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ORIGINAL

TECO
TAMPA ELECTRIC

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 07_____-EI
IN RE: TAMPA ELECTRIC'S
PETITION TO DETERMINE NEED FOR
POLK POWER PLANT UNIT 6

TESTIMONY
OF
CHARLES R. BLACK

TAMPA ELECTRIC COMPANY
DOCKET NO. 07_____-EI
FILED: 7/20/2007

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

PREPARED DIRECT TESTIMONY

OF

CHARLES R. BLACK

Q. Please state your name, business address, occupation and employer.

A. My name is Charles R. Black. My business address is 702 N. Franklin Street, Tampa, Florida 33602. I am employed by Tampa Electric Company ("Tampa Electric" or "company") as President.

Q. Please provide a brief outline of your educational background and business experience.

A. I am President of Tampa Electric and I am responsible for the overall management of the company. I received a Bachelor of Chemical Engineering degree in 1973 from the University of South Florida and I am a registered Professional Engineer in the State of Florida. I joined Tampa Electric in 1973 and have held various engineering and management positions at Tampa Electric and TECO Power Services, TECO Energy's independent power production operations. In December 1991, I was named

Vice President, Project Management for Tampa Electric. In that capacity I was responsible for the engineering and construction of Tampa Electric's Polk Station, a first-of-its-kind 255 MW integrated gasification combined cycle ("IGCC") unit. From December 1996 through October 2004, I held leadership positions of progressively greater responsibility within the organization. In October 2004, I became President of Tampa Electric.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to introduce and support Tampa Electric's request for an affirmative determination of need for Polk Unit 6, an IGCC unit with 610 MW and 647 MW summer and winter net capacity, respectively. If approved, the new advanced clean coal generating unit will be constructed at Polk Station, the site of Tampa Electric's existing IGCC unit. Polk Station occupies over 2,800 acres on State Road 37 in Polk County, Florida, approximately 40 miles southeast of Tampa and about 60 miles southwest of Orlando.

Q. Please describe how the Polk Station site was originally selected.

A. The Polk Station site was selected as the result of Tampa Electric's extensive Power Plant Site Selection Assessment Program, which set out in 1989 to select the most suitable location for meeting the company's future power supply requirements. An integral part of the Polk site selection process was the formation and participation of a Siting Task Force composed of 17 private citizens from environmental groups, businesses and universities in Tampa Electric's service area and throughout Florida. The company solicited and committed to the task force's participation in the siting program so that local and state public concerns would be addressed. The Siting Task Force met monthly from October 1989 through September 1990 to review and guide the siting process and to make a final recommendation. The recommended site was what is now known as Polk Station. The site currently consists of Polk Unit 1, a 255 MW IGCC unit, and Polk Units 2 through 5, four combustion turbines totaling 645 MW.

Tampa Electric's proposed Polk Unit 6 will provide benefits to 1) our customers by meeting future generation needs in the most cost-effective manner; 2) the state of Florida by improving fuel diversity and security of fuel supply; and 3) the environment by

achieving extremely low emissions by utilizing a proven technology that is well positioned to address potential future carbon regulations. All of these benefits will be achieved at a site that was selected by a citizen's task force with overall community support. For Tampa Electric, Polk Unit 6 is clearly the right technology, at the right location, at the right time.

Tampa Electric's 10 witnesses will present testimony demonstrating that Polk Unit 6 is the most cost-effective alternative for meeting Tampa Electric's need for additional generating capacity, while enhancing the company's fuel diversity of its generating fleet, reducing the impact of fuel price volatility, increasing system reliability and improving the state's environmental profile. Among other things, witnesses will provide a complete analysis of the 2013 generation need considering demand and energy forecasts that take into account comprehensive demand-side management ("DSM") programs and renewable energy alternatives. The analysis considers alternative technologies while focusing on the company's energy mix by fuel type and the need for more fuel diversity. Last, but certainly not least, the analysis considers current and expected future environmental regulations and puts the proposed

plant at the lowest emission levels of any other coal facility in Florida.

