

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET No. 060162-E1

In re: Petition of Progress Energy Florida, Inc.
to recover modular cooling tower costs
through the fuel cost recovery clause.

**DIRECT TESTIMONY OF
THOMAS LAWERY**

February 24, 2006

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

2 A. My name is Thomas Lawery. My business address is 8202 West Venable
3 Street, Crystal River, Florida 34429.

4
5 **Q. By whom are you employed and in what capacity?**

6 A. I am employed by Progress Energy Florida, Inc. (PEF) as Manager of
7 Regional Engineering.

8
9 **Q. What are your responsibilities in that position?**

10 A. I provide engineering and technical support to the fossil power plants for PEF.
11 This includes projects and troubleshooting for the Crystal River fossil plants,
12 Anclote plant, Suwannee plant and Bartow plant.

13

14

1 **Q. Please describe your educational background and professional**
2 **experience.**

3 A. I have a B.S. degree in Electrical Engineering from Florida State University
4 and I am presently pursuing a MBA at the University of Tampa. I am a
5 registered Professional Engineer in Florida with seventeen years experience
6 in fossil power plant operation and design. I have been involved in financial
7 and technical aspects of managing, evaluating and developing power
8 generation assets.

9
10 **Q. What is the purpose of your testimony?**

11 A. The purpose of my testimony is to support the Company's request for
12 recovery of costs for installation and operation of modular cooling towers at
13 PEF's Crystal River plant. Specifically, I describe the modular cooling tower
14 project, present cost estimates for the project, and describe how the
15 Company will assess the effectiveness of the project.

16
17 **Q. Are you sponsoring any exhibits with your testimony?**

18 A. Yes. I am sponsoring Exhibit No. __ (TL-1), a chart that shows cooling water
19 inlet temperatures for the summer months in 2003 through 2005, and the
20 associated amount of de-rates that have been necessary to ensure
21 compliance with the permit limit for the temperature of the cooling water
22 discharged from PEF's Crystal River plant during the same time period.

23

1 **Q. Please describe the modular cooling tower project.**

2 A. The purpose of the project is to reduce fuel costs to customers by minimizing
3 “de-rates” of Crystal River Units 1 and 2 (CR-1 and CR-2) necessary to
4 comply with the permit limit on the temperature of cooling water discharges
5 from the Crystal River plant. The Project involves installation and operation
6 of modular cooling towers in the summer months (mid-May through mid-
7 September) in order to reduce the discharge canal temperature. This will
8 enable PEF to reduce the number and extent of de-rates and thereby reduce
9 replacement fuel and purchase power costs.

10

11 The specific type and capacity of modular units to be installed will depend
12 upon the results of an ongoing competitive bidding process. Based on
13 physical limitations, environmental permitting considerations and projected
14 temperature decreases, however, the Company has assumed a water flow
15 capacity of approximately 180,000 gallons per minute for purposes of
16 analysis. At this capacity, the rental towers would reduce hourly de-rates
17 attributable to the thermal permit limit by approximately 330 MW.

18

19 **Q. What is meant by the term “de-rate”?**

20 A “de-rate” is a temporary reduction in the output of a generating unit.
21 Because CR-1 and CR-2 are base-load coal units, whenever those units are
22 de-rated PEF must replace the lost generation by using more expensive oil or
23 gas-fired units, or by purchasing higher-cost power on the open market.

1 **Q. Why have de-rates been necessary to comply with the thermal permit**
2 **limit?**

3 A. At Progress Energy's Crystal River plant, water is removed from the Gulf of
4 Mexico and used to condense turbine exhaust steam to water. The Crystal
5 River generating units share a common discharge canal that sends the
6 cooling water back into the Gulf of Mexico. The Florida Department of
7 Environmental Protection (FDEP) industrial wastewater permit for the Crystal
8 River plant includes a limit on the temperature of cooling water discharges
9 (i.e., 96.5° F 3-hour rolling average). This limit must always be met
10 regardless of the temperature of the inlet waters from the Gulf of Mexico.

