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1 BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

2

3 DOCKET NO. 070098-EI

4 In the Matter of:

5 PETITION FOR DETERMINATION OF NEED

FOR GLADES POWER PARK UNITS 1 AND 2

6 ELECTRICAL POWER PLANTS IN GLADES

COUNTY, BY FLORIDA POWER & LIGHT

7 COMPANY.

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11 THE .PDF VERSION INCLUDES PREFILED TESTIMONY.

12

VOLUME 7

13

Pages 862 through 1085

14

15

PROCEEDINGS: HEARING

16

BEFORE: CHAIRMAN LISA POLAK EDGAR

17 COMMISSIONER MATTHEW M. CARTER, II

COMMISSIONER KATRINA J. McMURRIAN

18

DATE: Wednesday, April 25, 2007

19

TIME: Commenced at 9:30 a.m.

20 Recessed at 6:10 p.m.

21 PLACE: Betty Easley Conference Center

Room 148

22 4075 Esplanade Way

Tallahassee, Florida

23

REPORTED BY: MARY ALLEN NEEL, RPR, FPR

24

APPEARANCES: (As heretofore noted.)

25

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1 P R O C E E D I N G S

2 (Transcript follows in sequence from

3 Volume 6.)

4 CHAIRMAN EDGAR: We will go back on the record

5 and get started again after the lunch break. First of

6 all, I apologize for my tardiness and being a little

7 longer than I had said. It's just another one of those

8 days where we've got a lot going on.

9 I believe that right when we took lunch break,

10 we were going to have questions from Commissioners and

11 questions from staff. So to our witness, thank you.

12 Commissioner McMurrian.

13 Thereupon,

14 DAVID N. HICKS

15 continues his sworn testimony from Volume 6 as follows:

16 COMMISSIONER McMURRIAN: Thank you, Chairman.

17 Mr. Hicks, I guess this question came to mind

18 when we were looking at Exhibit 175, that was marked as

19 175, and it was the cost of electricity comparison. And

20 I just wanted to ask, does it cost more to add carbon

21 capture -- I guess generally, does it cost more to add

22 carbon capture to pulverized coal plants than it does to

23 add carbon capture to IGCC plants?

24 THE WITNESS: I would say in the time frame

25 that we would be looking at carbon capture as an option

866

1 to meet climate change requirements, it would be more

2 expensive to add to IGCC rather than to PC. PC, you can

3 -- you leave a space in the design, and then you can

4 just add that equipment to it. IGCC is different in the

5 sense that a number of pieces of equipment have to be

6 either reengineered or replaced. So in the time frame,

7 in the relevant time frame, my contention would be that

8 IGCC is more expensive to add carbon capture equipment

9 to.

10 COMMISSIONER McMURRIAN: Okay. That clears

11 that up, because I think at some point you were talking

12 about how costs converge over time, and I wasn't really

13 clear what you meant there. Are you saying that with

14 technology improvements and things like that, that over

15 time the costs may not differ as much or --

16 THE WITNESS: Yes. With all the emphasis now

17 on R&D for new carbon capture equipment, the general

18 consensus is that the cost of carbon capture for both

19 technologies are going to get lower and converge with

20 each other.

21 COMMISSIONER McMURRIAN: Okay. Thank you.

22 And then the other questions I had were actually just to

23 help me understand some of the terms on some of the

24 items marked -- I believe it was 166 through 168, and

25 there were several different charts regarding efficiency

867

1 and heat rate and such. I guess specifically looking at

2 Number 168, which was the Black & Veatch exhibit -- do

3 you have that?

4 THE WITNESS: Uh-huh.

5 COMMISSIONER McMURRIAN: Just so that I can

6 understand better how to compare these percentages to

7 the percentage efficiency that you've given us, which I

8 believe was 38.8 percent --

9 THE WITNESS: Average degraded 38.8, yes.

10 That's over the life of the plant.

11 COMMISSIONER TEW: With respect to the column

12 that says "Net Plant Efficiency," can you tell me what

13 that term means and how that compares to the efficiency

14 that you've put forward?

15 THE WITNESS: Yes. During the lunch break, I

16 reviewed this document. And I actually attended this

17 conference where Mr. Ott presented this document. This

18 was in fact the last time I talked to Mr. Ott. This was

19 a CSX coal forum that was held in Welaka, which is a

20 resort they have in Palatka. And what he's referring to

21 here in terms of net plant efficiencies is general

22 efficiencies looking at what they call ISO conditions,

23 which is like 59 degrees Fahrenheit, new and clean type

24 of conditions versus the conditions that I represented

25 when I talked about the FPL Glades Power Park plant.

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1 The other thing I would note is, what Mr. Ott

2 was trying to present with this document is not Black &

3 Veatch's current view of what subcritical,

4 supercritical, and ultra-supercritical conditions would

5 be, but what their view of the world, of the state of

6 the industry would be towards the latter part of the

7 next decade, given that certain advances in metals were

8 achieved. There have been some setbacks in terms of

9 those metal advances, but this really represents their

10 view of the world towards the latter part of the -- or

11 the second half of the next decade.

12 What they actually view as ultra-supercritical

13 in the current time frame and during the time that the

14 FPL Glades Power Park will come online is actually in

15 the Clean Coal Technology Study, which they assisted us

16 on. There's a table in there in which they discuss --

17 it's Table 3-1, where they discuss notable worldwide

18 ultra-supercritical plants. The ultra-supercritical

19 plants that are in there are consistent with what we're

20 proposing at FPL Glades Power Park.

21 COMMISSIONER McMURRIAN: So is there a table

22 within the Clean Coal Technology -- and that's attached

23 to your testimony, isn't it?

24 THE WITNESS: Yes. There's a table inside the

25 Clean Coal Technology Study that actually has steam

869

1 temperatures, pressures, and reheat temperatures

2 consistent with what Black & Veatch's view of

3 ultra-supercritical technology is in the state of the

4 art now and in the foreseeable future.

5 COMMISSIONER McMURRIAN: Can you tell me where

6 that is in the --

7 THE WITNESS: It's page 3-1.

8 MR. ANDERSON: Commissioner, we're having a

9 copy of that walked around to everybody.

10 COMMISSIONER McMURRIAN: Okay. Thank you.

11 I'll look at that later.

12 I wanted to ask some other questions about

13 some of the terms in several of these documents. The

14 PSIG term, can you tell me what that means?

15 THE WITNESS: That's pounds per square inch.

16 And I don't recall what the G means, but it's a measure

17 in terms of pounds per square inch.

18 COMMISSIONER McMURRIAN: And those terms

19 should mean the same thing throughout different

20 documents, as far as your understanding would be?

21 THE WITNESS: Yes. As far as my

22 understanding, yes.

23 COMMISSIONER McMURRIAN: And then with the

24 Black & Veatch document, that far right column where it

25 says "Net Plant Heat Rate, HHV," can you –-

870

1 THE WITNESS: That's higher heating value.

2 COMMISSIONER McMURRIAN: Excuse me?

3 THE WITNESS: That's higher -- what they call

4 higher heating value.

5 COMMISSIONER McMURRIAN: And do those terms --

6 whenever HHV is referenced on other documents, do those

7 mean typically the same thing?

8 THE WITNESS: Yes, it does.

9 COMMISSIONER McMURRIAN: Okay. Chairman, I

10 believe that was all. Thank you for pointing me to the

11 other documents.

12 THE WITNESS: Thank you.

13 CHAIRMAN EDGAR: Questions from staff?

14 MS. FLEMING: Thank you, Chairman.

15 CROSS-EXAMINATION

16 BY MS. FLEMING:

17 Q. Good afternoon, Mr. Hicks.

18 A. Good afternoon.

19 Q. Just a few questions. Does the Glades Power

20 Park meet the requirements to be considered clean coal

21 technology under the Energy Policy Act of 2005?

22 A. Yes, it does. And we will be applying for

23 clean coal tax credits this year. The application

24 deadline is June 30th.

25 As a point of reference, the Duke Cliffside

871

1 plant, which is a pulverized coal plant, was awarded

2 clean coal tax credits last year. The Duke Cliffside

3 plant is not as advanced technology as FPL Glades Power

4 Park, nor does it include the same emissions control

5 equipment that the Glades Power Park does. And that --

6 Q. Has FPL -- excuse me.

7 A. And that project was awarded tax credits by

8 the DOE last year.

9 Q. Has FPL formally met with the Department of

10 Energy regarding their eligibility for the Glades Power

11 Park?

12 A. We have not formally met with them yet. We've

13 had a number of informal telephone discussions. Our

14 analysis, though, shows that this plant will meet the

15 requirements, and we will be scheduling a meeting with

16 them in advance of our application submittal.

17 Q. But at this time, FPL does not know if the

18 coal plant will actually qualify for tax credit;

19 correct?

20 A. We do not have a final determination at this

21 time.

22 Q. And even if FPL files for tax credit, it's not

23 guaranteed that it will be approved; correct?

24 A. That is correct.

25 Q. Did FPL include the value of these potential

872

1 tax credits in the estimate of cost of the Glades Power

2 Plant?

3 A. No, we didn't, because we don't have those tax

4 credits in hand.

5 Q. If FPL does qualify for and obtain these tax

6 credits, would these tax credits or funding be used to

7 reduce the final cost of the coal project for the

8 benefit of the customers?

9 A. Yes, they would.

10 Q. Okay. Mr. Hicks, I would like you to turn to

11 what's marked as staff Exhibits 155 and 156. They're

12 the yellow and blue packets in front of you, and I've

13 actually tabbed with a yellow sticky tab the relevant

14 pages that I need you to look at.

15 Specifically in Exhibit 156, it's pages 12 and

16 21, or for ease of reference, that information is just

17 consolidated on one page on page 3 of Exhibit 155, which

18 may be easier to look at so you have your side by side

19 comparisons.

20 A. Yes. I have them in front of me.

21 Q. Okay. Specifically, I'm going to be looking

22 at the emission rates and just talk about the comparison

23 of emission rates between the ultra-supercritical power

24 plant and IGCC. Looking at the exhibit, on page 3 of

25 Exhibit 155, which is the yellow cover –-

873

1 A. I'm looking at that.

2 Q. The CO2 emissions rates seem to be the same

3 for a coal plant and an IGCC; correct?