Q. Why is Tampa Electric proposing to construct Polk Unit 6?

A. As the state of Florida continues its rapid population growth, Tampa Electric expects to add almost 164,000 new customers over the next 10 years to its current base of 654,000 customers. As discussed in the testimony of witness Lorraine L. Cifuentes, the projected increase in customers and the increase in per-customer demand will increase the company's summer peak by almost 1,200 MW over the next decade. While some of the demand will be met by the company's DSM programs and renewable energy, the projected growth in demand for electricity must also be met through peaking capacity additions and the additional baseload capacity Polk Unit 6 will provide.

Additionally, as discussed in the testimony of witness Mark J. Hornick, Tampa Electric has 14 years of experience with IGCC technology, beginning with the design, construction and operation of its 255 MW Polk Unit 1, which has been in commercial operation for over 10 years. Polk Unit 1 is one of the best known and

highly acclaimed power generating units in the world. As discussed in the testimony of witness Michael R. Rivers, the basic configuration of Polk Unit 6 will be similar to Polk Unit 1 with some improvements based on the lessons learned from the operations of Polk Unit 1. Utilization of IGCC technology allows the company to leverage its existing operational experience while diversifying its generation fuel portfolio and providing a cost-effective solution to meet the projected increased customer demand for electricity in an environmentally sensitive way.

Finally, Polk Unit 6, which will be built on an existing power plant site that was originally selected by a community based task force, supports the company's commitment of balancing the need to be environmentally responsible with the need to provide its customers with reliable, cost-effective electricity. Tampa Electric has taken a leadership role in activities that protect the environment and in 1999, the company committed to a sweeping $1.2 billion environmental improvement plan to reduce emissions from fossil fuels. Polk Unit 6, which will be one of the cleanest and most efficient solid fuel units in the country, is the next step in the company's on-going efforts towards responsible

environmental stewardship.

Q. Have there been any policy recommendations or mandates for utilities to focus on fuel diversity and/or advanced generation technologies?

A. Yes. In 2006, state policymakers took actions to encourage utilities in Florida to pursue increased fuel diversity. Florida's Energy Plan, which addresses the importance of fuel diversity and the need to avoid reliance on any single fuel, was issued on January 17, 2006.

On June 19, 2006, then-Governor Jeb Bush signed into law House Bill 888, which amended the Florida Power Plant Siting Act, Section 403.519, Florida Statutes. The amended law requires the Commission to explicitly consider "the need for fuel diversity and supply reliability" when making a determination of need for new electric generating capacity.

On June 12, 2007, House Bill 549 was signed into law by Governor Charlie Crist. This legislation amended Section 366.93, Florida Statutes, to add new IGCC technology to the section that allowed advanced cost

recovery for siting, design, licensing, and construction of new nuclear power plants. The statute expressly states that the intent is to "promote" and "encourage" investor-owned utility investment in nuclear power and IGCC technology. The law also directs the Commission to consider the balance of fuel diversity when evaluating an IGCC's cost-effectiveness during a determination of need proceeding.

In addition, the Federal Energy Policy Act of 2005 authorized the United States Department of the Treasury to allocate tax credits as incentives to move advanced generation technologies into the marketplace, including certain coal technologies. Congress specifically authorized $350 million in tax credits for advanced gasification projects. As discussed in the testimony of witness Chrys A. Remmers, Tampa Electric was awarded the maximum Section 48A tax credits of $133.5 million for its proposed IGCC Polk Unit 6 project. As a result of the tax credits, Tampa Electric's customers will benefit through lower annual revenue requirements.

Q. Why should Florida and specifically, Tampa Electric, focus on increasing fuel diversity?

A. Fuel diversity provides two key benefits. The first advantage of fuel diversity is greater reliability. Using a wider variety of fuels helps to mitigate the impact of supply disruptions of any one fuel source. Florida learned this lesson in 2004 and 2005 when several hurricanes posed threats to gas supply in the Gulf of Mexico. The second benefit of fuel diversity is mitigation of fuel price volatility. Again, the 2004 and 2005 hurricane seasons resulted in daily prices into Florida peaking at $20.52 per MMBtu. With a more balanced fuel supply portfolio, price spikes have less effect than if the utility's fuel supply were heavily weighted toward one particular fuel.

