BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070098-EI

In the Matter of:

PETITION FOR DETERMINATION OF NEED FOR GLADES POWER PARK UNITS 1 AND 2 ELECTRICAL POWER PLANTS IN GLADES COUNTY, BY FLORIDA POWER & LIGHT COMPANY.

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VOLUME 11

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| PROCEEDINGS: | HEARING |
| BEFORE: | CHAIRMAN LISA POLAK EDGAR<br>COMMISSIONER MATTHEW M. CARTER, II<br>COMMISSIONER KATRINA J. MCMURRIAN |
| DATE: | Monday, April 30, 2007 |
| TIME: | Commenced at 9:39 a.m. |
| PLACE: | Betty Easley Conference Center<br>Room 148<br>4075 Esplanade Way<br>Tallahassee, Florida |
| REPORTED BY: | LINDA BOLES, RPR, CRR<br>Official FPSC Reporter<br>(850) 413-6734 |
| APPEARANCES: | (As heretofore noted.) |

# I N D E X

## WITNESSES

EXHIBITS

| NUMBER: | | ID. | ADMTD. |
|---|---|---|---|
| 132 | | | 1763 |
| 133 | | | 1763 |
| 164 | | | 1632 |
| 168 | | | 1632 |
| 184 | | | 1702 |
| 196 | | | 1634 |
| 197 | Kosky Environmental Group Exhibit | 1761 | 1763 |

P R O C E E D I N G S

(Transcript continues in sequence from Volume 10.)

CHAIRMAN EDGAR: Good morning. Call this hearing to order. And I believe when we left on Thursday we had some questions as to a few of the documents, so let's start there.

MS. BRUBAKER: Chairman, there are a number of exhibits that have been identified, and at the time they were asked to be moved into the record, parties either voiced objections or wished an opportunity to look at the exhibits to make sure they didn't have an objection. We could go ahead and start, I believe, with Exhibit 168 or actually 164.

CHAIRMAN EDGAR: Uh-huh. The dots, as I recall.

MS. BRUBAKER: Right. And I'll let the parties address any remaining concerns or if they can go ahead and be entered into the record.

CHAIRMAN EDGAR: Thank you. Mr. Guest.

MR. GUEST: As to 164, which is a chart of Mr. Schlissel's calculations, our objection was that there were pieces missing from it and other pieces added to it, and I don't think we've been dislodged from that objection.

CHAIRMAN EDGAR: Mr. Litchfield.

MR. LITCHFIELD: Thank you, Chairman Edgar. I think the exhibit goes in if it's relevant and has been authenticated. It's been authenticated clearly. We can refer to Page 622 of the current version of the transcript, if we

need to. But I don't think there's any contest with respect to that point. It's relevant, it directly goes to the proposition for which Mr. Schlissel offered the original exhibit in that he is proposing certain projections as reasonable, and this cross exhibit goes directly to that contention.

And with respect to the notion that it somehow should be allowed to be updated, I guess I would make a couple of points in that respect.

First of all, if there were more current data points to be reflected on the exhibit, Mr. Schlissel surely had that opportunity to submit those in his direct testimony. But, in fact, the record is pretty clear that there aren't any more current data points relative to the existing bills before Congress. Mr. Schlissel says on Page 615 of the transcript, "In fact, we will have to see as the analyses of the bills come out what impact or what projected initial allowance prices they have."

So I think the record is clear that those data points don't even exist at this point. Mr. Schlissel indicated that they were in the process of thinking about revising their projections over the next month or two, but the record will long be closed by the time we have that. The time for Mr. Schlissel to have indicated what, if any, additional information he would like to put before this Commission has long since passed. The exhibit is relevant, it's been

authenticated and it should be admitted.

CHAIRMAN EDGAR: And, Mr. Guest, would you refresh our memory as to your objection?

MR. GUEST: The objection was that, was that what we did was we started with a chart of data points by Mr. Schlissel and what they did is they removed some of them. It seems like if what you're going to do is represent what Mr. Schlissel did, you really have to honestly represent what it was and not check data points off. That's our -- I think it's prejudicial to take out important, relevant information.

CHAIRMAN EDGAR: Ms. Brubaker.

MS. BRUBAKER: I have to agree frankly with FPL's comments. To me, the exhibit is relevant. It was testified to and examined by the witness and discussed. I think it's abundantly clear on the record because it was mentioned on several points that this was not Mr. Schlissel's exhibit, that this was an adverse party making a modification to his exhibit for the purposes of cross-examination. I don't think it is incumbent on the proffering party to modify or adapt to that cross-examination exhibit to -- in the way that's been described by Sierra Club. So I would recommend that the objection be overruled and the item be entered into the record.

CHAIRMAN EDGAR: Okay. Then on the advice of counsel, the objection is overruled and we will admit 164 into the record.

(Exhibit 164 admitted into the record.)

MS. BRUBAKER: And that brings us next to Exhibit 168, which was proffered by Sierra Club. It is slides from a Black & Veatch Supercritical Plant Technology Overview PowerPoint presentation, if I, if I remember correctly.

CHAIRMAN EDGAR: Mr. Anderson.

MR. ANDERSON: Yes. Counsel was good enough to give us the whole slide deck it came from. We reviewed it. There's nothing additional to add in our view. Accordingly, we do not have objection to admission into evidence of Exhibit 168.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: We offered the whole thing. It's okay.

CHAIRMAN EDGAR: Okay. 168 will be entered into the record.

(Exhibit 168 admitted into the record.)

MS. BRUBAKER: The next is Exhibit 178, which was offered by FPL during Mr. Hicks' redirect on his direct examination. And I'll let FPL describe the item.

MR. ANDERSON: Madam Chairman, Mr. Guest and I had a little discussion this morning, and Mr. Guest has pointed out a number of labeling changes and things which would make this exhibit more apparent, what it is and what it shows. We've agreed to do those. And I've agreed to show those to Mr. Guest, and hopefully we'll then be able to just have the exhibit as amended with the labeling offered into evidence

then.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: I would take it one step farther. I think it wouldn't be correcting labels, it would be adding labels. Because when we studied it over the weekend, we couldn't figure out whether -- because there were no commas in the numbers and no labels in the rows. It certainly isn't self-evident about what it means. But we've agreed to what the labels ought to say and what it means, and I think it would be very useful to have labels. I think we have agreed about what they'll say, too.

CHAIRMAN EDGAR: Okay. Ms. Brubaker.

MS. BRUBAKER: I believe that the additions that have been discussed actually would be very helpful for the purposes of the exhibit. Mr. Guest, is it my understanding that with those additions you do not object to the exhibit?

MR. GUEST: Well, there's a loose number down in the lower right that seems to have mystified everyone, so we may need to work on clarifying that.

CHAIRMAN EDGAR: Okay.

MR. GUEST: It doesn't follow a row or a column, so.

CHAIRMAN EDGAR: So do we need to redistribute and have an updated, updated document for 178 substituted to counsel, to the court reporter, et cetera?

MR. ANDERSON: That would be the thought. And having

taken into account Mr. Guest's suggestions, we'll be preparing that at the next available break and would, for purposes of the convenience of the parties, show it to staff, show it to Mr. Guest, and hopefully then be in a position to take it up appropriately.

CHAIRMAN EDGAR: Okay. So we will come back to 178 after the midmorning break.

MS. BRUBAKER: With 178 tabled, the next item I have is 196. That is, I believe, an excerpt from an MIT study. Yes. The Future of Coal that was proffered by Sierra Club.

MR. GROSS: Madam Chair --

CHAIRMAN EDGAR: Mr. Gross.

MR. GROSS: -- my recollection is the objection was that it was an excerpt and that the entire report should be admitted, and we have absolutely no objection to that. They have that right.

CHAIRMAN EDGAR: Mr. Litchfield.

MR. LITCHFIELD: Madam Chair, we looked at the report. Really I just wanted to hold open the opportunity to see the extent of the exhibit. It's a 200-page document. We're not proposing to add the entire document into the record. We have no objection to the exhibit as marked.

CHAIRMAN EDGAR: Okay. So Exhibit 196 as distributed this past Thursday will be admitted into the record.

(Exhibit 196 admitted into the record.)

Any other matters?

MS. BRUBAKER: One last housekeeping matter is Exhibit 184 that was proffered by Sierra Club, I believe during Mr. Sim's direct examination. It was a PowerPoint presentation from TECO. It was my understanding that that exhibit might be brought up during Mr. Jenkins' cross-examination today, and, if so, I'd leave that to the Sierra Club to take up. But that was the only other exhibit I have currently on my list that had not been addressed.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: I'm not exactly sure what the question here is. Is the question --

CHAIRMAN EDGAR: Well, 184 was not admitted. It was distributed, I think, I think I recall discussed briefly, but it was not admitted into the record. And there was some discussion, if I remember correctly, at the time that there would be further questioning related to it with a later, different witness. It was --

MR. GUEST: May I have a moment on that? This one caught me a little by surprise.

CHAIRMAN EDGAR: Of course.

MS. BRUBAKER: I'm not recommending action be taken on it at this time. It was simply noting that exhibit is still left unentered into the record or denied being entered into the record, and so I just wanted to note that that's why that

matter is still pending.

MR. GUEST: I'm sorry. I missed what --

CHAIRMAN EDGAR: That's okay. Ms. Brubaker was restating that we were not suggesting or requiring action at this time, just refreshing all of our memories as to what the status of that is and was, which is that it was not admitted and there was the possibility that maybe that request would be made with one of the witnesses today, later today, later this morning.

MR. GUEST: Well, maybe I can just cut it short and just move it in now. Is there a reason not to?

MS. BRUBAKER: Well, my memory is there was an objection to it being entered into the record with Mr. Sim's cross-examination and that it might be discussed during Mr. Jenkins', that we would take it up at that time.

CHAIRMAN EDGAR: Okay. So we will come -- we will table that as well. And if there is, is need for further discussion, we will take it up at the end of Mr. Jenkins' testimony.

MS. BRUBAKER: With that, Madam Chairman, I am aware of no further preliminary matters.

CHAIRMAN EDGAR: Okay. Any other matters before we call the first witness of the morning? No?

Okay. Mr. Litchfield, Mr. Anderson, your witness.

MR. ANDERSON: Thank you, Madam Chairman. FPL would

call as its next witness Mr. Stephen Jenkins.

CHAIRMAN EDGAR: And for some reason I was expecting Mr. Hicks. Are we going --

MR. GUEST: We have agreed to take them out of order so that he could get away on an engagement.

CHAIRMAN EDGAR: Okay.

MR. KRASOWSKI: Madam Chair.

CHAIRMAN EDGAR: Every once in a while just let me know what it is you all have agreed to.

MR. ANDERSON: I'm sorry. I should have mentioned that to you.

MR. KRASOWSKI: Madam Chair?

CHAIRMAN EDGAR: Mr. Krasowski?

MR. KRASOWSKI: Likewise, we'd like to know what's going on as far as order of the witnesses. And once again, we have an objection to not being included.

CHAIRMAN EDGAR: As would our staff. So let's remember we're all in this together. And obviously, I mean, I said last week and will say it again, if we can work together to accommodate schedules, I am glad to consider that. But I hate being the only one who doesn't know, so.

MR. ANDERSON: Chairman Edgar, that's my oversight and I'm very sorry. We wanted to take Mr. Jenkins up first because he -- from a travel perspective. Other than that, the suggestion is follow the order of the witnesses as it stands.

MR. KRASOWSKI: Could we have a reading of the order, Madam Chair? It would be Jenkins, Hicks and --

CHAIRMAN EDGAR: Okay. Yes. So we will hear from Mr. Jenkins, then Mr. Hicks, then Mr. Kosky, then Mr. Sim and then Mr. Silva is what I have. Does that --

MR. ANDERSON: Yes.

MR. KRASOWSKI: Thank you.

CHAIRMAN EDGAR: Okay. Okay.

Mr. Anderson.

STEPHEN D. JENKINS

was recalled as a witness on behalf of Florida Power & Light Company and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. ANDERSON:

Q Good morning, Mr. Jenkins.

A Good morning.

Q You've been previously sworn?

A Yes, I have.

Q Tell us your name and business address again.

A My name is Stephen Jenkins and my business address is 4350 West Cypress Street, Tampa, Florida 33607.

Q Remind us by whom you're employed and in what capacity.

A I'm employed by the engineering firm CH2M Hill, Incorporated, as Vice President, Gasification Services.

Q Have you prepared and caused to be filed 34 pages of prefiled rebuttal testimony in this proceeding?

A Yes, I have.

Q Do you have any changes or revisions to your prefiled rebuttal testimony?

A No.

Q If I asked you the same questions contained in your prefiled rebuttal testimony, would your answers be the same?

A Yes, they would.

MR. ANDERSON: Madam Chairman, we ask that Mr. Jenkins' prefiled rebuttal testimony be inserted into the record as though read.

CHAIRMAN EDGAR: The prefiled rebuttal testimony will be entered into the record as though read.

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**FLORIDA POWER & LIGHT COMPANY**

**REBUTTAL TESTIMONY OF STEPHEN D. JENKINS**

**DOCKET NO. 070098-EI**

**MARCH 30, 2007**

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

A. My name is Stephen D. Jenkins. My business address is 4350 W. Cypress Street, Tampa, Florida 33607.

**Q. By whom are you employed and what is your position?**

A. I am employed by CH2M Hill, Inc., as Vice President, Gasification Services.

**Q. Did you previously submit direct testimony in this proceeding?**

A. Yes.

**Q. What is the purpose of your rebuttal testimony?**

A. My testimony responds to the original and supplemental testimony submitted by Mr. Richard Furman on behalf of certain intervenors in this proceeding. In summary, Mr. Furman's testimony contains many incorrect assertions and conclusions with respect to:

- the relative performance, availability and costs of Integrated Gasification Combined Cycle ("IGCC") and pulverized coal ("PC") technologies such as ultra-supercritical pulverized coal ("USCPC");
- the costs of electricity from both of these technologies; and

- the economic and technical viability of the capture and sequestration of carbon dioxide ("CO2") from both of these technologies.

As a professional working actively in the electric power industry with respect to the commercialization and use of IGCC technology, and using the best available industry information, I am able to conclude that Florida Power & Light Company's selection of USCPC technology for the FPL Glades Power Park Units 1 and 2 ("FGPP") is clearly the best choice to meet its needs for high availability, low cost, and fuel-diverse capacity in the time frame of its requirements. Mr. Furman's criticisms of FPL's technology choice lack merit, for the reasons discussed in my testimony and that of other FPL witnesses, and therefore his testimony should not be considered by the Commission.

**Q. Do you have any observations concerning Mr. Furman's methodology for preparing testimony and supporting his opinions in this proceeding?**

A. Yes. I reviewed the transcript of Mr. Furman's deposition taken on March 26, 2007 in this proceeding. It has been my sense, and I was able confirm from Mr. Furman's deposition, that nearly all of his 26 exhibits supporting his testimony are actually copies taken from other peoples' PowerPoint presentations. With minimal changes, this collection of exhibits has been used by Mr. Furman numerous times in making volunteer presentations outside of a testimonial setting on behalf of groups opposing various PC plants.

Mr. Furman conducted virtually no independent analysis of FGPP. Even the electric generation cost comparisons provided in Mr. Furman's testimony and exhibits are generic – not only were they prepared without using any FGPP data or information, but in fact they were prepared for presentations Mr. Furman made concerning other utilities' PC projects in Texas and Florida.

Mr. Furman's testimony and exhibits do not reflect the type or quality of analysis that utility engineers and managers rely on in making routine business decisions, much less decisions involving the investment of billions of dollars in complex electric generating assets designed to provide service to customers for decades. Accordingly, his recommendations should not be relied upon by the Commission for such purposes either.

**Q. Mr. Furman states that "Many utilities around the country are choosing IGCC plants due to IGCC's much lower emissions of all pollutants and its capability to capture CO2." Do you agree with this statement?**

A. No, I do not. Only a handful of utilities, not "many," are going forward with IGCC projects. Most new power generating plants using coal will use PC technology, not IGCC. There is a common misconception that IGCC has an inherent capability to capture CO2. It does not have such an inherent capability. Therefore, IGCC has not been chosen specifically for this purpose.

**Q. Mr. Furman states that "Large size IGCC plants can be built by using multiple gasifiers. This improves system reliability, increases efficiencies and provides fuel flexibility." Do you agree?**

A. No, there are several errors in Mr. Furman's statement. Most fundamental to his misstatement is the fact that currently available IGCC technology is more efficient than USCPC technology. Not one of the proposed coal-based IGCC power plants is expected to be more efficient than the FGPP. Moreover, as discussed in my direct testimony, IGCC plant availability has not been as high as that for PC units. Even with many of the planned design improvements, the availability of the next generation of IGCC plants may not be as high as what PC plants are already able to achieve. Modular design does not necessarily provide for increased efficiency. In fact, smaller gasifiers can be less efficient than larger gasifiers. Further, just because one uses multiple gasifiers does not mean that fuel (more correctly, feedstock) flexibility is increased. Gasifiers must be designed for specific feedstocks, although they do have some flexibility to handle some variability in those feedstocks. However, this is not an inherent characteristic of modularity as Mr. Furman states.

**Q. Mr. Furman suggests that since gasification plants can operate at high availabilities, that IGCC plants will inherently have the same high availabilities. He states "These examples demonstrate that IGCC plants can operate at the 90% availability level required by electric utilities for base load plants." Is this an accurate conclusion?**

A. No, it is not. Mr. Furman is confusing a basic gasification plant with a modern IGCC plant. Just because several individual gasifiers at a specific gasification plant may have a high availability does not imply that a complete, complex IGCC power plant that incorporates gasification, air separation, acid gas removal, sulfur recovery and power generation would have the same high availability. Each of these IGCC plant "islands" has its individual availability issues which have been shown to impact overall IGCC plant availability to a value lower than what the individual gasifiers achieve. This is highlighted in the fact that neither of the two coal-based IGCC power plants in the U.S. has achieved an availability level of 90% in the IGCC mode of operation (without using a back-up fuel for the power block). The IGCC plants being designed today will incorporate the thousands of lessons learned from the four coal-based IGCC plants in order to improve availability, efficiency, and operating performance. Tampa Electric plans to use many of the lessons learned from Polk Unit #1 in the design of its next full-scale IGCC plant. This includes using two gasifier trains. Even with these enhancements and design improvements, Tampa Electric notes that the new unit is expected to provide 85% availability, not 90% as Mr. Furman suggests.

