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DOCKET NO.: 960409-EI - [Tampa Electric Company]

WITNESS: Direct Testimony Of Tom Ballinger, Appearing On Behalf Of Staff

Date Filed: June 14, 1996

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DIRECT TESTIMONY OF TOM BALLINGER

- Q. Please state your name and business address.
- 3 A. My name is Tom Ballinger and my business address is 2540 Shumard Oak
- 4 Boulevard, Tallahassee, Florida, 32399-0850.

- 5 Q. By whom are you employed and in what capacity?
- 6 A. I am employed by the Florida Public Service Commission (FPSC) as a
- 7 Utility Systems/Communication Engineer Supervisor for the Bureau of System
- 8 | Planning/Conservation and Electric Safety.
- 9 Q. Please describe your educational and professional experience.
- 10 A. In April of 1985, I graduated from the Florida State University with a
- 11 B.S. in Mechanical Engineering. Since June, 1985, I have been employed at the
- 12 FPSC. From the beginning of my career, I have been involved with various
- 13 utility regulatory issues such as power plant and transmission line need
- 14 determinations, O&M expenditures, performance incentives, reliability issues.
- 15 and other issues relating to conservation and system planning. I have also
- 16 been involved with the non-utility side of regulation with such things as
- 17 purchased power contract approval, need determinations, and competitive
- 18 bidding. I have presented testimony before the Commission and given numerous
- 19 speeches to groups outside of the Commission. In July, 1993 I was promoted
- 20 to my current position.
- 21 Q. What is the purpose of your testimony?
- 22 A. My testimony highlights how TECO relied upon unrealistic, inconsistent,
- 23 and inflexible planning assumptions to justify the continued construction of
- 24 the Polk IGCC Unit. In light of this, I am recommending that the Commission
- 25 explore alternative cost recovery mechanisms for the Polk IGCC Unit in order

- 1 to protect TECO's ratepayers from the high capital cost and uncertain fuel 2 savings associated with this unit.
- 3 Q. Have you prepared any exhibits to your testimony?
- 4 A. Yes I have. Exhibit No. ____ (TEB-1) is a summary of the assumptions used by TECO in performing annual cost effectiveness comparisons of the Polk
- 6 IGCC unit to a natural gas fired combined-cycle unit. Exhibit No. ____ (TEB-

2) is a copy of a letter from TECO describing their intention of how Section

- 8 29 tax credits would be credited to TECO's ratepayers. Exhibit No.
- 9 (TEB-3) is a copy of TECO's response to staff's Interrogatory Number 6 in
- 10 Docket No. 960409-EI which attempts to justify how TECO has changed its mind
- 11 about how Section 29 tax credits would be credited to TECO's ratepayers.
- 12 Q. Why should the decision to build the Polk IGCC Unit be reviewed after
 13 the Commission has determined that the unit is needed?
- 14 A. The determination of need for a unit is not the end of the planning
- 15 process. It is simply an interim step. a snapshot in time, where the
- 16 Commission reviews the initial need for and cost effectiveness of capacity
- 17 additions. After certification, and throughout construction, a prudent
- 18 utility should closely monitor the continuing need for, and cost of, a new
- 19 generating unit. A prudent utility should also continue to explore possible
- 20 alternatives that may be more cost-effective.
- 21 A key factor in the decision to build the Polk IGCC Unit was the availability
- 22 of an \$120 million grant from the Department of Energy (DOE) to demonstrate
- 23 the technical feasibility of commercial coal gasification as part of its Clean
- 24 Coal Program. This grant became available when the City of Tallahassee
- 25 decided not to pursue the coal gasification technology. TECO secured the

grant from its subsidiary. TECO Power Services, abandoned its original plan to construct a phased natural gas fired combined-cycle unit, and filed for a need determination within a very short time frame. The Polk IGCC unit was not the result of a competitive bidding process, nor did it appear in TECO's Ten-Year Site Plan prior to certification.