4 A. For the purposes of the modeling, we used the

5 same emissions rates in pounds per MMBtu. But because

6 the IGCC plant has a higher heat rate, it uses more

7 MMBtus of fuel to produce electricity. The overall

8 emissions rate on a pounds per megawatt-hour basis for

9 the IGCC plant will be higher, but the rate in terms of

10 pounds per MMBtu of fuel is the same.

11 Q. And as far as -- let me have you look up at

12 SO2. The emissions rates are identical for the coal

13 plant as well as an IGCC; correct?

14 A. In this diagram, yes, they are; correct.

15 That's correct.

16 Q. Can you explain why that is?

17 A. The SO2 rates -- I would have to -- actually,

18 I have to defer to Mr. Sim, but my assumption would be

19 the SO2 rate, what it reflects is a 80/20 mix for the

20 pulverized coal plant, 80 percent coal, 20 percent

21 petroleum coke, and a 50-50 mix between petroleum coke

22 and coal for the IGCC plant. The higher the petroleum

23 coke, the higher the emissions rate for SO2 for all

24 technologies.

25 Q. Now, as for the mercury emission rate, looking

874

1 at this chart, it appears that the mercury emissions

2 rate are higher for an IGCC than a coal plant; correct?

3 A. For this diagram, yes. We used the requested

4 mercury emissions rate for the AEP 600-megawatt IGCC

5 plants located in Ohio and West Virginia as the proxy

6 for the mercury emissions rate for the IGCC plant.

7 Q. But typically, wouldn't a coal plant have a

8 higher mercury emissions rate than an IGCC?

9 A. No, particularly when you look at the FPL

10 Glades Power Park, because the FPL Glades Power Park

11 includes four emissions control technologies, the SCR,

12 the baghouse, the wet flue gas desulfurization, and the

13 wet ESP. Those are not specific -- each one of those is

14 not specifically designed to reduce mercury, but they

15 have co-benefits, in that they reduce mercury. Our

16 anticipation is that those four devices will lead to

17 about a 90 percent removal rate, which is state of the

18 art, given the sensitivity of measurement devices.

19 But because FPL was committed to going above

20 and beyond in terms of mercury emissions rate, we've

21 also included activated carbon injection. With

22 activated carbon injection, we anticipate mercury

23 removal rates as high as 94-1/2 to 95 percent, which

24 exceeds that for IGCC.

25 Q. And what is typically the mercury removal rate

875

1 for IGCC?

2 A. For most technologies -- well, there's not a

3 typical number. As you can see, with the AEP, they

4 asked for a mercury removal rate or mercury emissions

5 rate double. The Orlando Utilities plant has a mercury

6 emissions rate slightly higher than FGPP. Other

7 facilities have mercury removal rates at or slightly

8 below. Once again, it's driven in part by fuel type,

9 the type of fuel used.

10 Q. In addition to just looking at the emission

11 rate, is it also important to look at the total amount

12 of pollution that's emitted from a power plant on an

13 annual basis?

14 A. I'm going to defer that question to Mr. Kosky,

15 because he's our expert on emissions control, and he can

16 provide you a much more detailed answer on that

17 question.

18 Q. And earlier you discussed the extent to which

19 the Glades plant is designed to be capture-ready. Do

20 you recall that?

21 A. Yes, I do.

22 Q. Has there been any analysis done to date which

23 addresses the sequestration of carbon that could be

24 accomplished at the FGPP site?

25 A. There has been no formal analysis to date, but

876

1 I would note that that entire area has deep saline

2 aquifer geology, which is consistent with one of the

3 primary opportunities for carbon capture and

4 sequestration, or for carbon sequestration.

5 Q. For any combustion technology that's out

6 there, what is currently available to sequester CO2 once

7 it's captured?

8 A. A process called MEA is one process that's

9 available. But given the current state of R&D,

10 expectations are that by well in advance of this plant,

11 MEA will be obsolete, and something akin to the chilled

12 ammonia or another type of process will emerge as the

13 most cost-effective process in terms of carbon capture.

14 Once again, I would -- earlier I discussed

15 this concept of the horse and cart concept between

16 carbon capture and sequestration. The horse in this

17 instance is carbon sequestration, so it's going to take

18 longer to really resolve the sequestration issues than

19 it is the carbon issues for all technologies across the

20 United States. So by the time sequestration becomes a

21 reality, you'll have commercial carbon capture systems

22 at a much lower cost and much more efficient than what

23 you see today.

24 Q. And if you know, has FPL considered

25 constructing or participating in a joint ownership of an

877

1 IGCC unit to determine whether this technology may be

2 used in a future application for its system?

3 A. We are currently -- I'm also project manager

4 for an IGCC refueling study at our Martin site that

5 would involve refueling of one of the gas-fired combined

6 cycles to produce -- rather than oil and natural gas, to

7 burn syngas and natural gas. And we've been in that

8 process with a joint venture partner, which is a major

9 vendor of IGCC equipment, since about last August. I

10 can report that the results to date are not promising,

11 both in terms of cost and in terms of emissions. We

12 still hold hope that that may pan out, but right now the

13 numbers just don't look very good.

14 In addition to that, we've had a lot of

15 discussions with the vendor with regard to carbon

16 capture, and we've gained a lot of knowledge through the

17 process. That's where we gained the understanding that

18 in terms of IGCC, the vendors are really about in the

19 same place they are -- with regard to carbon capture as

20 they are with PC. They're just leaving a space in the

21 design for the carbon capture.

22 MS. FLEMING: Thank you. We have no further

23 questions.

24 CHAIRMAN EDGAR: Redirect?

25 MR. ANDERSON: Yes, please. Chairman Edgar, I

878

1 believe this would be Exhibit 175.

2 CHAIRMAN EDGAR: I am on 176.

3 MR. ANDERSON: 176. I'm sorry. Thank you.

4 CHAIRMAN EDGAR: That's okay.

5 (Exhibit 176 marked for identification.)

6 REDIRECT EXAMINATION

7 BY MR. ANDERSON:

8 Q. Mr. Hicks, you were asked some questions

9 earlier today about the definition used by FPL for

10 ultra-supercritical pulverized coal technology. You

11 have before you Exhibit 176. Could you tell us what

12 this is and how it relates to the definition?

13 A. It's a document entitled "Clean Coal

14 Technology." It's put out by the United States

15 Department of Energy. And on page 2 of the two pages in

16 the document, it provides the DOE definition of

17 ultra-supercritical. Under the heading "Materials

18 Development for Ultra-supercritical Boilers," it states,

19 quote, "As part of its effort to develop cleaner, more

20 efficient power generating systems to meet future energy

21 needs, the United States Department of Energy, DOE,

22 Office of Fossil Energy is collaborating on important

23 work to develop high-temperature, corrosion-resistant

24 alloys for use in ultra-supercritical steam cycles.

25 Steam cycles with operating pressures exceeding 3,600

879

1 pounds per square inch and main superheat steam

2 temperatures approaching 1,100 degrees Fahrenheit are

3 considered ultra-supercritical," end quote.

4 Q. Is this the definition that FPL has used and

5 referred to in its clean coal study?

6 A. Yes, it is.

7 Q. Do you have before you Exhibit 168, which was

8 Mr. Ott's presentation you were asked about earlier?

9 A. Yes, I do.

10 Q. If you would please flip through to the third

11 page of what we have here, first, looking at the page

12 numbers, does this look like the entire presentation

13 that you saw when you attended this?

14 A. No, it's not. It's selected slides from that

15 presentation.

16 Q. Okay. But just as to the slides we do have

17 here, look at page 3 titled "Thermal Generation

18 Technology Spectrum." Do you see that?

19 A. Yes, I do.

20 Q. You were asked some questions this morning

21 directed at the bottom of this page about advanced

22 supercritical and ultra-supercritical and about

23 temperatures and pressures, you know, inferring that

24 perhaps FPL's ultra-supercritical project is not that.

25 Would you comment on what this document is and what it

880

1 actually shows?

2 A. This document is -- Mr. Ott in presenting this

3 overall presentation was trying to give a viewpoint of

4 the current state and future state of PC technology.

5 And the purpose of this slide was to demonstrate that

6 even PC technology is an evolving technology. And what

7 this represents is not the current view of the

8 definitions of supercritical, subcritical, and

9 ultra-supercritical, or the view in the time frame that

10 FGPP would be constructed, but an advanced view based

11 upon significant improvements in exotic metals or metals

12 that are used in the combustion process. So those

13 metals, particularly with regard to what's defined here

14 as advanced supercritical and ultra-supercritical, those

15 metals are not available. They are not commercial.

16 They are not available, and so those plants cannot be

17 built and are not on the drawing board for any entities

18 to be built.

19 Q. So that's just sort of a future view then?

20 A. It is a future view; that's correct.

21 Q. Okay.

22 A. It does not represent the current view.

23 (Exhibit 177 marked for identification.)

24 BY MR. ANDERSON:

25 Q. We've previously walked around to everyone in

881

1 the room a document which I think would now be 177.

2 This is the document called "Clean Coal Technology

3 Selection Study, Final Report, January 2007," a

4 three-page document. The second pages have 3-1 and 3-2

5 at the bottom. Mr. Hicks, do you have a copy of 177?

6 A. Yes, I do.

7 Q. Tell us what this document shows in relation

8 to Black & Veatch's and FPL's expression of what

9 ultra-supercritical pulverized coal technology means in

10 the current environment?

11 A. If you look on the top cover, it shows both

12 the Black & Veatch logo and the FPL logo, which

13 represents the joint view of both Black & Veatch and

14 FPL. This table was put together by Black & Veatch and

15 represents their view of notable worldwide

16 ultra-supercritical plants.

17 Q. Are there any plants on here that compare

18 roughly in terms of temperatures and pressures, for

19 example, to the FGPP plant that FPL is proposing to

20 build?

21 A. Yes. If you look at the bottom of page 3-1,

22 Hitachi Naka, which is a 1,000-megawatt unit, very

23 similar in size, it has a steam pressure of 3,675 and

24 main steam and reheat temperatures of 1,112 degrees

25 Fahrenheit, very close to the FPL plant, which is 3,700,

882

1 1,112, and 1,130.

2 On the next page, the Hranomachi plant, 3,675,

3 1,112, 1,112, and the Tachibanawan, which is 3,750,

4 1,121, and 1,135, all those are within very close

5 proximity to the FPL proposed plant.

6 Q. So those are all actual ultra-supercritical

7 projects?