**Q. Mr. Furman's testimony states that "The Nuon utility in The Netherlands and Hunton Energy Group in Texas have announced plans to build 1200 MW IGCC plants using multiple gasification 'trains' and multiple combined-cycle units." Is this an accurate statement?**

A. No. Mr. Furman is incorrect concerning the status of many of the proposed IGCC projects. As an example, Nuon is not building a 1,200 MW IGCC plant. Nuon is planning a 600 MW IGCC plant and an adjacent 600 MW gas-fired combined cycle plant. Hunton Energy has also noted that at this time that it has a site that could accommodate a 1,200 MW IGCC plant, using petroleum coke as the feedstock. However, Hunton Energy has also noted that at this time, they are only pursuing the development of one 600 MW IGCC plant.

**Q. Mr. Furman's testimony states that "Proven commercially available technologies are not presently available for the proposed new coal boilers for mercury and CO2. This is one of the main reasons that we need to use gasification." Do you agree with this statement?**

A. No, I do not. Selective catalytic reduction, a commercially proven emission control technology for nitrogen oxides, actually converts a portion of the elemental mercury in the flue gas stream to the oxidized form, allowing easier removal by the downstream emission control processes. Mercury reduction is a proven "co-benefit" of baghouses, wet flue gas desulfurization systems, and wet electrostatic precipitators, all of which are commercially proven and will be installed on the FGPP. In addition, dedicated large-scale mercury control for SCPC boilers actually is commercially available, and has been proven in tests on

large PC boilers to achieve high mercury removal. An example of this is the powdered activated carbon technology. This technology uses activated carbon which is injected into the flue gas stream. After the mercury is captured, the carbon is removed in the plant's particulate collection device, i.e. electrostatic precipitator or baghouse. FGPP will incorporate such mercury control technology. This is discussed in detail in FPL s direct testimony of David Hicks, and FPL's direct and rebuttal testimony of Kenneth Kosky.

**Q. Mr. Furman's states "In the first step of the IGCC process, coal is slurried with either water or nitrogen and enters the gasifier. It is mixed with oxygen, not air, which is provided to the gasifier from an air separation unit." Is this an accurate description of the first step of the IGCC process?**

A. No, it is not. It is incorrect to say that IGCC uses only oxygen, not air. Most commercially available gasification technologies are air-blown, not oxygen blown. Air and oxygen are both viable for IGCC. For example, the KBR IGCC technology being developed by Orlando Utilities and Southern Power in the Orlando area will use air, not oxygen. So will the Mitsubishi IGCC technology which has been selected by NRG Energy for development in New York State. In addition, one does not "slurry" coal with nitrogen. Coal is a solid, while nitrogen is a gas. Modern dry feed gasifiers do use nitrogen as a carrier gas, but no slurry is produced.

**Q. Mr. Furman's states "The operating conditions in the gasifier vitrify the solids. In other words, the solids are encased in a glass-like substance that makes them less likely to leach into groundwater when disposed of in a landfill as compared to solid wastes from a conventional coal plant." Is this an accurate description of this portion of the IGCC process?**

A. No, it is not. The operating conditions in modern gasifiers do not necessarily vitrify the solids. For example, the gasifier operating conditions planned for the KBR demonstration IGCC plant in Orlando will be approximately 1,800F, so that its solids will not be produced in a vitrified form. Further, the glass-like slag produced from specific types of gasifiers is not more or less likely to leach into groundwater than the coal combustion byproducts from a coal-fired boiler. Both would be required to be stored in a double-lined landfill, using leachate collection and treatment. This protects the ground, as well as the groundwater, from any such leachate. That is another reason why ash and slag from both gasification and coal combustion are excluded from regulation under RCRA Subtitle C, Hazardous Wastes.

**Q. In describing the sulfur recovery section of an IGCC process, Mr. Furman states "The H2S that is removed from the syngas is usually converted into elemental commercial-grade sulfur using a Clauss plant." Is this an accurate description of this portion of the IGCC process?**

A. No, it is not. The sulfur is not usually converted into elemental sulfur. In the two IGCC plants in the U.S., one makes elemental sulfur, while Polk Power Station here in Florida recovers the sulfur as sulfuric acid. Tampa Electric has stated that

their next planned IGCC plant will also recover the sulfur in the form of sulfuric acid.[1]

**Q. Is Mr. Furman's overall description of how an IGCC plant works accurate?**

A. No, it is not. The integration step, which is the most critical part of making IGCC work, is not mentioned at all in Mr. Furman's description of IGCC. This is highlighted in his statement that the combined cycle plant used in IGCC is the same configuration that is used in natural gas-fired combined cycle plants. In fact, it is very different. Not only are the burners for combusting syngas in the gas turbine a completely different design from what is used for natural gas, but most of the steam used in the steam turbine to make electricity typically comes from the syngas coolers in the gasification plant, not from the heat recovery steam generator in the power block. Because of this, the steam turbine in an IGCC plant is typically sized larger than it would be for a natural gas-fired combined cycle plant with a similar gas turbine, heat recovery steam generator, and steam turbine configuration.

The description also fails to mention a critical part of the "integration" portion of an IGCC plant: utilizing the nitrogen produced in the air separation unit in the gas turbine for the purpose of augmenting power production and for reducing NOx emissions. In short, Mr. Furman's testimony does not convey at all a sense of the difficulty and complexity that is involved in integrating the different portions of an IGCC power plant.

[1] Also note that the process that converts the H2S in the syngas stream to sulfur is a Claus plant, not a Clauss plant as reported in Mr. Furman's testimony.

**Q. Is Mr. Furman's comparison of PC and IGCC costs of electricity, in his Exhibit RCF-5 appropriate or accurate?**

A. No, it is not. As he stated in his deposition, Mr. Furman has not used information concerning FGPP such as its capital costs, variable operations and maintenance costs, heat rate, expected delivered fuel costs, environmental compliance costs or any of the detailed information provided by FPL in its filing in this proceeding. As he admitted in his deposition, Exhibit RCF-5 was not even prepared for this proceeding. That said, however, Mr. Furman's Exhibit RCF-5 provides some very interesting comparisons if one were to assume that its data pertained to this case and was accurate. In order to attempt to make a point about the cost of electricity from various technologies, Mr. Furman compares USCPC technology using coal with IGCC using petroleum coke. This is not an accurate comparison. Further, using the data in Exhibit RCF-5 for the case where both technologies would use coal, the cost of electricity produced by USCPC technology would be lower than the cost of electricity from an IGCC plant using coal.

**Q. Is Mr. Furman's description of the use of petroleum coke for power generation accurate?**

A. No, it is not. Mr. Furman is apparently unaware that many power plants in the U.S. (and especially here in Florida) do use petroleum coke as a fuel, often blended with coal. His statement that the use of petroleum coke requires additional FGD systems is not correct. Rather, in order to utilize petroleum coke, one would typically increase the sulfur dioxide ("SO2") removal capability of the FGD system to treat the additional SO2 emissions produced from the combustion

of the sulfur in the petroleum coke (the sulfur content of petroleum coke tends to be higher than that of eastern bituminous coals). Such design enhancements include additional limestone handling and grinding capacity, more sprays or spray levels (for spray towers), addition of organic chemicals to improve mass transfer, and increased liquid to gas ratio in the absorber towers. Adding more FGD systems is not the appropriate method for the utilization of petroleum coke. Several of the utilities in Florida use petroleum coke, and they have not added more FGD systems just because of the petroleum coke. They have made changes or enhancements to their existing FGD systems, as described above. Mr. Furman also fails to mention the supply limitations inherent in the significant quantity of petroleum coke that would be required to supply an approximately 2,000 MW IGCC plant for many years. This point is discussed in the testimony of FPL's witness Seth Schwartz.

**Q. Mr. Furman attempts to show that CO2 capture from IGCC plants is just as viable and low cost as it would be on a gasification plant. Is this an accurate conclusion?**

A. No, it is not. Mr. Furman's testimony on CO2 capture begins with a very common misconception by those that do not have a good understanding of IGCC technology: he begins with a discussion of IGCC, but attempts to make his point by using the Great Plains Synfuels plant as the example for CO2 capture for IGCC. The Great Plains Synfuels plant is a coal gasification plant. It is not an IGCC plant and does not generate electricity. Therefore, it does not include any of the basic IGCC subsystems such as an air separation unit or a combined cycle

power block. At this time, there are not any IGCC plants that have CO2 capture systems, as this technology is not economically viable at this time. Further, Mr. Furman states that IGCC is capable of CO2 capture at significantly lower costs than what PC plants can do, despite the fact that no IGCC plants in the world presently capture CO2. In the newly released MIT report, "The Future of Coal," the status of carbon capture and sequestration ("CCS") is described as follows: "neither IGCC nor other coal technologies have been demonstrated with CCS."

**Q. Is Mr. Furman's use of Exhibit RCF-6 appropriate?**

A. No, it is not. In using data from other people's presentations, Mr. Furman notes the source of the data in Exhibit RCF-6 as coming from GE. This is information from a report prepared several years ago by the DOE, EPRI and Parsons. This is not the most recent data available to or utilized by the IGCC industry for CO2 capture.

**Q. Is Mr. Furman's use of the data in his Exhibit RCF-7 appropriate for comparing the costs of electricity for technologies with CO2 capture?**

A. No, it is not. However, Mr. Furman's own Exhibit RCF-7 supports the finding that without CO2 capture, PC is a lower cost alternative than IGCC. None of the more recent studies and data, including the new MIT study, supports a conclusion that SCPC with CO2 capture would be significantly more expensive than IGCC with CO2 capture.

FPL's choice of USCPC technology is consistent with "Recommendation #1" from the new MIT study, which states as follows: "New coal combustion units

should be built with the highest thermal efficiency that is economically justifiable. Any carbon charge will make the economics of higher efficiency coal plants more attractive than those of lower efficiency plants. In addition, continuous advancements in R&D make it likely that further reductions in heat rates will be possible. For pulverized coal plants this means super critical pulverized coal (SCPC) plants today and ultra-super critical pulverized coal (USCPC) plants soon. A 500 MWe USCPC plant will emit about 100 tonnes per operating hour less than a sub-critical plant, avoiding about 21% of the CO2 emissions. [See Chapter 3, Table 3.1]. For IGCC plants this means attention to higher efficiency and high availability operation."

**Q. Is the comparison that Mr. Furman makes in his Exhibit RCF-8 appropriate?**

A. No, it is not. It is not appropriate to compare CO2 emissions for SCPC without capture to IGCC with capture. In doing this, he shows that the CO2 emissions from IGCC would be 90% lower than those for SCPC. If this comparison were done appropriately, it would show that the CO2 emissions from SCPC and IGCC would be about the same for both the "no capture" and "capture" cases. In fact, since the efficiency of SCPC tends to be somewhat higher than that for IGCC, the CO2 emissions from SCPC would actually be somewhat lower than those from IGCC for both of these cases. This is because SCPC would be using less coal per kilowatt-hour of electricity generated. Mr. Furman's Exhibit RCF-8 does not make appropriate comparisons.

**Q. Is Mr. Furman's description of the availability of Tampa Electric Company's Polk Power Station IGCC unit accurate?**

A. No, it is not. While Mr. Furman correctly points out that the availability of Polk Power Station Unit #1 can reach 90% when using the back-up fuel, he fails to mention that there is an additional cost to Tampa Electric's customers to maintain this availability, due to the cost of the backup fuel oil being much higher than the cost of the solid feedstocks used in the IGCC plant, i.e. coal and petroleum coke. By analogy, if one were to provide backup fuel to a hypothetical IGCC plant located where FGPP is proposed to be located, one would need to factor in the costs of a natural gas pipeline extension and natural gas to back-up the gasifier from a reliability perspective, or the increased costs of purchasing and transporting diesel fuel oil if that were the backup fuel. None of this is mentioned in Mr. Furman's testimony.

**Q. Mr. Furman states that "For larger size plants, multiple units are being proposed which will improve system availability and reduce costs by making use of standard, modular designs." Is this an accurate statement?**

A. No, it is not. While it is expected that using multiple modules will improve IGCC availability, it does not reduce cost. The use of multiple, smaller gasifier trains actually increases the cost of the total plant, as it would in other similar industrial process plants. Larger modules benefit from economies of scale.

**Q. Mr. Furman states that "The much taller PC stack also decreases property values in a much larger surrounding area." Can you comment on this statement?**

A. Yes. In reviewing Mr. Furman's resume, I did not see any reference to his experience in real estate valuation, so I do not know if he is professionally qualified to make conclusions in this area. My personal observation is that Apollo Beach, adjacent to Tampa Electric's Big Bend Station and its four pulverized coal generating units, is a thriving community of middle and upper middle class housing developments, mostly constructed after the units at Big Bend went into service. I worked at Big Bend Station and know the area well. The nearby stacks at Big Bend are approximately 499 feet tall, the same size as the stack proposed for the FGPP. Recently, developers announced a new residential development in Apollo Beach. A study of real estate values in Apollo Beach will likely show that property values have increased substantially since Big Bend (with its "tall stacks") first went into service in 1970. Casual observations about real estate values aside, one also questions how much Mr. Furman's point would matter, even if true, given that the FGPP is proposed to be located on a very large parcel of land that is a considerable distance from most development, as explained in Mr. Hicks' direct testimony.

**Q. Mr. Furman states that "The Italian experience with IGCC, while using refinery residues as fuel, is relevant to discussions of coal-fired or petcoke-fired IGCC, because essentially the same equipment is utilized in both instances, differing only in the feed preparation and how solids are removed." Is this an accurate statement?**

A. No, it is not. It is neither appropriate nor accurate to compare the liquid feedstock IGCC plants in Italy to the four coal-based IGCC plants in the rest of the world. These plants differ not only in the feed preparation and how solids are removed, as Mr. Furman suggests, but in many other ways. Gasification of liquid feedstocks, such as refinery wastes, is different from the gasification of solid feedstocks. Even the chemical constituents of liquid and solid feedstocks are different, so that the designs of the gasification and gas treating systems are different. Further, when using coal as the feedstock (versus using liquid feedstocks as in the Italian plants), there is considerably more erosion, corrosion, ash removal system wear, fly ash deposition and plugging in syngas coolers, and a host of related issues dealing with the black water systems. Even the black water produced in coal-based gasification systems is different from the black water produced in liquid feedstock-based gasification systems. It is inappropriate to state that the Italian experience with IGCC is relevant to coal-based IGCC.

**Q. Mr. Furman provides a description of how IGCC technology and performance guarantees are commercially offered. Is this an accurate description?**

A. No, it is not. The companies listed do not all offer IGCC technology. Some only offer the gasification portion of the facility, but not other portions, which are typically provided from other companies, some under specific technology licenses. At this time, the nature of the commercial offerings is not fully known, since no company has yet signed a contract for a complete lump-sum, turn-key IGCC power plant with one of the companies named by Mr. Furman. While it is expected that the IGCC alliances (which typically include the gasification suppliers, engineering companies and power block suppliers) will offer guarantees, the nature of these guarantees is not yet publicly known. Unless Mr. Furman has been a part of the contracting for one of the proposed coal-based IGCC power plants -- and from his deposition testimony one knows that he is not -- he would not likely have the specific knowledge sufficient to make the claim that "IGCC can obtain sufficient performance warranties."

**Q. Mr. Furman states that "The standard IGCC unit is now 300 MW. Most manufacturers are supplying 600 MW plants which consist of two 300 MW units." Is this an accurate description of what is being commercially offered?**

A. No, it is not. Mr. Furman mischaracterizes or does not understand the basic IGCC reference plant. The IGCC reference plants being planned will not consist of two 300 MW units. The combined cycle power blocks are typically being designed on a basis of two 232 MW (approximately) "FB class" gas turbines, and one 320

MW (approximately) steam turbine generator, for a total of about 784 MW (gross). These values vary based on feedstock, gasification technology, power block supplier, and altitude. They are not separated into 300 MW "units" as Mr. Furman describes.

**Q. Mr. Furman states that "Therefore the 630 MW unit that Tampa Electric is building for operation in 2013 consists of two units the same size as their existing unit that has been operating for the past 10 years. Therefore there is no additional scaleup required." Is this an accurate statement?**

A. No, it is not. The proposed IGCC unit planned by Tampa Electric will not consist of two units of the same size as their existing unit. The gasifier on Polk Unit #1 was designed to provide sufficient syngas to load one GE Frame 7FA gas turbine, with a heat input of approximately 1,755 mmBtu/hour of syngas, and with nitrogen diluent, generating 192 MW. The total plant net output (including the steam turbine generator) is approximately 250 MW. The 630 MW (net) IGCC plant that Tampa Electric has announced for Polk Unit #6 would need to produce sufficient syngas to fully load two much larger "FB class" gas turbines that would require approximately 2,100 mmBtu/hr, an increase of about 20%. The overall system would require scale-up in the feedstock handling and slurry preparation, slag handling, syngas clean-up and other systems to handle the additional throughput. It is expected that the proposed unit would also operate at higher pressures, requiring some additional design considerations. In addition, Tampa Electric will incorporate many of the lessons learned into the new unit, in order to

improve efficiency and availability over Polk Power Station Unit #1. It will not just be two units of the same size as Polk Unit #1.

**Q. Mr. Furman uses his Exhibit RCF-21 to compare gasification plant availability to IGCC availability. Is this an appropriate comparison?**

A. No, it is not. Mr. Furman incorrectly tries to make the case that the high availability of GE gasifiers in China (in gasification service, but not IGCC) means that IGCC plants would have the same high availability when using coal and producing electricity. As noted previously, the availability of the individual systems in an IGCC plant impacts the overall IGCC plant availability, so that IGCC availability is lower than that of a gasification plant. For example, all four coal-based IGCC plants have experienced negative impacts on overall IGCC facility availability due to their power blocks. IGCC availability is lower than the availability of a plant that only includes coal (or liquid feedstock) gasification, without power generation.

**Q. Mr. Furman states that "Older IGCC plants built in the early 1990s such as Polk and Wabash that operate without a spare gasifier have demonstrated availabilities above 85%." Is this an accurate statement?**

A. No, it is not. These plants have not demonstrated availabilities above 85%, except when they have used back-up fuel. It is not considered IGCC operation when the coal gasification island is not in service producing syngas. Additional costs are imposed on an IGCC plant when it is designed to operate alternatively as a combined cycle on fuel oil or natural gas. Those costs must be accounted for and

evaluated in determining whether to incorporate backup fuel operation in an IGCC plant.

**Q. Mr. Furman states that "Major vendors of IGCC plants such as GE, Shell and ConocoPhillips will warrant that new IGCC plants will achieve greater than 90% availability with a spare gasifier." Are you aware of these vendors making such guarantees?**

A. While the industry expects that the use of such spare equipment is likely to improve IGCC availability, no suppliers have yet contracted for 90% availability guarantees for IGCC. Therefore, there is no reasonable basis for Mr. Furman's assertion that major vendors of IGCC plants will provide a 90% availability guarantee with a spare gasifier. In addition, the IGCC reference plant offered in the industry does not include a spare gasifier. A spare gasifier train is an additional option at considerable additional cost.

