BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition to Recover Costs of Crystal River Unit 3 Uprate pursuant to the Nuclear Cost Recovery Rule

DOCKET NO. 080119

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DIRECT TESTIMONY
OF DANIEL L. RODERICK

ON BEHALF OF
PROGRESS ENERGY FLORIDA

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IN RE: PETITION TO RECOVER THE COSTS OF THE CRYSTAL RIVER UNIT 3 UPRATE PURSUANT TO THE NUCLEAR COST RECOVERY RULE

BY PROGRESS ENERGY FLORIDA

FPSC DOCKET NO. 080119

DIRECT TESTIMONY OF DANIEL L. RODERICK

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Daniel L. Roderick. My business address is Crystal River Energy Complex, Site Administration 2C, 15760 West Power Line Street, Crystal River, Florida 34428.

Q. By whom are you employed and in what capacity?

A. I am employed by Progress Energy Florida ("PEF" or the "Company") in the capacity of Vice President – Nuclear Projects & Construction. As Vice President – Nuclear Projects & Construction, I am responsible for the management and oversight of all large, capital nuclear projects for the Company, including the Uprate Project at Crystal River Unit 3 ("CR3"), PEF's nuclear plant. Formerly, I was Director of Site Operations at CR3.

Q. What are your responsibilities as the Vice President Nuclear Projects and Construction?

A. I am an officer of PEF and I am responsible for all aspects of major projects and construction of nuclear generating assets in Florida. Formerly, as director of Site Operations, I was responsible for the safe, efficient, and reliable generation of electricity from CR3 and all plant functions reported to me and were under my supervision.

Q. Please summarize your educational background and work experience.

A. I have a Bachelor of Science and Master of Science degree in Industrial Engineering from the University of Arkansas and have completed the NRC program for a Senior Reactor Operator License. I have been at CR3 since 1996, serving in my current position as Vice President Nuclear Projects and Construction and, prior to that position, Director of Site Operations, Plant General Manager, Engineering Manager, and Outage Manager, respectively. Prior to my employment with the Company, I was employed for twelve years with Entergy Corporation at its Arkansas Nuclear One plant in Russellville, Arkansas with responsibilities in Plant Operations and Engineering.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to support the Company's request for cost recovery pursuant to the nuclear cost recovery rule for certain costs incurred in 2006 and 2007 for the replacement and modification of

equipment at CR3 to support an increase in reactor power from the nuclear plant.

Specifically, I will describe the construction costs that have been incurred, for which PEF is seeking recovery of the carrying costs. I will explain why those construction costs were reasonable and necessary to accomplish the uprate. My testimony further supports the prudence of those costs by describing the process by which vendors and technology were selected.

Q. Do you have any exhibits to your testimony?

A. No, I am not sponsoring any exhibits. I am, however, sponsoring Schedules T-7 through T-8B of the Nuclear Filing Requirements ("NFRs"), which are included as part of the exhibits to Will Garrett's testimony. Schedule T-7 is a description of the contracts and work for the nuclear technology selected, for years 2006 and 2007. Schedule T-8 is a list of the contracts executed in excess of $1.0 million, for years 2006 and 2007. Schedule T-8A reflects details pertaining to the contracts executed in excess of $1.0 million. Schedule T-8B reflects contracts executed in excess of $200,000, yet less than $1.0 million.

All of these schedules are true and accurate.

Q. Please summarize your testimony.

A. The CR3 Uprate Project is being completed in three phases and will result in the Company generating an additional 180 MWe of efficient nuclear power by 2011. To improve the cost-effectiveness of this project, the Company chose to complete the project in three phases by taking advantage of already-scheduled refueling outages at CR3. Since November 2006 and during 2007, PEF has incurred reasonable and prudent costs to complete all three phases of the project. The first phase of the CR3 Uprate Project was completed during the 2007 refueling outage. PEF incurred costs for the remaining two phases, scheduled for the 2009 and 2011 refueling outages, because long lead-times to secure contracts and equipment for that work is required. These costs are appropriate for recovery pursuant to the nuclear cost recovery rule.

As demonstrated in my testimony and the NFRs filed as exhibits to Mr. Garrett's testimony, PEF took adequate steps to ensure that the costs it incurred were reasonable and prudent. When selecting vendors, PEF utilized a Request for Proposals ("RFP"), or competitive bidding, process where appropriate, and used reasonable business judgment to select sole-source vendors when an RFP was not used. For all its contracts, PEF negotiated as favorable contract terms as it could given market conditions to provide reasonable cost certainty and appropriate risk-sharing. Accordingly, the Commission should approve PEF's costs incurred for 2006 and 2007 as reasonable and prudent pursuant to the nuclear cost recovery rule.

