

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Progress Energy
Florida for limited proceeding to
include the Bartow Repowering
project in base rates.

Docket No. 09044-ET

Submitted for filing:
March 20, 2009

DIRECT TESTIMONY OF
KEVIN MURRAY

On behalf of PROGRESS ENERGY FLORIDA

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CLK 1 Court Reporter

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DIRECT TESTIMONY OF

KEVIN MURRAY

1 **I. Introduction and Summary.**

2 **Q. Please state your name and business address.**

3 A. My name is Kevin Murray. My business address is 299 First Avenue North, St.
4 Petersburg, Florida 33701.

5
6 **Q. By whom are you employed and in what capacity?**

7 A. I am employed by Progress Energy Florida ("PEF" or "Company") as General
8 Manager of Plant Construction Projects.

9
10 **Q. What are the duties and responsibilities of your position with Progress
11 Energy Florida?**

12 A. As General Manager of Plant Construction Projects, I am responsible for the
13 oversight of PEF's major fossil generation projects, including the Bartow
14 Repowering Project.

15
16 **Q. Please describe your educational background and professional
17 experience.**

18 A. I received my Bachelor of Science Degree in Mechanical Engineering from the
19 University of Arizona. I have 15 years of professional experience in engineering
20 and project management within the electric power industry. I started my career
21 in the power industry with Westinghouse Power Generation (now Siemens)

1 based in Orlando, where I was employed as an engineer working on power
2 plant proposals. During this time, I received an award for my work on a project
3 in Thailand. I then went to work for El Paso Corporation as an engineer and
4 then as a project manager. I was involved in the development and construction
5 of power projects in both North and South America, including a 1-year
6 residency in Brazil. I joined Progress Energy in 2004 and served as the director
7 of engineering for the Company's new fossil power projects. In 2008, I was
8 promoted to General Manager of Projects for Progress Energy Florida, which
9 includes responsibility for implementing the Bartow Repowering Project.

10
11 **Q. What is the purpose of your direct testimony?**

12 A. The purpose of my testimony is to describe the Company's Bartow Repowering
13 Project, including the key benefits that the project will provide to the Company
14 and its customers.

15
16 **Q. Please summarize your testimony**

17 A. Progress Energy Florida is in the process of repowering the Bartow Power Plant
18 in Pinellas County to upgrade the existing conventional heavy oil-fired steam
19 units to state of the art natural gas-fired combined cycle technology with
20 distillate oil backup. All four combustion turbines were first test fired in
21 November and December 2008 and we expect the plant to commence
22 operation by its scheduled June 1, 2009 in-service date.

23 The Bartow Repowering Project is part of the Company's "Balanced
24 Solution," which includes upgrading existing plants to provide safe, cost-

1 effective and environmentally responsible sources of large-scale power
2 generation.

3 The project is designed to nearly triple the plant's generating capacity
4 while at the same time reducing air emissions and eliminating the use of heavy
5 fuel oil. The project will increase electric system reliability by increasing
6 dispatch flexibility and by providing additional generating capacity near the
7 Pinellas County load center. It will also satisfy the Company's need for
8 additional capacity beginning in the summer of 2009 in a cost-effective manner.
9 The repowered Bartow Plant will reduce future fuel costs and result in cleaner
10 air. By utilizing an existing plant site, the project will avoid the need to develop a
11 new site in the area.

12 We have managed the project to minimize construction impacts on the
13 surrounding community. It has had a positive economic impact on the Pinellas
14 County region by bringing approximately 500 high-quality construction jobs to
15 the area and increasing tax payments to Pinellas County and the local school
16 system.

17 The project is the most cost-effective alternative for meeting the
18 Company's capacity needs while at the same time ensuring compliance with
19 environmental requirements. Finally, we have managed the Bartow repowering
20 in a manner that ensures a high quality result at a reasonable cost.

