STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-7, SUB 1297

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of: Application of Duke Energy Carolinas, LLC for a Certificate of Public Convenience and Necessity to Construct an 850 MW Natural Gas-Fired Combustion Turbine Electric Generating Facility in Catawba County, North Carolina	)	**DIRECT TESTIMONY OF JOHN ROBERT SMITH, JR. ON BEHALF OF DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND OVERVIEW

Q. MR. SMITH, PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH DUKE ENERGY CORPORATION.

A. My name is John Robert Smith, Jr. (Bobby), and my business address is 525 South Tryon Street, Charlotte, North Carolina 28202. I am employed by Duke Energy Business Services, LLC as the General Manager for New Gas Generation Development within the Project Management and Construction ("PMC") Department of Duke Energy.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.

A. I received a Bachelor of Science in Civil Engineering from North Carolina State University in 1982. I am a registered Professional Engineer in North Carolina ("NC"), maintaining registration since 1987.

Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

A. I started my career with Duke Energy Carolinas, LLC's ("DEC" or the "Company") predecessor Duke Power in 1982 as a field engineer supporting construction of Catawba Nuclear Station. In 1988, I began a transition from engineering into project management working for DEC, Fluor, The Shaw Group, and CB&I in various roles focused on Engineering, Procurement, and Construction ("EPC") services for all forms of new generation installations throughout the United States and abroad. Upon returning to Duke Energy as

Senior Project Director in 2018, I focused on managing EPC projects. I assumed my current position as General Manager for New Gas Generation Development at the beginning of 2023. In total, I have over 35 years of experience with responsibility for EPC and project management of new power plant construction projects.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. In my role as General Manager for New Gas Generation Development, I provide leadership and direction for a team of project managers, engineers, sourcing resources, and estimators responsible for front-end development of new natural gas-fired generation projects (the "PMC Gas Development Team"), both in the Carolinas and in the other jurisdictions where Duke Energy owns generation resources and provides electric service. Other teams within DEC are responsible for generation and transmission strategy and integrated resource planning on the front end and then managing and/or supervising project construction on the back end.

Once the Company identifies the need for a new gas-fueled resource in a resource plan, the PMC Gas Development Team is responsible for developing conceptual designs that satisfy the need and the associated cost estimates to construct the new generating facility. The PMC Gas Development Team also establishes and initiates project structure, including seeking key regulatory approvals such as certificates of public convenience and necessity ("CPCN") to construct the resource. The PMC Gas Development Team coordinates with

internal stakeholders and multiple third parties to obtain all necessary permits and regulatory approvals, and issues purchase orders and contracts related to the construction of the generation resource. The PMC Gas Development Team also manages the Companies' process to obtain pricing from major equipment suppliers and EPC providers and uses the information to internally develop a comprehensive cost estimate. The PMC Gas Development Team uses the internally developed comprehensive cost estimate to seek internal approvals before it is used to obtain necessary regulatory approvals. Once all necessary internal and regulatory approvals, permits, purchase orders, and contracts are in place, the PMC Gas Development team transitions responsibility for the resource to a team assembled to oversee and manage execution of the project plan to construct the facility.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION ("COMMISSION")?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support DEC's CPCN application to construct an electric generating facility in Catawba County, NC ("Application"). Specifically, DEC proposes to construct two advanced-class, simple-cycle combustion turbine ("CT") units with an estimated nominal winter capacity of 425 megawatts ("MW") each at the site of its existing Marshall Steam Station ("Marshall"). Construction of the new CT units will facilitate the

permanent retirement of two of the four coal-fired generating units at Marshall. The remaining two coal-fired units, together with the new CT units, will collectively be known as the Marshall Energy Complex, and I will refer to the two proposed CT units and their associated facilities as the "Proposed Facility." In this testimony, I will describe the generation technology, site selection, proposed construction schedule, the status of various construction and environmental permits, DEC's plans to procure components and select contractors, and cost estimates for the Proposed Facility.