Q. Please elaborate on the preference for coal and pet coke as the fuel sources for its next baseload unit.

A. In recent years, Tampa Electric, as well as most utilities in Florida, has increased its share of natural gas fired generation. In Tampa Electric's case, this has improved the fuel diversity of the company's generation portfolio. In 2007, the company's energy mix by fuel type is expected to be 45 percent natural gas, 49 percent solid fuels and 6 percent fuel oil and other sources.

Natural gas prices have increased, relative to the price of coal, in recent years. As discussed in witness Joann T. Wehle's testimony, while fuel prices cannot be predicted with certainty, market conditions indicate that this price differential will be maintained and may even grow in the future. In addition, natural gas prices are much more volatile today than a decade ago, when much of the recent natural gas expansion was planned. Currently, the level and volatility of natural gas market prices, combined with abundant coal reserves, make solid fuels more attractive from a price perspective and a supply reliability standpoint.

If the Commission approves the construction of Polk Unit 6, Tampa Electric's energy mix by fuel type will be 34 percent natural gas, 64 percent solid fuels and 2 percent fuel oil and cogeneration purchases in 2013. Additional solid fuel-fired generation enhances fuel diversity, reliability and price stability in future years, compared to constructing a new natural gas-fired unit.

Q. What is the expected effect on Tampa Electric's fuel diversity if the Commission does not approve construction of Polk Unit 6?

A. If the Commission does not approve the construction of Polk Unit 6, given the timing of Tampa Electric's capacity need and the uncertainty regarding the time frames for the next generation of nuclear units, the only remaining viable option would be the construction of a natural gas-fired unit. The resulting 2013 energy mix by fuel type would be 51 percent natural gas, 47 percent solid fuels and 2 percent fuel oil and other sources.

Q. Please describe how Tampa Electric determined that the construction of Polk Unit 6 is the most cost-effective alternative means of meeting Tampa Electric's customers' need for electricity.

A. As explained by witness William A. Smotherman, Polk Unit 6 will provide a cumulative net present value savings of more than $184 million to Tampa Electric customers when compared to a natural gas combined cycle unit and savings of over $93 million compared to a supercritical pulverized coal unit. This represents cash savings in addition to the benefits of fuel diversity, environmental compliance by providing a technology platform for future carbon capture, and the further development of renewable energy resources that will flow

from this project.

Q. What did Tampa Electric consider in its evaluation of the most cost-effective generating alternative?

A. As described in greater detail in witness Smotherman's testimony, Tampa Electric conducted a thorough analysis of all viable demand and supply alternatives, including consideration of operational, strategic, and cost-effectiveness factors. Tampa Electric utilized an integrated resource planning process in the analyses that resulted in the selection of Polk Unit 6 to satisfy its need for additional capacity. After implementing additional demand and energy reduction programs which reduce the system energy and demand requirements, a reliability analysis determined the magnitude and timing of its new resource needs. The company next identified the options available to meet the need, including the self-build option on its existing Polk Station site. The supply alternative analysis included consideration of system concerns such as fuel diversity, as well as consideration of different technology options such as supercritical pulverized coal, circulating fluidized bed, natural gas fired combined cycle and IGCC technology.

Q. How will Polk Unit 6 benefit Tampa Electric and its customers?

A. Polk Unit 6 will provide numerous benefits to Tampa Electric and its customers. Tampa Electric's evaluation of the capacity need incorporated many factors. Given the company's existing generating portfolio and the expected markets for solid fuels, we concluded that solid fuel-fired baseload capacity is the best choice to reliably and cost-effectively meet the expected 2013 need. Polk Unit 6 will provide the benefits of greater fuel diversity and increased reliability, while meeting or exceeding environmental requirements.