In addition to the DOE grant, TECO relied upon a fuel forecast that assumed an ever widening cost differential between coal and natural gas to economically justify the construction of the Polk IGCC Unit. The Commission summarized its concern with this fuel forecast assumption in Order No. PSC-92-0002-FOF-EI. which states, in part:

The type of new generating unit chosen is not necessarily driven by fuel cost per se: rather. it is the difference in cost among competing fuels. TECO's fuel forecast projects a widening cost differential between coal and natural gas or oil, when in fact for many years the cost differential between the cost of coal and the cost of natural gas and oil has remained relatively constant. In the future, TECO should pay close attention to this differential, and must be ready to substantiate continued reliance upon fuel price forecasts that have not accurately predicted the relationship between the price of coal and the price of natural gas and oil. (Emphasis added)

The above language put TECO on notice that the Commission would review TECO's actions relating to this issue. In addition, Order No. PSC-92-0002-FOF-EI repeatedly states that the Polk IGCC Unit would cost approximately \$389 million, yet TECO now claims the final cost is approximately \$506 million.

Both cost figures include the DOE funding. TECO needs to justify this 1 | difference.

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Other factors raise questions as to the cost effectiveness of the Polk IGCC Unit. For example, Florida Power and Light (FPL) recently received Commission approval to write down its nuclear generation assets. These assets have a current book value of approximately \$855/kW compared to the estimated \$2,000/kW installed cost of the Polk IGCC Unit. Also, the Polk IGCC Unit is projected to have an initial overall cost of approximately \$60/mwh compared to approximately \$30/mWh power being produced at FPL's Martin plants and estimated for Florida Power Corporation's (FPC) Polk unit. TECO needs to justify why these differences are beneficial to its customers.

- Why was TECO put on notice to pay close attention to the actual price differential between coal and natural gas?
- As more fully discussed in Mr. Breman's testimony, these fuels have typically maintained a constant cost differential with each other. From a planning perspective, this constant price differential has been referred to as the "acid test" for comparing a coal fired plant to a gas fired plant. The results of an acid test will show how robust a generation expansion plan is to changes in fuel prices. Other planning assumptions also need to be analyzed to determine their impact on the overall plan. A robust plan is essential to insure that the customers' needs are met in the most cost effective manner.
- Why should a natural gas fired combined cycle plant be considered as an 23 alternative to the Polk IGCC Unit? 24
- Assuming system reliability criteria are met, the selection of 25

generating unit type is primarily based upon the difference in price between competing fuels. In the Polk IGCC Unit need determination proceeding this fact was very clear. In that proceeding, the technology of choice was basically the same, a combined-cycle unit. The decision to be made was should the unit be fueled by synthetic gas made from coal or natural gas from a pipeline?

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- Q. Who bears the economic risk of decisions made under the premise that the price difference between natural gas and coal will widen over time?
- TECO's ratepayers. Typically coal plants have higher up front capital costs than natural gas fired plants. The trade off is low operating costs. If TECO's relative fuel price forecasts turn out to be correct, then in time TECO's ratepayers will receive a net benefit because of these low operating costs. Conversely, if the historic pattern of natural gas and coal prices continues. TECO's ratepayers will be saddled with high fixed costs associated with the Polk IGCC Unit, with no offsetting net benefit from lower operating costs. From the ratepayers perspective, the preferred strategy would be to minimize the risk of the fuel forecast gamble by minimizing capital investments while preserving the widest range of fuel choice alternatives. One method for measuring this risk is to compare the annual difference of cumulative present value revenue requirements of two generating alternatives. This will demonstrate the relative time frame when up front capital costs will start to be off-set by lower operating costs. The longer the breakeven point. the more risk that is placed on the ratepayer. This is because the further out in time that fuel costs are projected, the greater the risk for error.
- Q. Is there a means to mitigate this risk?