**Q. Mr. Furman's testimony includes a description of the CO2 capture at the Great Plains Synfuels plant, and uses this to conclude that CO2 capture and sequestration are economically viable for coal gasification. Do you agree with this conclusion?**

A. No, I do not. CO2 capture and sequestration are costly, in both capital expense and O&M cost. The only reason that Great Plains Synfuels captures the CO2 from their coal gasification (not IGCC) process is that they are paid for the CO2 by EnCana and Apache Canada for use of the CO2 in enhanced oil recovery in the Weyburn oil fields in Canada. Prior to being able to sell the CO2, it was vented to the atmosphere. Further, the current use of the CO2 is solely for enhanced oil

recovery, not for sequestration. In enhanced oil recovery, the objective is the minimum use of CO2 and the maximum release of oil from the geologic formations; it is not to maximize the sequestration of CO2. The geology for enhanced oil recovery is very different from that needed for long-term CO2 sequestration. In enhanced oil recovery, easy release of the CO2/oil mixture is desired; conversely, in sequestration, permanent storage of all of the CO2 is the ultimate objective.

**Q. Mr. Furman states that "Leachable ash and scrubber sludge from the PC plants can cause ground water contamination." Do you agree with this statement?**

A. No, I do not. Due to the use of well-designed double-lined storage systems with leachate collection for coal combustion byproducts, groundwater is protected from contamination. Further, PC plants no longer produce "scrubber sludge." This was a technology that was used in the 1960s and 1970s. However, many modern PC plants have flue gas desulfurization ("FGD") systems that produce byproduct gypsum, which is commercially saleable for use in manufacturing cement and wallboard. A good example is Tampa Electric's Big Bend Station. The FGD systems there do not produce "scrubber sludge" and never have. They produce commercial grade gypsum, which is transported to a nearby wallboard plant. The FGD systems for FGPP will also produce gypsum, not "scrubber sludge." As noted previously, PC technology can also produce the same vitrified slag that IGCC can produce. This has been done world-wide in PC boilers, including almost 40 years of operation of Tampa Electric's PC units.

**Q. Mr. Furman refers to PC as being "an older, less efficient technology" compared to IGCC. Is this accurate?**

A. No, it is not. The USCPC technology planned for FGPP is neither old nor less efficient technology. USCPC is now being utilized worldwide for efficient coal-fired power generation. Further, not one of the planned "next generation" coal-based IGCC plants in the United States will be more efficient than the FGPP.

**Q. Mr. Furman states that "The disadvantage of PC plants is that they are only capable of using coal. Therefore PC plants can not respond to changing market conditions or changing emission standards." Do you agree with that statement?**

A. No, I do not. PC plants, including the FGPP, are often designed to use petroleum coke in blends with coal, in order to lower fuel costs and be able to respond to market conditions. In Florida, several of the PC plants use petroleum coke blended with coal for these specific reasons. Some PC plants have also incorporated the use of biomass in order to provide additional fuel flexibility. Over the years, Tampa Electric's power plants have co-fired several different fuels with coal, including petroleum coke, biomass, shredded tires, and processed trash from Disney World. PC plants are not only capable of using coal.

This next portion of my testimony addresses Mr. Furman's supplemental testimony and exhibits.

**Q. Mr. Furman states that "During my entire engineering career, I have worked on new energy technologies, alternative fuels for power plants, and pollution control for power plants. Prior to my retirement, I was an independent consulting engineer for 22 years to various utility companies, government agencies, process developers and research organizations on the development, technical feasibility and application of new energy technologies and alternative fuels for power plants." Can you tell from his resume whether or not he has actually worked on the design, permitting, construction or operation of coal gasification or IGCC power plants?**

A. No, I cannot. There is no mention of any gasification work except some consulting work several years back (although no specific projects are mentioned) and his thesis while a student in the early 1970s. The commercial development of all of today's modern IGCC technologies occurred after Mr. Furman worked in this area as a student. Based on Mr. Furman's deposition, he is not working on any of the planned IGCC plants using modern IGCC technology.

**Q. Mr. Furman states that "Mr. Jenkins has presented a very narrow view of gasification technology and IGCC plants by specifying only four coal-based IGCC plants." Why does your testimony discuss only the four coal-based IGCC power plants?**

A. As I have already noted, it is appropriate for this project and this docket to compare the coal-fired FGPP with coal-based IGCC. It is also not appropriate to compare liquid feedstock gasification with coal-based IGCC. This is due to the issues that I have previously pointed out, including the significant differences

between operating a gasification plant and an IGCC plant that generates electricity, as well as the many differences in design, sizing, feed handling and preparation, gasifier sizing and output, syngas cleaning, acid gas removal, and slag removal, as well as the impacts of these systems on total plant availability. Mr. Furman has, in large part, attempted to make his case by citing information from liquid feedstock-based gasification plants, not coal-based IGCC plants. Gasifiers are only a part of an overall complex IGCC power plant. Designing and operating a large, complex IGCC power plant is quite different from operating a basic gasification plant. For my testimony, it was not appropriate to compare the performance of boilers that make only steam to boilers that are a part of a modern power plant that generates electricity, or to compare boilers that burn gas or oil to boilers that burn coal.

The fact is that there are only four coal-based IGCC plants in the world. Mr. Furman's comparisons trying to directly link what he may know about a basic gasification plant to what is in a complex, well-integrated IGCC plant is like one saying that just because one has read magazines about how to operate a small internal combustion engine and then talked to others that operate such engines, that one is then an expert on how to design and operate a modern automobile, complete with the internal combustion engine, fueling system, cruise control, exhaust system, emission control systems, chassis, windows, electronics, transmission, drive train, wheels, tires, instruments and controls and a radio. Obviously, this is not a logical conclusion. Attempting to link the costs,

availability and performance of gasification plants, particularly those that use liquid refinery wastes, to an IGCC plant that uses coal for power generation, is neither an accurate nor meaningful comparison.

Q. **Mr. Furman attempts to describe the size of proposed IGCC plants by stating "Therefore any size IGCC plant can now be built as shown in my Exhibit RCF-20. This exhibit shows the 1200 MW IGCC plant that has been announced by Nuon, in The Netherlands. This utility has been operating a 300 MW IGCC unit for more than 10 years with coal and biomass. Nuon's new 1200 MW plant will have the flexibility to use coal, biomass and natural gas and will consist of four 300 MW units." Is his description correct?**

A. No, it is not. The capacity (size) of the IGCC plant will depend directly on the capacity of the gas turbines, as the gasifiers are typically sized so that one gasifier produces sufficient syngas to fully load one gas turbine. One would not design a smaller 500 MW IGCC plant using today's gasifier and gas turbine technology combinations, as it would neither be cost-effective nor efficient to design a plant where the gas turbines would always be operated at less than design capacity. In addition, as I discussed previously, the proposed Nuon plant consists of a 600 MW IGCC unit and a 600 MW combined cycle unit, not a 1,200 MW IGCC plant. Further, the existing Nuon plant has not been in operation over 10 years using biomass in the feedstock blends. The blending of biomass began in 2004 at Nuon's IGCC facility.

**Q. Mr. Furman describes the primary objective of the IGCC plant at Polk Power Station, and states that "Its primary purpose was to demonstrate the technical and economic feasibility of an IGCC unit at full commercial scale." Do you agree with his statement?**

A. No, I do not. From the perspective of my experience as an employee of TECO, the primary purpose of the unit was to provide base load electricity for TECO's customers, as described in many of the papers and presentations given by TECO staff during the initial development of the project.

**Q. Mr. Furman states that "Mr. Jenkins testimony does not completely or accurately represent this very successful commercial demonstration of an IGCC plant," referring to Polk Power Station Unit #1. Please describe the basis of your knowledge concerning the Polk Power Station.**

A. I was Tampa Electric Company's Deputy Project Manager for the Polk Power Station Unit #1 IGCC project and have personal knowledge of the project's basic objectives, design parameters, operation, and availability issues. In contrast, Mr. Furman had no involvement with that IGCC project, either in its design, permitting, construction or operation. The only information Mr. Furman has gained about Polk Power Station came from reading about it and from one or more short site visits.

**Q. In his supplemental testimony, Mr. Furman again attempts to make the point that the capture of CO2 is economically viable. Do you agree with his conclusion?**

A. No, I do not. As I have noted, the equipment and systems needed for CO2 capture are high in capital and O&M cost. CO2 capture is neither low in cost nor easy to do. Mr. Furman attempts to make his case for the commercial status of CO2 capture and sequestration ("CCS") technology on IGCC by inappropriately using experience with coal gasification plants. As noted in the MIT study, "neither IGCC nor other coal technologies have been demonstrated with CCS." Mr. Furman's application of CO2 capture experience to either SCPC or IGCC is neither accurate nor appropriate. While some CO2 is captured in the Coffeyville and Eastman gasification plants (along with the H2S in the syngas stream), it is a small part of the total CO2 volume. It must be separated from the hydrogen prior to further use of the syngas for the production of chemicals. Most of the CO2 at the Coffeyville facility is vented. The portion of the CO2 that remains is used in the manufacture of urea, due to its high market value. CO2 capture is only economically viable when the producer of the CO2 is being paid for the CO2 or if the CO2 has value in the end products.

**Q. Mr. Furman suggests that it is simple and easy to scale up from the demonstration size IGCC plant to the 600 MW (net) IGCC reference plant, simply by doubling the size. He states that "To provide larger size plants multiple units of this same 300 MW size are already in commercial use." Is this an appropriate way to accomplish this?**

A. No, it is not. The 600 MW (net) IGCC reference plants being planned at this time are not provided in individual 300 MW units. Also, they will actually produce more syngas, in order to fully load modern gas turbines at a rate about 20% greater than what the existing coal-based IGCC plants are using. The gas turbines in the existing coal-based IGCC plants generate about 192 MW using syngas and nitrogen diluent. The gas turbines proposed for use on the new IGCC reference plants will generate about 232 MW, a 20% increase. As I noted previously, many design considerations and changes will be required in moving from the existing scale to the commercial IGCC reference plant. It is not simply a doubling of what is already in use.

**Q. Mr. Furman attempts to show that the cost of electricity from USCPC would be greater than that from IGCC. He states "If the track record of these new USPC plants follows that of SCPC plants then the additional costs for the proposed FGPP plant will be much greater than the IGCC alternative." Is this an accurate statement?**

A. No, it is not. As noted earlier, Mr. Furman is using outdated information. The best source of cost information for FGPP is FPL's testimony and exhibits, which has not been analyzed or considered in Mr. Furman's testimony. The most recent

general information on the costs of PC and IGCC technology (EPRI and DOE) show that PC technology is less expensive than IGCC technology. Mr. Furman's own Exhibits RCF-5 and RCF-7 show that the cost of electricity from SCPC without CO2 capture is less than that for IGCC without CO2 capture. According to EPRI's latest study, the cost of electricity from SCPC units, with CO2 capture, is on par with that from IGCC technology. EPRI notes that the values in that study have a large "range of uncertainty," so that the costs of SCPC and IGCC with CO2 capture can be considered to be the same. Putting these elements together, it is clear that the costs of electricity from SCPC are lower than the costs of electricity from IGCC, without CO2 capture. Based upon available information concerning CO2 capture, if this were someday to be required, the most one can conclude at this point in time is that there is not a clear basis to prefer one technology over the other. This is consistent with the findings in the recent MIT report.

**Q. Mr. Furman attempts to show that an interruption in coal supply caused by a strike should be considered as a major impact on the overall availability of FGPP, and a reason that IGCC would have a higher availability. Is this an accurate assumption?**

A. No, it is not. Mr. Furman fails to acknowledge that the design of the FGPP units permits them to use a wide range of coals from domestic and international sources, as well as petroleum coke, in order to take advantage of market conditions and protect the units' fuel supply. Mr. Furman also fails to acknowledge the large amounts of coal that FPL will maintain on site, typically

about 60 days supply, which provides a substantial buffer from the immediate effects of supply interruptions, and also enables FPL to obtain fuel from other sources as may be necessary. Mr. Furman also does not mention whether his proposed petroleum coke supply is susceptible to supply interruption due to the far smaller amounts of petroleum coke available in the market, compared with coal, and the much smaller number of suppliers.

**Q. Referring to the operation of IGCC units on backup fuel, Mr. Furman states that "...the cost savings of higher availabilities more than offset these additional fuel costs." Is this an accurate statement?**

A. The cost savings of higher availabilities are not necessarily greater than the cost of using back-up fuel. This is a very complicated economic comparison which must be performed for each case, and the result is impacted greatly by the difference in cost between the primary fuel (coal) and the back-up fuel (fuel oil).

**Q. Mr. Furman states "Mr. Jenkins should have also pointed out that coal-slurry-fed gasifiers (such as GE and ConocoPhillips) operate on a feedstock that is very much like a liquid feedstock in that powdered coal is first mixed with water to form a pumpable, liquid-like slurry." Is this an accurate statement?**

A. No, it is not. Mr. Furman's comment ignores the significant differences between coal slurry and liquid feedstocks. Once the coal has been delivered, stored, reclaimed, handled, crushed and slurried, coal slurry may seem similar to some of the liquid gasifier feedstocks. However, there are great differences in chemical composition, ash content, viscosity, erosivity, corrosivity, ash melting

temperatures, sulfur content, and many other characteristics which have significant impacts on design and operation. It is not accurate to compare the costs, performance or availability of a coal-based IGCC plant to one which uses solely liquid feedstocks. Further, it is neither appropriate nor accurate to compare liquid-based gasification plants to coal-based IGCC plants which generate electricity.

**Q. Mr. Furman disagrees with your description of the equipment and systems needed to capture CO2. What was his suggestion?**

A. Mr. Furman recommended that a water shift reactor be placed in what is called "sweet shift" configuration, meaning after the acid gas removal system, instead of using the sour shift configuration that I noted in my direct testimony. It is interesting that he recommends such a configuration. Sour shift, not sweet shift, is the preferred method used in CO2 capture. In fact, the Great Plains Synfuels, Eastman Chemical and Coffeyville Resources plants, which Mr. Furman cites as the examples for CO2 capture, all use the sour shift configuration that I refer to in my direct testimony.

**Q. Mr. Furman disagrees with your statement that "gas turbines for the combustion of concentrated hydrogen streams are not yet commercially available at large scale." Is your original statement still accurate?**

A. Yes, it still is. As Mr. Furman notes, there are many industrial-sized gas turbines which combust gas streams that have high hydrogen content. These smaller gas turbines are used in refineries and other industrial facility applications (but not in large power plants) where these high-hydrogen concentration gases are

combusted primarily for generating power for the industrial facility's internal power needs. However, there are no large-frame gas turbines, of the type utilized in the IGCC reference plant configuration, using hydrogen fuels at this time. Both GE and Siemens are working on development programs to be able to commercially offer their large frame gas turbines in anticipation of the need to combust high hydrogen concentration syngas streams in IGCC configuration in the future. GE has even stated that they are "taking orders" for their 7FB gas turbine for this application. However, they also noted that while the gas turbines themselves may soon be "commercially available," they still have much work to do to prove them in actual IGCC service. In addition, while the gas turbines may soon be available, GE has noted that the fuel systems for handling the hydrogen stream, along with the nitrogen injection and natural gas (or fuel oil) back-up fuel lines are not yet ready or commercially available. This is a critical issue with gas turbines, because the combustion of hydrogen is very different than the combustion of syngas or natural gas. Mr. Furman's attempt to show that the experience in industrial size gas turbines applies directly to IGCC size units is not accurate.

**Q. Mr. Furman seems to disagree with your description of the status of CO2 capture for IGCC. Is your original statement still accurate?**

A. Yes, it is. I have addressed the CO2 capture issue previously. My direct testimony related specifically to the commercial status of CO2 capture on IGCC plants. Mr. Furman has again attempted to use the experience with CO2 capture in gasification plants, not IGCC plants, to make his point. As noted in the MIT

study, "The Future of Coal," "neither IGCC nor other coal technologies have been demonstrated with CCS." While several IGCC plants that plan to include some level of CO2 capture have been recently announced, the specific CO2 capture technology must still be developed. The DOE, EPRI and the IGCC industry are planning to go forward with several CO2 capture research and development programs over the next several years in order to prove this technology with IGCC. Once that is done, CO2 capture technology would be commercially available for use with IGCC. With the parallel research and development programs for CO2 capture from PC units, the technology is also expected to be CO2 capture ready at about the same time and at about the same costs, as noted by EPRI and DOE.

**Q. Will you please summarize your testimony?**

A. In contrast with FPL's presentation of evidence prepared by employees and outside consultants who are practicing experts in their fields, Mr. Furman's testimony relies almost entirely on recycled presentations that he prepared as a volunteer opposing new PC plants. The presentations themselves are made from pieces of presentations prepared by other people and used in other settings. As such, his testimony demonstrates virtually no analysis of FPL's actual proposed FGPP.

Given these deficiencies, it is not surprising that his testimony fails to demonstrate any reasonable basis for rejecting FPL's selection of USCPC technology, and certainly no basis for concluding that FPL should have selected IGCC technology instead.

Mr. Furman's testimony is also seriously flawed by continually pointing to reports of international experience with gasification of liquid feedstocks – not coal-based IGCC – and asserting that reliable gasification in applications not involving production of electricity somehow proves that IGCC will be just as reliable.

FPL's technology choice is sound and well supported by the most accurate and up to date information. In contrast, Mr. Furman's testimony should not be relied upon for accurate information in making decisions in this docket related to the selection of technology for power generation at the FGPP.

IGCC may be a good choice for future projects where total capacity needs are much smaller, higher costs and lower availability are acceptable, and the capacity is not required until after late 2013. However, based on FPL's need for fuel diverse generation on a timeline that will satisfy customers' growing needs, FPL made the correct decision in selecting USCPC technology.

**Q. Does this complete your rebuttal testimony?**

A. Yes, it does.

BY MR. ANDERSON:

Q Mr. Jenkins, have you prepared a summary of your rebuttal testimony?

A Yes, I have.

Q Please provide your summary to the Commission.

A Thank you.

Good morning, Chairman Edgar, Commissioners. I also prepared rebuttal testimony to testimony submitted by Richard Furman to you in this proceeding. My rebuttal testimony shows that the information that Mr. Furman has used and relies on is very generic in nature, has been used before in unrelated proceedings, and does not consider any of the information specific to the Glades Power Park that we are here discussing in this proceeding.

As we showed last week and will continue to show today, the technical references that Mr. Furman uses and continues to use rely on substantial incorrect and outdated information related to both pulverized coal and IGCC, specifically the cost, the performance and the availability, the cost of electricity from both of those technologies, and the economic and technical viability of CO2 capture and sequestration from both of those technologies.