8 A. They are actual operating ultra-supercritical

9 projects, yes.

10 Q. They're not proposed?

11 A. They're not proposed.

12 Q. They're in commercial operation?

13 A. They are in commercial operation, yes.

14 Q. Looking, please, at what Mr. Guest labeled as

15 Exhibit 166, NETL Materials Research Program, do you

16 have that?

17 A. Yes, I do.

18 Q. Could you page through that for me -- it does

19 not have page numbers on it, but counting the cover as

20 page 1, 2, 3, 4, 5, 6, 7, Pulverized Coal Efficiency,

21 this is a slide that Mr. Guest showed you; is that

22 right?

23 A. Yes.

24 Q. Would you please comment whether this

25 correctly shows the current industry understanding of

883

1 subcritical, supercritical, and ultra-supercritical?

2 A. No, it doesn't. It represents -- once again,

3 the same as the Black & Veatch, it represents a view of

4 the future of these technologies. And particularly the

5 higher temperatures and pressures are dependent upon

6 significant advances in materials and metals that have

7 not been realized to date and have actually been pushed

8 back somewhat. If you look, I believe it's one, two,

9 three further pages into it, it actually has a time line

10 for those ultra-supercritical materials, and it doesn't

11 really show those materials becoming commercial until

12 around the year 2015.

13 One should note this is a 2003 presentation,

14 and since this presentation has come out, the

15 advancement in these very exotic metals and materials

16 has been slowed somewhat. In fact, it's delayed several

17 plants in Europe to the second half of the next decade

18 because of the delays in those materials.

19 Q. So this is another future view?

20 A. It's another future view.

21 Q. And the future is coming a little slower than

22 we had expected?

23 A. The future is coming a little slower than once

24 expected, yes.

25 Q. Looking at what was marked as Exhibit 167,

884

1 "Final Report, Environmental Footprints," et cetera --

2 do you have that in front of you?

3 A. Yes.

4 Q. There's a page 1-1. Design Basis, the first

5 paragraph talks about the modeled plants include, and

6 then counsel referred you to various supercritical steam

7 definitions of things. Does this set of definitions

8 represent the current industry understanding of

9 ultra-supercritical?

10 A. No, it does not. Once again, particularly the

11 steam pressures are significantly higher than the

12 current view of what ultra-supercritical is. This is

13 just -- it appears to be just a modeling exercise more

14 than a representation of the current state of the art of

15 ultra-supercritical technology, particularly with regard

16 to steam pressures.

17 Q. This is by the EPA?

18 A. Yes, it is.

19 Q. They're not in the business of actually

20 building plants; right?

21 A. No, they're not.

22 Q. Okay. Please look at document 175, which is

23 the cost of electricity comparison which was submitted

24 by Richard Furman, RCF-7, and you were asked some

25 questions about it. Do you have that?

885

1 A. Yes, I do.

2 Q. Were you present at Mr. Furman's deposition

3 when he talked about this exhibit?

4 A. Yes, I was.

5 Q. Could you tell us about the relevance and

6 sources of the information and whether it's the kind of

7 thing that a commission or company would rely on in

8 making a $5.7 billion decision?

9 A. The sources of this document -- the sources of

10 these numbers are not consistent with the construction

11 of power plants in South Florida. These represent

12 representative Midwest plants, smaller sizes, and the

13 basis for these numbers is also in question.

14 Q. Do they include FGPP's capital costs?

15 A. No, they do not.

16 Q. FGPP's O&M expense?

17 A. No, they do not.

18 Q. Non-fuel costs?

19 A. No, they do not.

20 Q. Florida Power & Light company's projected fuel

21 costs?

22 A. No, they do not.

23 Q. Or consideration of CO2 sensitivities?

24 A. No, they do not.

25 Q. None of those things are on RCF-7?

886

1 A. None of those things.

2 Q. And you were asked some questions about the

3 cost and status of CO2 capture technology in reference

4 to this?

5 A. Yes.

6 Q. Would you please comment on the date of this

7 presentation in reference to the development of

8 information concerning CO2 capture?

9 A. The date of this is preliminary results,

10 September 2006. Just in the intervening time between

11 September 2006 and today, there has been significant

12 advancements in CO2 capture.

13 Q. Mr. Krasowski asked you about why you selected

14 Glades County for construction of FGPP. Are there

15 reasons you would construct a coal plant in Glades

16 County, but not a gas-fired combined cycled plant?

17 A. Yes. The Glades County site is a coal-fired

18 power plant site. It has characteristics that are

19 consistent with a coal plant site. One characteristic

20 is, unlike a gas plant, the rule of thumb for a coal

21 plant is one and a half acres per each megawatt of

22 generation. So given this is a roughly 2,000-megawatt

23 facilities, we were looking for 3,000 acres or more,

24 mainly because of the loop track for the rail line, the

25 fuel storage, and the by-product handling.

887

1 Also, this site was advantaged from a coal

2 perspective because it has a rail line that abuts the

3 site, and that rail line connects to two major networks.

4 If we were to build a gas-fired power plant site, we

5 would not build it at this site. It is not advantaged

6 as far as a gas-fired power plant site is concerned. It

7 is advantaged as a coal plant site and does provide

8 significant economic benefits to the community.

9 Q. Please look briefly at Exhibits 172, 173, and

10 174, which were given to you by Mr. Guest to review.

11 One is "Operating IGCC Facilities," another is "Proposed

12 Projects, IGCC and Polygeneration in North America," and

13 then the third, "Proposed IGCC and Gasification Plants

14 Ex-North America." Do you have those?

15 A. Yes, I do.

16 Q. Would you please comment on whether those

17 documents and the information contained in them change

18 FPL's views concerning technology selection?

19 A. No, they don't, because all these projects,

20 including the corrected one from Nuon, all these

21 projects are relatively small projects. They don't move

22 the needle in terms of fuel diversity. To get fuel

23 diversity in FPL's system, we need the 2,000-megawatt

24 sizing. None of these plants meet that sizing.

25 In addition, I have seen this document 172

888

1 before and noticed the plant costs. And what I did is,

2 I corrected those plant costs for 2014 dollars to get an

3 idea of what those plant costs would look like in 2014

4 dollars, and each one of those plants is significantly

5 more expensive than the FPL Glades Power Park in 2014

6 dollars. And I would note that the Tampa Electric

7 plant, I corrected it for the actual costs of the plant

8 rather than the projected costs which are listed on that

9 line.

10 MR. ANDERSON: Okay. Then I'm going to pass

11 around document 17 -- what? I'm sorry. Eight?

12 CHAIRMAN EDGAR: I'm on 8, 178.

13 MR. ANDERSON: Thank you, Chairman.

14 CHAIRMAN EDGAR: Will you give us a title?

15 MR. ANDERSON: Yes, please. "Comparative

16 Dollars Per kW for Operating IGCC Facilities."

17 (Exhibit 178 marked for identification.)

18 BY MR. ANDERSON:

19 Q. Mr. Hicks, would you explain what this

20 document is and how it relates to documents 172 through

21 174? You were asked some questions earlier about

22 comparing dollars per kW for IGCC.

23 A. Yes. What I did is, I took on the last column

24 plant costs, and I escalated them using historical and

25 projected escalation rates for capital costs. Between

889

1 1994 and 2003, the blended escalation rate between labor

2 and materials ran roughly around 3 percent. The

3 industry, the construction industry as a whole, and the

4 power plant industry in particular, experienced

5 significant increases in escalation during 2004, 2005,

6 and 2006, and those are reflected in the next three

7 numbers. And then consensus in the industry is that --

8 and this is adopted by FPL, is that beyond 2007, beyond

9 2006, we're assuming a 4 percent escalation rate.

10 So the first column you see there is the

11 years, and the second column you see is historical and

12 projected acceleration rates for capital costs. The

13 columns you see is where I took each one of those

14 capital costs that's listed here, with the exception of

15 the Polk plant, which I put into the corrected numbers,

16 and then escalated them to 2014 dollars.

17 Q. So to just pick one of these numbers so we

18 just explain it, you --

19 A. Let's look at Nuon (Demkolec), which is the

20 first one.

21 Q. Right.

22 A. That has a plant cost in dollars per kW in

23 1994 of $2,372. I took that 2,372 and escalated it to

24 2014 dollars and got $8,521 per kW.

25 Q. So $8,521 in 2014 dollars per kilowatt, how

890

1 does that compare to FGPP?

2 A. FGPP all in, which, by the way, in South

3 Florida includes substantial transmission upgrades, is

4 about $2,900 per kW in 2014 dollars.

5 Q. Looking across the bottom row of Exhibit 178

6 for year 2014 dollars, how do all the dollars per kW

7 compare generally to FGPP?

8 A. All the dollars per kW generally are much

9 higher with the exception of one plant, which is the

10 Sarlux plant. And I would say, given the numbers for

11 all the other plants, that something is missing there.

12 That might be an inside, just an inside the fence number

13 or what you call an overnight capital cost number rather

14 than a fully loaded capital cost number.

15 Q. Okay. And what does this show overall if you

16 compare costs of existing IGCC --

17 A. It shows that -- you know, once again, it's

18 further evidence that the capital costs of IGCC plants

19 are significantly greater than those for

20 ultra-supercritical or pulverized coal plants in

21 general.

22 MR. ANDERSON: That's all we have. Thank you.

23 CHAIRMAN EDGAR: Then we need to take up

24 exhibits. Mr. Guest.

25 MR. GUEST: May I have an opportunity just to

891

1 have a very short recross?

2 CHAIRMAN EDGAR: Based upon what?

3 MR. GUEST: I think this -- I want to inquire

4 whether this exhibit was generated over lunchtime.

5 THE WITNESS: It was not.

6 MR. GUEST: Okay. That's one issue.

7 CHAIRMAN EDGAR: Was that the witness? Did

8 you respond?

9 THE WITNESS: Yes.

10 CHAIRMAN EDGAR: Generally you let me respond

11 to the --

12 THE WITNESS: Oh, I'm sorry. I apologize.

13 CHAIRMAN EDGAR: Thank you.

14 THE WITNESS: I apologize.

15 CHAIRMAN EDGAR: Although I do appreciate your

16 cooperation in trying to answer the questions, but

17 sometimes you have to let me think first.