A. Yes. To mitigate this risk, a utility can construct a natural gas fired combined-cycle plant and add a coal gasification process if natural gas prices escalate to a point that justifies the added capital expense. The Commission embraced this concept, referred to as "fuel-capital cost flexibility", when they denied the need for the Cypress Energy Partners power plant. In Order No. PSC-92-1355-FOF-EQ, the Commission stated in part:

The initial capital cost of a combined cycle plant is lower than the cost of a pulverized coal plant. The physical plant itself is simply less expensive. Although the combined cycle plant typically burns gas or oil, which have historically been more expensive than coal, the combined cycle plant has the advantage of fuel flexibility. If gas or oil prices become prohibitive, a coal gasification unit can be added and the combined cycle plant can burn coal gas. Thus a combined cycle plant, capable of adding coal

Thus a combined cycle plant, capable of adding coal gasification at a future date, offers a strategic cost-effective advantage over a capital-intensive pulverized coal plant. The less expensive combined cycle plant can burn gas unless gas prices escalate enough to justify the capital expenditure required to convert the unit to burn coal.

The above language summarizes the Commission's longstanding policy of requiring multiple fuel type capability at new power plant sites with fuel switching capital investments made as rising fuel prices warrant.

Can you give some examples of why you believe TECO relied upon 11 2 unrealistic assumptions when evaluating the continued construction of the Polk 3 Unit? Yes. During the 1991 through 1996 time frame, TECO performed studies 4 that compared the continued construction of the Polk Unit with a natural gas 5 combined cycle unit at the Polk Site. The results of these studies were 6 provided through the discovery process. Exhibit No _____ (TEB-1) contains 7 a summary of the key assumptions used for each study. 8 Beginning with the 1992 study. TECO assumed the use of as-available natural 9 gas for the Spring and Fall and distillate oil for Summer and Winter as fuel 10 for the alternative combined-cycle unit at the Polk Site. TECO contends that 11 since a combined-cycle unit would run at a low capacity factor, firm 12 transportation of natural gas is not cost effective. However, TECO has not 13 provided any analysis to support this assumption. In fact, TECO's assumption 14 places a significant bias against ever choosing a natural gas fired combined-15 cycle alternative. Since the price of distillate oil is approximately double 16

that of natural gas, the blended fuel cost has a higher \$/MBTU cost. This would result in an even lower capacity factor than a unit dispatched on firm gas only. In addition, most utilities perform scheduled maintenance on generating plants during the Spring and Fall. This would magnify the bias because, for the majority of time, the combined-cycle unit would be burning

22 higher cost distillate oil.

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TECO has not justified why firm natural gas transportation would not be available or cost effective during this time frame. Florida Power Corporation (FPC), who is building a natural gas fired combined-cycle plant near the Polk

Site, acquired firm gas contracts during 1995 from various sources. Messrs. Niekum and Majors discussed FPC's fuel procurement process in more detail during their deposition.

In the 1993 study, the year before actual construction of the Polk IGCC Unit began, TECO abandoned the Polk IGCC unit's design fuel and instead assumed the use of a pet coke/coal blend as the primary fuel for the Polk IGCC Unit. Mr. Breman's testimony addresses certain concerns he has about the technical and market viability of pet coke. Even using TECO's erroneous natural gas forecast, the natural gas fired combined-cycle alternative was approximately \$68 million less expensive than the Polk IGCC unit fueled by Illinois #6 coal. This means that the decision to continue with the construction of the Polk IGCC unit hinged upon a speculative and unproven assumption.

In the 1994 study, TECO based the justification of the continued construction of the Polk IGCC Unit primarily on a \$98 million tax credit based on Section 29 of the Internal Revenue Code, but assumed standard Illinois #6 coal as the primary fuel for the Polk IGCC Unit. The tax credit alone accounts for 97% of the project's overall savings when compared to a gas fired combined cycle plant. In 1994, TECO was not, and is still not, eligible for this tax credit. Again, the decision to continue with the construction of the Polk IGCC unit hinged upon a speculative and unproven assumption.

In its 1995 study. TECO once again relied upon the use of pet coke in the later years of the study as well as an \$87 million tax credit to justify the construction of the Polk IGCC Unit. The tax credit accounted for approximately 60% of the Polk IGCC Unit's total savings in the 1995 study.

Again. TECO was not eligible for this tax credit.

