BEFORE
THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1276

In the Matter of:	)	
	)	
Application of Duke Energy Carolinas, LLC For Adjustment of Rates and Charges Applicable to Electric Service in North Carolina and Performance-Based Regulation	)))))	**DIRECT TESTIMONY OF STEVEN D. CAPPS FOR DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND OVERVIEW

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Steven D. Capps and my business address is 13225 Hagers Ferry Road, Huntersville, North 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 South Carolina nuclear plants, including Duke Energy Carolinas, LLC's ("DEC" or the "Company") Catawba Nuclear Station ("Catawba") in York County, South Carolina, the Oconee Nuclear Station ("Oconee") in Oconee County, South Carolina, and Duke Energy Progress ("DEP"), LLC's Robinson Nuclear Plant, located in Darlington County, South 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 executive oversight for the safe and reliable operation of Duke Energy's three South Carolina operating nuclear stations. I am also involved in the operations of Duke Energy's other nuclear stations, including DEC's McGuire Nuclear Station ("McGuire") located in Mecklenburg County, North Carolina.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have more than 35 years of experience in the nuclear field. I joined Duke Energy in 1987 as a field engineer at Oconee. During my time at Oconee, I served in a variety of leadership positions at the station, including Senior Reactor Operator, Shift Technical Advisor, and Mechanical and Civil Engineering Manager. In 2008, I transitioned to McGuire as the Engineering Manager. I later became plant manager and was named Vice President of McGuire in 2012. In December 2017, I was named Senior Vice President of Nuclear Corporate for Duke Energy with direct executive accountability for Duke Energy's nuclear corporate functions, including nuclear corporate engineering, nuclear major projects, corporate governance and operation support, and organizational effectiveness. I assumed my current role in October 2018. I earned a B.S. in Mechanical Engineering from Clemson University, and I have completed the Institute of Nuclear Power Operations ("INPO") senior nuclear plant management course.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE OR FILED TESTIMONY WITH THIS COMMISSION?

A. Yes. I provided testimony in DEC's 2019 base rate case in Docket No. E-7, Sub 1214 and provided testimony in DEC's fuel and fuel related cost recovery proceedings in Docket No. E-7, Sub 1163, Docket No. E-7, Sub 1190, Docket No. E-7, Sub 1228, Docket No. E-7, Sub 11250, and Docket No. E-7, Sub 1263.

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

A. The purpose of my testimony is to provide information in support of the Company's request for a base rate adjustment. To this end, I describe DEC's nuclear generation assets; update the Commission on capital additions since the Company's last rate case filed in 2019, Docket No. E-7 Sub 1214 (the "2019 Rate Case"); explain key drivers impacting nuclear operations and maintenance ("O&M") costs; provide operational performance results for calendar year 2021 (the "Test Period"); and support the nuclear capital investments included in the Company's Multiyear Rate Plan ("MYRP"). Capps Exhibit 1 provides additional details regarding projected cost, schedule, and scope for each MYRP project, as well as the reasoning for each project as required by Commission Rule R1-17B(d)(2)j.

Q. WAS CAPPS EXHIBIT 1 PREPARED OR PROVIDED HEREIN BY YOU, UNDER YOUR DIRECTION AND SUPERVISION?

A. Yes.

Q. WHAT ARE THE PRIMARY DRIVERS WITHIN THE NUCLEAR FLEET DRIVING THIS REQUEST?

A. Since the 2019 Rate Case, capital investments have been made to enhance safety, comply with new or revised regulatory requirements, enhance reliability and efficiency, and manage aging and obsolescent equipment. In addition, while the Company has effectively managed O&M challenges, it also continues to face O&M pressures.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. The remainder of my testimony is organized as follows:

II. NUCLEAR FLEET

Q. PLEASE LIST DEC'S NUCLEAR FLEET.

A. The Company's nuclear generation portfolio consists of approximately 5,389[1] megawatts ("MWs") of power capacity made up as follows:

Oconee - 2,554 MWs

McGuire - 2,316 MWs

[1] As of January 1, 2022.

Catawba - 519 MWs[2]

Q. PLEASE GENERALLY DESCRIBE DEC'S NUCLEAR GENERATION ASSETS.

A. DEC's nuclear fleet consists of three generating stations and a total of seven units. Oconee began commercial operation in 1973 and was the first nuclear station designed, built, and operated by DEC. It has the distinction of being the second nuclear station in the country to have its license, originally issued for 40 years, renewed for up to an additional 20 years by the NRC. The license renewal, which was obtained in 2000, extends operations to 2033, 2033, and 2034 for Oconee Units 1, 2, and 3, respectively.

McGuire began commercial operation in 1981, and Catawba began commercial operation in 1985. In 2003, the NRC renewed the licenses for McGuire and Catawba for up to an additional 20 years each. This renewal extends operations until 2041 for McGuire Unit 1, and 2043 for McGuire Unit 2 and Catawba Units 1 and 2. The Company jointly owns Catawba with North Carolina Municipal Power Agency Number One, North Carolina Electric Membership Corporation, and Piedmont Municipal Power Agency.

Q. WERE THERE ANY POWER CAPACITY CHANGES WITHIN DEC'S NUCLEAR PORTFOLIO SINCE THE LAST RATE CASE?

A. No.

[2] Reflects DEC's ownership of Catawba Nuclear Station.

Q. WHAT ARE DUKE ENERGY'S PLANS RELATED TO SUBSEQUENT LICENSE RENEWAL FOR THE EXISTING NUCLEAR FLEET?

A. In 2019, Duke Energy announced its intention to seek subsequent license renewal ("SLR") for all six nuclear plants, including DEC's Catawba, McGuire, and Oconee plants. The license application for the Oconee station was submitted to the NRC in June 2021. The remaining plant SLR submittals are scheduled to be submitted according to the NRC's required timelines prior to each station's current license expiration. The SLR application process is detailed and thorough, and each application review is expected to take approximately 18 months or longer.

