BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2013-1-E

In the Matter of Annual Review of Base Rates for Fuel Costs for Duke Energy Progress, Inc.	))))	**DIRECT TESTIMONY OF** **T. PRESTON GILLESPIE JR. FOR** **DUKE ENERGY PROGRESS, INC.**

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is T. Preston Gillespie Jr. and my business address is 526 South Church Street, Charlotte, North Carolina.

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

A. I am Senior Vice President of Nuclear Operations for Duke Energy Carolinas, LLC ("DEC"). I have executive accountability for the Oconee Nuclear Station ("Oconee") in Seneca, South Carolina and Duke Energy Progress, Inc.'s ("DEP" or the "Company") Robinson Nuclear Generating Station ("Robinson") near Hartsville, South Carolina.

Q. WHAT ARE YOUR RESPONSIBILITIES AS SENIOR VICE PRESIDENT OF NUCLEAR OPERATIONS FOR OCONEE AND ROBINSON?

A. As Senior Vice President of Nuclear Operations for Oconee and Robinson, I am responsible for providing executive oversight for the safe and reliable operation of those nuclear stations.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor's degree in Mechanical Engineering from Clemson University. I am a registered professional engineer in South Carolina, and held a senior operator license from the U.S. Nuclear Regulatory Commission ("NRC"). I began my career with DEC (d/b/a Duke Power) in 1986 as an assistant engineer at Oconee. Since that time, I have held various roles of increasing responsibility in engineering, work management, and operations, including operations shift manager, and nuclear engineering manager in 2004 responsible for managing the nuclear and electrical

engineering activities at Oconee. I was named operations manager at Catawba Nuclear Station in 2007, and in 2008 I became plant manager at Oconee, transitioning to site vice president in September 2010. I assumed my current role in March 2013.

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

A. The purpose of my testimony is to describe and discuss the performance of Brunswick Nuclear Station ("Brunswick"), Shearon Harris Nuclear Station ("Harris"), and Robinson for the period of March 1, 2012 through February 28, 2013 ("review period").

Q. YOUR TESTIMONY INCLUDES THREE EXHIBITS. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes. These exhibits were prepared at my direction and under my supervision.

Q. PLEASE PROVIDE A DESCRIPTION OF THE EXHIBITS.

A. The exhibits and descriptions are as follows:

Gillespie Exhibit 1 - Calculation of the nuclear capacity factor for the review period pursuant to S.C. Code Ann. § 58-27-865

Gillespie Exhibit 2 - Nuclear outage data for the review period

Gillespie Exhibit 3 - Nuclear outage data for the billing period[1]

[1] This data is provided in confidential and publicly redacted versions for security purposes.

Q. PLEASE DESCRIBE DEP'S NUCLEAR GENERATION PORTFOLIO.

A. The Company's nuclear generation portfolio consists of approximately 3,050 megawatts ("MWs") of generating capacity, made up as follows:

Brunswick - 1,527 MWs [2]

Harris - 778 MWs [3]

Robinson - 741 MWs

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

A. The Company's nuclear fleet consists of three generating stations and a total of four units. Brunswick is a boiling water reactor facility with two units located just north of Southport, North Carolina, 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 June 2006 by the NRC, extending operations up to 2036 and 2034 for Units 1 and 2, respectively. Harris, located in New Hill, North Carolina, is a pressurized water reactor that began commercial operation in 1987. The NRC issued a renewed license for Harris in 2008, extending operations up to 2046. Brunswick and Harris are jointly owned with the North Carolina Eastern Municipal Power Agency. Robinson is a single unit pressurized water reactor located near Hartsville, South Carolina that began commercial operation in 1971. The license renewal for Robinson Unit 2 was issued by the NRC in 2004, extending operation for Robinson up to 2030.

[2] Represents DEP's ownership share of 81.67%.
[3] Represents DEP's ownership share of 83.83%.

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 Carolinas customers. The Company achieves this objective by focusing on a number of 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 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 REVIEW PERIOD.

A. Overall, DEP's nuclear stations operated well during the review period, and supplied 46.1% of the power used by its Carolinas customers. The four nuclear units operated at an actual system average capacity factor of 90.5%, with Robinson Unit 2 achieving an actual capacity factor of 97.5%, and Brunswick Unit 2 achieving 97.1%. Brunswick Unit 2 also set a 2012 annual net generation record of 7,987,810 MW hours ("MWh"), no small feat considering it is nearing its 40-year anniversary of commercial operation. This mark bests Robinson's previous net generation record of 7,854,238 MWhs. Harris completed a breaker-to-breaker run of 525 days leading into the spring refueling and maintenance outage that began on April 21,

2012, and marked a milestone in May with 25 years of reliable operations. The Company added approximately 50 MWs of capacity during the spring 2012 refueling and maintenance outages at Harris and Robinson as part of a continuing uprate effort. Brunswick also successfully completed an evaluated exercise to test the station's Emergency Response Organization in August 2012. This is an NRC and Federal Emergency Management Agency test that is conducted every two years.