1995 Ten Year Site Plan in April, 1995.

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- 2 When was the staff of the Commission first made aware that TECO was 3 planning to use a pet coke/coal fuel mix for the Polk IGCC Unit?
- 4 A. TECO provided status reports of the Polk IGCC Unit when it filed its 5 annual Ten Year Site Plans starting in 1992. However, TECO did not indicate that they were planning to use a pet coke/coal fuel mix until they filed their 6
- 8 When was the staff of the Commission first made aware that TECO was 0. pursuing the Section 29 tax credit?
- 10 In January, 1994, TECO informed the staff that they were pursuing Α. 11 changes to Section 29 of the Internal Revenue Code. At that time, TECO also 12 informed staff that they had committed to pass any tax credits to TECO's ratepayers through the fuel adjustment clause. I have attached this letter 13 14 as Exhibit No. (TEB-2).

15 However, in response to Staff Interrogatory No. 6, TECO now claims that "Realization of any Section 29 tax benefits during or subsequent to the term 16 17 of the stipulation will contribute to a deferral of base rate increases." The entire Interrogatory question and response is contained in Exhibit No. (TEB-3).

- Earlier you mentioned the risk of relying upon a widening price 20 0. 21 differential between natural gas and coal. Have you compared the relative 22 risk to TECO's ratepayers of constructing the Polk Unit in lieu of a natural 23 gas fired combined cycle plant?
- 24 Yes. In response to Staff Interrogatory Number 4, TECO provided the difference in cumulative present value revenue requirements for the studies

performed in the years 1993 through 1996. The savings claimed by TECO are based on an ever widening difference between natural gas and coal prices and the questionable assumptions mentioned above. If TECO had utilized the type of gas forecast being recommended by Mr. Breman, I doubt TECO would have opted to build the Polk IGCC unit. Below is a summary of the breakeven points for each study using the in-service year of 1996 as a baseline.

STUDY YEAR	BREAKEVEN PERIOD	SUNK COSTS
1993	18	\$17.500.000
1994	10	\$35,000,000
1995	8	\$170.000.000
1996	5	\$245,000,000

These breakeven time periods are impacted by the amount of sunk costs assumed for the combined cycle alternative. The sunk costs did not become significant until the 1995 study.

In the 1993 study, using the speculative pet coke fuel savings, the breakeven analysis shows that TECO's ratepayers would have to wait 18 years after the unit came on line to realize a positive savings. This means that at the time the study was conducted. TECO was willing to wait until the year 2013 for its ratepayers to realize a net benefit from the continued construction of the Polk IGCC Unit. In my opinion, this is too much risk for TECO's ratepayers to bear, especially during a period when the generation market is becoming more competitive.

In the 1994 study, based on its optimistic tax savings assumptions, TECO was able to shorten the breakeven time period to 10 years. However, without the speculative tax savings, TECO's ratepayers would have to wait until the

year 2023 to realize a net benefit from the continued construction of the Polk IGCC Unit. While standard Illinois No. 6 coal was assumed as the primary fuel for the Polk Unit, this is still too much risk to place on TECO's ratepayers.

In the 1995 study, TECO's analysis shows a breakeven period of eight years. However, without the speculative tax savings, TECO's ratepayers would have to wait until the year 2016 to realize a net benefit from the continued construction of the Polk IGCC Unit. The breakeven period was shortened from the 1994 study by the inclusion of approximately \$170 million in sunk costs being added to the cost of the natural gas fired combined cycle alternative.

In addition to the above, the resulting capacity factors for the combined-cycle plant were very low, especially in the early years of each study. This indicates to me that a combustion turbine may have been a more appropriate alternative to the Polk IGCC Unit. TECO explored this alternative only in the 1992 study.

Q. Were the results of these studies ever presented to senior management or officers of TECO for their approval?

The results of the 1992 through 1994 studies were shown to TECO's senior management and the savings were consistently overstated compared to what TECO is currently presenting to the Commission. In response to Interrogatory No. 3 in Docket No. 950379-EI, TECO provided a summary table of the savings of the Polk Unit compared to a combined-cycle plan. At his deposition, Mr. Hernandez stated that the results of these individual studies were presented to senior management of TECO soon after the completion of each study. Below is a summary of the two different responses.