Q. ARE YOU SPONSORING ANY EXHIBITS TO THE APPLICATION?

A. Yes. I am sponsoring Exhibit 2 (Siting and Permitting Information), Confidential Exhibit 3 (Cost Information), and Confidential Exhibit 4 (Construction Information), which collectively contain the detailed information required by Commission Rule R8-61(b). Exhibit 2 provides limited updates to the information set forth in the Company's preliminary plans filed on November 1, 2023, as well as additional discussion about the methodology underlying the studies and analysis presented in the preliminary plans. Confidential Exhibits 3 and 4 contain commercially sensitive cost and supplier contract information that should be protected from public disclosure and DEC is, therefore, filing them under seal. Exhibits 2, 3, and 4 were prepared under my supervision and at my direction.

II. THE PROPOSED FACILITY

Q. PLEASE GENERALLY DESCRIBE THE PROPOSED FACILITY.

A. Marshall, a four-unit, coal- and natural gas-fired 2,078 MW generating facility located in Catawba County, is one of DEC's largest power plants and has operated commercially since 1965. The station was originally fueled primarily by coal, but DEC completed conversion projects in 2020 to allow 50% natural gas co-firing on Units 3 and 4, and in 2021 to allow up to 40% natural gas co-firing on Units 1 and 2.

Through its Application, DEC seeks Commission approval to construct two hydrogen-capable, advanced-class CT units with ultra-low sulfur diesel ("ULSD") backup about 1.25 miles northeast of Marshall's coal-fired units, within DEC-owned property. Advanced-class CTs are more flexible and efficient and have higher ramp rates and lower turndown than DEC's and Duke Energy Progress, LLC's ("DEP" and, together with DEC, the "Companies") existing CT fleet. As identified in the Companies' 2023-2024 Carbon Plan and Integrated Resource Plan ("CPIRP" or the "Plan"), including the initial Plan filed with the Commission on August 17, 2023, in Docket No. E-100, Sub 190, and the Supplemental Planning Analysis ("SPA") filed in the same docket on January 31, 2024, DEC plans to permanently retire Marshall's coal-fired Units 1 and 2 and replace them with two CT units by January 1, 2029.[1]

[1] CPIRP Chapter 4 at 10 (Table 4-2), 14 (Table 4-3); *see generally* CPIRP Appendix F.

Construction of the two CT units is an important component of DEC's strategy to replace dispatchable coal-fired generation with alternative forms of dispatchable generation necessary to ensure the reliability of its power delivery system, which is discussed in more detail in CPIRP Chapter 4 (Execution Plan). Constructing the CT units at the site of retiring coal generation facilities enables DEC to leverage prior customer investments in plant infrastructure including, for example, existing transmission facilities and natural gas infrastructure. The new CT units can leverage Marshall's existing generation and transmission infrastructure, which will allow DEC to construct and place them in-service more quickly and on a more certain timeline than if it attempted the same at a greenfield location (i.e., undeveloped land without existing plant infrastructure).

Q. DOES DEC PLAN TO EQUIP THE CT UNITS WITH EMISSIONS CONTROL TECHNOLOGY?

A. Yes. The Company will equip the CT units with dilution selective catalytic reduction ("DSCR") technology, which will significantly reduce the emissions profile of the Proposed Facility. The Company anticipates that replacing Marshall coal-fired Units 1 and 2 with the CTs will reduce annual emissions of NO_x by 82% and SO_2 by 92%, while also reducing CO_2 by 40% per megawatt hour.