Q. WHY IS THE COMPANY SEEKING SLR FOR ITS NUCLEAR FLEET?

A. The Company's nuclear fleet is a critical component of DEC's strategy for maintaining safe, reliable, and affordable electric service for its customers in North Carolina and South Carolina as part of DEC's dual state system. These units have contributed to the Company's ability to provide such service for decades and are projected to be needed for decades more. In addition, due to its zero carbon emissions, the nuclear fleet also represents a crucial piece of achieving a successful energy transition in the Carolinas. Put simply, the transition to a lower carbon energy landscape in the Carolinas will not occur without nuclear energy as a key component of the Company's energy portfolio. Seeking SLR for the fleet is therefore in the best interest of customers continuing to benefit from affordable and reliable electric energy as well as from reduced carbon emissions. The Company's long-term maintenance of its nuclear plants, including investments made for major modifications and upgrades to each plant and adherence to an aging management program pursuant to the stations' previous license extensions, make these stations good candidates for SLR.

III. CAPITAL ADDITIONS

Q. PLEASE PROVIDE ADDITIONAL DETAILS REGARDING MAJOR CAPITAL PROJECTS FOR NUCLEAR BEING INCLUDED IN THIS CASE.

A. Since the 2019 Rate Case, DEC has, or will have by July 31, 2023, invested approximately $758.8 million in beneficial capital projects for the nuclear fleet. These capital improvements were required to enhance safety, reliability, and efficiency, preserve performance and reliability of the plants throughout their extended life operations, and address regulatory requirements.

For example, all three DEC stations made advancements in the area of innovation by the installation of equipment associated with the intelligent monitoring and remote analytics center ("IMAC") at each site. IMAC enables remote online monitoring of certain plant equipment for vibration, motor current signature analysis, turbine monitoring, and transformer monitoring. This capability drives increased equipment reliability by allowing engineers to assess equipment performance and determine when maintenance is required, shifting many time-based preventive maintenance activities to condition-based maintenance.

Additionally, the fleet has completed the projects to optimize the sites' physical security via the execution of the secure owner-controlled area ("SOCA"), early warning and assessment system ("EWAS"), and defensive position upgrade ("DFP") projects. These projects, all completed by 2021, enhanced the security posture at each nuclear plant in the most cost-effective manner.

At Catawba, capital investments to replace the low-pressure turbine ("LPT") rotors and associated diaphragms were completed on Unit 1 in 2020 and Unit 2 in 2021. The LPT replacements were done to improve the reliability of the aging turbines and will reduce the frequency of inspections and maintenance. Additionally, Catawba Unit 2 replaced degraded safety and non-safety core exit thermocouples and cables in 2021. This work was required to maintain regulatory margin for this equipment and will reduce maintenance requirements and dose to site personnel. Catawba has also executed multiple projects to modernize and enhance the reliability of station equipment including control rod purchases, reactor coolant pump seal replacements, and retubing the component cooling heat exchangers.

At McGuire, projects have been executed to ensure continued safe and reliable operations including the completion of the modifications of the distributed control system ("DCS") for Unit 2 in 2020. The DCS project involved the replacement and upgrade of components supporting the nuclear steam supply system to address reliability of aging and obsolete equipment, and cyber security requirements. Additionally, McGuire executed multiple projects to modernize and enhance the reliability of station equipment including control rod purchases, reactor coolant pump seals and motors replacements, and feedwater pump turbines replacements.

Oconee has completed multiple projects to address aging equipment and ensure continued reliability in the future. The Oconee Unit 1 and Unit 3 low pressure turbine ("LPT") rotor and associated diaphragm replacements were completed during refueling outages in 2020. The LPT replacements improve the reliability of the turbines and reduce the frequency of inspections and maintenance. Additionally, to modernize equipment at Oconee, feedwater heaters, chillers, and reactor coolant pump seals and motors, and piping components subject to primary water stress corrosion cracking have been replaced. The replacement of this equipment will allow Oconee to continue to operate reliably while also enhancing safety and regulatory margins.

Q. MR. CAPPS, ARE THE CAPITAL ADDITIONS AND ENHANCEMENTS YOU HAVE DESCRIBED IN YOUR TESTIMONY USED AND USEFUL, OR WILL THEY BE USED AND USEFUL BY JULY 31, 2023, IN PROVIDING ELECTRIC SERVICE TO DEC'S ELECTRIC CUSTOMERS IN NORTH CAROLINA?

A. Yes. These capital additions are, or by July 31, 2023, will be, used and useful in safely and efficiently providing reliable electric service to the Company's customers. The Company recognizes the value to customers of well-maintained and high performing nuclear plants. DEC's nuclear plants have been maintained to a standard that allowed all seven units to be relicensed for an additional 20-years via the initial license renewal process, and these efforts support the subsequent license renewal process that can extend the life of the plants out through 80 years. The Company's successful efforts to maintain, and when required, replace obsolete equipment and systems, enhance safety margins in compliance with new NRC requirements, increase reliability, and ensure customers will continue to benefit from the power provided by this efficient, cost-effective and greenhouse gas emissions-free, 24/7 power source of energy for many years to come. These investments have positioned the Company to maintain high levels of operational safety, efficiency, and reliability that is reflected in the nuclear performance results I discuss later in my testimony.

IV. O&M EXPENSES

Q. PLEASE DESCRIBE SIGNIFICANT COST DRIVERS IMPACTING O&M EXPENSES FOR DEC'S NUCLEAR FLEET.

A. During the Test Period, approximately 35.9% of the required O&M expenditures for DEC's nuclear fleet were fuel related. A complete discussion of nuclear fuel costs can be found in Witness Kevin Y. Houston's testimony filed with this Commission on March 1, 2022, in the Company's annual fuel proceeding in Docket No. E-7, Sub 1263. In his testimony, Witness Houston noted that the Company anticipates nuclear fuel costs will remain relatively flat through 2023 and then the Company expects modest cost pressure in nuclear fuel costs on a cents per kilowatt hour ("kWh") basis through the next several years. Customers will continue to benefit from the Company's diverse energy mix and the strong performance of its nuclear fleet through lower fuel costs than would otherwise result absent the significant contribution of nuclear power to meeting customer demand.

Non-fuel items compose the remainder of O&M expenditures for the nuclear fleet. Nuclear power plant operations are very labor intensive and, therefore, a significant portion of O&M expenses are related to internal and contracted labor. The Company continues to face upward pressure on these ongoing labor costs and other challenges have occurred with rising costs for materials and supplies.