18 THE WITNESS: Okay. I'm sorry.

19 CHAIRMAN EDGAR: That's all right. Mr. Guest,

20 did you have further --

21 MR. GUEST: I just have a handful of --

22 CHAIRMAN EDGAR: But again, based upon what?

23 MR. GUEST: Oh, based on the new testimony, of

24 course, nothing that I'm repeating. For example, let me

25 -- may I give you a illustration?

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1 CHAIRMAN EDGAR: How about if I ask another

2 question and we go from there?

3 MR. GUEST: Yes.

4 CHAIRMAN EDGAR: Okay. Based upon information

5 that has come up in redirect or on previous cross?

6 MR. GUEST: I guess redirect. I guess that's

7 right. I'm trying to -- well, I don't have them

8 separated fully in my mind about which one it is. The

9 one I have in front of my, no doubt about it, it's

10 redirect.

11 CHAIRMAN EDGAR: Okay. Well, then let me turn

12 to our counsel. Mr. Harris.

13 MR. HARRIS: To the extent that he has

14 questions about the redirect, it would be within your

15 discretion to allow it. To the extent that he has

16 questions based on other cross-examination, I do not

17 believe that would be appropriate. I'm a little

18 concerned that counsel indicated he hasn't decided which

19 are based on redirect and which are based on recross, or

20 on cross.

21 MR. GUEST: Well, may I just go straight to

22 the issue, Madam Chairman? When I see cross-examination

23 which looks to me like it's rehabilitating the witness's

24 testimony, it doesn't feel like cross to me. And, for

25 example, what we got on some of the cross was –-

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1 CHAIRMAN EDGAR: Mr. Guest, quite frankly,

2 then you have the opportunity to object at the time that

3 the question is asked, and from this point forward,

4 let's try to do it that way. Generally I do not allow

5 recross. However, if there is something that has come

6 up in the redirect that you feel compelled to follow

7 through briefly, I will allow it.

8 MR. GUEST: Okay. Let me just ask one or two

9 then.

10 RECROSS-EXAMINATION

11 BY MR. GUEST:

12 Q. The document that was brought to you which was

13 marked -- which is "Clean Coal Today," 177, we hadn't

14 previously -- 176?

15 CHAIRMAN EDGAR: 176 is the way I have it

16 marked.

17 BY MR. GUEST:

18 Q. 175. That's actually a newsletter from DOE;

19 correct?

20 A. It says it's a newsletter about innovative

21 technologies for coal utilization, but it includes a

22 U.S. DOE definition in there.

23 Q. Right. And that's completely inconsistent

24 with the definition provided by the National Energy

25 Technology Laboratory?

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1 A. No, I would not say it's inconsistent, if you

2 could point to me where it is.

3 Q. Well, it's inconsistent with Exhibit Number

4 168?

5 A. Is that the one titled "NETL's Materials

6 Research Program"?

7 Q. Yes.

8 A. No. As I indicated, these definitions are

9 consistent with the diagram about three pages later,

10 which indicate ultra-supercritical materials necessary

11 to support those type of steam conditions. Without

12 those exotic metals, you cannot achieve these type of

13 steam conditions, and today you can't design and build

14 with these type of steam conditions. Those exotic

15 metals are not available.

16 Q. So are you saying then that the definition of

17 what ultra-supercritical is changes with time and that

18 these documents are referring to a definition of

19 ultra-supercritical that doesn't even exist now and will

20 be a definition used at some future time? Is that it?

21 A. Pulverized coal technology is an evolving

22 technology, and as that technology evolves, the

23 characterizations of what are ultra-supercritical,

24 supercritical, and subcritical will change over time.

25 But the current definition of ultra-supercritical, not

895

1 only the DOE definition, but the consensus of the

2 industry, is that the plant that we are proposing is a

3 state-of-the-art ultra-supercritical plant and will

4 bring the highest efficiency coal plant ever proposed

5 for the United States when looked at in terms of proper

6 temperature, pressure, and climatic conditions.

7 Q. And lastly, just one question. Document

8 number -- you know, I should be more careful about

9 marking these things. 177. This is the table by Black

10 & Veatch. That was made as an exhibit for this case

11 after the petition was filed; isn't that correct?

12 A. This was included in my direct testimony, as

13 an appendix to my direct testimony. The Clean Coal

14 Technology Study was appended to my direct testimony in

15 this case.

16 Q. But it was made by Black & Veatch as an

17 exhibit for this proceeding; correct?

18 A. No. The original document was made as a part

19 of the Clean Coal Technology Study that Black & Veatch

20 did in conjunction with FPL. This document is DNH-2,

21 which is one of the exhibits to my direct testimony in

22 this case.

23 Q. Dated after the petition was filed?

24 A. I don't know what date the petition was filed,

25 so I can't answer that question. I can tell you this

896

1 was appended to my -- this is part of a document that

2 was appended to my direct testimony.

3 MR. GUEST: Thank you for your indulgence,

4 Madam Chairman.

5 CHAIRMAN EDGAR: Thank you. Mr. Anderson.

6 MR. ANDERSON: Nothing.

7 CHAIRMAN EDGAR: Okay. All right. Then let's

8 take up the exhibits. We have Exhibits 25 through 38.

9 Seeing no objections, we will enter 25 through 38 into

10 the record.

11 (Exhibits 25 through 38 admitted into the

12 record.)

13 MS. BRUBAKER: Madam Chairman, if a may, just

14 a point of clarification. We have currently identified

15 but not entered Exhibits 162 through 165 on a prior day

16 of hearing. That was during Mr. Schlissel's

17 cross-examination. I recommend we do not take those up

18 at this time, but wait until Mr. Schlissel has joined us

19 again. And that would bring us to Exhibits 166 through

20 175, which Sierra has put forward, and 176 through 178,

21 which FPL put forward on redirect.

22 CHAIRMAN EDGAR: Mr. Anderson, any objections

23 to the exhibits that Mr. Guest has put forward.

24 MR. ANDERSON: One caveat as to Exhibit 168,

25 which is the partial pages of the Ron Ott presentation.

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1 We're happy to have that go in, but we've asked counsel

2 to give us a copy of the full presentation. We would

3 like to reserve the right to offer the balance of that

4 presentation if we feel it should go in, if that works

5 for people.

6 CHAIRMAN EDGAR: Mr. Guest.

7 MR. GUEST: That's the whole document rule

8 and, of course, we agree to that.

9 CHAIRMAN EDGAR: That is the whole document?

10 MR. GUEST: What I mean to say is, there's a

11 -- the whole document rule is that when someone puts in

12 one document, anybody can put the rest in, and

13 obviously, we play by those rules.

14 MR. ANDERSON: And because I asked counsel to

15 provide that to me, he has agreed to produce it, as I

16 understand, but I haven't seen it yet. If upon

17 examination we wish to offer the whole thing, that's the

18 only caveat. That's the only observation on any

19 exhibit. We have no objection to the balance.

20 CHAIRMAN EDGAR: Okay. Thank you for the

21 clarification. And so with that, we will enter exhibits

22 166 through 175.

23 (Exhibits 166 through 175 admitted into the

24 record.)

25 CHAIRMAN EDGAR: Mr. Guest, any objections to

898

1 the three exhibits that Mr. Anderson has put forward,

2 which I have as 176, 177, and 178?

3 MR. GUEST: May I have a moment?

4 CHAIRMAN EDGAR: You may.

5 MR. GUEST: Just as to 178. We are endlessly

6 puzzled by this, because -- by 178, because you may have

7 observed my previous argument about asking for judicial

8 recognition of the commutative property of

9 multiplication.

10 CHAIRMAN EDGAR: I recall that discussion.

11 MR. GUEST: And I think that this is sort of

12 the same thing, but it's a much larger set of

13 calculations. Maybe what we should do is spot check a

14 few of these and reserve an objection, or do you want me

15 to spot check them now? This is kind of a tricky

16 calculation, because it's a present value calculation,

17 where it's -- why don't we deal with that?

18 MR. ANDERSON: Our suggestion would be --

19 first of all, let me defer to the Chair as to how you

20 would like to proceed, but --

21 CHAIRMAN EDGAR: Well, actually, I was going

22 to ask for your comment.

23 MR. ANDERSON: Okay. My thought would be,

24 first, I'm confident that the figures are fine, but if

25 counsel wants to take a look at them, we'll happily

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1 amend any specific figure. But our suggestion would be

2 admit it into the record, subject to our agreement to

3 make any changes indicated based upon any math error

4 that's found.

5 MR. GUEST: That works for me.

6 CHAIRMAN EDGAR: Does that work for you?

7 MR. GUEST: Yes.

8 CHAIRMAN EDGAR: Okay. Then again, we will

9 all work together to try to get the right result

10 comfortably. Okay. With that, then we will enter

11 Exhibits 176, 177, and 178.

12 (Exhibits 176, 177, and 178 admitted into the

13 record.)

14 CHAIRMAN EDGAR: And the witness is excused.

15 Although we will be seeing you back again; correct?

16 THE WITNESS: Yes, you will.

17 CHAIRMAN EDGAR: Okay. Thank you. And I'm

18 ready to move on if you are, so your witness.

19 MR. ANDERSON: We are. Thank you very much.

20 FPL would call as its next witness Mr. Steve Jenkins,

21 who I think the record will show has been sworn.

22 MR. GUEST: May I raise an administrative

23 matter, Madam Chairman?

24 CHAIRMAN EDGAR: You may.

25 MR. GUEST: It's beginning to look like

900

1 there's a possibility that we're running slower than we

2 thought we were.

3 CHAIRMAN EDGAR: It is beginning to look that

4 way, yes.

5 MR. GUEST: And we have witnesses that are

6 fixing to hop on airplanes from far away, and I think

7 that I've got to call one of them in the coming 30

8 minutes to say should he come or not. And I think it's

9 about time to try to get there on this issue.

10 MR. LITCHFIELD: Madam Chairman, Wade

11 Litchfield for FPL. I wonder if it might be appropriate

12 to take maybe a five-minute recess, because I think

13 there may be a discussion that we can have with counsel.

14 CHAIRMAN EDGAR: Sure. I had actually hoped

15 that maybe some of those discussions had been worked out

16 at lunch, but I did not ask. And I apologize for that.

17 I probably should have before we had the next witness.

18 MR. GUEST: We had substantial discussions at

19 lunch, and there was a proposal to put it off until now,

20 essentially. That's what happened.