21
22 **II. The Bartow Repowering Project.**

23 **Q. Please describe the Bartow repowering project.**

1 A. The current Bartow Power Plant operates on 1950s-era technology. It
2 generates power from three units fired on heavy (No. 6) fuel oil and is capable
3 of generating approximately 450 MW of power.

4 In 2005, the Company studied ways to meet its need for additional
5 capacity by summer 2009 in a cost-effective, environmentally sensitive manner.
6 The analysis showed that repowering the Bartow facility to operate as a natural
7 gas-fired, combined cycle plant was the most cost-effective way to meet the
8 Company's reliability needs, while at the same time substantially reducing SO₂
9 and NOx emissions from the site.

10 Additional analysis during the study phase showed that the best
11 configuration would be to replace the three existing steam units with four gas-
12 fired combustion turbines (CTs), four heat recovery steam generators
13 (HRSGs), and one steam turbine – or what is referred to as a 4x4x1 combined
14 cycle configuration.

15 The repowering project will increase the generating capacity of the Bartow
16 Power Plant to about 1,279 MW, or an increase of approximately 827 MW. The
17 project will take advantage of existing site assets, such as the water intake
18 structures, discharge canals, the fuel oil barge unloader, existing 115kV lines,
19 existing 230kV lines, and the 230/115 kV switchyards. The project includes
20 additional transmission and substation improvements required to integrate the
21 project into the electric grid and to handle the increased electric output from the
22 site.

23
24 **Q. Has the repowered Bartow plant been designed to increase the**
25 **Company's dispatch flexibility?**

1 A. Yes. The plant design includes auxiliary duct firing for the HRSGs and steam
2 power augmentation for the CTs to provide optimum peaking capacity. By-pass
3 stack dampers installed on all four CTs will provide the option to operate the
4 plant in simple cycle mode, as well as in combined cycle mode. This plant can
5 also be operated in a 3x3x1, 2x2x1 or 1x1x1 combined cycle mode during
6 periods of low system load. Because the steam turbine can be kept warm even
7 during periods of low load, the design significantly reduces plant start-up time
8 compared to the existing oil-fired units. Taken together, these design features
9 provide maximum output, operational ease, and system dispatch flexibility.
10

11 **Q. What transmission and substation improvements are being made to**
12 **support integrating the project into the electric grid?**

13 A. The transmission improvements associated with the project include: expansion
14 and upgrades to the Bartow and Northeast substations; the addition of three
15 230 kV underground circuits between those two substations; rebuilding an
16 existing 230 kV line between the Northeast and 40th Street substations;
17 installing a new 115 kV line between the Northeast and 32nd Street substations;
18 installing a new transformer at the 51st Street substation and looping an existing
19 230 kV line into that substation; and replacing a 115 kV breaker at the Central
20 Plaza substation.
21

22 **Q. Has PEF secured a reliable and adequate source of natural gas fuel**
23 **supply?**

24 A. Yes, PEF has entered into an agreement with Gulfstream Natural Gas System
25 for Firm Pipeline Transportation (FT) capacity to access gas supply for the

1 Bartow plant. The total FT capacity contracted for is 155,000 Dths/day for a
2 term of 23 years. This is roughly equivalent to the total daily gas demand of the
3 re-powered plant at full load for 16 hours. To provide natural gas to the plant,
4 Gulfstream has constructed approximately 17 miles of 20" pipeline from its
5 existing pipeline in the Tampa Bay to the Bartow site. In addition, Gulfstream
6 has added compression at its compressor station in Coden, Alabama, and
7 constructed a new compression station in Manatee County, Florida, to support
8 the project.

9 The gas transportation contract provides for an initial 80,000 Dths/day
10 of natural gas to support testing and startup of the CTs in 2008. The contract
11 provides for the full 155,000 Dths/day to be available by January 1, 2009. The
12 terms of the contract with Gulfstream are reasonable and consistent with
13 industry standards.