11
12 The primary strategy for complying with the thermal permit limit is the
13 operation of permanent cooling towers. Plant operation and maintenance
14 personnel strive to maintain a 100% availability of the towers during months
15 of peak usage. Once the cooling capacity of the towers is reached, the only
16 other immediate option to ensure compliance with the thermal permit limit is
17 to de-rate CR-1, CR-2 or both. Recently, de-rates necessary to ensure permit
18 compliance have increased due to weather conditions beyond PEF's control
19 that have increased the temperature of inlet waters for the CR-1 and CR-2
20 cooling systems. As shown in Exhibit No. __ (TL-1), inlet water temperatures
21 and associated thermal de-rates were particularly severe in the summer of
22 2005 which, according to the National Weather Service, was the second
23 hottest summer since 1890.

1

2 **Q. In general, what are the economic effects of de-rates due to the**
3 **temperature permit limit?**

4 A. As I previously noted, whenever the Crystal River units are de-rated, PEF
5 must replace the lost generation by using more expensive oil or gas-fired
6 units, or by purchasing higher-cost power on the open market. De-rates due
7 to the thermal permit limit have occurred mostly during the hottest summer
8 days during peak demand periods when fuel and purchase power costs are
9 at a peak. In addition, if off system sales opportunities are available during
10 the periods when CR-1 and/or CR-2 are de-rated, those opportunities and the
11 associated customer benefits are lost.

12

13 **Q. Has the Company explored the possibility of obtaining less stringent**
14 **permit conditions?**

15 A. Yes. Based on discussions with FDEP, however, the likelihood of obtaining
16 less stringent permit conditions is negligible and would depend upon the
17 results of lengthy and expensive scientific studies that may prove
18 inconclusive.

19

20 **Q. Has PEF explored other alternatives to the modular cooling towers?**

21 A. Yes. The Company evaluated and compared several alternatives, including:
22 (a) installation of new permanent helper cooling towers; (b) installation of
23 additional cells to the existing cooling towers; (c) enhancement of existing

1 cooling tower fan performance to reduce recirculation and interference; and
2 (d) installation of additional dilution pumps to dilute the temperature of the
3 water in the discharge canal. Based on the relative efficiencies and costs of
4 the various options, however, PEF determined that the modular cooling tower
5 solution would be most cost-effective. Moreover, use of modular towers will
6 enable the Company to assess whether the thermal de-rate problem is a
7 temporary or cyclical phenomenon before costs are unnecessarily expended
8 on a permanent solution. Unlike permanent towers, the modular towers can
9 be easily mobilized and used at other locations if they are no longer needed
10 at Crystal River at some point in the future.

11
12 **Q. What are the projected costs of the temporary cooling tower project?**

13 A. PEF estimates project costs of approximately \$2 million to \$3 million per year
14 beginning in 2006. Project costs are expected to include O&M expenses for
15 unit mobilization and setup, rental fees, de-mobilization, and fill replacement.
16 Additionally, in 2006, PEF expects to incur one-time capital expenses of
17 approximately \$1.5 million to \$2 million for installation and ancillary
18 equipment, such as power transformers, switchgear, and cable.

19
20 **Q. How will the Company assess the effectiveness of the modular cooling
21 towers in avoiding thermal de-rates?**

22 A. The University of Florida is in the final stages of developing a computer
23 model that will be able to predict the amount of de-rates that would be

1 necessary to ensure permit compliance without the modular cooling towers.
2 Once the rental towers are installed and operating, avoided de-rates can be
3 determined by comparing the actual amount of thermal de-rates *with* the
4 modular towers to the amount predicted by the University of Florida model
5 *without* the rental towers.

6

7 **Q. What steps is PEF taking to ensure that the costs of the modular**
8 **temporary cooling tower project are reasonable and prudent?**

9 A. PEF is conducting a competitive bidding process to ensure that costs are
10 reasonable and prudent. As part of the bid evaluation process, PEF is
11 analyzing traditional leasing and lease-to-own options submitted by various
12 bidders.