Polk Unit 6 will burn solid fuels that are widely available from domestic and international sources and are less susceptible to disruptions from severe weather, or other events, than natural gas. Witness Wehle's testimony, explains that solid fuels are readily available and the Energy Information Administration indicates there are well over 200 years of coal reserves in the United States alone. The use of solid fuels is cost-effective and is expected to mitigate price volatility due to adverse weather or political events in other countries by lessening our company's reliance on

natural gas, with its associated volatile pricing, and increasing our reliance on solid fuel, which enjoys historical price stability. The unit will burn natural gas as a backup fuel, which provides reliability enhancements. With the use of the backup fuel, Polk Unit 6 is expected to improve the overall availability from 86 percent to 95 percent. The use of a backup fuel to improve reliability is unique to IGCC technology as compared to other solid fuel technologies.

Polk Unit 6 will use commercially proven IGCC technology to generate electricity with very low emissions. As described in the testimony of witness Hornick, the IGCC process uniquely allows for the use of an efficient combined cycle system, which optimizes the power output per unit of fuel input or heat rate. By recovering waste heat from the synthesis gas production and the combustion process and converting it to power output, more power can be produced with fewer emissions. The proposed power plant will be one of the cleanest and most efficient planned power plants in the country.

Q. Why is IGCC technology the most appropriate choice for Tampa Electric?

A. IGCC technology is the most appropriate choice for Tampa Electric because 1) it is the most cost-effective alternative for meeting the company's future need for additional generating capacity; 2) Tampa Electric has used IGCC technology to generate electricity for over 10 years, generating more than 13 million MWH of electricity; 3) the fuel flexibility will allow Polk Unit 6 to burn the most cost-effective fuel blends, including biomass, to minimize fuel cost; 4) Tampa Electric's previous experience designing, building, owning and operating an IGCC unit will enhance the operation of Polk Unit 6; 5) the emissions will be much lower than any other conventional coal plant currently planned in the state of Florida; and, 6) the unit design layout provides space for additional equipment that would be needed to meet potential future carbon emission regulations.

Q. Please describe the positive environmental results that will be achieved by Polk Unit 6.

A. Tampa Electric is designing Polk Unit 6 to use proven emission controls, and its air emission rates are expected to be the lowest in comparison to comparable planned projects in Florida. Witness Paul L. Carpinone

provides specific information about environmental compliance and comparisons of Polk Unit 6 to the emission rates for comparable projects planned in Florida. Not only will Polk Unit 6 be capable of meeting all current regulatory requirements and permit levels, but Tampa Electric is designing the unit with consideration of potential future CO_2 emission regulations. The design provides space for commercially available and technically proven carbon control equipment to be added should future legislation be passed. This approach will ultimately result in lower costs, compared to retro-fitting other technologies that have not considered carbon capture in the design.

At this time, IGCC technology is the only coal-based generating technology with commercially proven carbon capture capability. Additionally, Tampa Electric has already begun evaluating the potential for carbon sequestration at its Polk Station site, in conjunction with the University of South Florida and others, and the company will continue those efforts.

Q. What is Tampa Electric's position regarding greenhouse gas emissions such as CO_2?

A. Tampa Electric, with the support of this Commission, made environmental strides long before focus on global climate change and greenhouse gas emissions became prominent. As a result of our overall environmental improvement program, Tampa Electric's current CO_2 emissions are 20 percent lower than in 2000. As discussed in witness Carpinone's testimony, the company believes that any legislation addressing the greenhouse gas emission issue should apply to all industries, while ensuring implementation does not economically disadvantage the United States. Furthermore, the legislation should encourage technology development to address reductions with tax incentives, give credit to companies, like Tampa Electric, who have taken early actions, and support a realistic timeframe for addressing climate change that maintains fuel diversity.

Q. Please describe Tampa Electric's DSM efforts to defer or reduce the need for Polk Unit 6.

A. From the mid-1970s to the present, Tampa Electric has been offering its customers cost-effective DSM programs along with a comprehensive educational emphasis on the efficient use of energy. Tampa Electric is viewed as a national leader for its DSM accomplishments. According

to the Energy Information Administration of the United States Department of Energy reports for the 2001 through 2005 period, Tampa Electric has ranked nationally in the 96th percentile for cumulative energy conservation and the 90th percentile for load management achievements. Through 2006, Tampa Electric has achieved winter and summer cumulative reductions of 659 MW and 222 MW, respectively and 600 GWH of annual energy savings. This amount of peak load reduction has eliminated the need for the equivalent of more than three 180 MW power plants.