Q. WILL THE PROPOSED FACILITY REQUIRE CONSTRUCTION OF NEW OFFSITE NATURAL GAS TRANSMISSION PIPELINE?

A. No. The Proposed Facility will not require construction of new natural gas transmission pipeline to deliver incremental volumes of natural gas to Marshall, but DEC will need to install necessary piping to transport natural gas from the onsite metering and regulation ("M&R") station to the new CTs. Piedmont Natural Gas Company, Inc. ("Piedmont"), a DEC affiliate and natural gas local distribution company, provides intrastate natural gas pipeline redelivery service to Marshall. Piedmont's existing transmission pipeline that currently delivers natural gas to Marshall can accommodate the increased volumes of natural gas that the Proposed Facility will require and, therefore, no new transmission pipeline will be necessary. Piedmont will install a new electric compressor station on DEC-owned property to increase the pressure of the gas delivered to Marshall to enable the higher pressure intrastate firm transportation ("FT") service the CTs require. Piedmont will also expand its interconnection with Transcontinental Gas Pipe Line Company, LLC ("Transco") and the existing Marshall M&R station. On December 15, 2023, Piedmont filed a First Amendment to the existing Natural Gas Construction and Redelivery Services Agreement for Commission review and approval in Docket No. G-9, Sub 718, pertaining to incremental FT service to Marshall.

Q. IS THERE SUFFICIENT FIRM NATURAL GAS TRANSPORTATION CAPACITY FOR THE PROPOSED FACILITY?

A. Yes. The proposed First Amendment to DEC's agreement with Piedmont enables increased volumes of FT from Transco, where the Company will procure firm delivered Transco Zone 5 gas supply as required to fuel the CTs. The CTs could also utilize portfolio Transco FT service, instead of firm delivered gas supply, if it is not being utilized by a more efficient combined-cycle generator. Furthermore, the CT units will have dual-fuel capability along with six days' volume of on-site ULSD fuel storage for generation purposes if necessary.

Q. DOES DEC PLAN TO CONSTRUCT ANY NEW ELECTRIC TRANSMISSION FACILITIES TO SERVE THE PROPOSED FACILITY?

A. Yes. Interconnection facilities and limited network upgrades to existing electric transmission facilities will be required to interconnect the Proposed Facility. Each proposed CT unit will supply a 230 kilovolt ("kV") 1.09-mile span bus line that will connect through its own breaker to the nearby Marshall 230 kV switchyard. Several 230 kV breakers in Marshall's switchyard are required to complete the breaker-and-a-half scheme to facilitate the Marshall Energy Complex's point of interconnection. To route the two new span bus lines, DEC must relocate a section of an existing 230 kV transmission line to prevent line crossings and open a location for the point of interconnection at Marshall's existing switchyard. The Company does not plan to construct any new

transmission lines outside of Marshall property although, as noted below, it will need to perform limited transmission network upgrades to safely and reliably interconnect the Proposed Facility to the grid.

Pursuant to the Large Generator Interconnection Procedures established by the Companies' Joint Open Access Transmission Tariff, DEC submitted a Generator Replacement Request ("GRR") to utilize the roughly 780 MW of transmission interconnection rights from Marshall's coal-fired Units 1 and 2. The GRR process facilitates expedited interconnection of replacement generation at the retiring generation's point of interconnection and can, thereby, reduce or save the cost of expensive network upgrades. The GRR Facilities Study indicated minimal network upgrades were necessary for the Proposed Facility and DEC has executed an associated GRR Large Generator Interconnection Agreement to support interconnecting the replacement MW. For the incremental MW of the Proposed Facility beyond those included in the GRR, the Company submitted an interconnection request into the 2023 Definitive Interconnection System Impact Study ("DISIS") Cluster Study process. The Phase I DISIS study report indicated minimal network upgrades are necessary to support the incremental MW. Phase II of the DISIS study is underway and DEC expects to receive results in May 2024.

Q. DOES DEC PLAN TO CONSTRUCT ANY NEW FACILITIES TO ENABLE THE CT UNITS TO OPERATE USING ULSD?

A. Yes. The Company will construct ULSD and demineralized water storage facilities that will provide approximately six days of on-site backup fuel storage for the Proposed Facility.