Q. WHAT EXAMPLES CAN YOU PROVIDE RELATED TO THE COMPANY'S EFFORTS TO CONTROL O&M COSTS?

A. The Company has many efforts in place for controlling and/or saving costs. An area of focus in recent years has been outage optimization, focusing on duration, scope, budget, dose, and production. This approach applies strict controls on reducing outage durations aligning typical maintenance work within duration templates, allocating costs based on scope and duration templates, improving alignment of bulk work to minimize schedule impacts, and targeting dose to the five-year ALARA[3] plan. Continuing efforts to reduce refueling outage durations are yielding results. In 2021, Catawba Unit 1 set a Duke Energy nuclear fleet refueling outage duration record with a sub-20-day refueling outage. Additionally, Oconee Unit 2 had its shortest refueling outage on record in 2021 along with having continuous operations for over 700 days between December 2019 and November 2021. Oconee Unit 3 also experienced a continuous run of over 720 days between May 2020 and May 2022. Catawba Unit 2 and McGuire Unit 1 also experienced extended periods of continuous operations exceeding 530 days and 525 days respectively. Shorter refueling outages and longer continuous runs directly benefit customers by allowing increased output from the lower fuel cost nuclear units.

Innovation is another key area of focus to help control costs. I mentioned IMAC earlier in my testimony. The remote monitoring capability enabled by

[3] Code of Federal Regulations (10 C.F.R. § 20.1003) acronym for "as low as (is) reasonably achievable."

IMAC is expected to increase efficiencies as more maintenance activities are initiated by equipment performance-based maintenance versus time-based preventive maintenance, thereby reducing both labor and material requirements. The Company has expanded the use of robotics and drones for inspection activities in high dose areas or areas that are difficult or impossible to access during plant operations. Expanded use of these type technologies reduces radiation exposure and enhances personnel safety for workers. As indicated by these examples, the Company is aggressively pursuing innovation and technology.

Q. CAN YOU COMMENT ON THE COMPANY'S EFFORTS TO MAINTAIN AND IMPROVE CYBER SECURITY?

A. Yes. DEC operates under a Cyber Security Plan approved by the NRC. The activities outlined by the Company within its Cyber Security Plan include examining current practices, developing cyber security program processes, reviewing critical digital assets, performing validation testing, and implementing new controls. The DEC nuclear plants assess cyber threats and vulnerabilities and make improvements on an ongoing basis. The Nuclear Generation organization maintains dedicated resources for these key protective actions and works with enterprise cyber security experts, the NRC, Department of Homeland Security, and other law enforcement agencies. Additionally, the Company partners with nuclear organizations such as the Nuclear Energy Institute and the Institute of Nuclear Power Operations and maintains open communications with industry peers. The combination of these actions provides a robust defense.

V. ADDITIONAL NUCLEAR FLEET CONSIDERATIONS

Q. HAS THE COMPANY ATTEMPTED TO LIMIT COST INCREASES FOR CAPITAL ADDITIONS AND O&M EXPENSES?

A. Yes. The Company controls costs for capital projects and O&M utilizing a rigorous cost management program. The Company sustainably controls costs through routine executive oversight of project budget and activity reporting, with new projects requiring approval by progressively higher levels of management depending on total project cost. The Company also controls ongoing capital and O&M costs through strategic planning and procurement, efficient oversight of contractors by a trained and experienced workforce, rigorous monitoring of work quality, thorough critiques to drive out process improvement, and industry benchmarking to ensure best practices are being utilized.

Q. HAS THE COMPANY INCURRED ADDITIONAL O&M OR CAPITAL COSTS DUE TO ANY OTHER REGULATORY OBLIGATIONS SINCE THE 2019 RATE CASE?

A. No. In the 2019 Rate Case, the Company indicated that additional Fukushima and Environmental Protection Agency regulations related to water intake and cooling functions could potentially result in additional O&M and capital expense. Those potential increases have not materialized.

There were no new Fukushima regulatory actions announced since the 2019 Rate Case, and all Fukushima related actions at Catawba, McGuire, and Oconee have been completed.

All three DEC stations have submitted the required study reports related to the EPA water intake and cooling water regulations. Submittals for all three stations demonstrate that all DEC nuclear stations meet the EPA rule requirements. While the South Carolina Department of Health and Environmental Control and the North Carolina Department of Environmental Quality have not yet made final 316(b) compliance determinations, the Company does not anticipate any plant modifications will be required.

Q. DOES THE COMPANY INTEND TO APPLY FOR ANY INFLATION REDUCTION ACT ("IRA") BENEFITS?

A. Yes. The Company intends to pursue the production tax credits afforded by Section 13105 of the IRA. Since the passage of the IRA, the Company has engaged with the Internal Revenue Service and Treasury Department as they develop guidance implementing the IRA.

Q. ARE THERE CURRENT ISSUES IN THE NUCLEAR INDUSTRY THAT MAY FURTHER IMPACT COSTS FOR CAPITAL AND/OR O&M?

A. Yes. For example, as a result of the Russian invasion of Ukraine, supply challenges and increased cost pressures on the procurement of uranium and uranium fuel process services are expected over the next several years. Duke

Energy has always valued diversity of supply and is working with urgency to mitigate these potential impacts.

As I discussed earlier in my testimony, cyber security requires an ongoing effort to maintain defenses against ever increasing technical capabilities of adversaries. The current geopolitical unrest associated with Russian aggression in Ukraine has heightened the threat assessment for critical infrastructure including power generation. Continued diligence is required to ensure reliable operations are not impacted by malicious cyber actors. As cyber risks continue to increase, Company efforts must match these threats. Continued diligence could require deployment of additional resources. As I noted earlier, despite the success of the Company's efficiency initiatives to mitigate cost increases, DEC continues to face upward pressure on O&M costs. The Company is also experiencing supply chain challenges resulting in longer lead times and increased costs for some materials. These challenges have increased as the world begins to exit the pandemic. Efforts to mitigate these challenges include relying on the size and scale of Duke Energy's combined purchasing and contracting scale, partnering with community colleges and universities to ensure that a pool of well-trained candidates is available in our service territories, and developing our existing workforce with training.

Finally, a significant challenge facing the nuclear industry is the cost and technological requirements for modernizing systems and equipment within nuclear stations across the country to ensure safe, reliable, and economical power that emits zero greenhouse gases. Therefore, maintaining the Company's nuclear assets is critical to achieving significant reductions to current and future levels of greenhouse gas emissions.