1	STUDY YEAR	INTERROGATORY RESPONSE	VALUE PRESENTED TO SENIOR MANAGEMENT
2	1992	\$155,000,000	\$230,000,000
3	1993	\$108,000,000	\$140,000,000
4	1994	\$101.000.000	\$160,000,000
5	1995	\$148,000,000	\$260,000,000
6	1996	\$201,000,000	\$200,000,000
7	At his depos	ition, Mr. Hernandez expla	ined these differences as follows:
8	In	the course of preparing	the summaries and
9	go	ing back and looking at	the five different
10	sto	udies that we had done ar	nd the presentations
11	tha	at were made, we wanted to	be consistent in how
12	we	were handling cost com	ponents in the DOE
13	fur	nding, as well as how we m	modeled the dual fuel
14	cap	pability for the IGCC unit	t as well as for the
15	cor	mbined cycle alternative.	In the course of
16	go	ing back and maintaining co	onsistency from study
17	to	study, we effectively came	e up with new savings
18	est	timates, and those are wha	it we reported in the
19	re	sponse to Interrogatory No). 3.
20	This r	aises serious concerns re	garding the validity of TECO's claimed
21	savings of th	he Polk IGCC Unit at the t	ime the studies were made.
22	Q. What co	onclusions do you draw fro	om the results of the studies performed
23	by TECO?		
24	A. TECO a	pparently adopted and pur	sued a "coal at any cost" construction

25 strategy. I believe that even with TECO's unrealistic and inflexible

assumptions. TECO should have stopped construction of the Polk Unit in the 1993-1994 timeframe. To more cost effectively meet the needs of its ratepayers. TECO should have built a natural gas fired combined-cycle unit. or perhaps a combustion turbine unit, at the Polk Site.

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The addition of a power plant is a significant capital investment. As such, utilities perform sensitivity analyses to determine how robust a plan is to changes in load or fuel prices. Since TECO's studies are radically affected by one assumption. TECO's ratepayers are held captive to decisions that had little room for error. This essentially placed all of TECO's ratepayer's eggs in one basket. With impending competition in the generation market, utilities across the nation are looking for ways to mitigate potential stranded generation assets. A way to mitigate potential stranded generation assets is through "fuel-capital cost flexibility." TECO should have pursued this course of action. Instead, TECO chose a path that will increase its rate base by approximately 25% at a time when TECO's operating costs, in cents/kWh, are already higher than FPC or FPL.

- Q. Since construction of the Polk Unit is virtually completed, how can some of this risk be shifted away from TECO's ratepayers?
 - A. If the Commission agrees that TECO should have built a natural gas fired combined-cycle plant in lieu of the Polk IGCC Unit, then there are a number of options the Commission should explore. Any action taken should recognize the relationship between fuel and capital costs. To ignore this interrelationship would unfairly penalize TECO. To be fair, TECO should assume the risk of their fuel forecast while at the same time, have the opportunity to reap the rewards if TECO's projected natural gas prices do

materialize. There may be several methods of achieving this result. TECO and the other parties to this proceeding should be directed to negotiate the details of an alternative ratemaking treatment. If these negotiations are not fruitful, then I believe that the Commission should adopt a treatment such as the method outlined in Witness Larkin's testimony. In response to Interrogatory No. 11. TECO has committed to work out the details of this proposal if ordered to make such an adjustment.

- Q. Does this conclude your testimony?
- A. Yes.

	TECO Present Worth IGCC Savings Compared to Combined Cycl	e unit (Mil	lions)	
Study Year	Major Assumption4	Present Worth Savings	Forecast 1999 IGCC Puel Price (\$/MBTU)	Forecast 1999 Gas Fuel Price (\$/MBTU)
1991	Need Determination Illinois #6 coal for IGCC Firm natural gas primary fuel for CC	\$195	\$2.29	\$8.31
1992	Illinois #6 coal for IGCC As-available natural gas/distillate as primary fuel for CC \$4.7 million IGCC sunk cost assumed for CC	\$155	\$1.94	\$5.59
1993	80/20% Petcoke/Galatia coal mix starting in 1999 for IGCC As-available natural gas/distillate as primary fuel for CC \$17.5 million IGCC sunk cost assumed for CC	\$108	\$1.17	\$3.77
1994	• Illinois #6 coal from 1999 to end of study for IGCC • \$98 million PWRR tax credit assumed to be available • As-available natural gas/distillate as primary fuel for CC • \$35 million IGCC sunk costs assumed for CC	\$101	\$1.63	\$3.78
1995	• Illinois #6 coal from 1999 to 2007 for IGCC • Beyond 2007, 65/35% Petcoke/Powder River Basin coal mix for IGCC • \$87 million PWRR tax credit assumed to be available • As-available natural gas/distillate as primary fuel for CC • \$170 million IGCC sunk costs assumed for CC	\$148	\$1.62 (\$1.61 in 2008)	\$3.77
1996	75/25% Petcoke/PRB coal mix starting in 1999 for IGCC As-available natural gas/distillate as primary fuel for CC \$245 million IGCC sunk costs assumed for CC	\$201	\$1.20	\$3.03