21 CHAIRMAN EDGAR: Okay. Well, then let's take

22 a few minutes and see if we can --

23 MR. KRASOWSKI: Excuse me, Madam Chair.

24 CHAIRMAN EDGAR: -- work out some

25 efficiencies. Mr. Krasowski, yes.

901

1 MR. KRASOWSKI: Yes, ma'am. We have an

2 interest -- I have an interest as well in the sequence

3 of witnesses, so if we might be able to listen in to the

4 discussion.

5 CHAIRMAN EDGAR: Mr. Krasowski, I would

6 absolutely ask you to join our staff and the other

7 attorneys involved in the proceedings. Thank you.

8 (Short recess.)

9 CHAIRMAN EDGAR: Are we ready?

10 MR. GUEST: Yes.

11 CHAIRMAN EDGAR: Okay. Do we have --

12 MR. LITCHFIELD: Madam Chairman --

13 CHAIRMAN EDGAR: -- some agreement, some

14 compromise?

15 MR. GUEST: What happened is that we have been

16 unable to reach agreement, and I think we need some

17 assistance from the Chair in getting there.

18 What happened, as you recall, the last day

19 that we were here is that Mr. Schlissel was examined at

20 great length, and there were a few questions left, but

21 he had to go and catch his plane. And he went back up

22 to Cambridge, and he's waiting for a phone call about

23 whether to come back here for the five questions. He

24 was taken out of order and in the hope that --

25 CHAIRMAN EDGAR: In an effort to accommodate.

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1 MR. GUEST: Indeed. Oh, indeed, he was, and

2 we appreciate that. And what we're trying to do is look

3 at the testimony of Mr. Sim, and having done that, make

4 a decision about whether we even need to bring him back,

5 whether we need to bring Dr. Schlissel back. There are

6 a number of rebuttal witnesses that don't deal with

7 anything related to him. Mr. Schlissel deals solely and

8 exclusively with the matter of carbon costs. It doesn't

9 relate to the testimony of Mr. Hicks, Mr. Jenkins,

10 Mr. Kosky, or Mr. Rose.

11 So what we would like to do is take them out

12 of order, in the hope that we will come up with a way to

13 not have to bring -- well, take -- if necessary -- I

14 think there's a question is it even necessary alone. If

15 we end up getting our case in chief done tomorrow,

16 which, at the rate we're going, may even not happen, to

17 hold open the option of just not calling David

18 Schlissel, and if there's still a little time left

19 tomorrow, going into rebuttal on issues that are

20 unrelated to him, and that might avoid him leaving home

21 in Cambridge at all. That's what we're seeking to try

22 to do.

23 MR. LITCHFIELD: Madam Chair, if I might

24 respond.

25 CHAIRMAN EDGAR: Mr. Litchfield.

903

1 MR. LITCHFIELD: If I'm looking at the order

2 of witnesses as it's laid out here, we've finished with

3 Mr. Hicks. We're taking Mr. Jenkins and Mr. Kosky,

4 which we expect we'll be able to do this afternoon. And

5 Mr. Sim, I'm told the questions for Mr. Sim on his

6 direct are very few.

7 There's also a possibility I think that we

8 should explore right now as to the possible stipulation

9 of Mr. Yeager, both as to his direct and rebuttal. My

10 understanding is that there are perhaps few, perhaps no

11 questions of any party for Mr. Yeager, subject, of

12 course, to the Commissioners' questions.

13 The next one, two, three, four, five witnesses

14 are either all stipulated or have already appeared, both

15 on direct and rebuttal, which takes us to very quickly,

16 I think, tomorrow into the three witnesses of the

17 intervenors, Mr. Furman, Plunkett, and Schlissel. Now,

18 we're amenable to taking up Mr. Schlissel first and

19 Mr. Plunkett second and Mr. Furman third, any order that

20 Mr. Guest would suggest in terms of his witnesses. But

21 I think it is a certainty that we will get to all three

22 of these witnesses tomorrow.

23 Now, as to whether Mr. Schlissel needs to come

24 back, we had offered previously, and in talking with

25 Mr. Guest here today, we've renewed the offer to simply

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1 submit Mr. Schlissel's deposition into the record and

2 forgo any further questions and save him the trip. But

3 I would be reluctant to hold out essentially an option

4 to Mr. Guest to decide when and if Mr. Schlissel is

5 going to appear, to allow him again at his option to

6 place him toward the end of the witness order.

7 And I think it is incorrect to suggest that

8 the witnesses that we have on rebuttal have nothing to

9 do with Mr. Schlissel's testimony. In fact, Mr. Kosky,

10 Mr. Sim, Mr. Rose, and Mr. Silva all have to do with

11 Mr. Schlissel's testimony.

12 So my view is, Mr. Schlissel ought to -- if

13 he's going to testify, he ought to plan to be here

14 tomorrow, and we will make every accommodation to take

15 him out of order tomorrow, or if they don't need him to

16 come back, we'll put in the deposition, and he will not

17 have to make the trip.

18 CHAIRMAN EDGAR: Mr. Guest, that seems

19 reasonable to me. We offered the option at the close of

20 the last day, the prior day of the proceeding, to enter

21 the deposition or to have him return. If FPL has

22 renewed their willingness to go with either of those

23 options, I renew mine as well to go with either of

24 those.

25 For scheduling purposes, also, I think we can

905

1 go till 7:00, 7:30ish this evening. Tomorrow I have an

2 appointment, so that I cannot go beyond 4:00 tomorrow.

3 Therefore, we will not be going beyond 4:00 tomorrow.

4 Close out that thought. And I apologize for that. I've

5 moved as much as I can, and I know that everybody else

6 has as well.

7 So realizing that I think we can go a little

8 later than usual this evening, the possibility -- let's

9 take up the easy thing first. Witness Yeager, there has

10 been a suggestion that his direct and rebuttal could be

11 stipulated. So, Commissioners, I will ask you to

12 consider that and ask our staff, do we have questions --

13 MS. BRUBAKER: Staff has no questions.

14 CHAIRMAN EDGAR: So staff would be able to

15 stipulate. Commissioners? Mr. Krasowski?

16 MR. KRASOWSKI: No questions of Mr. Yeager.

17 CHAIRMAN EDGAR: No questions for Mr. Yeager.

18 MR. GUEST: There was a suggestion that -- or

19 a representation that we weren't going to ask any

20 questions, and I don't think that's accurate.

21 CHAIRMAN EDGAR: Actually, if that was the

22 representation, I missed it, and I was not representing

23 that.

24 MR. LITCHFIELD: I was, and if I'm mistaken, I

25 apologize, but that certainly had been my understanding.

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1 CHAIRMAN EDGAR: Okay. And, Mr. Guest, I was

2 going to ask you the same question. So --

3 MR. GUEST: We are going to have some

4 questions.

5 CHAIRMAN EDGAR: Okay. Then I think where we

6 are is, we will take here in just a moment Mr. Jenkins.

7 We will get as far as we can with Jenkins, Kosky, Sim,

8 and -- is Mr. Yeager here today? Maybe we'll get there,

9 maybe not.

10 And so the question comes back to you

11 Mr. Guest, as to whether we have Mr. Schlissel appear

12 tomorrow to finish the cross and redirect or admit his

13 deposition testimony in lieu of.

14 MR. GUEST: I'm going to need a minute to

15 decide that. I didn't except to have that option.

16 CHAIRMAN EDGAR: Okay. Do you want to decide

17 that now, or do you move on and tell us later?

18 MR. GUEST: Well, he's supposed to catch a

19 plane in 20 minutes.

20 CHAIRMAN EDGAR: Then we'll take a moment in

21 place.

22 (Off the record briefly.)

23 CHAIRMAN EDGAR: All right. Back on the

24 record. I apologize. I didn't realize you were ready.

25 Okay. Where are we?

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1 MR. GUEST: Thank you for indulging us and

2 giving us the time to work this through. We are not

3 going to call Dr. Schlissel. We're going to leave him

4 in Cambridge. He's got personal issues up there. It's

5 probably a really good idea to be doing this for him

6 too. So we just won't call him, and we'll just put in

7 the deposition.

8 CHAIRMAN EDGAR: Ms. Brubaker, any concerns or

9 other issues that we would need to address? We do have

10 the matter of the exhibits, and we will need to put in

11 the deposition.

12 MS. BRUBAKER: Provided, of course, no other

13 party has any questions for Mr. Schlissel, staff is

14 happy to stipulate to his existing testimony as well as

15 his deposition in lieu of further cross. As far as

16 entering his testimony and current exhibits in the

17 record, we can simply take those up, if you like, when

18 he comes up in turn as listed on page 4 of the

19 Prehearing Order, or we can take them up now if that's

20 the --

21 CHAIRMAN EDGAR: We'll do it in order so that

22 I don't get confused.

23 MR. LITCHFIELD: Madam Chairman, I have one

24 other --

25 CHAIRMAN EDGAR: Mr. Litchfield.

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1 MR. LITCHFIELD: I have one other suggestion,

2 again, to potentially save Mr. Plunkett a trip down as

3 well. We would also be amenable to forgoing cross and

4 putting his deposition into the record and stipulating

5 his testimony in as well.

6 MR. GUEST: I think Mr. Plunkett needs to be

7 here.

8 CHAIRMAN EDGAR: Okay. All right.

9 MR. GUEST: So we're going to do him for sure

10 tomorrow, and if we're going to do him for sure tomorrow

11 -- is that our understanding, Madam Chairman?

12 CHAIRMAN EDGAR: I think we can get there.

13 I'll need everybody to work with me. Okay?

14 MR. GUEST: Well, of course, I will work in

15 every way possible, but it wasn't sure how for sure that

16 felt.

17 CHAIRMAN EDGAR: It's not all within my

18 control, but I will certainly work to accommodate that.

19 MR. GUEST: Okay.

20 CHAIRMAN EDGAR: Mr. Krasowski, did you have a

21 question or concern before we move on?

22 MR. KRASOWSKI: No, ma'am. Everything is just

23 fine right now.

24 CHAIRMAN EDGAR: Thank you.

25 Okay. Mr. Anderson.

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1 MR. ANDERSON: Thank you, Chairman Edgar.

2 CHAIRMAN EDGAR: Thank you.

3 Thereupon,

4 STEPHEN D. JENKINS

5 was called as a witness on behalf of Florida Power &

6 Light Company and, having been duly sworn, testified as

7 follows:

8 DIRECT EXAMINATION

9 BY MR. ANDERSON:

10 Q. Good afternoon, Mr. Jenkins.

11 A. Good afternoon.

12 Q. Have you been sworn?

13 A. Yes, I have.

14 Q. Would you please tell us your name and your

15 business address?