VI. NUCLEAR OPERATIONAL PERFORMANCE

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

A. The primary objective of DEC's nuclear generation department is to safely provide reliable and cost-effective energy to the Company's customers. The Company achieves this objective by focusing on several key areas. Operations personnel and other station employees are well-trained and execute their responsibilities to the highest standards in accordance with detailed procedures. The Company maintains station equipment and systems reliably, and endeavors to ensure 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 THE COMPANY'S NUCLEAR FLEET DURING THE TEST PERIOD.

A. As in years past, DEC's nuclear fleet continued to perform well during the Test Period, providing approximately 61% of DEC's generation needs. During 2021, DEC's nuclear plants achieved an annual capacity factor of 96.12%, marking the 22nd consecutive year in which DEC's nuclear fleet exceeded a system capacity factor of 90%. The Oconee station and Oconee Unit 1 achieved record annual generation and capacity factors during 2021, and both Oconee Unit 3 and McGuire Unit 1 achieved new annual generation records in 2021. As I mentioned earlier in my testimony, Catawba Unit 1 achieved a fleet record refueling outage duration during the review period and Oconee Unit 2 achieved its shortest ever refueling outage. Additionally, Catawba Unit 2, Oconee Unit 2, and Oconee Unit 3 each had continuous runs between refueling outages during the review period.

These performance results support DEC's continued commitment for achieving high performance without compromising safety and reliability.

Q. WHAT INITIATIVES HAS THE COMPANY TAKEN TO INCREASE EFFICIENCIES IN NUCLEAR OPERATIONS?

A. The Company uses benchmarking, long-range planning, work prioritization tools, innovation, and other processes to continuously improve operational and cost performance. Over the years, the Company has gained efficiencies from the implementation of common policies, practices, and procedures across the Duke Energy nuclear fleet. In addition, efficiencies are sought through incorporation of industry best practices. Since the merger, a focused effort remains on improving fleet performance in various areas, and a focus on organizational effectiveness continues identifying and addressing work improvements. The goal is aligning operations at a fleet level, taking advantage of shared experiences and process improvement opportunities. Overall, improvement efforts result in enhanced fleet reliability and efficiency on a cost per kWh basis.

Q. HOW DOES THE DUKE ENERGY NUCLEAR FLEET COMPARE TO OTHERS IN THE INDUSTRY?

A. The Company's nuclear fleet has a history of top performance. The most recently published North American Electric Reliability Council's ("NERC") Generating Unit Statistical Brochure ("NERC Brochure")[4] indicates an average capacity factor of 91.87% for comparable units representing the period 2017 through 2021. The Company's Test Period capacity factor of 96.12% exceeds the NERC average of 91.87%.

Duke Energy's nuclear fleet continues to rank among the top performers when compared to the seven other large domestic nuclear fleets using Key Performance Indicators ("KPIs") in the areas of personal safety, radiological dose, manual and automatic shutdowns, capacity factor, forced loss rate, industry performance index, and total operating cost. The Duke Energy nuclear fleet achieved the lowest Total Operating Cost per MWh for five of the past six years compared to other U.S. nuclear fleet operations. Industry benchmarking efforts are a principal technique used by the Company to ensure best practices.

[4] The most recent GADs Generating Unit Statistical Brochure, published in August 2022, represents years 2017 – 2021.

These efforts further ensure overall prudence, safety and reliability of DEC's nuclear units.

VIII. <u>PROPOSED MULTIYEAR RATE PLAN CAPITAL ADDITIONS</u>

Q. DOES THE COMPANY'S PROPOSED MYRP INCLUDE NUCLEAR PROJECTS?

A. Yes. Thirty-three nuclear projects are included in the Company's proposed MYRP.

Q. WHAT PROCESS AND CRITERIA DID THE COMPANY USE TO SELECT THESE PROJECTS FOR INCLUSION IN THE PROPOSED MYRP?

A. The Company selected the projects for inclusion in the proposed MYRP based on the value of the projects in maintaining safe and reliable operation of the nuclear stations in combination with having a high level of confidence in both the cost estimates and schedule for the projects.

Q. HOW WERE THE PROJECTED COSTS FOR THE PROJECTS CALCULATED?

A. The projected costs for the nuclear projects included in the proposed MYRP were obtained from the Company's long-range nuclear planning tool, which is updated regularly to reflect the most accurate total project costs (including AFUDC and contingency), cash flows, and schedule, as required by Commission Rule R1-17B(d)(2)j.

Q. WERE ANY OF THESE PROJECTS PRESENTED AT THE NOVEMBER 2, 2022 TECHNICAL CONFERENCE HELD IN THIS PROCEEDING?

A. No. The technical conference addressed only the transmission and distribution ("T&D") projects in the proposed MYRP, and none of the nuclear projects are T&D.

Q. WILL ANY OF THE NUCLEAR MYRP PROJECTS REQUIRE A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FROM THE COMMISSION?

A. No.

Q. DO ANY OF THE PROJECTS OFFER PROJECTED OPERATING BENEFITS?

A. The qualitative benefits of completing all of the MYRP projects are that they will enable DEC to maintain safe and reliable operation of the nuclear stations, including aging systems and equipment. Several of these MYRP projects that address reliability, aging and obsolesce, as well as projects in-service in this case, will produce benefits including avoided maintenance and deferred inspection activities. These projects enable the ongoing efficiencies that the Nuclear organization has achieved. The specific benefits of each project are presented in further detail in Capps Exhibit 1.

Q. IN YOUR VIEW, IS THE COMPANY'S DECISION TO INVEST IN THESE PROJECTS PRUDENT, JUST, AND REASONABLE FOR THE PROVISION OF SAFE AND RELIABLE ELECTRIC SERVICE TO CUSTOMERS AND IN THE PUBLIC INTEREST?

A. Yes. The Company has prudently and reasonably selected these projects for investment as they will enable DEC to maintain the nuclear fleet in reliable and efficient condition for the benefit of customers.

Q. WILL YOU PLEASE PROVIDE ADDITIONAL DETAIL REGARDING THE NUCLEAR MYRP PROJECTS?

A. Yes. In this section of my testimony I will present additional details regarding these projects. I will first discuss the DEC projects applicable to all stations, and then will discuss remaining projects organized by station. Capps Exhibit 1 provides additional details regarding projected cost, schedule, and scope for each project, as well as the reason for each project, as required by Commission Rule R1-17B(d)(2)j.