As discussed in the testimony of witness Howard T. Bryant, Tampa Electric recently filed for Commission approval of numerous new and modified DSM programs which will increase winter and summer cumulative reductions in 2013 to 707 MW and 263 MW, respectively. Despite all these efforts and given Tampa Electric's projected load growth, the company's proactive DSM initiatives do not eliminate or delay the need for Polk Unit 6.

Q. Please describe Tampa Electric's efforts to utilize renewable energy sources to meet the projected customer load growth.

A. Tampa Electric recognizes the growing importance of renewable energy as a vital component of its resources utilized to meet customer load. Witness Bryant's testimony describes the company photovoltaic ("PV") arrays which are located on local schools, the company's Manatee Viewing Center and the Tampa Museum of Science and Industry. In May 2007, the company unveiled the largest PV system installed to date, a 10 kW array deployed at a local high school. Tampa Electric also offers a permanent renewable energy program which allows customers the option of paying an additional charge for incremental renewable energy. Finally, in June 2007, the company issued an RFP for renewable energy that seeks new and existing renewable generating sources.

Tampa Electric also engages in a number of other renewable energy activities aimed at increasing the amount of clean, renewable energy on its system. Annually, the company purchases over 125,000 MWH of renewable energy produced from the waste heat of phosphate production. Tampa Electric also has 42 MW of firm capacity under contract from the municipal solid waste industry. Finally, Tampa Electric is generating renewable energy through a landfill gas facility utilizing a micro-turbine as the generating unit.

Q. What is the expected relative rate impact of Polk Unit 6 compared to the NGCC alternative?

A. As discussed in the testimony of witness Smotherman, the projected relative rate impact analysis comparing IGCC as the optimal solid fuel technology to NGCC resulted in the IGCC plan being $2.72 per MWH higher than the NGCC plan in 2013. This is primarily due to higher capital costs; however, the rate impact for IGCC is estimated to be lower by 2017 and through the balance of the remaining life of the unit due primarily to lower fuel and purchased power costs.

Q. Please summarize your testimony.

A. My testimony addresses and supports the need for Polk Unit 6, an IGCC unit with 610 MW and 647 MW summer and winter net capacity, respectively, to meet the projected need for additional generating capacity on Tampa Electric's system in 2013.

My testimony describes the careful and detailed analysis the company has performed to ensure that Polk Unit 6 is the most cost-effective means of meeting our future capacity needs. I describe the benefits associated with

the proposed plant addition including improvements in fuel diversity and reliability along with the environmental benefits of the proven IGCC technology including the compatibility of the plant design layout for potential CO_2 control requirements if required by future legislation.

I also describe recent state and federal legislation designed to encourage the development of advanced clean coal technology projects like Polk Unit 6, including significant federal tax credit incentives that will help reduce the cost of Polk Unit 6 to our customers.

Finally, I describe the significant DSM efforts that Tampa Electric has put forth since the mid-1970's in a concerted effort to avoid or defer the need for additional generating capacity, along with the exemplary results those efforts have achieved. I also describe the company's demonstrated commitment to the development and reliance upon renewable energy resources. Even after these DSM and renewable energy efforts and achievements are factored into the analysis, Tampa Electric, nevertheless, will need the planned output of Polk Unit 6 in order to meet its customers' demand and energy requirements by 2013.

The witnesses who will testify in support of the need for Polk Unit 6 are representatives for an even larger and fully dedicated Tampa Electric team. Our team's charge was to develop the most cost-effective means available for meeting the needs of Tampa Electric's customers and to do so in a manner that is consistent with all applicable statutory criteria, as implemented by this Commission. We believe that the evidence presented by the company demonstrates that Tampa Electric has accomplished this task. I, therefore, respectfully urge the Commission to recognize and approve the need for Polk Unit 6.

Q. Does this conclude your testimony?

A. Yes, it does.