14
15 **III. Benefits of the Project**

16 **Q. Please summarize the benefits of the repowering project.**

17 A. Repowering the Bartow plant will add approximately 827 MW of capacity in
18 June 2009. This increase avoids a capacity purchase in summer 2009, the
19 Hines 5 combined cycle unit, and CTs originally planned for 2010 and 2012.
20 Under current planning assumptions, PEF still requires additional capacity by
21 summer 2009 to meet its 20% minimum reserve margin obligation and the
22 Bartow repowering meets that need.

23 The design of the Bartow repowering reduces plant start-up time and
24 increases dispatch flexibility. The addition of new capacity near the Pinellas

1 County load center, and the related transmission upgrades, will address low
2 voltage conditions that can exist in the area during periods of peak demand.

3 The Bartow repowering will significantly reduce the site's emissions,
4 including a 98 percent reduction in SO₂ emissions and reduced NOx emissions.
5 This will enable the Company to meet the Clean Air Interstate Rule (CAIR)
6 requirements without installing costly Selective Catalytic Reduction ("SCR") at
7 the Anclote Plant.

8 The Bartow repowering project has become part of the Company's
9 "Balanced Solution" for meeting its customers' needs, and the project is
10 consistent with the goals set forth in Florida's Energy and Climate Change
11 Action Plan, submitted to the Governor by his Action Team. Part of this plan
12 emphasizes achieving efficiency improvements at existing plants by repowering
13 existing plants to use natural gas in place of oil, which is what the Bartow
14 repowering project will do.

15 During construction, PEF has added nearly 500 jobs to the area workforce
16 which has provided an economic boost to the community. In addition, the local
17 economy has received a financial boost from taxes and increased revenue
18 during the construction project and will benefit from a higher tax base in the
19 future.

20
21 **IV. Implementation of the Bartow Repowering Project.**

22 **Q. Please describe how the Bartow Repowering Project is managed.**

23 A. A key project team was organized to consider alternatives for projected
24 generation needs. A portfolio of initiatives was developed to analyze generation
25 and transmission alternatives. The project team, together with PEF's System

1 Planning & Regulatory Performance Unit, developed an Integrated Project Plan
2 summarizing the key project decision points. The integrated resource planning
3 process essentially matches PEF's projected needs with the most cost-effective
4 power plant additions.

5 The project team is responsible for approving project milestone
6 progression and funding for both generation and transmission upgrades. The
7 team also developed a contracting and procurement strategy and assembled
8 predominantly firm-price contracts with qualified suppliers that are responsible
9 for the execution of various aspects of the project. The team mitigated cost and
10 performance risk by capturing favorable contract terms and conditions such as
11 retention provisions, performance guarantees, and reliability guarantees. The
12 project team provides regular updates to Senior Management in the areas of
13 cost, schedule, performance, risk, safety and environmental issues.

14
15 **Q. When will the project be complete?**

16 A. Both the generation and transmission components of the project are on-
17 schedule for commercial operation by June 1, 2009.

18
19 **Q. What is the estimated cost for the Bartow Repowering Project?**

20 A. The estimated cost for the project is \$800.2 million. This includes new
21 generation capital expenditures of \$560.3 million, transmission capital
22 expenditures of \$143.0 million, and \$96.9 million in AFUDC.

23
24 **Q. In your opinion, is the project prudent and will it be completed at a**
25 **reasonable cost?**

1 A. Yes. The initial study of the 4x4x1 configuration showed \$171 million NPV of
2 after-tax cash flow savings from the Bartow repowering project compared to the
3 base case alternative. Although the projected savings has varied over time as
4 the project has evolved, the project continues to provide significant savings to
5 our customers by meeting our generation and environmental needs in a cost-
6 effective manner. As I have described in my testimony, the reasonableness of
7 the project costs has been assured by our procurement practices, including
8 competitive bidding and the use of predominantly firm price contracts where
9 appropriate, the purchase of a secondary market steam turbine, and our cost
10 control activities.

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Q. Does this conclude your testimony?

A. Yes.