16 A. My name is Stephen Jenkins, and my business

17 address is 4350 West Cypress Street, Tampa, Florida

18 33607.

19 Q. By whom are you employed and in what capacity?

20 A. I'm employed by the engineering firm CH2M

21 Hill, Inc. I am their Vice President, Gasification

22 Services.

23 Q. Have you prepared and caused to be filed 33

24 pages of prefiled direct testimony in this proceeding?

25 A. Yes, I have.

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1 Q. Did you also cause to be filed errata to your

2 testimony on March 13, 2007?

3 A. Yes, I did.

4 Q. Do you have any further changes or revisions

5 to your prefiled direct testimony other than the errata

6 sheet?

7 A. No, I do not.

8 Q. With those changes, if I asked you the same

9 questions contained in your prefiled direct testimony,

10 would your answers be the same?

11 A. Yes.

12 MR. ANDERSON: Madam Chairman, we ask that

13 Mr. Jenkins' prefiled direct testimony as amended by the

14 errata be inserted into record as though read.

15 CHAIRMAN EDGAR: The prefiled direct testimony

16 with the errata will be entered into the record as

17 though read.

18 MR. ANDERSON: We note that Mr. Jenkins has no

19 exhibits or attachments to his direct testimony.

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1 BY MR. ANDERSON:

2 Q. Do you have a summary of your testimony,

3 Mr. Jenkins?

4 A. Yes, I do.

5 Q. Will you please provide your summary at this

6 time?

7 A. Yes, thank you.

8 Good afternoon, Chairman Edgar and

9 Commissioners. My name is Stephen Jenkins, and I'm Vice

10 President of Gasification Services for the engineering

11 firm CH2M Hill. My work deals directly with the

12 permitting and design of integrated gasification

13 combined cycle or IGCC power plants nationwide. When I

14 worked at Tampa Electric Company, I was the deputy

15 project manager for the Polk Power Station IGCC unit,

16 which is one of the two IGCC plants in the United

17 States.

18 My testimony shows that FPL's choice of the

19 ultra-supercritical pulverized coal technology is the

20 first choice for Glades Power Park and is a prudent one.

21 In fact, it's a better choice than IGCC, which is still

22 a developing technology.

23 Some of my main points are as follows: There

24 are only four coal-based IGCC power plants in the entire

25 world. There are over 500 supercritical pulverized coal

945

1 power plants, with 17 of them being ultra-supercritical,

2 that using the official DOE designation and definition

3 that Mr. Hicks already told you about.

4 Supercritical technology has been in

5 commercial use worldwide for about 50 years, while IGCC

6 has an operating history of only about 12 years.

7 Ultra-supercritical units have been proven in

8 service at sizes over 1,000 megawatts, while IGCC has

9 been demonstrated at only about 250 megawatts in size.

10 Larger units mean lower relative costs and higher

11 efficiency. While there are 600-megawatt IGCC plants

12 now being designed, they won't go into operation and be

13 proven for about another six years.

14 Supercritical units have a higher reliability

15 than IGCC. For example, the Glades Power Park units

16 will be designed for an availability of about 92

17 percent. None of the four coal-based IGCC plants in the

18 world have met their target availability of only

19 85 percent. Now, while we are designing a lot of

20 enhancements into IGCC to improve availability, again,

21 those changes in those units won't go into service for

22 years to come and won't be proven for about six years.

23 Supercritical technology is actually more

24 efficient than IGCC. That's not what we expected in the

25 IGCC industry. Not one of the planned coal-based IGCC

946

1 power plants that we've been talking about this morning

2 will be as efficient as the units at Glades Power Park,

3 not one of them. Higher efficiency means using less

4 coal to produce the same power, the same kilowatt-hours

5 of electricity. That's what Glades Power Park will do

6 in comparison to IGCC units. Using less coal means

7 lower emissions and less CO2.

8 We also expected that the capital cost premium

9 for IGCC over the supercritical pulverized coal units

10 would be only about 20 percent. But based on some

11 recent detailed cost estimates and regulatory filings in

12 other states, we now know that number to be closer to 35

13 to 40 percent more for IGCC than for the supercritical

14 pulverized coal. But we really won't know what IGCC

15 costs until one utility is the first to actually

16 purchase and contract for one of the new 600-megawatt

17 units, which will happen late this year, we think.

18 Another issue is CO2. While some believe that

19 IGCC inherently captures the CO2 from the process, it

20 does not. It takes a significant amount of very capital

21 intensive equipment to do that. In fact, CO2 capture is

22 not proven at any scale on IGCC worldwide. However, we

23 do expect that this CO2 capture technology will become

24 commercially available for both IGCC and supercritical

25 pulverized coal in the future at a similar cost. And

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1 that's an important note. That's one more reason why

2 it's prudent to select the ultra-supercritical

3 pulverized coal technology.

4 Overall, ultra-supercritical pulverized coal

5 technology is more commercially proven, higher in

6 efficiency, has a higher availability, and lower in cost

7 than IGCC, and has the capability for CO2 capture.

8 That's why FPL's selection of the ultra-supercritical

9 pulverized coal technology is the right choice for the

10 Glades Power Park units.

11 Thank you.

12 MR. ANDERSON: Mr. Jenkins is available for

13 cross-examination.

14 CHAIRMAN EDGAR: Okay. Ms. Perdue.

15 MS. PERDUE: No.

16 CHAIRMAN EDGAR: No questions. Thank you.

17 Mr. Beck.

18 MR. BECK: Thank you, Madam Chairman.

19 CROSS-EXAMINATION

20 BY MR. BECK:

21 Q. Good afternoon, Mr. Jenkins.

22 A. Good afternoon.

23 Q. Would you turn to page 26 of your prefiled

24 testimony, please.

25 A. Yes.

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1 Q. At lines 17 through 18, you state that

2 applying CO2 capture to a PC plant is presently much

3 more difficult and expensive than for an IGCC plant. Do

4 you see that?

5 A. Yes, I do.

6 Q. And I think in your summary you just stated

7 that you thought that carbon capture for an

8 ultra-supercritical pulverized coal plant and IGCC would

9 have a similar cost in the future; is that right?

10 A. Yes, I did.

11 Q. Okay. Were you here during the redirect

12 examination of Mr. Hicks just before yourself?

13 A. Oh, yes, I was.

14 Q. And did you understand him to say that he

15 thought carbon capture would be cheaper for an

16 ultra-supercritical pulverized coal plant than it would

17 be for an IGCC plant?

18 A. Yes.

19 Q. What's your understanding of --

20 A. If you look at line 18, the fourth word is

21 "presently," and that is based on the research and

22 development that has been done to date on CO2 capture

23 technologies and very many studies that have been done.

24 As Mr. Hicks explained in some of his answers, there are

25 now more and more research and development projects

949

1 being done for CO2 capture on pulverized coal

2 technologies. Obviously, the market for that kind of

3 technology is with pulverized coal, not IGCC. There are

4 only four coal-based IGCC plants in the world. There

5 are hundreds and thousands of pulverized coal plants.

6 That's why the boiler companies are doing so much more

7 research and development to lower the cost and be able

8 to apply this technology to PC technology, while the

9 IGCC industry is doing some additional CO2 capture R&D.

10 So the point is, the present types of data and

11 studies that have been available have shown that PC

12 would be more expensive. That's why I said presently in

13 there. However, as Mr. Hicks specifically noted, the

14 latest cost estimates and the projections from -- like

15 on the chilled ammonia system will clearly show that

16 overall, the costs for CO2 capture are going to be

17 fairly equivalent for both technologies. Fortunately,

18 we'll be able to apply the CO2 capture technology to

19 either one.

20 Q. So do you agree with Mr. Hicks or disagree

21 that pulverized coal will be less expensive for carbon

22 capture than for IGCC?

23 A. It depends on which coal you're using and what

24 -- the size of the units and a few other issues there.

25 Q. Well, how about the Glades plant?

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1 A. It would be -- PC would be less expensive.

2 Q. And why would it be less expensive for the

3 Glades plant as compared to other types of

4 ultra-supercritical pulverized coal plants?

5 A. I didn't say that it would be more expensive

6 on others.

7 Q. Okay. What's your basis for thinking it would

8 be less?

9 A. Oh. Well, for example, there was a recent

10 study done by the Electric Power Research Institute for

11 City Public Service of San Antonio looking at PC and

12 IGCC with and without CO2 capture. And this is a

13 publicly available report and has been discussed at

14 length in many different fora across the industry and in

15 the regulatory proceedings. It is one of the latest and

16 most up to date studies that shows what the best costs

17 are for PC and IGCC with and without CO2 capture. The

18 bottom line result of that study shows that when you add

19 CO2 capture to both PC and IGCC, that the pulverized

20 coal unit was actually less expensive. That is the

21 latest data that is being used and accepted in the

22 industry. And that's a public report, should you like

23 to see that, at EPRI.com.

24 Q. Okay. So you think that the economics are

25 going to change, IGCC versus pulverized coal plants, for

951

1 carbon capture, as I take it. You know, from your

2 testimony, you said it's presently much more difficult

3 and expensive for a PC plant than it is for IGCC; right?

4 A. Yes, based on present studies. I mean, nobody

5 is doing this, so we really can't say, "Here's a system,

6 and it's removing CO2 from a PC plant, and this is the

7 cost." This was based on studies, and now we have,

8 since the EPRI report came out, even better numbers and

9 more up-to-date numbers.

10 Q. What's the date of the EPRI report that you're

11 referring to?

12 A. It was just a few months ago that EPRI

13 released this. In fact, I was with City Public Service

14 of San Antonio earlier this week going over the report

15 with them.

16 Q. Over what time frame do you see the economics

17 change from what you say is presently the economics to

18 what you see it changing to in the future?

19 A. Daily. There's so much work being done with

20 so many R&D projects looking at pulverized coal, because

21 as I said, with hundreds of thousands of PC plants

22 around the world, whenever time comes that we have to do

23 CO2 capture, that's the market. And the boiler

24 manufacturers want to be here in five years, ten years,

25 15 years, so they will find the technology and make it

952

1 work so that it will be cost-effective.