The Company continues to look for ways to improve the operations of its nuclear fleet, which, as shown on Gillespie Exhibit 1, achieved a net nuclear capacity factor, excluding reasonable outage time pursuant to S.C. Code Ann. § 58-27-865(F) of the Code of Laws of South Carolina ("Code"), of 102.96% for the review period. This capacity factor is above the 92.5% set forth in this section of the Code, which states in pertinent part:

> There shall be a rebuttable presumption that an electrical utility made every reasonable effort to minimize cost associated with the operation of its nuclear generation facility or system, as applicable, if the utility achieved a net capacity factor of ninety-two and one-half percent or higher during the period under review. The calculation of the net capacity factor shall exclude reasonable outage time associated with reasonable refueling, reasonable maintenance, reasonable repair, and reasonable equipment replacement outages; the reasonable reduced power generation experienced by nuclear units as they approach a refueling outage; the reasonable reduced power generation experienced by nuclear units associated with bringing a unit back to full power after an outage....

The performance results discussed above support the Company's continued commitment for achieving high performance without compromising safety and reliability.

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

A. In general, refueling requirements, maintenance requirements, prudent maintenance practices, and NRC operating requirements impact the availability of DEP's nuclear system. The Company's scheduling philosophy is to plan for a best possible outcome with minimal contingency days included in the outage plan. When an extension is necessary, however, DEP believes that such extensions prepare the facility for longer continuous run times and fewer forced outages following the refueling and maintenance outage, thereby reducing fuel costs borne by customers. Therefore, if an unanticipated issue that has the potential to become an on-line reliability issue is discovered while a unit is off-line for a scheduled outage, the outage is typically extended to perform necessary maintenance or repairs prior to returning the unit to service. 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. WERE OUTAGE EXTENSIONS REQUIRED DURING THE REVIEW PERIOD FOR REFUELING AND MAINTENANCE OUTAGES THAT OCCURED AT DEP'S NUCLEAR FACILITIES?

A. Yes, there were three refueling and maintenance outages during the review period and additional time was required for each of these outages to complete activities needed for on-line reliability. The spring 2012 refueling and maintenance outage on Brunswick Unit 1 required just under a 20-day extension, most notably due to

completing jet pump plug installation, tool failures with vessel visual inspection activities, and major rebuild work on the main steam isolation valves. Other major work completed during the Unit 1 outage at Brunswick included installation of an alternate decay heat removal system and significant electrical system reliability improvements, including switchyard and grid breaker, insulator, and relay upgrades. The Company also installed a new reactor coolant pump seal filtration system, completed chemical cleaning of several plant systems to reduce piping radiation levels, performed significant inspection and piping replacement activities supporting the extended life of the plant, and completed major upgrades to main steam isolation valves including guide pad modifications and stem bushing upgrades.

The refueling and maintenance outage for Unit 1 at Harris began in April 2012 and required an additional day for nozzle repairs due to indications detected during the vessel head inspection performed within the outage. Activities completed also included replacement of the high pressure turbine, the main transformer, and the turbine lube oil cooler and piping. The team also completed (1) a modification for the isophase bus duct, (2) a reactor vessel cold leg inspection, and (3) replacements of the emergency diesel generator governor, safety inverter, and emergency service water pumps and motor. The high pressure turbine is part of DEP's nuclear uprate program which also includes replacement of the moisture separator reheater and low pressure turbines scheduled in upcoming refueling outages. These major equipment replacements not only improve reliability, but also improve efficiency and generation output, which is a direct benefit to customers.

Robinson began a refueling and maintenance outage in January 2012 for Unit 2 which was extended by 16 days primarily due to significant scope addition required to address unit reliability. The scope change included mitigation of single point vulnerability ("SPVs") to reactor trips such as equipment failures. A total of 283 SPVs have been mitigated in the last two years and another 300 have been identified and are being reviewed for proper mitigation methodology. Major work completed during this outage also included a 10-year reactor vessel inspection per 10 CFR 50.55 of the American Society of Mechanical Engineers Code. Additional major work efforts included replacement of both low pressure turbines, the addition of blade tip and torsional vibration monitoring equipment, replacement of a reactor coolant pump motor, and rewind of motors for main feed, heater drain and condensate pumps.

Q. WHAT MEASURES HAS DEP TAKEN TO MAINTAIN THE GOOD PERFORMANCE OF ITS NUCLEAR FLEET?

A. At Robinson, engineering, operations, and maintenance teams made significant improvements in system and component performance during the spring 2012 refueling and maintenance outage, and more are scheduled for the fall 2013 refueling and maintenance outage. The Company has developed high intensity teams for major modification work planned in the fall 2013 outage, with site leadership providing direct oversight. The Company also has increased staffing levels to industry standards and began a major training and qualification program to ensure high level performance.