In contrast, using very detailed information specific to the Glades Power Park, FPL did a very thorough evaluation of power generation technologies, and FPL's selection of

ultra-supercritical pulverized coal technology for the Glades Power Park is the right choice. Thank you.

MR. ANDERSON: Mr. Jenkins is available for cross-examination.

CHAIRMAN EDGAR: Okay. Ms. Perdue? No questions.

Mr. Beck?

MR. BECK: No questions.

CHAIRMAN EDGAR: No questions.

Mr. Guest.

MR. GUEST: Thank you, Madam Chairman.

CROSS EXAMINATION

BY MR. GUEST:

Q Good morning, Mr. Jenkins.

A Good morning.

Q I would just like to turn to a couple of issues here. I think -- am I correct that you previously testified that the cost of mercury control based on your old PowerPoint was quite a bit cheaper for IGCC?

A I did not testify to that, no.

Q Have you ever done a PowerPoint where you made that representation?

A Yes, I have. That was not in testifying. That was an old presentation from probably a year ago.

Q Uh-huh. And the price was about 10 percent, the IGCC cost was about 10 percent that of the PC cost?

A Yes. And when I used that information, that was based on some studies that EPA and the Department of Energy had put out at least a year ago, and showing that mercury removal from IGCC would be cheaper than that from pulverized coal. And since then the pulverized coal industry and several companies have done a lot of testing and enhancements to mercury removal for pulverized coal systems, and those numbers are now very comparable.

As an example, one of -- the leader in mercury control technology for pulverized coal is a company called ADA Environmental Systems. They have 17 mercury removal pilot plants and full-scale systems going through right now. There are zero mercury removal pilot tests or demonstrations on IGCC. So we have much more and better information on mercury removal from PC, and what we're finding is that costs are becoming comparable between the two technologies.

Q I think that, that you also previously indicated in that same PowerPoint that, that Eastman reported a greater than -- what does this wiggle mean? I forgot.

A Approximately.

Q Thank you. Approximately 95 percent removal of mercury.

A Yes.

Q Is that what you anticipate the, the Glades plant, coal plant to remove is 95 percent?

A What we'll see from Glades is that we have an advantage of the emission control systems that they will use called cobenefits, meaning we have a selective catalytic reduction system for NOx removal, we have an electrostatic precipitator or baghouse for fly ash removal, we have a flue gas desulfurization system for taking out the sulfur dioxide, and a wet electrostatic precipitator just prior to the stack for taking out fine particulate. Each of those has its own job to take out its own specific emission.

But what the industry has found and EPA has confirmed is that they also have the ability to remove a good portion of the mercury in the flue gas, and that's why they call it cobenefits, meaning it's there, for example, to take out the fly ash but it also removes the mercury. And overall the emission control systems on Glades Power Park will remove about 90 percent of the mercury. And then there will be an incremental part because FPL will be using the carbon injection system -- as they talked about, it may not necessarily come from ADA Environmental Systems, but from them or someone -- to take that from 90 to 95 percent overall mercury removal. But the first 90 percent I won't say is free, but it's already in place with the emission control systems that they have selected.

Q Thank you. Let me turn to the matter of cost of fuel that you contested with Mr. Furman.

Where's my notes? Oh, yes. Okay.

A When did I do that?

Q In your rebuttal testimony. You say that it's operations costs.

A You said fuel cost.

Q Well, that's one of the part of the operations costs, isn't it?

A Okay.

Q I just want to deal with fuel cost as a part of the operation costs.

A Sure.

Q Now I need -- do you have a calculator?

A I do not.

Q Well, I've got one. But I've only got one, so I guess you're going to have to -- you need one that goes into exponents.

Am I being incoherent here, Chairman?

CHAIRMAN EDGAR: No, actually I think I'm following you, but I do need you to make sure that you speak into the microphone so that the court reporter can hear you as well. And I was just noticing that Mr. Kosky was offering the use of a calculator that he has as well if we need another one.

MR. GUEST: Well, this is a --

CHAIRMAN EDGAR: Mr. Krasowski. I'm sorry. I misspoke.

MR. GUEST: I'm sorry. Without belaboring the point, that's a calculator for high mathematics. It'll go up to big numbers. When you go off the edge, it starts building into exponents which we move backwards, if that's coherent.

CHAIRMAN EDGAR: Okay.

BY MR. GUEST:

Q Okay. I've got a little calculation I'd like you to do to just give us a picture here.

Now you agree with me that this plant gives you -- you have to get 8,800 Btus per kilowatt hour.

A That is what FPL has submitted. Yes.

Q And then you've got 1,960 megawatts in the plant.

A Net.

Q Net?

A Yes.

Q Okay. Okay. And there are 8,760 hours in a year.

A Yes.

Q Well, assuming it's not a leap year; right?

A I'm sorry?

Q Assuming it's not a leap year.

A Fine.

Q Eighteen -- 8,760, and then let's just assume the life of the plant is going to be 50 years.

A I don't know that that's a good assumption.

Q What would you say the correct assumption would be?

A I'm not here to testify about the life of that plant.

Q Okay. Let's just, let's just make an assumption that it's 50 to make the numbers a little bit rounder because this is a generic point.

So, so how many Btus do you use over 50 years using those three figures? And I know you're going to be putting an exponent up there.

A I hope your solar calculator works.

Q It does.

A Since it's solar, I guess we to have three of them to make sure we have the appropriate availability.

MR. ANDERSON: FPL would object to this line of questioning because it's beyond the scope of Mr. Jenkins' rebuttal testimony.

CHAIRMAN EDGAR: Ms. Brubaker.

MS. BRUBAKER: Perhaps Mr. Guest could direct us to the page and line numbers to which it's relevant.

MR. GUEST: May I have a moment?

CHAIRMAN EDGAR: You may.

MR. GUEST: The first place would be the very first page of the rebuttal testimony, Line 22, which is the cost of electricity from both of these technologies.

MR. ANDERSON: I'd point out that Line 22 is a characterization and summary with respect to what Mr. Furman's points were.

MR. GUEST: Page 10 beginning with Line 1, is Mr. Furman's comparison of PC and IGCC costs of electricity appropriate or accurate? And if you look in Lines 3 through 5, expected delivered fuel costs is where I'm going.

MR. ANDERSON: The point of Mr. Jenkins' testimony is that Mr. Furman presented an entirely generic analysis. He's pointing to the fact that FPL and FGPP is based upon a very specific set of assumptions, basically makes that point.

MR. GUEST: Well, I'm using the specific assumptions that are stated in, in FPL's application. I mean, I think if he says that the numbers are wrong, I get to, you know, bring out something about fuel costs by doing a simple computation. Well, fairly -- it's big numbers, but it's a small computation.

CHAIRMAN EDGAR: Ms. Brubaker.

MS. BRUBAKER: Madam Chairman, I hate to admit on the record that I've at this point quite forgotten Mr. Guest's question.

BY MR. GUEST:

Q Where, where I'm going here, I think what we're doing is we're going through -- where I think the last computation ended up was we were getting to the total number of Btus over 50 years. Is that as far as I got?

A Yes, it is.

Q Did you get a number out of that?

A I have not calculated that.

Q Okay. All right.

A But you've already provided in your RCF-7 the cost of electricity of IGCC versus PC supercritical, and it clearly shows that the cost of electricity from IGCC is far less than it is for PC supercritical.

Q Well, that's sort of what I wanted to explore in your, in your rebuttal. So can we continue with the calculation, Madam Chairman?

CHAIRMAN EDGAR: Hold on just a moment, if you would.

Mr. Anderson.

MR. ANDERSON: We presented the testimony of Mr. Schwartz, who is the fuel expert in terms of how much fuel and where it would come from and all those things, and counsel has had a full and fair opportunity to interrogate the witness. Remember, the role of Mr. Jenkins and his testimony focuses upon technology choice. His rebuttal testimony responds to specific points raised by Mr. Furman concerning technology choice. And computations of how many Btus would be consumed by one machine or the other machine over a 50-year period is not relevant in any respect to any portion of that rebuttal testimony of Mr. Jenkins.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: I'm on, I'm on Page 10, Line 5, expected delivered fuel costs and heat rate, et cetera. I mean, I think we're squarely within the rebuttal.

MR. ANDERSON: If I may just very briefly, you have to look at Lines 3 through 5. Mr. Jenkins states, "As he stated," referring to Mr. Furman, "in his deposition, Mr. Furman has not used information concerning FGPP such as its capital costs, variable operations and maintenance costs, heat rate, expected delivered fuel costs, environmental compliance costs or any of the detailed information." That's Mr. Jenkins' point is that all that information was available to Mr. Furman but was not used. And that's his criticism there. That's not a proper jumping off point for lengthy computations.

MR. GUEST: Well, first of all, they're not lengthy computations. But I think if the issue for this forum is looking at the total capital and operating costs, I think it's fair game, if he says the costs are all wrong, for me to show you an interesting number that you could have when you compare the two. That's all.

CHAIRMAN EDGAR: Mr. Harris.

MR. HARRIS: Madam Chairman, if the objection I heard was outside the scope of rebuttal, I believe that's correct. I don't believe these calculations are within the scope of the rebuttal testimony as filed.

CHAIRMAN EDGAR: So the objection is sustained.

MR. GUEST: May I make an offer of proof?

CHAIRMAN EDGAR: I'm sorry?

MR. GUEST: May I make an offer of proof, please?

CHAIRMAN EDGAR: I'm sorry. I'm not understanding you. May you --

MR. GUEST: An offer of proof, a proffer.

CHAIRMAN EDGAR: Yes.

MR. GUEST: And your method -- I mean, there are a variety of methods of doing proffers. The method I would suggest would be just to start the proffer, ask all the questions and then stop the proffer. Other, other fora use different methods. Is that all right to do it that way?

CHAIRMAN EDGAR: Ms. Brubaker.

MS. BRUBAKER: I think it's perfectly fine to go ahead and offer the questions into the record. How extensive are these questions?

MR. GUEST: It's not very extensive. Less time than to argue about the --

MS. BRUBAKER: I think the harm of letting it in is much less than letting it out at this point.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: Does that mean the objection is withdrawn? I mean, what did you just mean there, Ms. Brubaker?

MS. BRUBAKER: I think you should go ahead and read your questions into the record.

MR. GUEST: Okay. All right. Where we were was that -- we're getting the answers too, aren't we? Right? Let's get the answers too.

BY MR. GUEST:

Q Now I think where I started with was we had 8,800 Btus per kilowatt hour.

A Yes.

Q You're writing this down so you can do the computation. Then we have 1,960 megawatts. And then we have 8,760 hours per year. Can you tell us from -- and we have 50 years too. From that can you tell us how many Btus that you get over 50 years, assuming we'll just use a 50-year life?

A Yes. I could do that calculation.

MR. ANDERSON: We object to the foundation of the proffer. There's nothing stated concerning the availability of such unit either.

CHAIRMAN EDGAR: Ms. Helton? Hold on.

MS. HELTON: This is not something that we do very often here. But as I understand the process, Mr. Guest may ask the question, state on the record what he thinks the answer may be, and then ask the next question, state on the record what he thinks the answer may be. But I believe this is not a process by which he can obtain answers from the witness on the stand.

MR. GUEST: I could not disagree more. I mean, the purpose of a proffer is to, is to get the evidence that has been excluded and preserve the answers for the record. So for me to answer the question isn't really making evidence.

MR. ANDERSON: Just from a trial practice

perspective, first of all, we're happy with whatever the Chairman wants to do, but generally what happens is counsel says what he believes the proof will be. In a jury trial, for example, that's just done outside of the presence of the witness. And the point is, is we've all been going a long time in this case. Our fundamental problem here is with trying to bring Mr. Jenkins for a lengthy period of time into other parts of the case he has nothing to do with. This method of proffer just eats up that time in the same way. If counsel wishes to make an offer of proof for the record, another appropriate method is just to state what he thinks it will show so we can move on and proceed.

MS. HELTON: Madam Chairman, if I could make a request. If we could look that up, and maybe Mr. Guest has another line of questioning he can go to, and then we can see what Judge Padovano or Mr. Ehrhardt say on the subject and we will have a definitive answer for you.

CHAIRMAN EDGAR: I am quite interested to hear what Professor Ehrhardt has to say on the matter, so let's take five. Let's take five.

(Recess taken.)

CHAIRMAN EDGAR: Okay. We're back on the record.

Mr. Guest.

MR. GUEST: I think what we've reached closure on is the method that staff would prefer that I do is just say what

the calculations would come out to and then explain the relevance in the end.

CHAIRMAN EDGAR: Mr. Harris.

MR. HARRIS: That's correct. Yes, ma'am.

MR. GUEST: Okay. So if you start with 8,800 Btus per kilowatt hour and 1,960 megawatts and, and you have 8,760 hours per year and you have 50 years, you end up with 7.55 times ten to the 15th over 50 years. And then when you divide that by the, a million to get down to the million Btu number on Exhibit Number 91, which is the forecast of delivered coal prices, you see that the differential between pet coke runs between $1.00 and $1.50 to $2 as compared to Colombian coal and runs up, it looks to me, like an average of maybe $2.50 between pet coke and, and coal. And that if, if it were an IGCC plant that ran straight pet coke and you were to account for the operation costs over 50 years through that central calculation, you conclude that for each dollar different between pet coke and, and coal, you have an overall savings over 50 years of $7.5 billion. So that the savings over that time, if it were a $2 differential, would be $15 billion.

The relevance of that is that by having a plant that could operate on straight pet coke as contrasted to, to pulverized coal, the increased cost of the capital construction would be offset or more than offset by the, the amount of fuel

cost savings as shown by Mr. Schwartz's exhibit. That's the relevance and that's what the calculations show.

If I were to ask the witness the questions, I think that those -- is what the answers would be. Those calculations are evident from running a calculator on them.

CHAIRMAN EDGAR: Mr. Harris.

MR. HARRIS: And that, I think, is an appropriate proffer. Mr. Guest has put in the calculations, what he believes the answer would be and why he believes they're relevant. I would suggest that that probably concludes the proffer and, if he's ready to move on, then we could move on.

MR. GUEST: That's correct. That does conclude the proffer.

CHAIRMAN EDGAR: Thank you.

MR. ANDERSON: Just to bundle up the record in one point, Madam Chairman, we'd note that two things were missing from the proffer. One would be something about capacity factor. The other would be the net present value idea in relation to all those figures.

The other, this last observation is, as we, I believe, have demonstrated, the proffer and that line of questioning is far beyond the scope of redirect, and we just wanted for purposes of the record to have the proffer and the objection next to each other.

MR. GUEST: May I respond to that, Madam Chairman?

CHAIRMAN EDGAR: Let's just move on.

MR. GUEST: Okay.

THE WITNESS: Let me add one thing. Excuse me for the record. I wanted to make a correction of something I said in one of my answers. And what I should have said is that the cost of electricity from pulverized coal is far less than it is for IGCC, as shown on Mr. Furman's chart that he used in his exhibit. In fact, it would be 5 percent less. And if we corrected the capital cost portion for now what we know IGCC plants will cost, that the cost of electricity from pulverized coal will be approximately 32 percent less than it is for IGCC, a third less in cost for PC than IGCC. I wanted to correct what I said before. Thank you.

BY MR. GUEST:

Q Okay. Let me move on. I think that -- refresh my recollection, if you would, Mr. Jenkins. Did we ask you when you were last here about Page 20 of Exhibit 184? Does this -- can you see this?

A I cannot.

Q Well, let me see if we can get you another copy.

A Is that one of the exhibits in Mr. Furman's testimony?

MR. GUEST: May I approach the witness?

CHAIRMAN EDGAR: You may.

MR. GUEST: This may take one minute, but I think it

might be the last question.

CHAIRMAN EDGAR: Then let's take one minute.

MR. GUEST: Last line of questions; there may be two or three.

THE WITNESS: Will I need the calculator again?

MR. GUEST: No.

THE WITNESS: Okay.

BY MR. GUEST:

Q You will agree that's an excellent calculator though, won't you?

A It's wonderful.

MR. ANDERSON: Mr. Guest, did you give the witness a full set of 184?

MR. GUEST: Yeah. I'm going to give him, I'm going to have to give him mine.

MR. ANDERSON: Thank you.

BY MR. GUEST:

Q Okay. When you testified last when I was cross-examining you, do you remember I pulled out a page of your PowerPoint presentation in which you said EPC -- okay. I'm sorry. This is Page 46 of Exhibit 180. Yeah. The page is Exhibit 180.

Do you remember your PowerPoint presentation that said "EPC alliances can provide important guarantees"?

A Yes. And I think I answered that the EPC alliances

have not been able to do that, especially in Duke Indiana's case where they said it's not even viable.

Q Well, okay. Your -- that presentation was made on March 14th, 2007. That's six weeks ago.

A Yes. And Duke Energy made its filing with the Indiana Utility Regulatory Commission on April 2nd where that was the first IGCC plant project, let's say, out of the box to make its filings with a state regulatory commission. And they clearly say in their filing that the EPC option is not a good option nor is it a viable option for their project. They were not able to get the EPC wrap, the Engineer-Procure-Construct, along with the appropriate guarantees like FPL has been able to get with FGPP. It's been a significant change in the IGCC industry.

Q Would you, would you just, as a predicate to my question just state very clearly what EPC stands for again?

A Engineer-Procure-Construct.

Q And could you just give us a mouthful on what that means?

A Yes. For example, what FPL has been able to do with its contractors is to get a contract with a company that will come in, they will do the engineering, they'll procure the equipment, they will construct the plant and they will turn it over to FPL, for example, with guarantees on cost and date certain and performance and environmental guarantees. And

that's what you want to get from a contractor when you spend $5.7 billion. And unfortunately the IGCC industry has not yet been able to provide such guarantees or even the entire EPC concept.

MR. GUEST: Okay. Now I have my question. May I approach the witness?

CHAIRMAN EDGAR: You may.

BY MR. GUEST:

Q I have handed the witness Exhibit 184, which is the TECO presentation. And I put a little yellow tag on the line that I would like you to look at. And I believe that -- of course, since I don't have one in my hand, I'm going to have to remember what it says. Why don't you tell us what it says?

A It says, it is a point on the slide that says, "Perceptions and Misperceptions Regarding IGCC." And the specific point says, "No single supplier or overall performance guarantee." And then it says, "No longer true." And the explanation is that "Alliances GE/Bechtel and Conoco/Phillips-Fluor are offering comprehensive EPC contracts with performance guarantees." And I don't know the date of this Tampa Electric presentation, but it was likely to be before the Duke Energy filing, which specifically, in their case, GE/Bechtel was not able to provide the comprehensive EPC contract with performance guarantees. And my latest IGCC 101 since the Duke Energy filing, which you do not have but you

have the copy from my workshop six weeks ago, my newest one reflects the fact that these EPC contracts are not being offered yet.