III. DESCRIPTION AND STATUS OF CR3 UPRATE PROJECT

Q. Please briefly describe the CR3 Uprate project.

A. The power uprate project for CR3 increases the electrical power output from the plant from about 900 MWe by approximately 180 MWe to 1,080 MWe. The power uprate project involves increasing the power or thermal MWs produced in the reactor core by making modifications to the design to allow for use of additional nuclear fuel. In addition, some modifications to supporting equipment are necessary to support the additional heat from the power increase to accommodate all designed accident conditions in the plant. The additional heat will raise the heat exchange between the Primary and Secondary Systems and create more steam to turn the turbines.

The major modifications resulting from the power uprate involve the secondary system; specifically, the turbine generator set, which has three parts, two low pressure and one high pressure rotor, and the generator, plus their supporting systems and equipment. The secondary system must be modified to accept the additional heat produced by the reactor core. This is accomplished by increasing the secondary system water and steam flow. Increasing the flow requires larger pumping capacity than currently exists, which requires modification or replacement of some existing pumps and heat exchangers. A series of evaluations,

models, and other studies have been completed to identify the required pumps and motors to upgrade or replace .

In addition to the reactor power increase, design improvements to some major system components will allow for increased efficiencies, providing additional electrical power beyond that obtained from the higher thermal output. These design improvements to obtain the steam efficiencies are factored into the CR3 power uprate costs. For example, when the steam turbine high pressure rotor was designed in 1962, a multi-piece assembly was made. These multi-piece assemblies cause drag on the system, but better technology did not exist at the time. Since then, in the late 1990's, technological advancements have resulted in a single piece rotor blade that has less drag and, therefore, provides increased megawatt output for the same steam input.

Q. Please explain when and how the CR3 Uprate project will be accomplished.

A. The CR3 power uprate project is planned for completion in three scheduled refueling outages for CR3 in 2007, 2009 and 2011. By completing this work during the times when CR3 will already be offline, customers receive the benefits of the CR3 Uprate Project without incurring replacement energy costs.

Phase I, the MUR, was installed during the 2007 refueling outage and went on-line on January 31, 2008. The MUR is a series of

engineering analyses to measure the "secondary heat balance" with improved accuracy through modifications to plant instrumentation and associated calculations. The improved accuracy in measuring the secondary heat balance, however, allows the rated thermal power to be increased by 41 thermal megawatts ("MWt") and plant electrical generation to increase by approximately 12 megawatts electric ("MWe"). Phase 2 of this project is a series of improvements to the efficiency of the secondary plant also known as the Balance of Plant ("BOP"). The Company currently anticipates, for example, that all or at least part of the low pressure turbine and electrical generator replacement can be completed during the BOP phase. The BOP phase is scheduled concurrently with the steam generator replacement during the 2009 refueling outage. Other modifications and replacements will be evaluated for inclusion in the 2009 refueling outage if the outage is not extended, appropriate resources are available to support the changes, and the impact of further modifications or replacements for the power uprate project on the duration of the scheduled 2011 refueling outage can be minimized.

The changes during the BOP phase do not increase the licensed output of the nuclear reactor but they will improve the efficient use of that output to produce a higher electrical output. The estimated increase in output is 28 MWe from the BOP phase.

The full power uprate is scheduled for the 2011 refueling outage, when the remaining work necessary to provide the full 180 MWe power uprate, called the Extended Power Uprate ("EPU") phase, will be completed. The BOP phase improvements will be sized to support the EPU. The EPU maximizes the output of the reactor and the BOP to their ultimate capacity.

The remaining two phases of the CR3 uprate project are on schedule to come online during the 2009 and 2011 outages.

Q. Will the CR3 uprate project require changes to other units or the Crystal River site?

A. No. All changes necessary to generate the full power uprate are internal to the CR3 power block. No changes to the Company's current plant siting are required. However, modifications to address Point of Discharge ("POD") issues to accommodate the full 180 MWe power uprate will be necessary.

Q. What changes are anticipated to address the Point of Discharge issues?

A. The power uprate from the project will generate additional heat and steam thereby increasing the water temperature of the cooling water for the CR3 unit. This additional heat will likely cause the Company to exceed the thermal permit requirements for the cooling water discharge flow and

temperature. The Company has begun a study to evaluate all reasonable options before making a final determination of how to address the POD issue. Whatever modifications are necessary to address the thermal cooling water discharge limit, however, will accommodate the full power generated by CR3.