At Harris, projects are underway to improve reliability, address end-of-life equipment, and perform upgrades required to comply with current industry standards. Replacement projects include the "C" air compressor, emergency diesel generator governor, and fire detection system. Additionally, DEP is upgrading the start-up transformer oil filled cable - eliminating the underground cable and replacing it with overhead cable to meet updated standards and address environmental concerns with age and leakage.

The Company also has implemented a breaker replacement program at Harris, which is another major effort, along with the replacement of the fire detection system. Upgrades involve controls for the heater drain system, the main turbine, and the electro hydraulic controls. These upgrades advance the control systems to digital format and provide improved performance and reliability, as well as support extended plant life. The reactor vessel head is another replacement project that is driven by industry recommendation to reduce the risk of end-of-life failure.

At Brunswick, safety and plant reliability are also a key focus with industry benchmarking that resulted in the implementation of several innovations in the use of shielding, remote monitoring equipment, and robots to reduce radiation dose. Significant equipment upgrades are underway and an SPV review is in progress to identify and eliminate challenges to reliable plant operations.

Overall, DEP has realized measurable improvement with these efforts. At Brunswick, for example, the implemented emergency diesel generator improvements have reduced the unplanned unavailability by approximately 60% and

main stream improvements have reduced leakage and vulnerabilities that result in significant outage work. At Harris, DEP has had continuous operation since the spring 2012 refueling and maintenance outage. And Robinson achieved upward movement in the INPO performance index, moving from 4th quartile to the industry median, with the opportunity to improve further leading into the fall outage season. In fact, Robinson has operated for over 400 continuous days as of this filing. These examples represent improvements of both equipment and operator performance.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

DUKE ENERGY PROGRESS
SOUTH CAROLINA ANNUAL REVIEW OF BASE RATES FOR FUEL COSTS
NUCLEAR CAPACITY FACTOR PURSUANT TO S.C. CODE ANN. § 58-27-865(F)
REVIEW PERIOD OF MARCH 2012 THROUGH FEBRUARY 2013

1	Nuclear System Actual Net Generation During Review Period	27,747,121	MWH
2a	Total Number of Hours During 2012 portion of Review Period	7,344	
2b	Total Number of Hours During 2013 portion of Review Period	1,416	
3a	Nuclear System MDC During 2012 portion of Review Period	3,494	MW
3b	Nuclear System MDC During 2013 portion of Review Period	3,539	MW
4	Reasonable Nuclear System Reductions	3,832,391	MWH
5	Nuclear System Capacity Factor ((L1+L4)/((L2a*L3a)+(L2b*L3b))*100	102.96	%

DUKE ENERGY PROGRESS
SOUTH CAROLINA ANNUAL REVIEW OF BASE RATES FOR FUEL COSTS
NUCLEAR OUTAGE DATA FOR REVIEW PERIOD OF
MARCH 2012 THROUGH FEBRUARY 2013

Nuclear Outages Lasting One Week Or More - Review Period

Station/Unit	Date of Outage	Explanation of Outage
Outages overlapping into current review period:		
Brunswick 1	2/28/2012-5/2/2012	Scheduled Refueling - EOC 19; includes a 20 day extension for completing jet pump plug installation, vessel inspection efforts, and major valve rebuilds.
Robinson 2	1/21/2012-3/22/2012	Scheduled Refueling - EOC 27; includes 16 day extension to resolve equipment and system reliability.
Outages beginning during review period:		
Robinson 2	3/28/2012-3/31/2012	Unscheduled - Feedwater control
Harris 1	4/21/2012-6/8/2012	Scheduled Refueling - EOC 17; includes 1 day extension.
Brunswick 1	6/14/2012-6/16/2012	Scheduled maintenance to repair the level switch arm for the seal oil vacuum tank.
Brunswick 1	9/16/2012-9/28/2012	Unscheduled - replacement of seal for 1B recirculation pump.
Brunswick 2	11/22/2012-11/24/2012	Unscheduled - inspect and repair generator no load disconnect switch due to detected hot spots.
Brunswick 2	11/24/2012-11/26/2012	Unscheduled - valve leak repair.

PUBLIC
Gillespie Exhibit 3

DUKE ENERGY PROGRESS
SOUTH CAROLINA ANNUAL REVIEW OF BASE RATES FOR FUEL COSTS
NUCLEAR OUTAGE SCHEDULE FOR BILLING PERIOD OF
JULY 2013 THROUGH JUNE 2014

Scheduled Nuclear Outages Lasting One Week Or More - Billing Period

Station/Unit	Date of Outage	Explanation of Outage

REDACTED