Q. WHAT MYRP CAPITAL INVESTMENTS IS THE COMPANY PROPOSING TO MAKE ACROSS THE NUCLEAR FLEET?

A. The Company is proposing to execute two fleet-wide projects: 1) operational data process book replacement, and 2) fleet firewall replacement. The operational data process book replacement project will upgrade the fleet's existing system used to track and analyze station system and equipment performance using real-time data. This upgrade will replace the currently used obsolete software with a version that can receive vendor technical support and continue to receive the latest cyber security patches. This upgrade will also be applied to the Duke Energy nuclear stations in the DEP fleet. The fleet firewall replacement project will upgrade the existing firewall used for all Duke Energy nuclear stations in both the DEC and DEP fleets with a new firewall that provides additional protection and functionality.

Q. WHAT MYRP CAPITAL INVESTMENTS IS THE COMPANY PROPOSING TO MAKE AT CATAWBA STATION?

A. The Catawba station is executing multiple projects that will allow both operating units to maintain reliability of various station systems and equipment.

For example, both Catawba units will replace the high pressure turbine nozzles and diaphragms. This original plant equipment has been experiencing increased wear since 2015 attributed to age-related degradation over its life cycle. Replacement of the nozzles and diaphragms will prevent additional high pressure turbine efficiency losses, which would impact the ability of downstream equipment to operate in the most effective and efficient manner. Additionally, both Catawba units will be replacing the main power protective relays that are original plant equipment that has reached end-of-life and are obsolete. The relays are being replaced with a more robust design that is compliant with the NERC standards and will improve the relays' reliability to help ensure continued reliable operations of the Catawba station.

Catawba Unit 1 will also replace its '1A' main step-up transformer. This transformer has reached the end of its service life and is being replaced to ensure continued safe and reliable operations of Catawba Unit 1. A failure of this transformer would result in an unplanned outage and could result in damage to surrounding equipment.

Q. WHAT MYRP CAPITAL INVESTMENTS IS THE COMPANY PROPOSING TO MAKE AT MCGUIRE STATION?

A. The McGuire station is executing multiple projects that will allow the site to maintain safe and reliable operation. Both of the station's units will replace the moisture separator reheaters ("MSR"), which have operated beyond their expected design life. The replacement of the MSRs mitigates the risk of an equipment failure that would lead to an unplanned power reduction and an extended unit shutdown to emergently repair or replace.

McGuire Unit 1 will also replace the turbine controls system ("TCS"), which has been in-service since 1990. The new TCS will eliminate multiple single point vulnerabilities with the turbine-generator and allow for continued reliable operations.

Q. WHAT MYRP CAPITAL INVESTMENTS IS THE COMPANY PROPOSING TO MAKE AT OCONEE STATION?

A. The Oconee station is executing multiple projects that will allow the site to maintain safe and reliable operation. Oconee Unit 3 will replace the '3A1' and '3B2' high pressure feedwater heaters, which are original plant equipment and have operated beyond their originally expected design life. The replacement of these feedwater heaters will mitigate the chance of the equipment experiencing an age-related failure, which would result in an unplanned unit shutdown or an extended unit derate while a replacement is procured and installed. Additionally, a failed feedwater heater has the potential to send debris downstream that could impact the performance of other equipment.

Oconee Unit 1 and Oconee Unit 3 will also be replacing Alloy 600 piping nozzles that are subject to primary water stress corrosion cracking ("PWSCC"). A failure of these piping nozzles would lead to an unplanned shutdown to execute repairs. The proactive replacement of these nozzles will prevent failure due to PWSCC and ensure continued reliable operations of Oconee 1 and Oconee 3.

VIII. CONCLUSION

Q. IS THERE ANYTHING YOU WOULD LIKE TO SAY IN CLOSING?

A. Yes. The Company has a proven history of cost competitive operation of its nuclear assets concurrent with maintaining safety, quality, and reliability. DEC is positioned to continue as a leader in the industry with a solid base of knowledge and experience, and with a nuclear fleet that is highly efficient and reliable. This base rate increase will allow the Company to continue the tradition of operational excellence and focus on safe operations, reliable generation, and strong performance that ultimately benefits our customers. The MYRP projects that the Company is seeking approval of in this case will do the same over the next several years as DEC continues to transition toward a cleaner energy future.

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

A. Yes.

DUKE ENERGY CAROLINAS
MYRP PROJECT LIST
DOCKET NO. E-7 Sub 1276

Witness **Steven Capps**
Exhibit **1**

Line No.	MYRP Project Name	FERC Function	Forecasted In-Service Date	Project Description & Scope	Reason for the Project	Total Project Amount (System): Projected In-Service Costs	Total Project Amount (System): Projected Annual Net O&M	Total Project Amount (System): Projected Installation O&M
1	Catawba Nuclear Station Main Step-Up Transformer Replacement	Nuclear Plant in Service	Oct-24	Replace the Catawba Nuclear Station '1A' main step-up (MSU) transformer.	The Catawba '1A' MSU transformer has reached the end of its service life and needs to be replaced to support continued safe and reliable operations of Catawba Unit 1. A failure of the MSU transformer would result in an extended forced outage and could result in damage to surrounding equipment	$ 4,003,909	$ (10,000)	$ 4,794
2	Catawba Nuclear Station Unit 1 High Pressure Turbine Nozzles and Diaphragms Replacement	Nuclear Plant in Service	Oct-24	Replace the existing Catawba Nuclear Station Unit 1 high pressure turbine (HPT) nozzles and diaphragms.	The Catawba Unit 1 HPT has been experiencing wear on the nozzles and diaphragms since 2015, which is attr buted to age-related degradation over the life cycle of this original plant equipment. If these nozzles and diaphragms are not replaced, the Catawba Unit 1 HPT will experience additional losses in HPT efficiency and will impact the ability of downstream equipment to operate in the most effective and efficient manner. Additionally, the replacement of these nozzles and diaphragms will allow for continued reliable operation of Catawba Unit 1 in the future.	$ 3,369,410	$ -	$ 332