MR. GUEST: That completes my cross-examination.

CHAIRMAN EDGAR: Thank you.

Mr. Krasowski.

MR. GUEST: May I approach the witness and retrieve my document?

CHAIRMAN EDGAR: You may.

CROSS EXAMINATION

BY MR. KRASOWSKI:

Q Good morning, Mr. Jenkins.

A Good morning.

Q Mr. Jenkins, early on in your comments you said that you believed the USCPC was the right choice made by FP&L.

A Yes.

Q And this is specifically in comparison to the IGCC facility?

A And other technologies.

Q In your evaluation in making that statement, did you compare these two technologies and the other technologies to increased DSM programs?

A I did not do that evaluation. My work was focused on power generation technologies.

Q So I'm safe to say -- or did you include solar

technologies in comparison to IGCC and USCPC?

A I did not in my evaluation. Others at FPL did that.

Q Okay. And, and being that -- well, did you, did you evaluate general conservation opportunities in comparison to the two technologies and other technologies?

A I did not. I looked at methods to generate electricity.

Q Could you, could you tell me what other technologies you did evaluate along with the IGCC and the USCPC?

A Yes. There are three primary methods of power generation using coal. They are the pulverized coal, circulating fluid bed and IGCC.

Q You're here because you're pretty much an expert and have a lot of experience with IGCC, the Tampa plant; is that not right?

A Yes. And others, as well as PC, since I did most of my work at Tampa Electric on pulverized coal units.

Q And you spoke earlier of ash, the ash by-product, waste by-product of, of the USCPC.

A Yes.

Q Can you make a comparison to the, the ash from the USCPC and an IGCC residue?

A Yes.

Q Could you, could you elaborate a bit on that?

A Depending on the type of gasifier technology, the ash

that comes from the gasifier could be very similar or a bit different than what comes from a, an ultra-supercritical pulverized coal unit. Both of them have capabilities for use as combustion by-products to be used for making cement and roofing tile granules, sandblasting grit, but typically those types of by-products are recycled back into industry.

Q Are there mercury issues involved with each one of those products as far as containing mercury?

A There is some amount of mercury that ends up in these by-products.

Q And how about radioactivity?

A I'm not aware of radioactivity issues. I'm sure that all materials on this planet have some level of radioactivity, but I'm not sure what they are specifically in the slag and bottom ash.

Q You're not familiar with any discussion regarding the health impacts of radioactivity in these materials?

A I am not.

Q Okay. One other thing, if I may, could you give me an understanding, help me understand the water, the different water usages between the two technologies you're mainly addressing here, the IGCC as opposed to the USCPC?

A There are many different users of water in each of these technologies. An IGCC plant, if you're using a slurry-based system, will require water to crush and slurry the

coal. There are boilers, so you're purifying the water for use and making water that will be makeup to a boiler just as you clean up raw water and demineralize it to use for boilers for ultra-supercritical pulverized coal. Both plants would likely use cooling towers, so there'd be a use of water for the cooling towers. A pulverized coal plant would use water in its flue gas desulfurization system where you crush and slurry limestone for use in absorbing sulfur dioxide. So there's a wide range of water uses.

Q With your understanding of these different facilities, how are the economics of either plant affected by the, by the fact that the Southwest Florida Water Management District will require that the water for either type of facility will have to come from a lower aquifer so -- I'll try to simplify my question.

MR. ANDERSON: FPL would object to the question because it does not reflect accurately -- first, it doesn't reflect facts in evidence and it's inaccurate.

MR. KRASOWSKI: I'll rephrase my question, Madam Chair.

BY MR. KRASOWSKI:

Q How does the quality of the water that's drawn into either facility affect the cost of operating the facility?

A Cleaner water would likely cost less and higher -- or less quality or lower quality water would cost more to purify,

but both plants would require that same water.

Q If one of those plants was used?

A Yes.

Q Compared to the other technologies you did or didn't evaluate.

Then the -- you've spoken -- or in regards to the sequestration or the economic operation of either type of plant, how does sequestration affect the efficiency of the plant if it's hooked up to the, to carbon capture and sequestration mechanisms?

A The sequestration of the CO2 would be independent of the technology. You would -- if you're capturing the same amount of CO2, then you're going to sequester it. The sequestration doesn't care where it's coming from. So the cost would be the same for either technology.

Q Does it affect the efficiency of, of both technologies equally?

A Once you get to the battery limit of the plant, it doesn't care where the CO2 is coming from. If it's the same amount and you're going to put it in the same place, that's external to the technology. So the impacts would be identical to either technology.

Q And what would that identical impact be?

A Well, it would be power costs to compress it and move it to wherever you're going to sequester it.

Q And what would those power -- so what would those power costs be? Can -- excuse me.

Can those power costs be represented in an amount of efficiency?

A Not really, no. It would be some draw of electricity from the plant or the system to run the compressors that would send the CO2 to wherever you're sequestering it.

Q Do you consider yourself very knowledgeable on this specific issue?

A I am not here to testify on CO2 sequestration.

Q Okay. Well, good. Well, I appreciate your answers.

I'm finished, Madam Chair. Thank you.

CHAIRMAN EDGAR: Thank you. Are there questions from staff?

MS. FLEMING: Staff has no questions.

CHAIRMAN EDGAR: Commissioners? No.

Mr. Anderson.

MR. ANDERSON: May I have just a moment?

CHAIRMAN EDGAR: Yes.

MR. ANDERSON: Thank you.

REDIRECT EXAMINATION

BY MR. ANDERSON:

Q Mr. Jenkins --

A Yes.

Q -- Mr. Kowsloski (sic.) was just asking you some

questions about carbon sequestration and you were talking about how the carbon sequestration technology doesn't really look to the source of the carbon dioxide. Do you remember those questions?

A Yes, I do.

Q Do natural gas plants emit carbon dioxide?

A Yes, they do. In fact, it may be a common misconception that natural gas plants don't put out any CO2. Looking at some calculations, that FGPP will put out about 14 million tons of CO2 per year. And if this were a natural gas plant providing the same electricity, it would still put out 8 million tons of CO2. So that's still -- it's about 40 percent less CO2 from gas. But I want to make it clear to everyone that natural gas plants do emit CO2 and a lot of it.

Q And so just keeping carbon sequestration in perspective, if down the line that would be required for a variety of fossil sources including natural gas, your point about it would take energy to compress it and pump it down, would that, would that be true across all fossil technologies?

A Yes, it would.

MR. ANDERSON: That's all we have.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: Well, I was going to object on the grounds that it was leading, but I don't think it's worth it at this juncture.

CHAIRMAN EDGAR: Okay. Do we need to discuss 184 at this time? Were you going to, Mr. Guest?

MR. GUEST: Certainly. I mean, the question is should we talk about it, is that the question?

CHAIRMAN EDGAR: I think, yes, that is the question.

MR. KRASOWSKI: Madam Chair, over here.

CHAIRMAN EDGAR: Mr. Krasowski. Sorry.

MR. KRASOWSKI: Thank you. Just for the record, I know it's been a while, but it's pronounced Krasowski for the gentleman from FP&L so the court reporter would know.

CHAIRMAN EDGAR: For the court reporter. And I think I've mispronounced it once or twice too, for which I apologize if I've --

MR. ANDERSON: My apologies also, Mr. Krasowski.

MR. KRASOWSKI: No problem. Thank you.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: I think the objection is to authenticity. Is that the objection?

CHAIRMAN EDGAR: Mr. Anderson?

MR. ANDERSON: FPL objects to the admission of Exhibit 184 into evidence on the basis that only one line in it, actually a small portion on Page 20 was interrogated about, was answered, was proper cross-examination. But there's no basis for taking a PowerPoint presentation from another utility about its project and just offering it into the evidence, into

evidence wholesale.

CHAIRMAN EDGAR: Mr. Guest.

MR. GUEST: May I confer? That's a different objection than what I thought we were going to get.

CHAIRMAN EDGAR: You may confer.

MR. ANDERSON: We also maintain the points about the prior discussion. But, remember, the idea was to bring this in front of a witness who knows something about TECO, and in listening to the examination the additional basis occurred to me. But the prior discussion about authentication and all that, we'd stand on the same points that have been made before.

MR. GUEST: We are, I think we are narrowing our dispute pretty substantially now.

So I think what I'm hearing is that we could include maybe the first page that gives you a sense on what -- I mean, that tells you what we're talking about. Do you know what I mean, the title page?

MR. ANDERSON: I'm listening. Yes.

MR. GUEST: And Page 20, which has been used with the witness. And the idea would be we wouldn't put anything else in besides those two pages. Is that the concept?

MR. ANDERSON: Let me read the balance of Page 20 real quick.

FPL agrees with Mr. Guest's suggestion as to Exhibit 184, admitting the cover sheet, Page 1, and Page 20.

CHAIRMAN EDGAR: Okay. Then seeing no objection, we will enter 184, Page 1 and Page 20 into the record.

(Exhibit 184 admitted into the record.)

Mr. Jenkins, you're excused. Thank you.

Mr. Anderson, your witness.

MR. ANDERSON: Thank you, Madam Chairman. FPL calls David Hicks as our next witness, please.

DAVID N. HICKS

was recalled as a witness on behalf of Florida Power & Light Company and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. ANDERSON:

Q Good morning, Mr. Hicks.

A Good morning.

Q Have you been sworn?

A Yes, I have.

Q Would you remind us of your name, business address, employer and position?

A David N. Hicks, 700 Universe Boulevard, Juno Beach, Florida 33408. Employed by FPL as a Senior Director of Project Development.

Q Have you prepared and caused to be filed 13 pages of prefiled rebuttal testimony in this proceeding?

A Yes, I have.

Q Do you have any changes or revisions to your prefiled

rebuttal testimony?

A No, I don't.

Q If you were to be asked the same questions contained in your prefiled rebuttal testimony, would your answers be the same?

A Yes, they would.

MR. ANDERSON: FPL asks that Mr. Hicks' prefiled rebuttal testimony be inserted into the record as though read.

CHAIRMAN EDGAR: The prefiled rebuttal testimony will be entered into the record as though read.

MR. ANDERSON: Mr. Hicks has no rebuttal exhibits.

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**FLORIDA POWER & LIGHT COMPANY**

**REBUTTAL TESTIMONY OF DAVID N. HICKS**

**DOCKET NO. 070098-EI**

**MARCH 30, 2007**

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

A. My name is David N. Hicks. My business address is Florida Power & Light, 700 Universe Boulevard, Juno Beach, Florida 33408.

**Q. By whom are you employed and what is your position?**

A. I am employed by Florida Power & Light Company (FPL or the Company) as a Senior Director of Project Development. In my position at FPL, I have responsibility for the development of power generation projects to meet the needs of FPL's customers.

**Q. Please describe your duties and responsibilities with regard to the development of solid fuel generation to meet FPL customer needs.**

A. Commencing in the summer of 2003, I was assigned the responsibility for leading the investigation into the potential of adding new solid fuel generation to FPL's system, and the subsequent development of new solid fuel generation additions to FPL's power generation fleet. I was responsible for the development and permitting team for the Southwest St. Lucie Power Park (SWLPP). I am currently leading the

development and permitting team for the FPL Glades Power Park (FGPP).

**Q. Have you previously submitted direct testimony in this proceeding?**

A. Yes.

**Q. What is the purpose of your rebuttal testimony?**

A. The purpose of this testimony is to reaffirm that FPL has made a prudent and well-informed technology choice in choosing ultra-supercritical pulverized coal (USCPC) technology for the FPL Glades Power Park (FGPP), notwithstanding the assertions made in the testimony of Richard Furman on behalf of certain intervenors. FPL's experience in evaluating and successfully bringing new generation technologies to its customers is well known, respected in the industry and has served its customers well. Whether it be the development of commercial nuclear power in the 1960s, the adaptation to efficient natural gas fired combined cycle units in the 1980s and 1990s or the significant expansion of wind power in the 2000s by its sister company, FPL Energy, FPL's engineers have demonstrated a prudent and successful track record of bringing the right technology to its customers at the appropriate time in its development stage, to maximize the benefit while minimizing the risks. This is a fact and cannot be summarily dismissed.

In making the selection of USCPC technology for FGPP, FPL relied upon not only its own significant experience, but the collective experience of the international power generation industry and a number of prominent engineering firms and subject matter experts. The in-depth engineering analysis, commercial negotiations and design work conducted thus far are unequivocal in the conclusion that USCPC technology, as proposed for FGPP, is the most prudent means of delivering measurable fuel diversity to FPL customers by 2013 and 2014 while maintaining the high standards of reliability, cost-effectiveness and environmental stewardship that are at the core of FPL's reputation.

**Q. Mr. Furman provides information that he asserts demonstrates that IGCC is a better choice than USCPC technology. Do you agree with Mr. Furman's approach and conclusion?**

A. No, I do not. The technical process that FPL employs in the selection of new generation technology for its customers is characterized by a far reaching research program and rigorous engineering review by multiple experts, including well-respected and highly competent third party engineering firms. This technical process is complemented by an equally aggressive commercial process by which each alternative technology is investigated to determine the cost, schedule and risks associated with engineering, procurement, construction and operation of the facility. The technical and commercial analyses culminate in a

thorough set of economic and system analyses to determine the cost-effectiveness and reliability benefits offered by the various technology choices.

Mr. Furman, in contrast, has engaged in a process that does not employ a consistent, methodical engineering and analytical approach. Instead, Mr. Furman grasps optimistic pieces of information from unconnected studies, presentations and published articles in an attempt to cast doubt on FPL's rigorous and transparent technology selection process. FPL's customers have a great deal to lose if Mr. Furman's misrepresentation of current coal technology capability is accepted.

**Q. What specific errors, inconsistencies and misinformation are contained in Mr. Furman's testimony and how does the testimony filed by you and other witnesses address the issues created by this testimony?**

A. FPL has conducted a full review of Mr. Furman's testimony and will address the areas he discusses through the rebuttal testimony of several witnesses. Mr. Seth Schwartz identifies several fundamental flaws in the assumptions made by Mr. Furman in addressing current and projected delivered prices for coal and petroleum coke. Reconciling these flaws shows that Mr. Furman has improperly concluded that IGCC can be a more cost-effective alternative than the proposed FGPP. Mr. Kennard Kosky corrects a number of misrepresentations

made by Mr. Furman regarding the alleged environmental advantages of IGCC in comparison to USCPC technology. Mr. Stephen Jenkins, a former deputy project manager at the Polk IGCC power station project, addresses a wide range of errors and inconsistencies in Mr. Furman's discussion of IGCC technology, itself.

Building on the conclusions of these witnesses, this rebuttal reaffirms that FPL has made a prudent and well-informed choice of USCPC technology for its proposed FGPP facility.

**Q. The underlying assertion in Mr. Furman's testimony is that IGCC would provide FPL's customers with a better generation alternative than USCPC technology. How is Mr. Furman's conclusion drawn, and why is it incorrect?**

A. Mr. Furman addresses issues such as fuel cost, emissions profile, capital cost and reliability in a singular manner that does not appreciate how these issues interact to affect the overall costs and capabilities of a specific project. This approach allows for the assertions most beneficial to his case to be brought forward on any individual issue. However, this approach is incomplete in that it does not properly compare all the characteristics of one specific defined alternative (gasifier and power plant configuration, fueling plan, and emissions control equipment suite) to the proposed FGPP project. Had Mr. Furman restricted himself to a more rigorous and realistic

approach, as FPL does in its detailed screening process, the results would demonstrate that there is no single IGCC alternative that can credibly meet or exceed the reliability, cost-effectiveness and environmental benefits offered by FGPP's proposed USCPC design.

Viewed in the context of this Need Determination proceeding, it is also clear that there is no available single IGCC alternative that can compete with USCPC technology in a timeframe to meet the 2013 and 2014 capacity need.

**Q. Has FPL conducted analyses in which it reviewed the impact of alternate fueling plans on the range of alternative technologies?**

A. Yes. As a matter of good practice, FPL reviews a range of fueling plans and alternative technologies. For example, in the Clean Coal Technology Selection Study (January 2007) an IGCC unit with a fueling plan of 50% coal and 50% petroleum coke was considered against three coal combustion options with a fueling plan of 20% petroleum coke, and 80% bituminous coal. The results of that analysis concluded that such an IGCC unit and fueling plan would not be competitive with any of the coal combustion options, including USCPC.

**Q. Do you agree with Mr. Furman's characterization of the cost and feasibility of capturing carbon from the two technologies?**

A. No. Carbon capture and sequestration has not been demonstrated for any generation technology, including IGCC, and remains a significant technological challenge for all alternatives, as discussed more specifically in Mr. Jenkins' direct and rebuttal testimony. There is no evidence at this stage of development to indicate that the choice of one technology over another today will realize benefits in more effective or economical capture of carbon dioxide at some later date. In fact, the recent MIT Study, The Future of Coal (March 2007, page 96) recommends the following:

> "New coal combustion units should be built with the highest thermal efficiency that is economically justifiable. Any carbon charge will make the economics of higher efficiency coal plants more attractive than those of lower efficiency plants. In addition, continuous advances in R&D make it likely that further reductions in heat rates will be possible. For pulverized coal plants this means supercritical pulverized coal plants (SCPC) today and ultra-supercritical pulverized coal (USCPC) plants soon...For IGCC plants this means attention to higher efficiency and high availability operation."

As demonstrated in FPL's need application and supporting testimony, FGPP's USCPC units will be more efficient, less expensive to build

and operate, more reliable, and produce less $CO_2$ per MWH of electricity provided FPL's customers than would an IGCC plant at the FGPP site. In short, within the context of the points made in the quotation from the MIT study above, FPL is demonstrating technology leadership in bringing the benefits of this advanced USCPC technology for service to its customers at FGPP.

**Q. Mr. Furman suggests that the potential for improvement in IGCC technology should be sufficient to justify the choice of IGCC over USCPC technology. Do you agree with such a suggestion?**

A. No. It would be imprudent to abandon the known capability and benefits of the USCPC technology for a hypothetical future capability that may or may not be more effective and economic. Again, the recent MIT study, The Future of Coal (March 2007, page xiii), cautions:

> "It is critical that the government RD&D program not fall into the trap of picking a technology 'winner,' especially at a time when there is great coal combustion and conversion development activity underway in the private sector in both the United States and abroad."

**Q. Would you please describe FPL's overall view of Integrated Gasification Combined Cycle technology?**

A. FPL is committed to delivering fuel diversity to its customers through a variety of technologies. Were IGCC a more promising technology at

this phase, you would see FPL and many other power producers aggressively pursuing its development without the need for public subsidies to mitigate the risk of an uncertain developing technology. The reality is that IGCC is simply not ready to dependably and cost-effectively meet the needs of FPL's customers.