2 Another example is in the EPRI Journal,

3 Electric Power Research Institute, which does the R&D

4 for the utility industry. In last month's EPRI Journal,

5 they had a very good and detailed article called "The

6 Challenge of Carbon Capture." And one of the specific

7 statements in there was that with the enhancements being

8 made to both IGCC and PC -- and I'm paraphrasing it, and

9 I could get you that article if you would like -- we

10 expect the cost of electricity with CO2 capture on both

11 IGCC and PC to be the same number. And that is the

12 latest data out.

13 Q. Do you have an opinion on whether at some time

14 during the life of the Glades Power Plant, do you have

15 an opinion on whether they would put in carbon capture

16 or not, or whether that would be --

17 A. I do not.

18 Q. Could you turn to page 27 of your testimony?

19 A. Yes.

20 Q. On lines 8 through 10, you say, "A recent

21 study by the EPA shows that the addition of a CO2

22 capture system would reduce the output of an IGCC plant

23 by 14 percent and an SCPC plant by 28 percent." Do you

24 see that?

25 A. Yes, I do.

953

1 Q. Okay. What's the date of -- you said a recent

2 study. What's the date of that study?

3 A. That, I believe, was the EPA environmental

4 footprints study that was referenced previously when

5 Mr. Hicks was here.

6 Q. And do you know about the time frame when that

7 was issued?

8 A. That came out in June of 2006.

9 Q. Do you see those numbers changing over time,

10 the 14 and 28 percent that you refer to in your

11 testimony?

12 A. Yes, I do, fortunately.

13 Q. And how do you see that going over time?

14 A. What the Department of Energy has recently

15 said is, they want to be able to get CO2 capture from PC

16 and IGCC to the point where the units, the base units

17 are more efficient, and then when you add the CO2

18 capture, I think by 2020 was the number, or maybe sooner

19 than that, that the impact on efficiency would be no

20 impact on both IGCC and PC. That's the goal of their

21 CO2 capture program, so that we won't have these huge

22 impacts that we're seeing right now.

23 MR. BECK: Thank you, Mr. Jenkins. That's all

24 I have.

25 CHAIRMAN EDGAR: Mr. Guest, do you have

954

1 questions.

2 MR. GUEST: Yes. Thank you, Madam Chair,

3 Madam Chairwoman.

4 CROSS-EXAMINATION

5 BY MR. GUEST:

6 Q. Good afternoon, Mr. Jenkins.

7 A. Good afternoon.

8 Q. In the course of your work at CH2M Hill,

9 you've had the opportunity to do presentations about

10 IGCC plants, have you not?

11 A. Yes, I have.

12 Q. Do you have them with you?

13 A. No, I do not.

14 Q. Well, let me refer you first to a presentation

15 that you made at the Gasification Technology Council

16 workshop on March 14, 2007. Do you remember that?

17 A. Oh, yes, very well.

18 Q. That was just about what? Six weeks ago?

19 A. About that, yes.

20 Q. Five weeks ago?

21 A. Yes.

22 Q. And it was called IGCC 101?

23 A. Yes.

24 Q. Well, I have that sheet. Maybe I'll pass that

25 around with the second page that we turn and use with

955

1 this.

2 Do you remember saying that it had advantages?

3 A. That what had advantages?

4 Q. IGCC has advantages.

5 A. Yes.

6 Q. And what you meant by advantages was

7 advantages over pulverized coal, didn't you?

8 A. And other technologies, including pulverized

9 coal.

10 Q. And the advantages included that it had a wide

11 range of feedstocks; is that right?

12 A. Yes, if specifically designed for them. One

13 unit by itself does not necessarily design for all

14 feedstocks or a wide variety. As Mr. Hicks stated

15 earlier today, just like pulverized coal units, you have

16 to design the IGCC unit for the specific feedstock.

17 Q. So you worked on the TECO unit?

18 A. Yes, I did.

19 Q. And when you say you have to design it for a

20 specific feedstock, does that mean that you would run it

21 only with coal or only with coke, petcoke?

22 A. At the time we designed it, our plan was that

23 it was designed only for coal. In fact, we designed it

24 for Pittsburgh No. 8 seam coal from northern West

25 Virginia as the performance coal, along with an Illinois

956

1 No. 6 coal, because it was slightly higher in sulfur and

2 was available at low cost to Tampa Electric on its river

3 and barge system that would bring the coal to the

4 station. So there were really two, one design coal and

5 one performance coal.

6 Q. Well, but that plant runs 60 percent petcoke.

7 A. When the petcoke as an opportunity fuel is

8 lower in cost than coal, Tampa Electric does use it.

9 There are other costs, environmental and technical

10 issues that come along with petcoke, such that there are

11 times when Tampa Electric does not use 60 percent

12 petcoke, and particularly because it was neither

13 designed or permitted to use petcoke.

14 Q. Now, turning to the cost issue, you're aware,

15 are you not, that FPL has submitted in this proceeding

16 cost projections on petcoke versus coal?

17 A. I have heard that, yes.

18 Q. And the TECO plant can use 100 percent coal?

19 A. It was designed to use 100 percent coal.

20 Q. Or 100 percent petcoke?

21 A. It was not designed to use 100 percent

22 petcoke.

23 Q. Can it? Can it use 100 percent petcoke?

24 A. I do not know that it can. It was not

25 designed to do so. And as I noted, since the

957

1 environmental permits do not allow for 100 percent

2 petcoke, the design of the gasification system does not

3 allow for 100 percent petcoke. And the sulfur removal

4 system that allows them to meet their environmental

5 permitting conditions does not allow for 100 percent

6 petcoke.

7 Q. So it runs a maximum of 60 percent?

8 A. I know that it has run before at 60 percent.

9 I'm not sure what the maximum number is.

10 Q. So it could run at 60 percent, 50 percent, 40,

11 30, 20, 10, or zero?

12 A. It has done different blends of petcoke with

13 different coals. And the reason that they do that is

14 again for cost purposes. But there are times -- because

15 of the nature of the gasifier design, you just don't put

16 any blend in there. You have to blend the petcoke with

17 a coal that will still end up with a sulfur content that

18 will meet their environmental permits, ash

19 characteristics that will work right in the gasifier,

20 and many other issues that go along with the basic

21 design. And that's because the plant was not designed

22 to use petcoke. Every time they want to change a blend,

23 they do testing. They have a computer simulation that

24 shows what that blend will look like, and then they do a

25 small test feedstock use of that before they go into any

958

1 major change.

2 Q. Okay. Turning now to your testimony a moment

3 ago that carbon dioxide capture was not actually proven

4 on any scale.

5 A. On IGCC. That's what I said in my summary,

6 that's correct.

7 Q. Okay. And I'm working out of your PowerPoint

8 presentation of five weeks ago.

9 A. Yes.

10 Q. And I want to ask you, did you have anything

11 in your PowerPoint presentation about an IGCC plant that

12 had -- a plant that had captured carbon dioxide?

13 A. No, I did not.

14 Q. How about a gasification plant?

15 A. Yes, there is a gasification plant, but there

16 are no IGCC plants that do any capture of CO2. That's a

17 big distinction. A gasification is a small part of an

18 overall IGCC plant. Gasification plants are typically

19 used to make chemicals, natural gas. Kodak film is made

20 from syngas. But they don't make power. IGCC is when

21 you match and integrate the gasification process from

22 the chemical industry with a combined cycle power plant

23 from the power industry, and you do all the engineering

24 to make them work together for power generation. That's

25 a big difference.

959

1 Q. Well, you included a description of a plant

2 like this as the sixteenth page of what you described as

3 IGCC 101.

4 A. Yes, I did. And the reason I did that, again,

5 is that I am often asked to do this IGCC 101. In fact,

6 prior to doing that workshop, I was asked by Chairman

7 Binz of the Colorado Public Utilities Commission to give

8 them my IGCC presentation so that they could better

9 understand what IGCC is, particularly because Excel

10 Energy, the local utility in Denver, has proposed an

11 IGCC unit. And they found out that I was going to be in

12 town, and Chairman Binz's assistant called me and said,

13 "Would you be willing to come over in the afternoon and

14 give the three Commissioners your IGCC 101 that we've

15 heard so much about." And I did that. And then at the

16 workshop, since it was also in Denver, the one that

17 Mr. Guest is talking about, all three Commissioners came

18 back and brought their staff to hear it again.

19 Now, the reason I discuss that plant, that

20 gasification plant, is so people have a good

21 understanding that an IGCC plant is made up of a

22 gasification plant and a combined cycle plant. So

23 whatever slide number that was, that was the piece of

24 what a gasification plant is, looks like, and does.

25 Then I talk about what combined cycle power generation

960

1 is, and then I talk about how you put them all together

2 and about how important that "I" of integrated

3 gasification combined cycle is that keeps engineers like

4 me up at night trying to figure out how to make them

5 work better. That was the reason for including that

6 specific plant.

7 Q. Well, when you talked about that plant, it had

8 another feature of interest besides that it was

9 gasification, didn't it, the plant at Dakota?

10 A. Yes. It makes synthetic natural gas from

11 coal.

12 Q. What else does it do that's of interest to

13 IGCC?

14 A. What?

15 Q. Does it have any other feature that's of

16 interest to IGCC?

17 A. I'm not sure what you're getting at.

18 Q. Well, that plant that you have on the

19 sixteenth page of your IGCC 101 presentation from five

20 weeks ago also says that it captures carbon dioxide,

21 doesn't it?

22 A. Yes, it does. It captures a part of the

23 carbon dioxide that's produced. When you gasify coal

24 and turn it into synthetic natural gas -- and that plant

25 does that, and they put it into the local pipeline, a

961

1 good part of the carbon that was in the coal is

2 converted to carbon dioxide. They used to just vent it,

3 because that was the thing to do. I mean, that was part

4 of the original design and the process back in 1978.

5 What they've done since then, and it is an

6 interesting aspect of that plant, about 200 miles away

7 from this plant -- and this plant is in Beulah, North

8 Dakota, which is a great place to be in the summer, but

9 not in the winter, I found out. EnCana and Apache

10 Canada have oil fields in southern Saskatchewan. They

11 have found that those plants -- the oil production rate

12 has fallen off considerably, and they have learned

13 through a lot of R&D that if you use pressurized carbon

14 dioxide and you put it down several thousand feet, it

15 mixes with the oil and can help you get more oil out.