Line No.	MYRP Project Name	FERC Function	Forecasted In-Service Date	Project Description & Scope	Reason for the Project	Total Project Amount (System): Projected In-Service Costs	Total Project Amount (System): Projected Annual Net O&M	Total Project Amount (System): Projected Installation O&M
3	Catawba Nuclear Station Unit 1 Protective Relay Replacements	Nuclear Plant in Service	Dec-24	Replace the Catawba Nuclear Station Unit 1 Zones A and B protective relays with new multifunction digital relays during the 2023 refueling outage.	The main power protective relays are the original electromechanical relays installed during plant construction, have reached end of life, and become obsolete. These relays are being replaced to comply with NERC Standard PRC-005-2 (FERC Order No. 793). The new relay design is more robust and will improve the relays' reliability to help ensure continued reliable operation of Catawba Unit 1.	$ 1,302,455	$ -	$ 84,964
4	Catawba Nuclear Station Unit 1 Reactor Coolant Pump Motors Replacement	Nuclear Plant in Service	Oct-24	Replace the Catawba Nuclear Station '1B' and '1C' reactor coolant pump (NCP) motors.	The reactor coolant pumps are required to ensure safe and reliable operations of Catawba Unit 1. The NCP motors are refurbished on a time-based frequency to ensure reliable operations of these pumps. Failure to replace the motors greatly increases the chances of a motor failure, which would require an extended unit shutdown to repair/replace.	$ 1,211,914	$ -	$ 153,600

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5	Catawba Nuclear Station Unit 1 Reactor Coolant Pump Seals Replacement (2024)	Nuclear Plant in Service	Oct-24	Replace the Catawba Nuclear Station Unit 1 reactor coolant pump (NCP) seals as part of the site's preventive maintenance program for this equipment during the 2024 refueling outage.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of Catawba Unit 1.	$ 229,634	$ -	$ -
6	Catawba Nuclear Station Unit 1 Reactor Coolant Pump Seals Replacement (2026)	Nuclear Plant in Service	Apr-26	Replace the Catawba Nuclear Station Unit 1 reactor coolant pump (NCP) seals as part of the site's preventive maintenance program for this equipment during the 2026 refueling outage.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of Catawba Unit 1.	$ 247,291	$ -	$ -

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7	Catawba Nuclear Station Unit 2 High Pressure Turbine Nozzles and Diaphragms Replacement	Nuclear Plant in Service	Apr-24	Replace the existing Catawba Nuclear Station Unit 2 high pressure turbine (HPT) nozzles and diaphragms.	The Catawba Unit 2 HPT has been experiencing wear on the nozzles and diaphragms since 2015, which is attr buted to age-related degradation over the life cycle of this original plant equipment. If these nozzles and diaphragms are not replaced, the Catawba Unit 2 HPT will experience additional losses in HPT efficiency and will impact the ability of downstream equipment to operate in the most effective and efficient manner. Additionally, the replacement of these nozzles and diaphragms will allow for continued reliable operation of Catawba Unit 2 in the future.	$ 2,530,494	$ -	$ -
8	Catawba Nuclear Station Unit 2 Nuclear Service Water Pumps Replacement	Nuclear Plant in Service	Oct-25	Replace the Catawba Nuclear Station Unit 2 nuclear service water (RN) pumps	The RN pumps are required to safely operate the plant and are replaced on an eight refueling cycle frequency in order to ensure reliability. If the RN pumps become inoperable and extended unit shudown is required to make emergent repairs. The replacement of these pumps is a preventive maintenance activity to ensure continued safe and reliable operations of the station.	$ 280,573	$ -	$ -

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9	Catawba Nuclear Station Unit 2 Protective Relay Replacements (2024)	Nuclear Plant in Service	Apr-24	Replace the Catawba Nuclear Station Unit 2 Zones A and B protective relays with new multifunction digital relays during the 2024 refueling outage.	The main power protective relays are the original electromechanical relays installed during plant construction, have reached end of life, and become obsolete. These relays are being replaced to comply with NERC Standard PRC-005-2 (FERC Order No. 793). The new relay design is more robust and will improve the relays' reliability to help ensure continued reliable operation of Catawba Unit 2.	$ 1,178,796	$ -	$ -
10	Catawba Nuclear Station Unit 2 Protective Relay Replacements (2025)	Nuclear Plant in Service	Oct-25	Replace the Catawba Nuclear Station Unit 2 Zones A and B protective relays with new multifunction digital relays during the 2025 refueling outage.	The main power protective relays are the original electromechanical relays installed during plant construction, have reached end of life, and become obsolete. These relays are being replaced to comply with NERC Standard PRC-005-2 (FERC Order No. 793). The new relay design is more robust and will improve the relays' reliability to help ensure continued reliable operation of Catawba Unit 2.	$ 1,416,459	$ -	$ 72,009
11	Catawba Nuclear Station Unit 2 Reactor Coolant Pump Motors Replacement	Nuclear Plant in Service	Apr-24	Replace the Catawba Nuclear Station '2A' and '2C' reactor coolant pump (NCP) motors.	The reactor coolant pumps are required to ensure safe and reliable operations of Catawba Unit 2. The NCP motors are refurbished on a time-based frequency to ensure reliable operations of these pumps. Failure to replace the motors greatly increases the chances of a motor failure, which would require an extended unit shutdown to repair/replace.	$ 1,217,037	$ -	$ 307,200

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Exhibit 1

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12	Catawba Nuclear Station Unit 2 Reactor Coolant Pump Seals Replacement	Nuclear Plant in Service	Oct-25	Replace the Catawba Nuclear Station Unit 2 reactor coolant pump (NCP) seals as part of the site's preventive maintenance program for this equipment.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of Catawba Unit 1.	$ 235,587	$ -	$ -
13	Fleet Firewall Replacement	Nuclear Plant in Service	Dec-25	Replace the Adaptive Security Appliance (ASA) 5555-X firewalls at each of the Duke Energy Carolinas (DEC) sites (Catawba, McGuire, and Oconee).	This project will upgrade the existing firewall used for all Duke Energy nuclear stations in both the DEC and DEP fleets with a new firewall meeting the latest cyber security requirements. The new firewall maintains cyber security of digital assets and allows for continued compliance with cyber security regulations.	$ 19,854,388	$ -	$ -