When a critical evaluation of all of the issues related to the USCPC technology versus any hypothetical potential benefits of IGCC technology is conducted, it becomes clear that USCPC technology is the prudent and responsible choice for FPL's customers at this time.

**Q. What action is FPL taking to further the development of IGCC?**

A. In addition to my work on the FGPP project, I am currently assigned responsibility for the potential development of an IGCC facility at FPL's existing Martin plant. FPL, in conjunction with a leading IGCC vendor, is investigating a proposed project where a gasification system would be constructed, owned and operated by an IGCC technology vendor or other third party adjacent to an existing natural gas fueled combined cycle unit. The gasification system output would be purchased through a tolling agreement, where FPL would supply raw feedstock to the facility and purchase the synthetic gas and other potential thermal products for a tolling or "conversion" fee.

This approach has several benefits to FPL and its customers. The capital cost impact of the project would be minimized by utilizing an existing site and combined cycle facility with the IGCC technology vendor or other third party bearing the capital cost and risks of the gasification system. Additionally, the project would have the existing natural gas supply infrastructure as an alternate fuel source to accommodate upsets in the gasification process without impacting generation reliability. Finally, this approach would maximize the fuel diversity impact of a new project by adding syngas fueled capacity that augments existing natural gas fired capacity.

**Q. As an example of IGCC development activity, Mr. Furman mentions that Tampa Electric Company (TECO) has announced that they will build a 630 MW IGCC plant at the Polk Power Plant for operation in 2013. Do you have any comments with respect to this?**

A. FPL is familiar with TECO's plans. FPL notes that TECO's proposed plant is much smaller than the size that FPL needs to serve its customers, and that TECO is proposing to build one of the next-generation reference plants of the kind described in Mr. Jenkins direct testimony. It is unclear whether TECO would proceed with this plant absent passage of special IGCC cost recovery legislation pending before the Florida legislature at the date of this rebuttal testimony.

Consistent with FPL's observation that IGCC technology does not intrinsically perform any carbon capture or carbon sequestration function, FPL notes there is no specification in TECO's February 7, 2007 RFP or its March 9, 2007 update for carbon capture or carbon sequestration. TECO did announce that they are investigating what it would take to include CO2 capture technology on the new IGCC plant, and are having the University of South Florida study the capability of local geology for CO2 sequestration. However, the block flow diagram for the plant does not indicate carbon capture and sequestration processes or equipment necessary to capture $CO_2$.

Similarly, the New York Power Authority (NYPA) recently announced that it would "conditionally award" a contract for an IGCC plant in Huntley, New York to NRG. However, the NYPA noted that NRG's IGCC bid was not accepted and that any contract award was "conditional" because the IGCC proposal was not "priced at a level consistent with the Authority's mission of being competitive in the current market environment." The scope of the NRG plant does not include carbon capture and sequestration; rather it is proposed that if built it will be have "provisions for future capability to capture and sequester CO2 emissions."

FGPP similarly has space in its design for possible retrofit for carbon capture and sequestration at a later date, should that be required and become feasible and economical.

**Q. Based on the in-depth experience you have obtained in participating in FPL's ongoing evaluation of coal technologies and the potential development of the Martin IGCC project, have you drawn conclusions regarding the current state of industry development of IGCC?**

A. Yes, I have. Through my involvement in the SWSLPP project, the FGPP project and the Martin IGCC project I have gained first hand insight into the status of the industry and its current ability to successfully deploy coal generation technologies. At present the industry is struggling with the design, construction and deployment of IGCC technology that is competitive with USCPC technology in reliability, cost and environmental performance.

The slow pace of IGCC technology development experienced over the past 30 years does not mean that IGCC technology will not continue to improve. In fact, FPL expects that IGCC technology will improve. FPL remains committed, as has been its history with many of the technologies it now employs, to deploy new technologies as soon as they can provide an acceptable economic and operating risk profile for its customers. To that end, the proposed Martin IGCC project has the

potential to maintain a reasonable balance of risk and opportunity for FPL's customers to deploy IGCC technology in the future.

**Q. Given your experience, what is the best way for FPL to provide cost effective, reliable, and environmentally sensitive fuel diversity to meet its customers' needs in the 2012-2014 time frame?**

A. The FGPP project FPL has developed and continues to pursue is the most certain and proven means of providing measurable fuel diversity for FPL's customers in the 2012-2014 time frame.

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

A. Yes.

BY MR. ANDERSON:

Q Mr. Hicks, have you prepared a summary of your rebuttal testimony?

A Yes, I have.

Q Please provide your summary to the Commission.

A Good morning, Chairman Edgar and Commissioners.

The purpose of my rebuttal testimony is to reaffirm that FPL has made a prudent and well-informed technology choice in the ultra-supercritical pulverized coal technology for the FPL Glades Power Park, notwithstanding the assertions made in the testimony of Richard Furman on behalf of certain Intervenors.

FPL's experience in evaluating and successfully bringing new generation technologies is well-known, respected in the industry and has served its customers well. Whether it be the development of commercial nuclear power in the 1960s, the adaption to efficient natural gas-fired combined cycle units in the 1980s and 1990s or the significant expansion of wind by its sister company FPL Energy, FPL's engineers have demonstrated a prudent and successful track record of bringing the right technologies to its customers at the appropriate time in its development stage to maximize the benefit while minimizing the risk. This is a fact and cannot be summarily dismissed.

The in-depth engineering analysis, commercial

negotiations and design work conducted thus far are unequivocal in the conclusion that ultra-supercritical technology as proposed for the Glades Power Park is the most prudent means of delivering measurable fuel diversity to FPL's customers in the 2012 to 2014 time period, while maintaining the high standards of reliability, cost-effectiveness and environmental stewardship that are at the core of FPL's reputation.

Mr. Furman, in contrast, is engaged in a process that does not employ a consistent, methodical engineering and analytical approach. Instead, Mr. Furman grasps optimistic pieces of information from unconnected studies, presentations and articles in an attempt to cast doubt on our rigorous technology selection process.

FPL's customers have a great deal to lose if Mr. Furman's misrepresentation of current coal technology capability is accepted. We conducted a full review of Mr. Furman's testimony and have addressed the flaws in his testimony through the rebuttal of Mr. Seth Schwartz, Mr. Ken Kosky and Mr. Stephen Jenkins. Building on the conclusions of these witnesses, my rebuttal reaffirms that FPL has made a prudent and well-informed choice of ultra-supercritical technology for its proposed Glades Power Park facility.

The first recommendation of the March 2007 MIT study, The Future of Coal, is that, quote, new coal combustion units should be built with the highest thermal efficiency that is

economically justifiable. Any carbon charge will make the economics of higher efficiency coal plants more attractive than those of lower efficiency plants. For pulverized coal plants this means supercritical pulverized coal plants today and ultra-supercritical pulverized coal plants soon, end quote.

As demonstrated in FPL's need application and supporting testimony, the FPL Glades Power Park ultra-supercritical units will be more efficient, less expensive to build and operate, more reliable and produce less CO2 per megawatt hour of electricity provided to FPL's customers than would an IGCC plant at the Glades Power Park site. In short, within the context of the points made in the previous quotation from the MIT study, we are demonstrating technology leadership in bringing the benefits of ultra-supercritical technology to FPL's customers.

Through my involvement in FPL's solid fuel development activities since the summer of 2003, including the FPL Glades Power Park Project and overall responsibility for the Martin IGCC feasibility investigation, I have gained first-hand insight into the status of the industry and its ability to successfully deploy coal generation technologies. At present, the industry is struggling with the design, construction, deployment of IGCC technology that is competitive with ultra-supercritical technology in reliability, cost and environmental performance. The slow pace of IGCC technology

development does not mean that it will not continue to improve. In fact, FPL expects that IGCC technology will improve. FPL remains committed, as has been its history, to deploying new technologies when they can provide an acceptable economic and operating risk profile for our customers.

In summary, the FPL Glades Power Park is and continues to be the most certain and proven means of providing measurable fuel diversity for FPL's customers in the 2012 to 2014 time period. Thank you.

MR. ANDERSON: Mr. Hicks is available for cross-examination.

CHAIRMAN EDGAR: Mr. Beck? No questions.

Mr. Guest.

MR. GUEST: Good morning, Mr. Hicks.

THE WITNESS: Good morning.

MR. GUEST: I have no questions for you at this time.

THE WITNESS: Thank you.

CHAIRMAN EDGAR: Mr. Krasowski.

CROSS EXAMINATION

BY MR. KRASOWSKI:

Q Good morning, Mr. Hicks.

A Good morning, Mr. Krasowski.

Q Mr. Hicks, on Page 2 of your rebuttal testimony, Line 11, you say, "Notwithstanding the assertions made in the testimony of Richard Furman on behalf of certain Intervenors."

What you don't my "certain intervenors"?

A The Intervenors that are represented by Mr. Guest in this proceeding.

Q As opposed to all Intervenors?

A That is correct, sir.

Q Okay. Thank you.

And then a statement that you had in your brief as well, it's the same Page 2, I think it starts on Line 18 to 22, 19 to 22, about the successful track record of FPL in bringing the right technology to its customers at the appropriate time in its development stage to maximize the benefit and minimize risk, and this is a fact that, it's a fact that cannot be summarily dismissed. Okay?

Is population projection part of the analysis in achieving the goal of bringing the right technology at the right time?

A Could you rephrase the question, please?

Q Sure. In your efforts to bring forward the right technology at the right time, is the population projection for the state involved in making that assessment?

A Population projections are part of our long-run planning process. That question is most appropriately addressed in Mr. Sim or Mr. Silva, who will follow me.

Q Okay. Then I'll, I'll hold it for that. Thank you.

On Page 6, Mr. Sim -- excuse me. Mr. Hicks. Thanks.

A Yes, Mr. Krasowski.

Q Page 6, Line 10, the question was to you, "Has FPL conducted analysis in which it reviewed the impact of alternative fueling plans on the range of alternative technologies?" And you say, "Yes."

Could you, could you elaborate or could you state specifically what alternative technologies you did consider? And may I add outside of the coal burning facilities that we are aware of.

A Yeah. I think we discussed this last week and I talked fairly at length about wind technology and solar technology.

Q Right. Okay.

A That those were considered, and I think we discussed that. And also the analysis that Mr. Sim did involved comparing different coal technologies versus natural gas-fired generation.

Q And was -- in your, in your analysis of solar technologies, and I don't know if we went into this last week, but maybe you'll remember. But --

A I believe we did. Yes, sir.

Q Well, in your analysis of solar technologies did you consider the, the opportunities for efficiency that are presented by locating the solar hot water heaters onsite as opposed to relying on energy coming from the facility?

A That, the question with regard to residential solar generation would probably be most appropriate for Mr. Brandt. What we looked at, what I looked at was industrial or commercial solar generation such as -- a good example of it would be our SEGS plant in California, which is the largest solar generating facility in the world.

Q Now I understand Mr. Silva, Mr. Sim and Silva will be coming up again today. In the structure of your corporate organization, who, who does Mr. Brandt fall under? And if you don't know that, I'll look it up in the book here, but do you know?

A I don't know for sure.

Q Okay. I'll find out.

A I'd be speculating.

Q Okay. Mr. Hicks, Page 12, Lines 1 through 3, you state that, "FGPP similarly has space in its design for possible retrofit for carbon capture and sequestration at a later date, should that be required and become feasible and economical."

Have there been any geological studies specific to this site to determine the feasibility of this practice?

A No specific studies done to date. But we've looked at various carbon analysis and other information that was available to us through our participation in the Electric Power Research Institute's Coal Fleet of Tomorrow Carbon Capture and

Sequestration Program, and the evidence that we have gotten from that fairly extensive database is that there is abundant deep saline aquifer formations both at the site and in our service territory. Deep saline aquifers are considered the prime candidate for carbon sequestration.

Q But you have no specific geological surveys for the area to determine the makeup of the rock that contains these deep saline aquifers as far as the type of geology, the type of rock, how it will be impacted by the materials that you'd be pumping down there?

A Could you rephrase the question?

Q Yeah. Thank you for the opportunity to rephrase the question.

So if I understand you correctly, there have not been specific site studies that identify the makeup of the specific rocks that exist in these saline aquifers.

A We have not conducted a study at that specific site yet with regard to deep saline aquifers.

MR. KRASOWSKI: Thank you, Mr. Hicks. Thank you, Madam Chair.

CHAIRMAN EDGAR: Are there questions from staff?

MS. FLEMING: No questions.

CHAIRMAN EDGAR: No questions.

Mr. Anderson?

MR. ANDERSON: We have no redirect.

CHAIRMAN EDGAR: Okay. Mr. Hicks, you are excused. Thank you.

THE WITNESS: Thank you.

MR. ANDERSON: FPL would call as its next witness Mr. Kennard Kosky.

KENNARD F. KOSKY

was recalled as a witness on behalf of Florida Power & Light Company and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. ANDERSON:

Q Mr. Kosky, have you been previously sworn?

A Yes, I have.

Q Please remind us of your full name, business address, by whom you're employed and in what capacity?

A My name is Kennard Kosky. I'm employed by Golder Associates, Inc., as a principal in the Gainesville office. The business address is 6241 Northwest 23rd Street, Gainesville, Florida 32653.

Q Have you prepared and caused to be filed 17 pages of prefiled rebuttal testimony?

A Yes, I have.

Q Did you file an errata sheet on or about March 13th, 2007?

A Yes, I did.

Q With the changes in your errata sheet, if I asked you

the same questions contained in your prefiled rebuttal testimony, would your answers be the same?

A They would be the same.

Q FPL asks that Mr. Kosky's prefiled rebuttal testimony be inserted into the record as though read.

CHAIRMAN EDGAR: The prefiled rebuttal testimony with the errata will be entered into the record as though read.

BY MR. ANDERSON:

Q Mr. Kosky, you sponsored some exhibits to your rebuttal testimony?

A Yes, I did.

Q These are exhibits or documents KFK-8 and KFK-9?

A Yes, that's correct.

MR. ANDERSON: Madam Chairman, I'd note that Mr. Kosky's rebuttal exhibits have been premarked for identification as Exhibits 132 to 133.

CHAIRMAN EDGAR: Thank you.

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**FLORIDA POWER & LIGHT COMPANY**

**REBUTTAL TESTIMONY OF KENNARD F. KOSKY**

**DOCKET NO. 070098-EI**

**MARCH 30, 2007**

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

A. My name is Kennard F. Kosky and my business address is 6241 NW 23rd Street, Suite 500, Gainesville, Florida 32653.

**Q. Have you previously provided testimony in this proceeding?**

A. Yes. I sponsored direct testimony dated February 1, 2007 related to certain environmental aspects of FPL Glades Power Park (FGPP) including an overview of the major environmental requirements, information on the environmental design to meet, or be better, than these environmental requirements, a description from an environmental perspective that the selected technology is the best alternative to meet the fuel diversity and a description of the existing and possible future environmental requirements and potential costs. My key conclusions based upon my training, 35 years of experience, and analysis conducted in relation to the Site Certification Application for FGPP, were: (i) the selection of ultra-supercritical pulverized coal (USCPC) technology and environmental controls for FGPP not only meets, but exceeds the extensive environmental regulatory requirements; (ii) the technology selected for FGPP is the best available alternative from an

environmental perspective consistent with maintaining fuel diversity; and (iii) the environmental compliance costs evaluated by FPL to meet future environmental requirements reflect an appropriate range of possible future costs, which fairly and reasonably takes into account uncertainty concerning future environmental requirements and costs.

**Q. In the preparation of this rebuttal testimony have you reviewed the direct testimonies of Mr. Richard C. Furman and Mr. David A. Schlissel filed on behalf of certain interveners?**

A. Yes. I reviewed the direct testimonies of Mr. Furman and Mr. Schlissel both dated March 7, 2007 and the supplemental direct testimonies of Mr. Furman and Mr. Schlissel dated March 16, 2006.

**Q. What is the purpose of your rebuttal testimony?**

A. The purpose of my rebuttal testimony is to address certain environmental assertions regarding FGPP in the testimonies of Mr. Richard Furman and Mr. David A. Schlissel. The specific items I will address are:

- IGCC technology does not provide significantly lower air emissions than the USCPC technology proposed for FGPP as stated by Mr. Furman. [Furman Testimony at Page 3 (Lines 18-20), Page 12 (Lines 14-24), Pages 13-15, Page 16 (Lines 1-16) ]
- IGCC technology is not appropriate for consideration as Best Available Control Technology (BACT) under the Florida Department of Environmental Protection (FDEP) Prevention of Significant Deterioration (PSD) regulations approved by the Environmental

Protection Agency (EPA) as claimed by Mr. Furman. [Furman Testimony Page 3 (Lines 23-25, Page 16 (Lines 17-24), Page 17 (Lines 1-14) ]

- USCPC will be fully compliant with applicable mercury regulations and IGCC does not provide greater mercury emissions reduction than USCPC being proposed for FGPP as stated to by Mr. Furman. [Furman Testimony Page 6 (Lines 18-20), Page 27 (Lines 4-24), Page 28 (Lines 1-8)]
- USCPC does not require taller stacks than IGCC for the reasons asserted to by Mr. Furman. [Furman Testimony Page 18 (Line 25), Page 19 (Lines 1-14)]
- IGCC does not necessarily produce less solid wastes than the USCPC being proposed for FGPP. [Furman Testimony Page 3 (Lines 20-21), Page 28 (Lines 9-20]
- USCPC does not have higher air quality impacts than IGCC as suggested by Mr. Furman. [Page 27 (Lines 4-25, Page 28 and Page 29 (Lines 1-11)]
- Alternative carbon dioxide allowance costs presented by Mr. Schlissel (Page 21, Figure 1) are not analytically persuasive. FPL considered reasonable and appropriate environmental costs in the ranges that are predicted to occur in the future.

**Q. Are you sponsoring any exhibits to your rebuttal testimony?**

A. Yes. I am sponsoring an exhibit consisting of two documents, KFK-8 and KFK-9, which is attached to my rebuttal testimony.

**Q. Do you agree with Mr. Furman's testimony that IGCC provides significantly lower air emissions than USCPC proposed for FGPP?**

A. No. As I testified in my direct testimony (Page 12, Lines 7-17) and demonstrated in Document Nos. KFK-4 and KFK-5 emission rates proposed for FGPP are lower than IGCC for some air pollutants and higher for others. Mr. Furman's characterization that IGCC has significantly lower emissions than USCPC is not correct.