III. SITING THE PROPOSED FACILITY

Q. PLEASE DESCRIBE DEC'S PROCESS TO DETERMINE WHERE TO CONSTRUCT THE CT UNITS.

A. As I referenced earlier in my direct testimony, and as discussed in more detail in CPIRP Chapter 4, replacing retiring coal-fired generation with other forms of equally reliable dispatchable generation is central to the Companies' plan to execute an orderly transition of its generating fleet towards carbon neutrality while maintaining the needed generating capacity to provide the energy and capacity required to reliably serve system growth. Consistent with that plan, DEC evaluated site locations using the following factors: projected retirement dates of existing units, transmission capacity, natural gas capacity, ULSD/water availability, long-term simple cycle operations, operational synergies, rail access, and land availability. The Company considered its existing generation sites with planned unit retirement dates that aligned with planning needs for new simple-cycle gas generation in the 2028-2029 timeframe. Those sites were Allen Steam Station ("Allen") (Gaston County, NC), the James E. Rogers Energy Complex ("Cliffside") (Rutherford County, NC), and Marshall. The Company considered these sites due to the plan to retire on-site coal-fired

generation in the 2028-2029 timeframe and because existing infrastructure at the sites—especially transmission facilities—necessary to support new CT units allowed for their accelerated deployment. Constructing the CT units at a greenfield location likely would have delayed their in-service date beyond the planning need identified in the CPIRP.

Of the sites evaluated, Marshall had the most favorable attributes. The targeted retirement date for its Units 1 and 2 most closely aligned with the targeted approximate in-service date of the proposed CTs. As discussed above, the existing natural gas transmission infrastructure that already delivers gas to Marshall can accommodate the incremental fuel required by the CTs without construction of additional pipeline to the site. On the other hand, development of the CT units at the Cliffside or Allen sites would have required the installation of new gas pipeline. Additionally, the Allen Steam Station does not have as much available land as the other sites considered, and the Company was unable to identify a suitable location to construct the CT units on DEC-owned land at that site.

Marshall's existing transmission infrastructure also presented advantages over the other sites considered. Specifically, Allen Units 1 and 5 and Cliffside Unit 5 were the only other potential GRR retirement candidates and neither had sufficient capacity to accommodate interconnection of the two new CT units. Further, the Company's planned retirement date for Cliffside 5 by the beginning of the year ("BOY") 2031 did not align with the BOY 2029 need for

new CT capacity. Finally, as explained in CPIRP Appendix L (Transmission System Planning and Grid Transformation), if DEC retires but does not replace the generation capacity of Marshall Units 1 and 2, it will have to accelerate completion of costly network upgrades to prevent overloading the McGuire – Marshall 230-kV lines, which is an outcome that DEC can otherwise avoid by constructing the CT units at Marshall.[2]

These factors in conjunction with the Company's comparative analysis—as further addressed in Exhibit 2 to the Application—all support DEC's siting determination and selection of Marshall as the most favorable planned location to construct the Proposed Facility to meet the CPIRP's identified need for new CT generation by January 1, 2029. Based on a comprehensive site assessment, DEC found no major obstacles to constructing the Proposed Facility at Marshall, and subsequent detailed field work substantiated DEC's preliminary evaluation.

Q. AS PART OF ITS SITING ANALYSIS, DID DEC CONSIDER POTENTIAL CULTURAL IMPACTS OF THE PROPOSED FACILITY ON THE LOCAL COMMUNITY?