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14	Fleet Operational Data Process Book Replacement	Nuclear Plant in Service	Dec-25	Replace the Operational Data Process Book software at each of the Duke Energy Carolinas (DEC) nuclear sites (Catawba, McGuire, and Oconee).	The Process Book application is used by all nuclear departments (e.g., engineering, operations, maintenance, etc.) to track and analyze station system and equipment performance using real-time data. The existing software is obsolete, and the vendor no longer provides technical support. This upgrade will replace the software that is currently in use with a version that can receive vendor technical support and be updated with the latest cyber security patches. Note, this upgrade will also be applied to the Duke Energy Progress (DEP) nuclear stations (Brunswick, Harris, and Robinson).	$ 15,985,914	$ -	$ -
15	McGuire Nuclear Station Ice Condenser Refrigeration	Nuclear Plant in Service	Dec-24	Replace the McGuire Nuclear Station ice condenser refrigeration (NF) chillers	The NF chillers are degraded and are beyond their recommended service life. These chillers maintain ice bed temperatures within Technical Specification (TS) limits. Failure of the chillers could lead to exceeding the TS limit for ice bed temperature, requiring shutdown. In addition, failure of the chillers leads to freeze-thaw cycles that damage the ice and the supporting ice bed structure, which require extensive maintenance repairs during refueling outages. In order to maintain reliability of the ice condenser system, and allow continued operations into the future, replacement of this equipment is required.	$ 5,989,942	$ -	$ -

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16	McGuire Nuclear Station Unit 1 Moisture Separator Reheaters Replacement	Nuclear Plant in Service	Dec-26	Replace the six moisture separator reheaters (MSRs) at McGuire Nuclear Station Unit 1.	The McGuire Unit 1 MSRs have operated beyond their recommended design life and require replacement due to equipment degradation primarily caused by steam cutting on the internal components. Failure of an MSR would lead to a unit derate and an extended shutdown for repair, as well as creating a risk of debris traveling downstream and damaging the turbine. Replacing the MSRs would reset the life of the equipment and to allow reliable operation in the future. In addition, replacing the MSRs allows for a reduced equipment inspection frequency and is anticipated to result in a 8-10 MW recapture of thermal efficiency losses.	$ 54,756,802	$ -	$ -
17	McGuire Nuclear Station Unit 1 Nuclear Service Water Pump Motor Inspections and Replacement	Nuclear Plant in Service	Apr-25	Inspection and replacement of the McGuire Nuclear Station Unit 1 nuclear service water (RN) pump motors.	The RN pump motors are safety-related equipment required to safely operate the plant. These motors are reaching the end of their 15-year replacement interval and a failure to replace the motors will lead to an increased likelihood of the plant experiencing an unplanned derate or shutdown. Replacement of these motors is required to ensure continued safe and reliable operations.	$ 2,316,328	$ -	$ -

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Exhibit 1

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18	McGuire Nuclear Station Unit 1 Polar Crane Motor and Controls Upgrade	Nuclear Plant in Service	Jul-24	Replace the McGuire Nuclear Station Unit 1 polar crane motors and controls with upgraded controls, controllers, and motors.	The polar crane motors and controls are obsolete and replacement parts are no longer available. The cranes have been experiencing an increase in parts failures and malfunctions due to the age-related degradation of the equipment. These cranes are required to execute work during refueling outages and a failure of the motors or controls could lead to unplanned refueling outage extensions due to the need to make emergent repairs.	$ 8,484,482	$ -	$ -
19	McGuire Nuclear Station Unit 1 Reactor Coolant Pump Seal 1A Replacement	Nuclear Plant in Service	Sep-26	Replacement of the McGuire Nuclear Station '1A' reactor coolant pump seal as part of the site's preventive maintenance program for this equipment.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of McGuire Unit 1.	$ 1,408,130	$ -	$ -

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20	McGuire Nuclear Station Unit 1 Reactor Coolant Pump Seal 1C Replacement	Nuclear Plant in Service	Mar-25	Replacement of the McGuire Nuclear Station '1C' reactor coolant pump seal as part of the site's preventive maintenance program for this equipment.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of McGuire Unit 1.	$ 1,328,868	$ -	$ -
21	McGuire Nuclear Station Unit 1 Turbine Controls Replacement	Nuclear Plant in Service	May-25	Replace the McGuire Nuclear Station Unit 1 turbine controls system (TCS)	The existing TCS was installed in 1990. In 2009 an engineering vulnerability assessment identified 26 components in the main turbine control system per operating unit as single point vulnerabilities (SPVs). These have resulted in previous unit trips, operation at reduced power, and load swings. The replacement of the Unit 1 TCS will eliminate the SPVs and allow for continued reliable operation.	$ 13,092,286	$ -	$ -

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22	McGuire Nuclear Station Unit 2 Component Cooling Pump Motor Inspections and Replacement	Nuclear Plant in Service	Sep-24	Inspection and replacement of the McGuire Nuclear Station Unit 2 component cooling (KC) pump motors.	The KC pump motors are required to safely operate the plant and the motors have been operating beyond the industry recommended time. Failure to replace the motors will lead to a failure and the plant will enter a 72-hour technical specification (TS) action. Due to the location and difficulty in accessing these motors, it is anticipated that repairs cannot be made within the 72-hour window and an unplanned shutdown would be required. Replacement of these motors is required to ensure continued safe and reliable operations.	$ 2,581,220	$ -	$ -
23	McGuire Nuclear Station Unit 2 Lower Containment 2B and 2C Air Handling Unit Coils Replacement	Nuclear Plant in Service	Apr-26	Replace the McGuire Nuclear Station Unit 2 lower containment component vent '2B' and '2C' air handling unit (AHU) coils.	The containment lower compartment ventilation system (VL) is required in order to meet Technical Specification (TS) temperature limits for lower containment. Failure to maintain the VL air handlers will eventually lead to excessive leakage caused by flow accelerated corrosion and could result in an unplanned shutdown if the TS temperature limits cannot be met. AHU coil leakage has been degrading as the equipment ages and replacement is needed to ensure reliabilty of the system and avoid unplanned generation losses.	$ 4,887,503	$ -	$ -