**Q. Do Mr. Furman's Exhibits RCF-8 through RCF-11 support his assertion that IGCC has significantly lower emissions? Please explain.**

A. No they do not. Exhibits RCF-8 and RCF-9 provided comparisons of FGPP and a hypothetical IGCC of the same size. However, the information used to develop these exhibits are not supported by Exhibits RCF-10 and RCF-11 as suggested by his testimony and confirmed in his deposition. I evaluated the information in Exhibits RCF-10 and RCF-11 and the emission rates for $SO_2$, $NO_x$, particulates and mercury in any combination and the information does not support Mr. Furman's estimated emissions in Exhibit RCF-9. In addition, it should be noted that many of the projects shown in Exhibit RCF-10 have not yet been approved and the emission rates have not been demonstrated for IGCC. In contrast, the air quality control systems proposed for FGPP have

been demonstrated as effective on over 100,000 MW for pulverized coal-fired power plants.

**Q. Does past performance of existing IGCC demonstrate that this technology will have performance and emission rates suggested by Mr. Furman?**

A. No, in fact existing performance suggests quite the contrary. One of the four existing IGCCs in the U.S. is Tampa Electric's Polk Power Station. Mr. Furman noted this facility many times in his testimony suggesting that operational and emissions performance of IGCC has been demonstrated. The latest data from continuous monitoring systems required by EPA and FDEP for 2005 indicate that the Polk IGCC operated only about 65 percent of the time in 2005. In addition to having a low rate of operation, from an emission perspective, the annual average emission rate of sulfur dioxide was 0.16 lb/MMBtu for Polk Power or about four times higher than that proposed for FGPP at 0.04 lb/MMBtu. The annual average nitrogen oxides emission rate was 0.06 lb/MMBtu, which is higher than the 0.05 lb/MMBtu proposed for FGPP. In addition, with respect to mercury, the Polk plant, which is an approximate 252 MW net facility, reported 67 pounds of mercury emissions in 2005. Scaled up to 1960 MW (equal to FGPP) and accounting for full operation, that would be about 800 pounds. This compares very unfavorably with the maximum mercury emissions filed by FPL with respect to FGPP of a maximum of 183.8 pounds of mercury per year. It should also be noted that the Polk IGCC unit is about 16 percent less efficient (based on Polk's recent

self-reporting of an annual heat rate of 10,200 btu/kwh compared with FGPP's expected 8800 btu/kwh), which results in even higher emission rates on a MW-hr generated basis. Past actual experience demonstrates that operational and emissions performance favor the USCPC technology selected for FGPP.

**Q. Is IGCC technology appropriate for consideration as BACT as testified by Mr. Furman? What is the basis for your answer?**

A. No. While Mr. Furman raises this point as if it is an open issue, this is a regulatory determination within the jurisdiction of the FDEP that was resolved by EPA guidance and FDEP practice regarding the nature of BACT reviews. A BACT review requires an analysis of technologies for the particular type of source being proposed by the applicant, or in this case power generation technology (e.g., combined cycle, pulverized coal and IGCC). Both EPA and FDEP have addressed the specific issue regarding IGCC as an alternative control technology under BACT for pulverized coal units. The EPA and FDEP have both stated that IGCC is not an alternative control technology for pulverized coal-fired power plants and should not be evaluated as BACT. In a letter addressing this issue EPA's statement was: "EPA's view is that applying IGCC technology would fundamentally change the scope of the project and redefine the basic design of the proposed source." [Letter from Stephen D. Page, Director, Office of Air Quality, Planning and Standards, United States Environmental Protection Agency, to Paul Plath, Senior Partner, E3 Consulting, LLC (December 13, 2005)]. FDEP included this position in the

Technical Evaluation and Preliminary Determination for the draft permit issued for Seminole Generating Station Unit 3 Project.

Over the past few years, several PSD permit applications have been submitted to various permitting agencies proposing to construct pulverized coal-fired steam electric generating units. In a majority of these preconstruction permit reviews, the permitting agency applied the BACT process to the source as defined by the applicant (e.g., pulverized coal (PC) steam electric generating unit), and have specifically stated that IGCC is a different technology than PC and therefore is not part of the BACT process. For example, this conclusion was determined in the following PSD permit applications: (1) KCP&L Hawthorne Facility in Missouri; (2) Thoroughbred Generating Facility in Kentucky; (3) Wygen II Project in Wyoming; (4) Roundup Power Project in Montana; and (5) Sunflower Electric – Holcomb Generating Project in Kansas. In each of these recent PSD permit applications, the permit applicant defined the source as a pulverized coal-fired unit, and applied the BACT process to identify the best available technologies to control emissions from a pulverized coal-fired unit.

In his Exhibit RCF-12, Mr. Furman cites 30-year old legislative history language that does not recognize the longstanding history and practice of BACT reviews. Mr. Furman admitted at his deposition that he did not know

where this exhibit came from. (Furman Deposition Page 49, Line 24). Mr. Furman's claim should be rejected.

**Q. Does IGCC provide greater mercury emissions reduction than USCPC being proposed for FGPP as stated to by Mr. Furman?**

A. No. The EPA recently promulgated final New Source Performance Standards (NSPS) for New and Existing Steam Electric Utility Generating Units (71 Federal Register, No. 111 Pages 33388 through 33402, June 9, 2006). This update of the NSPS was promulgated as part of the Clean Air Mercury Rule (CAMR). Mercury emission standards were adopted for PC and IGCC units. EPA developed this rule after reviewing the available technologies to reduce mercury from both PC and potential IGCC units. EPA's technology evaluation concluded that both technologies could meet an emission rate of 20 x $10^{-6}$ lb per MW-hr. In fact, EPA lowered the NSPS mercury emission rate for PC units in the final promulgation in June 2006. As shown in Document No. KFK-6 of my direct testimony, the maximum mercury emission rate being proposed for FGPP is less than one-half of the recent NSPS.

**Q. Do you agree with Mr. Furman's conclusion that FGPP is at risk in meeting the proposed mercury emission limit?**

A. No. Mr. Furman's testimony demonstrates a lack of understanding of mercury removal processes in USCPC units and his assertion that it is not economically feasible to remove mercury from the exhaust gases of a USCPC unit is incorrect. Mercury removal in USCPC involves the entire air quality control systems that for FGPP includes selective catalytic reduction (SCR),

fabric filter, wet limestone flue gas desulfurization (FGD) and wet electrostatic precipitator (WESP). The use of sorbents, like ~~powered~~ powdered activated carbon, enhances the overall removal process. In many studies supported by EPA and DOE, the air quality control system being proposed for FGPP can achieve 90 percent mercury removal and the use of ~~powered~~ powdered activated carbon can further enhance this level of removal. The additional commitment by FPL to utilize ~~powered~~ powdered activated carbon enhances mercury removal and provides further assurance that the mercury emission limit can be achieved. The cost for all these controls were included in FPL's filing before the Commission.

**Q. In your opinion is there any risk of FGPP meeting the proposed mercury emission rate?**

A. In my opinion, there is no risk that FGPP cannot meet the proposed mercury emission rate. The combination of SCR, fabric filter, wet FGD and WESP combined with ~~powered~~ powdered activated carbon will meet or be better than the proposed mercury emission limit.

**Q. Will the mercury emissions from FGPP using this USCPC technology rather than IGCC contribute measurable amounts of mercury to Florida's environment as suggested in Mr. Furman's testimony and exhibits? Please explain your answer.**

A. No. There is a misconception within Mr. Furman's testimony that suggests that the mercury emissions from FGPP would have adverse impacts. The emissions of mercury from FGPP and the resultant impacts will be very low and must be put in perspective. I have prepared Document No. KFK-8, which

provides an overview of the different sources of mercury and the amount of deposition in southern Florida. The mercury emissions and deposition of FGPP are included on the document. Of the total mercury emitted to the atmosphere worldwide, only about three percent is from sources in the U.S. Mercury emissions from U.S. power plants account for less than one percent of the worldwide total. In contrast, about one-third of the worldwide mercury emissions are from natural sources (volcanoes and oceans) and about 50 percent of the man-made emissions are from Asia. The result is that of the majority of mercury in Florida's atmosphere is from sources outside Florida. The contribution of mercury emissions from FGPP will be very small (<0.6 percent) at the maximum emission rate and expected to be even lower as I will explain later. As a consequence, the majority of mercury deposition in Florida is from sources other than those in Florida. FGPP will add such small amounts of mercury as to be immeasurable in Florida's environment. To be specific, the maximum estimated mercury deposition when FGPP is operational will be 250 times lower than mercury currently being deposited from other sources (i.e., 0.4 percent). Within the Everglades National Park, the maximum mercury deposition from FGPP will be 4,000 times lower than the amount that is currently being deposited by other sources (i.e., 0.03 percent). The contribution of mercury from FGPP to Florida's environment will be too small to be measurable.

**Q. In your opinion, will the controls proposed for FGPP result in lower total mercury emissions than provided in the Site Certification Application and Air Construction/Prevention of Significant Deterioration Permit Application submitted to FDEP?**

A. Yes. My opinion is based on technical knowledge of the co-beneficial mercury removal capabilities of the combination of controls, which form the basis for proposing the mercury emission rates. The maximum FGPP mercury emission rates were based on conservative (worse than what would be expected to occur) concentrations of mercury in the coal, mercury removal efficiencies and operational factors. In my opinion, the actual mercury emissions from FGPP once operational will be approximately 50 percent lower than the maximum "potential" emissions that I described previously.

**Q. Will lower mercury emissions result in even lower mercury deposition?**

A. Yes.

**Q. Do you agree with Mr. Furman's assertion that USCPC units require taller stacks than IGCC because impacts are unacceptable to people?**

A. No. Mr. Furman's conclusion demonstrates a total lack of understanding of both the regulations and process involving determining environmental impacts from power plants. The reason that PC units have taller stacks than IGCC units is a result of their physical differences and not environmental impacts. As I demonstrated in Document No. KFK-3, the maximum impacts of FGPP are well below the FDEP ambient air quality standards designed to protect public health and welfare, with an adequate margin of safety. Indeed, the

maximum air quality impacts of FGPP are over 17 times lower than the FDEP PSD Increments designed to protect air quality from degradation. This is achieved by the high efficiency of FGPP and the comprehensive suite of emission controls that I have described, the costs of which have been presented as part of FPL's testimony and exhibits in this proceeding.

**Q. Explain briefly the solid wastes or byproducts produced by USCPC and IGCC.**

A. In contrast to Mr. Furman's Exhibit RCF-25, USCPC units produce useful byproducts that have a long history of use. Fly ash collected in the fabric filters will have properties useful in the manufacture of concrete block. Bottom ash is used as an aggregate in construction projects. These byproducts have been recycled for over thirty years in Florida. The wet FGD system will produce wallboard grade gypsum that can be used in the manufacturer of building products. In fact, the Seminole Generating Station has a large manufacturing plant co-located on the site where gypsum produced by the wet FGD is used to manufacture wallboard. IGCC produces a slag, as well as ~~consisting of~~ either elemental sulfur or sulfuric acid. IGCC overall has lower quantities of byproducts but the ultimate amount of useful byproducts for IGCC remains to be seen.

**Q. Please explain why USCPC may have lower amount of byproducts.**

A. The byproducts produced by USCPC have demonstrated markets for reuse. Ash has been used in concrete and cement manufacture for decades. Gypsum produced by wet FGD is a preferential byproduct for wallboard manufacture.

On the other hand, IGCC slag does not have a long track record for reuse as that for the byproducts of PC units. If there is no market for IGCC generated slag, then there would be larger amounts of byproducts from an IGCC unit than an USCPC unit.

**Q. Does USCPC have higher air quality impacts than IGCC as suggested by Mr. Furman?**

A. No. In fact air quality impacts may be higher with IGCC for certain air emissions. In determining air quality impacts, the physical configuration of air emissions source is an important aspect in determining impacts. Document No. KFK-9 shows the impacts of FGPP compared to a comparable size IGCC plant. For this example, I used the air quality impact analysis prepared for the Orlando Utilities Commission Unit B IGCC recently permitted by FDEP. As shown in this exhibit, the air quality impacts for FGPP are lower than a comparable sized IGCC for most air pollutants. This is true, even though for several pollutants the emission rates for the IGCC example are lower than that proposed for FGPP.

**Q. Are the allowance costs used in FPL's economic analysis reasonable and appropriate future environmental compliance costs?**

A. Yes. As I stated in my direct testimony, FPL considered reasonable and appropriate environmental costs in the ranges that are predicted to occur in the future. While there is considerable uncertainty on what will actually be required in the future, the environmental costs utilized represent a range of

possible future environmental costs that included the high, medium and mild forecasts of potential $CO_2$ regulation.

**Q. Has your opinion changed in light of the $CO_2$ costs presented by Mr. Schlissel in his direct and supplemental testimony? Please explain your opinion.**

A. No, the $CO_2$ cost projections presented by Mr. Schlissel have not changed my opinion. There is no indication that the $CO_2$ allowance costs forecasts in the Synapse Energy Economics Report and sponsored by Mr. Schlissel were developed in a fashion that recognized the relationships of the electric, fuel and environmental markets. In contrast, the allowance forecasts by ICF used in the FPL economic analysis are predicted using integrated modeling of the electric, fuel and environmental markets in the U.S. The ICF process is described in detail by FPL's witness Judah Rose. In contrast with Mr. Schlissel's "forecasts", ICF's forecasts are based on ICF's extensive experience in evaluating these markets for allowance costs of $SO_2$ and $NO_x$. These air emissions are currently regulated under a cap-and-trade system that would likely be a model for future potential legislation initiatives involving $CO_2$. Indeed, allowance costs for $SO_2$ and $NO_x$ have a long track record under the 1990 Amendments of the Clean Air Act. In my opinion, any forecasts of future environmental costs must include energy, fuel and environmental markets since they are interrelated. Mr. Schlissel's and Synapse Energy Economics' forecasts do not.

**Q. Is it appropriate to use as the sole basis of FPL's economic analysis the highest $CO_2$ costs as suggested by Mr. Schlissel?**

A. No.

**Q. Why would this be incorrect?**

A. As I stated in my direct testimony, there is considerable uncertainty in the future regulation of $CO_2$. While legislation is possible sometime in the future, the precise framework of such legislation is uncertain. To encompass this uncertainty, future costs should consider an appropriate and reasonable range of future environmental costs. The use of a "highest cost scenario" as the sole basis for an economic analysis in this case reflects an outcome that is less likely given the range in potential legislation. The range used in the FGPP economic analysis provides a reasonable and appropriate approach to evaluate future environmental costs.

**Q. Are you familiar with Mr. Schlissel's testimony that FGPP will emit 14.5 million tons of $CO_2$ per year?**

A. Yes.

**Q. In your opinion, other than future potential costs, does the amount of $CO_2$ have any other meaningful environmental aspect? Please explain your answer.**

A. No, other than estimating potential $CO_2$ cost from potential future legislation that has not yet been passed, there is no meaningful environmental aspect whatsoever to the tons/year of $CO_2$ from a single power plant. As I explained in my direct testimony (Page 13, Lines 9 through 22), a more meaningful

comparison for $CO_2$ is the efficiency of the power plant and how emission rates are trending. FGPP will be a highly efficient coal-fired power plant and this efficiency translates to less $CO_2$ for each MW-hr generated. For example, I evaluated the $CO_2$ emission rates and efficiencies for major existing coal-fired power plants in Florida. Because FGPP is so efficient, it will actually emit two million tons per year less of $CO_2$ than other Florida power plants for the same amount of generation. If all other major coal-fired power plants in Florida were as efficient as FGPP, the $CO_2$ emission generated would be over six million tons/year less or about 15 percent less.

It must be recognized that $CO_2$ is emitted by all fossil fuels. In 2005, the estimated $CO_2$ emissions in Florida were on the order of 300 million tons. About 36 percent of the $CO_2$ emissions in Florida are from transportation, while about 45 percent is from electric generation (EPA Climate Change Web Site, 2007). Each vehicle in Florida emits an average of 4.6 tons per year. Clearly, future legislation of $CO_2$ may involve much more than coal-fired power plants. Indeed, Mr. Schlissel recognized this in his direct testimony. Table 1 of his direct testimony (Pages 10 and 11) includes legislation that would apply to many sources of $CO_2$ rather than solely coal-fired power plants. This is shown by the legislation indicated as "Economy Wide" in the table.

As I testified previously, FPL Group has one of the lowest $CO_2$ profiles in the country and in the 2015 to 2020 timeframe the $CO_2$ emission rate is expected to be 17.4 percent lower. Indeed, this trend in lower $CO_2$ emission rates with FGPP is beneficial from an overall environmental standpoint of $CO_2$ emissions.

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

A. Yes.

In re: Florida Power & Light Company's )
Petition to Determine Need for FPL Glades )
Power Park Units 1 and 2 Electrical Power Plant )

Docket No: 070098-EI

# ERRATA SHEET

## REBUTTAL TESTIMONY OF KENNARD F. KOSKY

| PAGE # | LINE # | CORRECTION |
|---|---|---|
| 9 | 2, 5, 7, 14 | change the word "powered" to "powdered" |
| 12 | 16 | add comma after "slag", remove comma after "well", add the word "as" after the word "well" |
| 12 | 17 | remove words "consisting of" |

BY MR. ANDERSON:

Q Have you prepared a summary of your rebuttal testimony, Mr. Kosky?

A Yes, I have.

Q Please provide your summary to the Commission.

A Yes. Madam Chairman, members of the Commission, I will now summarize my rebuttal testimony with respect to key environmental aspects of FPL Glades Power Park or FGPP. My rebuttal testimony explains that IGCC technology does not provide significantly lower air emissions than the ultra-supercritical pulverized coal technology proposed for FGPP. There is no risk that ultra-supercritical pulverized coal technology will not comply with the proposed mercury emission rate as suggested by certain Intervenors. FGPP will fully comply with the applicable mercury regulations and has included controls that are proven to remove mercury. In fact, I demonstrated through document number KFK-8 that both the mercury emissions from FGPP and the potential impacts will be very low. For ease of reference I have separated this exhibit into two charts: One for emissions and one for impacts.

Turning to the mercury emissions chart as shown on the far left-hand bar which represents worldwide mercury emissions, it is important to note that the contribution from U.S. manmade sources is about 3 percent of the total global mercury emissions, with U.S. power plants contributing less

than 1 percent. Of the total mercury in Southern Florida, as shown on the second bar towards the right, only 10 percent of the total mercury is from manmade sources within the region.

The two bars on the right show FGPP's relative contribution to mercury in Southern Florida. As shown, FGPP's maximum contribution to the total mercury in Southern Florida will be less than six-tenths of 1 percent, with the expected contribution less than three-tenths of 1 percent.