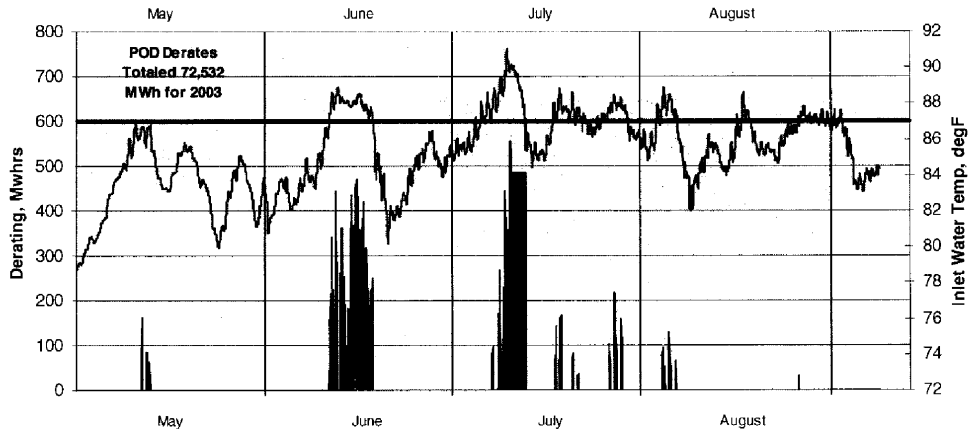
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14 **Q. Does this conclude your testimony?**

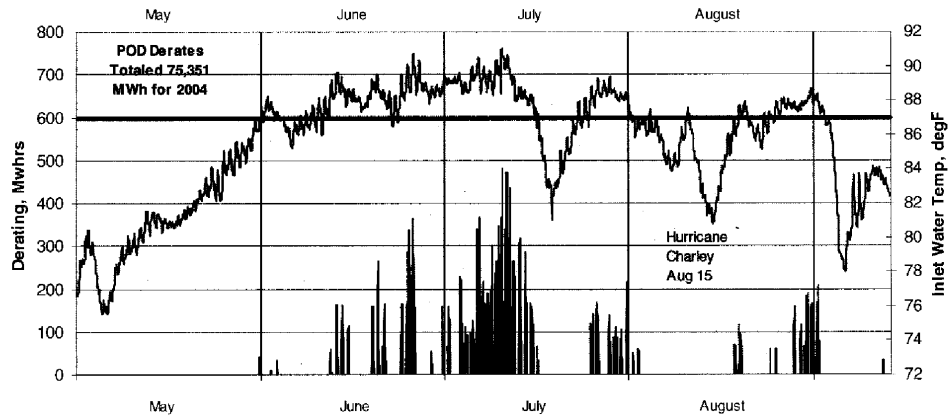
15 A. Yes, it does.

16

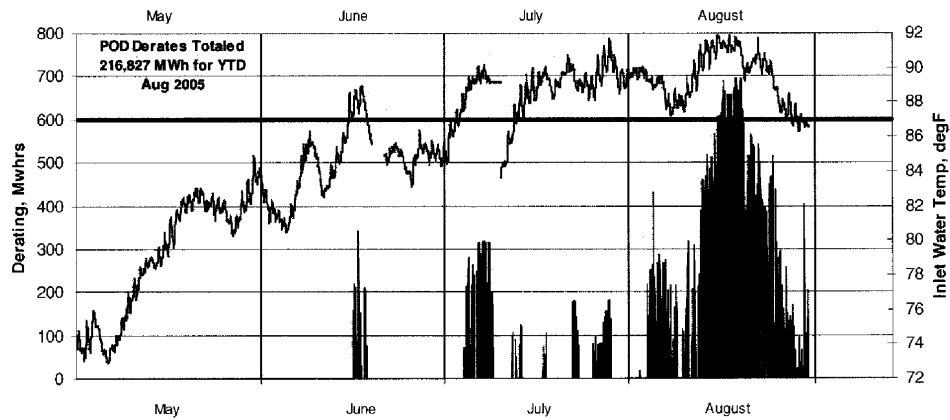
**Crystal River South
 Plant POD Derate vs Inlet Water Temp - 2003**



**Crystal River South
 Plant POD Derate vs Inlet Water Temp - 2004**



**Crystal River South
 Plant POD Derate vs Inlet Water Temp - YTD Aug 2005**



Derate Water Temp 87° Water Temp