A. Yes. The Company contracted with Pike Engineering, LLC ("Pike") to research and study several aspects of the local community including, but not limited to, area development, visual and auditory resources, and aesthetic and cultural resources. The results of these studies are set forth in more detail in Exhibit 2 to the Application. Some notable conclusions from Pike's analysis are as

[2] CPIRP Appendix L at 28.

follows:

- The Proposed Facility will be visible from areas totaling only 0.69 square miles (0.88% of the total area) outside of DEC-owned property when considering the total area within five miles of the Marshall Energy Complex (a total of 78.55 square miles). Further, the Proposed Facility would only be visible from 0.34 square miles that do not already have a view of Marshall (0.43% of the total area) within five miles of the Marshall Energy Complex.
- Although a limited number of residences may have a view of the tallest parts of the Proposed Facility, it is unlikely that the visual quality of the area will be negatively impacted because the distance between the Proposed Facility and any residence with a view will render its visible portions visually inferior to the surrounding environment.
- There are only a few roads from which motorists will have more than a brief view of the Proposed Facility and, in most of those cases, the Proposed Facility's visibility will be subordinate to that of the existing Marshall infrastructure.
- The construction of the Proposed Facility will not impact any archaeological resources.

Q. DO YOU HAVE ANY INDICATION OF LOCAL SUPPORT FOR CONSTRUCTION OF THE PROPOSED FACILITY?

A. Yes. The Company has long been a taxpayer and engaged corporate citizen in Catawba County and many of our employees live in the local community

around Marshall. In response to the Company's November 1, 2023, preliminary plans filing in advance of this Application, the Catawba County Board of Commissioners adopted Resolution No. 2024-9 on February 5, 2024, expressing the County's support and encouragement for DEC's plans to construct the Proposed Facility in proximity to the existing Marshall Steam Station. The Company continues to be engaged in Catawba County to support and explain the Proposed Facility's role in the Companies' CPIRP Execution Plan to retire and replace the aging coal units at Marshall as the Company transitions its fleet.

IV. CONSTRUCTION AND PERMITTING OF THE PROPOSED FACILITY

Q. WHAT IS DEC'S CONSTRUCTION SCHEDULE FOR THE PROPOSED FACILITY?

A. Confidential Exhibit 4 to the Application provides the detailed construction schedule for the Proposed Facility. Under the construction schedule, DEC plans to achieve "Substantial Completion and Commercial Operation" in 3Q 2028 and "Final Completion" of the Proposed Facility in 1Q 2029.

Q. WHAT ENVIRONMENTAL PERMITS ARE REQUIRED FOR THE PROPOSED FACILITY?

A. The Company must obtain an Air Permit for the Proposed Facility from the Division of Air Quality within the North Carolina Department of Environmental Quality. The Company plans to file its Air Permit application on or about March 28, 2024. The Company will address other permits necessary for the Proposed Facility within the agreement with the EPC contractor that DEC intends to

execute in 2Q 2026. Exhibit 2 to the Application provides additional information on the necessary permits for the Proposed Facility.

Q. HOW WILL DEC SELECT MAJOR COMPONENTS AND MAJOR COMPONENT SUPPLIERS FOR THE PROPOSED FACILITY?

A. The Company's process for requesting bids from the marketplace begins with an evaluation of providers it strategically intends to include in the bidding process. The PMC Gas Development Team assembles the documents necessary to describe the project and to develop the specifications that will satisfy the performance requirements for the facility. In parallel, PMC develops the evaluation criteria that DEC will use to evaluate bids once received. The evaluation criteria are tailored to each purchased component and weighted based upon the team's determination of the needs of the individual project. The evaluation criteria are also grouped into technical, commercial, and corporate responsibility categories and include criteria such as bid understanding and completeness, technical operating parameters, technology and maturity, ability to comply with requested schedule, sourcing location, warranty, payment and cancellation terms, and the bid price for delivery. After completing the evaluation, the team decides to proceed with the supplier with the best valued commercial offering.

Q. WHAT IS THE STATUS OF THE COMPANY'S BID EVALUATION AND SELECTION PROCESS FOR THE SUPPLIER(S) OF THE CT UNITS?

A. DEC has received and is evaluating bids to supply hydrogen-capable, advanced-class CT units to be constructed at Marshall. The Company received bids from all three major CT manufacturers, i.e., General Electric Vernova, Siemens Energy, and Mitsubishi Power Americas, Inc., and the bidders have included required DSCR equipment with the bids to couple emissions guarantees under a single original equipment manufacturer.