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Exhibit 1

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24	McGuire Nuclear Station Unit 2 Lower Containment 2D Air Handling Unit Coils Replacement	Nuclear Plant in Service	Sep-24	Replace the McGuire Nuclear Station Unit 2 lower containment component vent '2D' air handling unit (AHU) coils	The containment lower compartment ventilation system (VL) is required in order to meet Technical Specification (TS) temperature limits for lower containment. Failure to maintain the VL air handlers will eventually lead to excessive leakage caused by flow accelerated corrosion and could result in an unplanned shutdown if the TS temperature limits cannot be met. AHU coil leakage has been degrading as the equipment ages and replacement is needed to ensure reliabilty of the system and avoid unplanned generation losses.	$ 3,784,693	$ -	$ -
25	McGuire Nuclear Station Unit 2 Moisture Separator Reheaters Replacement	Nuclear Plant in Service	Dec-26	Replace the six moisture separator reheaters (MSRs) at McGuire Nuclear Station Unit 2.	The McGuire Unit 2 MSRs have operated beyond their recommended design life and require replacement due to equipment degradation primarily caused by steam cutting on the internal components. Failure of an MSR would lead to a unit derate and an extended shutdown for repair, as well as creating a risk of debris traveling downstream and damaging the turbine. Replacing the MSRs would reset the life of the equipment and to allow reliable operation in the future. In addition, replacing the MSRs allows for a reduced equipment inspection frequency and is anticipated to result in a 8-10 MW recapture of thermal efficiency losses.	$ 47,255,148	$ -	$ -

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26	McGuire Nuclear Station Unit 2 Reactor Coolant Pump Seal 2C Replacement	Nuclear Plant in Service	Sep-24	Replacement of the McGuire Nuclear Station '2C' reactor coolant pump seal as part of the site's preventive maintenance program for this equipment.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of McGuire Unit 2.	$ 1,331,952	$ -	$ -
27	McGuire Nuclear Station Unit 2 Reactor Coolant Pump Seal 2D Replacement	Nuclear Plant in Service	Mar-26	Replacement of the McGuire Nuclear Station '2D' reactor coolant pump seal as part of the site's preventive maintenance program for this equipment.	Reactor coolant pump seals serve as a pressure boundary for a nuclear power generating station's primary coolant system. These seals are replaced on a time-based frequency, recommended by the manufacturer, in order to maintain the integrity of the pressure boundary. Failure of the seals would require an unplanned unit shutdown, emergent seal repair, and could lead to a loss of coolant accident (LOCA). Replacement of these seals at the recommended frequency helps to ensure safe and reliable operations of McGuire Unit 2.	$ 1,408,025	$ -	$ -

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28	Oconee Nuclear Station Feedwater Heaters Replacement	Nuclear Plant in Service	May-24	Replace the Oconee Nuclear Station Unit 3 '3A1' and '3B2' high pressure feedwater heaters (FWH).	The 3A1/3B2 feedwater heaters at Oconee Nuclear Station are original equipment and have operated beyond their design life. These feedwater heaters are carbon steel and an outlier in the industry (most feedwater heaters are stainless steel). In 2014 the Oconee Unit 1 '1A2' FWH, which has the same design, failed resulting in an unplanned outage and an extended unplanned unit derate until replacement could be completed. Additionally, a FWH failure could send debris downstream, damaging other components. Replacement of the 3A1/3B2 FWHs is required to ensure continued reliabile operations of Oconee Unit 3.	$ 17,468,302	$ -	$ -
29	Oconee Nuclear Station Unit 1 Alloy 600 Nozzles Replacement	Nuclear Plant in Service	Nov-24	Replace nozzles made from an Alloy 600 material on the primary coolant piping at Oconee Nuclear Station Unit 1.	Primary water stress corrosion cracking (PWSCC) associated with Alloy 600 components is a known issue in the nuclear power generation industry. The Oconee Unit 1 flow meter weld bosses are nozzles that are subject to PWSCC development. A failure of these nozzles require an unplanned outage to repair the piping and continue to be operational. Proactive replacement is needed for these nozzles to prevent failure and ensure continued reliable operation of Oconee Unit 1.	$ 8,367,056	$ -	$ -

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30	Oconee Nuclear Station Unit 1 Reactor Coolant Pump Motor Replacement	Nuclear Plant in Service	Dec-24	Replace the Oconee Nuclear Station Unit 1 reactor coolant pump (RCP) motor	The reactor coolant pumps are required to ensure safe and reliable operations of Oconee Unit 3. The motors are refurbished on a time-based frequency to ensure reliable operations of these pumps. Failure to replace the motors greatly increases the chances of a motor failure, which would require an extended unit shutdown to repair/replace.	$ 2,179,849	$ -	$ -
31	Oconee Nuclear Station Unit 3 Alloy 600 Nozzles Replacement	Nuclear Plant in Service	May-24	Replace nozzles made from an Alloy 600 material on the primary coolant piping at Oconee Nuclear Station Unit 3.	Primary water stress corrosion cracking (PWSCC) associated with Alloy 600 components is a known issue in the nuclear power generation industry. The Oconee Unit 3 resistance temperature elements (RTEs) are nozzles that are subject to PWSCC development. A failure of an RTE requires an unplanned outage to repair the piping and continue to be operational. Proactive replacement is needed for these nozzles to prevent failure and ensure continued reliable operation of Oconee Unit 3.	$ 8,677,495	$ -	$ -
32	Oconee Nuclear Station Unit 3 Reactor Coolant Pump Motor Replacement	Nuclear Plant in Service	Dec-24	Replace the Oconee Nuclear Station Unit 3 reactor coolant pump (RCP) motor	The reactor coolant pumps are required to ensure safe and reliable operations of Oconee Unit 3. The motors are refurbished on a time-based frequency to ensure reliable operations of these pumps. Failure to replace the motors greatly increases the chances of a motor failure, which would require an extended unit shutdown to repair/replace.	$ 2,334,948	$ -	$ -

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33	Oconee Subsequent License Renewal	Nuclear Plant in Service	Feb-24	The development, submittal, review, and approval of a Subsequent License Renewal (SLR) Request for the Oconee Nuclear Station that will allow for operations of each operating unit up to 80 years.	Obtaining subsequent license renewal for all three of the Oconee Nuclear Station operating units provides Duke Energy with a strategic position for the future operations of the station beyond the 2033-2034 timeframe. SLR approval provides Duke Energy with the ability to utilize existing carbon free generation for up to an additional 20 years beyond the current license.	$ 50,049,523	$ -	$ -
	TOTALS					**$ 290,766,410**	**$ (10,000)**	**$ 622,899**