and the availability of resources to address the emergent challenge. In general, if an issue poses a credible risk to reliable operations until the next scheduled outage, the issue is repaired prior to returning the unit to service. This approach enhances reliability and results in longer continuous run times and fewer forced outages, thereby reducing fuel costs for customers in the long run. In the event that a unit is forced off-line, every

effort is made to safely perform the repair and return the unit to service as quickly as possible.

Q. DOES DEP PERFORM POST-OUTAGE CRITIQUES AND CAUSE ANALYSES FOR INTERNAL IMPROVEMENT EFFORTS?

A. Yes. The nuclear industry recognizes that constant focus on operational excellence results in improved nuclear safety and reliability. DEP applies self-critical analysis to each outage and, using the benefit of hindsight, identifies the potential causes of an outage delay or event resulting in a forced or extended outage, and applies lessons learned to drive continuous improvement. The Company also evaluates the performance of each function and discipline involved in outage planning and execution to identify areas in which it can utilize self-critical observation for improvement efforts.

Q. IS SUCH ANALYSES INTENDED TO ASSESS OR MAKE A DETERMINATION REGARDING THE PRUDENCE OR REASONABLENESS OF A PARTICULAR ACTION OR DECISION?

A. No. Given this focus on identifying opportunities for improvement, these critiques and cause analyses are not intended to document the broader context of the outage, nor do they make any attempt to assess whether the actions taken were reasonable in light of what was known at the time of the events in question. Instead, the reports utilize hindsight (*e.g.*, subsequent developments or information not known at the time) to identify every potential cause of the incident in question. However, such a review is quite different from evaluating whether the actions or decisions in question were reasonable given the circumstances that existed at that time.

Q. WHAT OUTAGES WERE REQUIRED FOR REFUELING AT DEP'S NUCLEAR FACILITIES DURING THE TEST PERIOD?

A. There was one refueling outage completed during the test period at Brunswick Unit 1 in the spring of 2024. On February 11, 2024, Brunswick Unit 1 was removed from service for refueling earlier than scheduled due to a reactor recirculation pump seal leakage trend. In addition to refueling, maintenance activities, safety and reliability enhancements, inspections and testing was completed. Reliability enhancing work executed during the outage included the replacement of the main generator voltage regulator, main steam isolation valve upgrades, and replacement of the '1A' and '1B' reactor recirculation pump seals. Additionally, multiple inspections and tests were executed to help ensure continued safe and reliable operations including the torus lining inspection, east and west moisture separator reheater inspections, and the '1A' reactor feed pump steam path inspection, and the containment integrated leak rate test. The outage was successfully completed with no recordable injuries or environmental events and the unit was returned to service on March 14, 2024—an outage duration of 31.3 days compared to a scheduled allocation of 32 days.

Q. WHAT OTHER OUTAGES OCCURRED DURING THE TEST PERIOD?

A. There were two outages unrelated to refueling during the test period. One occurred at the Brunswick Nuclear Plant and the other occurred at the Robinson Nuclear Plant.

On April 20, 2023, Brunswick Unit 1 experienced a simultaneous loss of both the main and backup power supplies for the turbine protection system, which resulted in a turbine trip and subsequent automatic reactor trip. Both the main and backup

turbine protection system power supplies were replaced, and the unit was safely returned to service on April 24, 2023—an outage duration of 4.3 days.

On June 22, 2023, while a reactor trip breaker was opened for testing, the Robinson Nuclear Plant experienced a turbine control system-initiated turbine trip and subsequent automatic reactor trip when the mounting support flexed on a switch for the 'B' reactor trip bypass breaker, causing the switch to not operate as designed. The mounting support was evaluated, and additional switch supports were installed. The unit was safely returned to service on June 24, 2023—an outage duration of 2.3 days.

Q. WHAT CAPACITY FACTOR DOES DEP PROPOSE TO USE IN DETERMINING THE FUEL FACTOR FOR THE BILLING PERIOD?

A. The Company proposes to use a 94.99% capacity factor, which is a reasonable value for use in this proceeding based upon the operational history of DEP's nuclear units and the number of planned outage days scheduled during the billing period. This proposed percentage is reflected in the testimony and exhibits of Company witness Harrington.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.