Q. Did PEF obtain a need determination for the CR3 Uprate project?

A. Yes, the Commission approved the need for the CR3 Uprate in Order No. PSC-07-0119-FOF-EI, issued on February 7, 2007.

Q. What is the current status of the CR3 Uprate project in terms of completion?

A. Phase I, also known as the MUR phase, was successfully completed during the 2007 scheduled outage. Concurrently with the MUR phase work, we have been securing contracts, making plans, and incurring costs for Phases II and III. The project thus far is progressing as expected, and we expect no problems with completing them in the expected timeframes.

Q. How did PEF choose the vendors with which it contracted during the 2006 and 2007 timeframe?

A. PEF employed a competitive bidding process to choose most of the vendors for the various projects associated with the CR3 Uprate Project. PEF issued a Request for Proposal ("RFP"), evaluated the RFP responses

based on a variety of factors (including price, dependability of the vendor, technical considerations, and the like), and chose the vendor that provided the best value for the price.

In those instances in which an RFP process was not employed to choose a vendor for a contract, PEF used reasonable business judgment to justify that decision. For example, AREVA was chosen as a sole source contract (meaning PEF did not issue an RFP) to perform the analytical and licensing support for the NRC approval for the MUR and EPU phases. This decision was made because AREVA had unique access to and experience with the requisite safety analyses for CR3. This allows AREVA to efficiently perform the analyses required to secure NRC approval. AREVA has also out-performed other vendors in these types of analyses. These factors reasonably lead to the selection of AREVA as the vendor for such a time-sensitive project like the CR3 Uprate Project. We nevertheless have secured a favorable contract terms with AREVA to provide reasonable cost-certainty and appropriate risk-sharing.

A more detailed description of the contracts executed for the work required for the technology chosen for the CR3 Uprate Project is contained in Schedule T-7, which is attached as part of an exhibit to Will Garrett's testimony. Also, a detailed description of the contracts executed in excess of $1 million, including the dollar value and term of the contract, the method of vendor selection, the identity and affiliation of the vendor,

and current status of the contract, is contained in Schedules T-8 through T-8B, attached to an exhibit to Mr. Garrett's testimony.

IV. COSTS INCURRED IN 2006 AND 2007 FOR CR3 UPRATE PROJECT

Q. Has the Company incurred costs for the CR3 Uprate Project?

A. Yes, PEF has incurred costs related to all three phases of the CR3 Uprate Project. The total capital expenditures, for both years 2006 and 2007, gross of joint owner billing and exclusive of carrying cost, were $38.5 million.

Q. Please generally describe these costs.

A. As part of the MUR phase, which PEF completed during the 2007 refueling outage, PEF incurred $8.7 million in costs related to the installation of improved instruments to allow more accurate measurement of inputs to the secondary heat balance. These costs were reasonable and prudent and include engineering and licensing support, project management, the improved instruments, and installation of those instruments. PEF entered into contracts with NuFlo Technologies Sales Co., AREVA NP, Thermal Engineering International, and Atlantic Group for these services and products.

PEF also incurred $32.1 million in reasonable and prudent costs for certain long-lead items associated with the BOP Phase (Phase II) and with the EPU (Phase III). The remaining two phases for the CR3 Uprate Project are proceeding in parallel. To maximize efficiencies, work related to both phases is being simultaneously performed where possible. In addition, as the studies progress, the Company is evaluating whether certain equipment can be installed earlier, during the 2009 outage rather than the 2011 outage. Until those decisions are made, and until the actual 2009 outage and installation are completed, the costs for Phases II and III will not be separated as between those two phases. These costs, however, were necessary to accomplish the entire Uprate Project and were prudently incurred.

PEF entered into contracts with Yuba Heat Transfer Div. and Siemens for the heat exchangers and turbine/generator retrofits, respectively. PEF also entered into a contract with AREVA NP for a detailed technical evaluation to ensure timely completion of the remaining uprate work. PEF also contracted with AREVA NP for licensing and analytical support to seek NRC approval for the EPU. In addition, PEF entered into a contract with the limited partnership of Worley Parsons and AREVA for the engineering support for the balance of the EPU. Each of these contracts, along with how those vendors were selected, are explained in greater detail in Schedules T-7 and T-8.

The specific cost amounts contained in Will Garrett's testimony and exhibits reflect the reasonably and prudently incurred costs which are described above for the CR3 Uprate project work in 2006 and 2007.

Q. Does this conclude your testimony?

A. Yes, it does.