Note: Data taken from Interrogatory #'s 3, 5, and Order No. PSC-92-0002-FOF-EI.



January 19, 1994

Mr. Joseph Jenkins Director of Electric and Gas Florida Public Service Commission Fletcher Bldg., 101 E. Gaines Street Tallahassee, Florida, 32399-0850

Dear Mr. Jenkins:

This letter will set forth specific details of the Conversation that John Rowe and I had with you last month about the potential for a Federal Income Tax Credit on fuel at Tampa Electric's planned Polk unit.

Section 29 of the Internal Revenue Code of 1986, as amended (IRC), provides a credit for the production of fuel from non-conventional sources. In our planned Polk unit, we expect to convert coal to methane gas as the primary fuel to produce electricity. This process meets the definition of non-conventional fuel contained in the IRC, and the fuel would qualify for the credit but for the fact that another section of the IRC (Sec. 29(d)(7)) requires that the fuel produced be sold to unrelated third parties to be eligible for the credit.

Attempts have been made to amend the IRC so that if the fuel produced is immediately converted to electricity for sale to third parties, the fuel would qualify for the credit. We have met with several economists from the Joint Committee of Taxation, to discuss the basis for the revenue estimate and in the course of our discussions, we indicated that if the credit were available to Tampa blectric, it would probably be passed on directly to Customers as reduced fuel charges. They expressed some skepticism that the FPSC would require such treatment and we told them that they were welcome to talk to Commission personnel directly, as soon as I identified the correct individual, and advised that person of the nature of the question.

We believe that the Sec. 29 credit is different from previous tax credits to which we were entitled, in that it would be directly related to fuel (methane) which is produced and consumed on site. Thus, we believe that any credit earned would be treated as a reduction of the cost of the fuel and passed to Customers as part of the fuel clause. We think you would agree that any reduction in the cost of the fuel so produced should be and will, under existing Commission policy, be passed along to electric customers. You need to tell anyone who calls from the Joint Committee of Taxation staff that the FPSC would treat any fuel credit available as a benefit passed directly on to customers.

Mr. Joseph Jenkins Page Two

If you have any questions about this matter, please call either John Rowe or me.

Sincerely,

Donald A. Mulligan Vice President - Taxes

cc: John R. Rowe

TAMPA ELECTRIC COMPANY DOCKET NO. 960409-EI FPSC STAFF'S 1st SET INTERROGATORY NO. 6 WITNESS: ROWE PAGE 1 of 1

- 6. In a letter dated January 19, 1994, from Mr. Donald Mulligan to Mr. Joseph Jenkins, TECO proposed that any potential tax credits resulting from changes to Section 29 of the Internal Revenue Code would be passed along to TECO's customers through the fuel adjustment clause. However, in response to the FPSC's Data Request No. 10 in Docket No. 950379-EI, TECO stated that any tax credits should be credited to base rates to offset the revenue requirement of the Polk Unit. Please explain why TECO has changed its opinion on these potential tax credits.
- A. Between early 1994 and the present, Tampa Electric's efforts refocused on every available means to minimize or postpone base rate increases. Realization of Section 29 tax credits could have been significant in achieving this objective. The stipulation approved April 30, 1996, is evidence of Tampa Electric's efforts in this regard. Realization of any Section 29 tax benefits during or subsequent to the term of the stipulation will contribute to a deferral of base rate increases.