The second chart shows the mercury deposition in Southern Florida, with the bar to the far left representing total mercury deposition. The bars to the right show the deposition from FGPP. The second bar to the right of the total shows the maximum deposition from FGPP, which will be less than .4 percent or 250 times lower than the mercury that is currently being deposited. In the Everglades shown in the far right-hand bar FGPP's maximum deposition will be less than .03 percent or 4,000 times lower than the mercury that is currently being deposited. The amount of mercury that would be deposited by FGPP will be too small to be measured.

I also presented in my rebuttal testimony as document number nine a chart showing the maximum impacts of FGPP compared to a comparable size IGCC using information from the latest permitted IGCC project, which happens to be in Florida. For ease of reference I have separated for each air emission into separate charts.

The first chart shows the maximum impacts of sulfur dioxide, with the bar on the left representing the impacts of the IGCC and the bars on the right showing the impacts of FGPP. As shown on this chart, the maximum impacts of FGPP are less than IGCC.

The next chart shows the impacts for nitrogen dioxide. Again, the impacts of FGPP are less than the IGCC.

The third chart shows the maximum impacts of particulate matter, and, again, the impacts of FGPP are less.

My final chart shows the maximum impact for carbon monoxide where the impacts of FGPP are less in the eight-hour period and about equivalent for the one-hour period. As all these charts clearly show, IGCC does not have lower air quality impacts than FGPP. This concludes my summary.

MR. ANDERSON: Mr. Kosky is available for cross-examination.

CHAIRMAN EDGAR: Mr. Beck? No questions.

Mr. Guest.

CROSS EXAMINATION

BY MR. GUEST:

Q Good morning, Mr. Kosky.

A Good morning.

Q You would agree with me, would you not, that if this plant were avoided through conservation and other measures, that there wouldn't be any pollution at all?

A If that were possible -- that's not my expertise -- but if, if it wasn't built, there would be no impacts if that was somehow done through other means, as you've indicated.

Q And, and the, the amount of pollutants in some cases is measured in hundreds, thousands or millions of tons per year.

A Well, the pollutants are measured in tons per year in some cases as a criteria. In fact, typically the actual concentration which is more important from an environmental sense is generally in the parts per million level. For example, sulfur dioxide, nitrogen oxide, these air emissions actually in a sense in terms of concentration in the airstream are actually in parts per million. Tons is more of a convention as a threshold, and sometimes people don't recognize that air has mass. This hearing room here I would estimate has maybe two tons of air in it. People don't think that way because it's a fluid, but it's the same sense of air emissions. So it's important that although you have tons, it's actually dispersed, it's very dilute. For example, just a calculation that I had done, 99.98 percent of the exhaust gases from FGPP will not contain pollutants, per se. It's things like nitrogen, oxygen that are in this room. So although your question is correct in terms of a quantitative sense, that's really a threshold. From an environmental sense it's really the importance of what the impact is.

Q And just to use an illustration, you would agree with me that you'd get about 14.5 million tons of carbon dioxide from this plant every year?

A That's what you would calculate as, as how many tons. Again, that is a percentage of the actual gas stream. When you really think about how many tons there are -- for example, there's well over 300 million tons emitted annually in Florida, over 7,500,000,000 tons in the U.S. So it's sort of a relative basis, but, again, from an environmental standpoint it's really the concentration.

Q And so if you, if you said there's two tons of air in this room, would that mean that the carbon dioxide emissions annually would fill up 7 million rooms this size?

A You could say that, but it's a concentration. It's actually in the atmosphere, whether it be a FGPP or a gas plant. For example, over the site itself, the FGPP site, there are approximately 120 trillion tons of air that just goes across the site. That's not even on either side of the site. So the important thing is concentration and what that is to the environmental effects, not necessarily the tons.

Q You don't have even a notice of intent to issue a Clean Air Act permit yet, do you, from the Department of Environmental Protection?

A No. I believe I testified on my direct testimony that that process is ongoing.

MR. GUEST: Okay. No further questions. Thank you.

CHAIRMAN EDGAR: Mr. Krasowski.

MR. KRASOWSKI: Yes, ma'am.

CROSS EXAMINATION

BY MR. KRASOWSKI:

Q Good morning, Mr. Kosky.

A Good morning.

Q On Page 15 of your rebuttal you were posed with the question: "In your opinion, other than the future potential costs, does the amount of CO2 have any other meaningful environmental aspect? Please explain your answer."

So you go on to answer, Line 20, you say, "No, other than estimating potential CO2 costs from the potential future legislation that has not yet been passed, there is no meaningful environmental aspect whatsoever to the tons/year of CO2 from a single power plant."

Let me ask you, are you suggesting that this proposed project, whether it be IGCC or otherwise, of coal is not a major source of air pollution?

A Well, it's defined as a major source in terms of the air permit. It's not unlike any other facility. In fact, even gas plants are major sources as well.

Q Well, how would you define it? Would you redefine it as not being a major source of air pollution?

A No. I don't think that's this testimony,

particularly the line that you had. I think I do point out on Page 16 the importance of FGPP. For example, the efficiency alone of FGPP as compared to other coal units in the state would reduce CO2 emissions by 2 million tons. If you were to look at the overall efficiency itself, if that were applied to the whole coal fleet in Florida, that would be 6 million tons. So in the context of CO2, working in air pollution for more than 35 years, it's important to put in context. And the important point of FGPP is that for every megawatt hour generated, it has a significantly lower emission of CO2 than present plants or any other plant that I'm aware of that's on the drawing board.

Q But you would agree it does not have -- contribute less CO2 than efficiencies, implementation of efficiencies?

A I think I understand.

Q Can I rephrase so maybe I can make it more clear? My apologies.

In comparison to other cleaner technologies, would the CO2 from those other technologies or efficiency or conservation be less even than these coal burning power plants?

A Well, conservation, as I testified for Mr. Guest, would essentially be less. Gas plant would be less. I think previous testimony related to heat rate for an IGCC actually would be more. So it depends on what you're comparing it with.

It would be important to note that I believe on FGPP

the amount of effort that FP&L is doing to make sure that it is the most efficient plant, for every megawatt generated it will have very low emissions.

Q Were you involved in the evaluation of the, all the, all the evaluated technologies to come to the conclusion that FGPP was the right way to go?

A No, I was not.

Q Okay. So you're specifically testifying on the FGPP existing proposal in regard to its impacts on environmental, economic environmental conditions?

A Correct. Specifically to FGPP and, as included in my direct and rebuttal testimonies, those comparisons that I've made with IGCC units as well as other units in Florida.

MR. KRASOWSKI: Okay. Thank you, Mr. Kosky.

Thank you, ma'am.

CHAIRMAN EDGAR: Are there questions from staff?

MS. FLEMING: No questions.

CHAIRMAN EDGAR: Mr. Anderson?

Oh, I'm sorry. Before you do that, I apologize. Commissioner McMurrian.

COMMISSIONER McMURRIAN: Thank you. Mr. Kosky, I was looking over the handout, which I know is just another copy from your exhibit attached to your rebuttal testimony, but I had some questions just to make sure I understand sort of what's represented here.

I guess with regard to the last several charts on the vertical axis there where it says, "Impacts ug/m$^3$," which is that cubic meters?

THE WITNESS: It's microgram, one-millionth of a gram per cubic meter of air.

COMMISSIONER McMURRIAN: Could you say that again, please? I'm sorry.

THE WITNESS: One -- it's a microgram, which is one-millionth of a gram per cubic meter of air. A cubic meter is roughly a cubic yard approximately.

COMMISSIONER McMURRIAN: Can, can you elaborate for me on what this is measuring? I see that it's impacts. And I know that earlier probably in your direct testimony we discussed more of the emission rates. But how does -- how do I interpret the impacts of microgram per cubic meter? What does this tell me?

THE WITNESS: Well, the air standards are established in micrograms per cubic meter. It's amount of a particular air emission per cubic meter of air. In this particular chart it shows the maximum impacts of an IGCC plant, as it were, if it were the same size as FGPP. And I made comparisons of the four pollutants related to the emissions. And as I've shown, the impacts of IGCC is actually higher in many of the cases, in almost all the cases than FGPP.

In my direct testimony I provided comparisons to the

ambient air quality standards and the, what's called the prevention of significant deterioration increments.

As far as a comparison related to those charts, these concentrations are well less than that for both plants. This was a chart that related to some statements that were made in testimony that indicated that there would be higher impacts from an ultra-supercritical coal unit than an IGCC, and that's just not the case.

COMMISSIONER McMURRIAN: Okay. I guess to continue along this line, on the last page where it compares CO, is that carbon monoxide versus carbon dioxide which we've been talking about in the other charts? I just want to make sure. Is that --

THE WITNESS: Yes. Carbon monoxide is an air emission that actually has an air quality standard. Carbon dioxide is an air emission that results from the combustion of fossil fuels.

It should, it should be interesting to note to the Commission that carbon dioxide is a natural occurring part of the atmosphere. It is in the several hundred PPM in the atmosphere and it has been for a long time. It, it doesn't have any direct health effects, per se, relative to pollutants like carbon monoxide, which do.

COMMISSIONER McMURRIAN: Thank you. I'm probably going to need some help with this next question. I was looking

at the remainder of Exhibit 184, which wasn't entered into the record, and Page 10. I was wondering if someone could get a copy of Page 10 to the witness because I'll need mine.

MR. GUEST: I think we probably have that somewhere. We'll have it in a moment.

COMMISSIONER McMURRIAN: Thank you.

Mr. Kosky, do you have it handy?

THE WITNESS: I do.

COMMISSIONER McMURRIAN: So you're looking at Page 10 of that, of the full Exhibit 184? I realize that what was entered into the record was just Pages 1 and 20, but for purposes of my question I was looking over this chart and, of course, this is talking about the emissions, pounds per MMBtu with regard to the Polk plant and it has numbers for permit in parentheses, steady state in parentheses and then expected new IGCC. Can you help me understand, and I realize that you're not the expert on the TECO plant itself, but can you help me understand or, or do you know with respect to the permit and the steady state characterizations there what those refer to with respect to the emissions listed below?

THE WITNESS: I can't really say what the steady state means. The permit rates, I think, are expressed a little differently on the, on the column under Polk permit. They are approximately correct. I did look at what the actual emissions were, which is available on the EPA acid rain Website, that

information is reported. SO2 under that was .16. That was the average reported in 2005 for the Polk plant. NOx was .06, which is similar to what's here on the chart. I really don't know what they mean by steady state.

COMMISSIONER McMURRIAN: Okay. And with respect to the expected new IGCC, perhaps you can help me. I was comparing that to the, you probably have this, their Exhibit 155 with the yellow cover that staff has been using. Is that -- do you have that handy? It's Exhibit 155 as marked but it has a yellow cover sheet. Perhaps we can get that for you.

MR. GUEST: May we have a moment to catch up and find that?

COMMISSIONER McMURRIAN: Sure.

THE WITNESS: That's Exhibit 155?

COMMISSIONER McMURRIAN: Yes. Is everyone there?

THE WITNESS: And which page?

COMMISSIONER McMURRIAN: It is marked as Bate stamp Number 3 at the bottom. At the top it reads Comparison of FPL's Generation Alternatives. And I'm looking at the section that's titled Emission Rates within that chart, and there's a comparison of the USCPC to IGCC and, of course, gas combined cycle. And the emission rates specifically under IGCC, I was comparing those to the information on this chart. And, again, realizing that you didn't prepare this chart or -- and I'm not really asking you to verify the information on this chart, but

can you -- in comparing -- well, let's just start with SO2. In SO2 for expected new IGCC in Exhibit 184, Page 10, it says, .02, and I guess that's pounds per MMBtu, and on staff's Exhibit 155 for the IGCC it has .04. Can you, can you help me explain sort of the difference in the .02 and the .04?

THE WITNESS: Well, I don't know specifically how it's calculated. I have seen similar values depending upon what specific coal source and sulfur content might be used initially. For example, if the sulfur content was high, if you're using maybe 50 percent petroleum coke, which has a relatively high sulfur content of 6 to 7 percent, you use that in an IGCC unit along with coal, you could have an emission of .04 pound per million. As shown on the staff exhibit on the Table 10, if you're using lower sulfur fuels, a .02 is not an unreasonable number for expected IGCC. In fact, the Orlando Unit B is using Powder River Basin coal, which is very low sulfur, and it has an SO2 emission rate of approximately around the .02 level that's on Page 10 of that, I believe it's Exhibit 184.

COMMISSIONER McMURRIAN: Yes. Thank you. And so in staff's exhibit it's assuming a 50/50 blend with 50 percent of that being pet coke for the IGCC plant. Did I understand you correctly?

THE WITNESS: Yeah. That's -- if that's the case, then that .04 certainly makes technical sense of what an

emission would be.

COMMISSIONER McMURRIAN: Okay. Moving on to the NOx emissions and then on the Page 10 of Exhibit 184 it has .02 with SCR, and then on staff's exhibit, again on Page 3, it shows .06.

First off, I guess does the .06 in staff's exhibit, do you know if that includes SCR? I know there was some discussion earlier in testimony about SCR technology with respect to NOx. But do you know if the .06 on staff's exhibit includes that?

THE WITNESS: The .06 would not likely include SCR. I would have to say on Exhibit 184, Page 10, my experience with looking at IGCCs, Orlando Unit B, the AEP projects and the Mesaba project in Minneapolis are not using SCR. In fact, there's some technical issues regarding SCR. I know that the consortium of GE using the Texaco process has some issues. They control NOx using diluent gas reaching a level of .06 pound per million Btu.

COMMISSIONER McMURRIAN: Okay. Chairman, I think that concludes my questions. The other two were not included on that exhibit except mercury. And, of course, on Page 10 it did not include numbers for that except to say that for expected new IGCC it includes 90 percent removal, and I think that was mentioned in testimony earlier. So that's all my questions. Thank you, Mr. Kosky.

CHAIRMAN EDGAR: Mr. Anderson.

MR. ANDERSON: Thank you.

REDIRECT EXAMINATION

BY MR. ANDERSON:

Q Mr. Kosky, Mr. Krasowski was asking you some questions about comparison with other plants. If all coal plants in the United States were as clean as FGPP, do you have a sense of what that would do to emissions?

A The reductions would be considerable. It would be hundreds of thousands of tons reduction. On SO2, for example, it would probably be close to a 90 percent reduction in S02. Nitrogen oxide, probably close to 80 percent reduction. And, again, hundreds of thousands of tons reduction if all the coal units in the United States had the technology.

In fact, if you look at efficiency alone, it would be hundreds of thousands of tons. For example, if you look at all the coal units in the United States, FGPP on an average basis comparison is 23 percent more efficient. If you were to take even the top 10 percent here of coal plants in the United States, FGPP is, is about 10 percent more efficient. That alone translates to lower emissions per megawatt hour, not including the control technologies that are being applied here.

Q Commissioner McMurrian was asking you some questions concerning the various regulatory standards. Will FGPP meet or do better than all applicable air pollution standards?

A It's well less than all applicable standards.

MR. ANDERSON: We have no further questions. Thank you.

MR. GUEST: Madam Chairman.

CHAIRMAN EDGAR: Yes, Mr. Guest.

MR. GUEST: Some questions were asked about Page 10 of 184.

CHAIRMAN EDGAR: Yes.

MR. GUEST: Would it be appropriate to include that page to make it clear what we were talking about on the record?

CHAIRMAN EDGAR: Ms. Brubaker.

MS. BRUBAKER: Questions were asked and answered on it. I think it would be appropriate.

MR. GUEST: So this -- could we just simply include that as part of the 184 then, just tack on an extra page?

CHAIRMAN EDGAR: That is what I was thinking. Ms. Brubaker, does that work for you?

MS. BRUBAKER: I think that would be appropriate, yes. We would just amend.

CHAIRMAN EDGAR: Okay. So for Exhibit 184 where we had just Page 1 and Page 20, we will also add Page 10.

Mr. Anderson, does that --

MR. ANDERSON: We'd just like to offer Exhibits 132 and 133 into evidence.

MR. GUEST: We have an issue with -- may I have a

moment to confer with my opposing counsel?

CHAIRMAN EDGAR: You may.

MS. BRUBAKER: And may I ask a point of clarification? Does FPL intend to identify this exhibit?

MR. ANDERSON: I think that would be fine if we just give the whole thing one number. Would that be okay?

CHAIRMAN EDGAR: That's okay with me. So that would be 197?

MR. GUEST: Madam Chairman, we have an issue with this exhibit. We'd like to --

CHAIRMAN EDGAR: Okay. Let's go ahead and mark it and label it and then we can talk about the issue. Okay. So 197. And will you give us a title, Mr. Anderson? Mr. Anderson, can you give us a title?

MR. ANDERSON: Oh, yes, please. Let's call that Kosky Environmental Group Exhibit.

CHAIRMAN EDGAR: Thank you.

(Exhibit 197 marked for identification.)

Mr. Guest.

MR. GUEST: What's happened is there are additional exhibits here, but what they've done is chopped up existing pieces and enlarged them into other places. So we've gone through them all and we agree that the substance hasn't really changed, just cut up the pieces so that they look substantially different but there's no difference in information.

CHAIRMAN EDGAR: So with that, no objection?

MR. GUEST: No objection.

CHAIRMAN EDGAR: Okay.

MR. GUEST: Well, let me preserve one objection here, which is that I don't think that this forum can appropriately make determinations about air emission levels without overlapping into the Power Plant Siting Act case where you've got a permit. DEP is the one that does the modeling and all those other things. To the extent that cost of the projected permitting for these issues and carbon costs too are, are things that fall within the PSC's jurisdiction, we think they're appropriate. But to make findings about what emissions levels are going to be kind of short-circuits DEP's jurisdiction. It's not an issue raised in our, in our intervention petition. I mean, I don't want -- I guess you can understand where I'm coming from in the sense that we don't want to be in the position of having DEP in the place where they're stuck with these numbers and can't independently make decisions. That's all I'm trying to do.

Am I making myself clear or not?

CHAIRMAN EDGAR: Yes. I don't think that's an issue or a concern. In other words, the jurisdiction of DEP under their statutory authority is not impacted.

MR. GUEST: That's my issue. Thank you.

CHAIRMAN EDGAR: All right. Okay. Then my

understanding is there is no objection to Exhibits 132, 133 and 197; is that correct?

MR. GUEST: That is correct, Madam Chairman.

CHAIRMAN EDGAR: Okay. So Exhibits 132, 133 and 197 will be entered into the record.

(Exhibits 132, 133 and 197 admitted into the record.)

And, Mr. Kosky, you are excused. Thank you very much.

(Transcript continues in sequence with Volume 12.)

STATE OF FLORIDA )
: CERTIFICATE OF REPORTER
COUNTY OF LEON )

I, LINDA BOLES, RPR, CRR, Official Commission Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorneys or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 1st day of May, 2007.

Linda Boles

LINDA BOLES, RPR, CRR
FPSC Official Commission Reporter
(850) 413-6734