Each manufacturer's CT unit proposal under consideration has slightly different estimated nominal MW capacities, operating requirements, and characteristics. In order to identify the top evaluated bidder, DEC will consider each manufacturer's unique requirements and characteristics, along with other factors including normalized capital cost in dollars per kilowatt, performance, experience, reliability, completeness of bid, ability to meet schedule, operating and maintenance cost, and key contract terms and conditions. Please see Confidential Exhibit 4 to the Application for additional information pertaining to the CT units that DEC is considering.

Q. HAS DEC SELECTED THE SUPPLIERS FOR OTHER MAJOR COMPONENTS OF THE PROPOSED FACILITY?

A. Yes. After receiving and evaluating bids, DEC selected the supplier for generator step-up and auxiliary transformers. To identify the top bid, DEC evaluated criteria such as supplier experience, technical compliance, operating

characteristics, ability to achieve schedule, and key contract terms and conditions. Please see Confidential Exhibit 4 to the Application for more detailed information about DEC's transformer procurements.

The Company is also actively monitoring market lead times for various types of components to ensure that it will be able to secure manufacturing slots that support the project schedule and has solicited the market for high voltage switchgear/circuit breakers.

Q. HAS DEC SELECTED THE PRINCIPAL CONTRACTORS FOR CONSTRUCTION OF THE PROPOSED FACILITY?

A. No. The Company has not yet selected the EPC contractor for the Proposed Facility but will assemble the project specifications and Request for Proposal ("RFP") documents later this year and then open the bidding process for the project around July 2025. The Company continually evaluates potential EPC providers through site visits, interviews, and by evaluating their experience, financials, workload, and available resources to understand their abilities and availability. Based upon this process, DEC developed an initial qualified bidders list. DEC will continue to update the list based on bidder qualifications as well as information learned from the marketplace before issuing the RFP. The Company ultimately anticipates a bid list of between three and six qualified providers. Confidential Exhibit 4 to the Application contains a list of the initial qualified bidders as of March 14, 2024, which DEC is filing under seal.

Evaluations for an EPC contractor are amongst the most comprehensive

evaluations that DEC performs. Once DEC receives bids, it will consider and score various criteria that it will then summarize under technical, commercial, and corporate responsibility categories. The criteria will include safety, environmental, scope understanding, engineering capabilities, construction team experience and commitment, project management and project controls teams and tools, experience with similar technology and project scale, quality assurance, project execution planning, schedule adherence, and key aspects of the commercial terms and conditions that provide confidence that the contractor is committed to the project. After completing the evaluation, the PMC Gas Development Team will summarize and recommend to management the contractor that, through the evaluation process, it identified as best suited for execution of the work.

Q. PLEASE DESCRIBE THE ESTIMATED CONSTRUCTION AND ANNUAL OPERATING COSTS ASSOCIATED WITH THE PROPOSED FACILITY.

A. The projected capital costs and operating expenses are confidential and proprietary and, as a result, the Company is filing this information under seal in Confidential Exhibit 3 to the Application. However, Confidential Exhibit 3 provides a detailed, non-confidential explanation of the methodology DEC used to develop its construction cost estimate.

Q. IN SUMMARY, WHY DOES DEC SEEK APPROVAL TO CONSTRUCT THE PROPOSED FACILITY?

A. DEC seeks to construct the Proposed Facility because (1) new CT generating capacity is a crucial component of the Companies' strategy to maintain or improve grid reliability through the energy transition described in the CPIRP; and (2) constructing the CT units at Marshall will enable DEC to leverage prior customer investments in plant infrastructure and meet the timeframe for new CT units identified in the CPIRP. The Company has a reasonable and executable plan to construct the Proposed Facility on the planned schedule and the Commission should grant the requested CPCN.

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

A. Yes.