16 So they did a deal with Great Plains and

17 Dakota Gasification that operates the plant. And what

18 they did is, they paid Great Plains to install a more

19 enhanced CO2 removal system, three huge

20 20,000-horsepower compressors, and they compress the CO2

21 that they get, not all of it, but a part of it -- the

22 rest is still vented -- and they pipe that 205 miles to

23 these wells in Saskatchewan, and it helps EnCana to get

24 a little bit more oil out of those fields. And someday

25 they will tail off again. That's the term that we

962

1 talked about called enhanced oil recovery, and that is a

2 potential use for CO2. That's what happens there.

3 Q. So at that gasification plant, they're able to

4 sequester some CO2?

5 A. That's not correct.

6 Q. Well, how do they -- I'm sorry. How do they

7 get the CO2 sequestered if they don't sequester it?

8 A. The intent of enhanced oil recovery is not to

9 sequester the CO2. There you want to use as little CO2

10 as possible, because they are paying for it.

11 Q. I'm sorry. I garbled the question is what

12 happened there. What I meant to ask instead of what I

13 did ask was that they had succeeded here at the Dakota

14 plant in capturing CO2 and then putting it to use to

15 enhance oil recovery 200 miles away. That was my only

16 question.

17 A. Yes, because they're being paid a lot of money

18 to do it.

19 Q. Okay. And then we have the Coffeyville

20 Resources plant that you also included in your IGCC 101.

21 A. Yes, I did.

22 Q. Could you explain that for us, please?

23 A. Which part of it?

24 Q. Well, it operates on petcoke.

25 A. Yes, it does.

963

1 Q. And it produces syngas?

2 A. Yes.

3 Q. And it removes carbon dioxide?

4 A. A portion of the carbon dioxide. And they do

5 that for a very good reason. They are paid to do it.

6 They remove a little over 50 percent of the carbon

7 dioxide from that process. The Coffeyville Resources

8 plant takes petcoke, and they gasify it. And the reason

9 they do that is because they are a fertilizer plant, and

10 to make fertilizer, you need ammonia. The only way to

11 make ammonia is from hydrogen. The only way to make

12 hydrogen has been from using natural gas.

13 When natural gas prices went up significantly,

14 as we have all seen, their cost of making hydrogen and

15 ammonia made them uneconomic, so they installed this

16 petcoke gasification plant. They make the hydrogen from

17 the syngas. It is a mixture of carbon monoxide and

18 hydrogen. And now they are very economic.

19 As part of that, they also make a product

20 called urea, which is used in making fertilizer. And

21 urea has a couple of carbon dioxide molecules in there

22 as part of the urea, and you do that by reacting ammonia

23 with carbon dioxide. And I hate to get into the

24 chemical reactions.

25 But to them, they are paid a lot of money in

964

1 the market for the urea, so it is economically an

2 advantage for them to capture as much CO2 as they can.

3 They react it with the ammonia, and they make urea, and

4 they sell it for a lot of money because they are so

5 economic now at that Coffeyville Resources plant. But

6 they don't capture all the CO2, and the part that they

7 do capture, it's only because they get paid to do it, a

8 lot.

9 Q. And actually, the part that they capture is

10 vented; is that right?

11 A. The part that they do not capture is vented,

12 just like it was years ago.

13 Q. Now, I think that the point of this

14 presentation up until now was to show that the

15 gasification component of an IGCC plant is really a

16 chemical plant process as contrasted to burning coal and

17 heating a boiler like you do in an old steam locomotive.

18 Isn't that the point of that part of your presentation?

19 A. Yes. That part of the presentation was to

20 explain to people what the gasification portion of an

21 IGCC plant is, and the best way to do that, I have

22 found, is to show people what gasification is.

23 Q. Right. And so there really is a huge

24 difference here, in that an IGCC plant is really a

25 chemical plant that produces a gas that drives a turbine

965

1 and then captures the heat after the turbine. Isn't

2 that really what's going on here?

3 A. That's why we had so many chemical engineers

4 working on Polk Power Station.

5 Q. Right.

6 A. Because this is a chemical process.

7 Q. Yes. It's a chemical plant that produces a

8 gas that you burn in a turbine.

9 A. Yes.

10 Q. Isn't that the concept?

11 A. Yes, gasification plus combined cycle,

12 integrate them, IGCC.

13 Q. All right. And there are a lot of chemical

14 gasification plants out there?

15 A. Yes.

16 Q. 117?

17 A. Yes, 117 plants, just under 400 gasifiers

18 around the world, but only four coal-based IGCC plants.

19 And that's a big difference.

20 Q. Okay. We'll deal with these things one at a

21 time. So the gasification component, that's no

22 surprise. That's not a new technology, and it's in wide

23 use around the world?

24 A. Gasification is in wide use around the world,

25 yes.

966

1 Q. And they gasify coal, petcoke, refinery

2 wastes, and a wide variety of other things?

3 A. Yes. Most use refinery wastes, asphalts,

4 tars, things like that, because they have been sited at

5 adjacent refineries for the purpose of using the

6 refinery wastes and gasifying them and making hydrogen

7 for use in the refinery.

8 Q. You had in your presentation five weeks ago a

9 list of the benefits of IGCC.

10 A. Yes, the potential benefits of IGCC are part

11 of that IGCC 101.

12 Q. And it lists benefit of IGCC, and the first

13 item that you listed -- well, wait a minute. Just to be

14 clear, you didn't say potential. Your presentation says

15 benefits. It doesn't say potential benefits.

16 A. Well, what I said at that -- that's what the

17 presentation says.

18 Q. Okay. That's your words, but not the

19 PowerPoint.

20 A. Sometimes I put the word "potential" in there.

21 You know, it's just when I do the presentation. It just

22 depends. I don't say exactly the same thing every time

23 on that presentation. I've given that probably 30 times

24 to different groups, different commissions, different

25 environmental agencies in Florida, Texas, Colorado.

967

1 Q. So the first advantage that you listed in your

2 PowerPoint from five weeks ago was that you could take

3 advantage of low cost coal or petcoke?

4 A. If so designed for it, and I explain that when

5 I get to that slide.

6 Q. And then you say that coal costs -- or you say

7 coal at $2 per million Btu, petcoke at half that.

8 A. As an example.

9 Q. And that corresponds with the exhibit that's

10 in this case about the estimated future costs of petcoke

11 versus Appalachian coal.

12 A. I have not looked at that.

13 Q. Another advantage of IGCC that you had in your

14 PowerPoint was that it took advantage of high efficiency

15 of combined cycle power block. What does that mean?

16 A. The combined cycle power plant is an efficient

17 way of using natural gas to make electricity. And when

18 you use syngas in the integrated gasification combined

19 cycle mode, you're taking advantage of the combined

20 cycle power plant. That's what it means, just like you

21 would take advantage of a high efficiency boiler and

22 mating that with a high efficiency steam turbine

23 generator.

24 Q. And the then third item was that you say

25 environmental profile, under benefits, air emissions,

968

1 liquid discharges, and solid by-products.

2 A. Yes.

3 Q. So the environmental -- the benefit of IGCC,

4 one of the three listed here, does that mean lower air

5 emissions?

6 A. In some cases, yes, in some cases, no.

7 Q. And then the liquid discharge advantage,

8 what's that?

9 A. IGCC plants can be, but are not always --

10 well, we only have four to go by right now, and some

11 have this, and some don't, where instead of having a

12 liquid discharge, it goes through like a distillation

13 system, and you end up with a solid cake, and that

14 allows you to recycle as much water as you can back into

15 the system, the same way that you do with the gypsum

16 from a flue gas desulfurization system in a

17 supercritical pulverized coal unit. It comes out as a

18 slurry, you put it through vacuum filters, and you have

19 this solid cake gypsum which, as Mr. Hicks talked about,

20 you can sell for making wallboard and cement, and all

21 that water goes back into the process. It's just a

22 method of being smarter with water use.

23 Q. Okay. Use less water? Is that it?

24 A. Yes, it use less water, discharges less.

25 Q. Okay. And then another piece of the

969

1 environmental profile that's an advantage is solid

2 by-products.

3 A. Yes.

4 Q. Does that mean that you can sell -- if you do

5 it right, you could sell the -- instead of discharging

6 sulfur dioxide into the air or capturing it in a

7 scrubber, that you actually can turn it into powdered

8 sulfur and sell it? Is that the concept?

9 A. It depends on your local market. Some units

10 may make -- actually, you make a molten sulfur, not a

11 powdered sulfur, and that is a commodity, a chemical,

12 and can be used in different processes, or like we did

13 at Polk Power station, the sulfur was recovered as

14 sulfuric acid. That is one -- actually, that's not what

15 I meant by solid by-products. What I meant by solid

16 by-products was the slag.

17 Q. Well, I'm glad you told us about the sulfur.

18 Let me ask you a follow-up quick question about the

19 sulfur. When I see that -- when I'm out on Gaines

20 Street and I see that rail car go by that says sulfur on

21 it, is that what's in it? It's liquid sulfur?

22 A. I've not seen that tank car.

23 Q. But do you see tank cars with liquid sulfur

24 going by on railways? Is that --

25 A. I try not to hang out in those places. I

970

1 don't know.

2 Q. There's something about the sulfur you don't

3 like?

4 A. No, it's a good chemical, but I just -- I've

5 not been at a rail crossing at the time to see a tank

6 car come by.

7 Q. All right. Returning to your point, which was

8 the solid by-product to which you were referring, that

9 was -- I think you said slag. Is that what it was?

10 A. Yes, yes.

11 Q. Can you give us a mouthful of what slag is?

12 A. Yes. The ash that is inherently and naturally

13 in the coal, whether it's being used in a gasifier or in

14 a pulverized coal unit, because of the high

15 temperatures, it typically -- that ash melts, and it's

16 molten. It falls into a water bath, it is

17 quench-cooled, and it turns into a black, glassy

18 material that the industry calls slag. It's crushed,

19 it's pumped out, it's screened, and if it meets certain

20 properties, it can be used for things like making

21 cement, making sand blasting grit, roofing tiles -- when

22 you see the shingles that have that gritty stuff, that's

23 typically boiler slag -- and other types of uses. And

24 you do with either PC units -- pulverized coal units or

25 gasifiers make almost the same identical slag.

971

1 Q. Oh, it looks the same?

2 A. Not only does it look the same, but it has the

3 same chemical characteristics.

4 Q. Okay. All right. Also in your PowerPoint,

5 you had some illustrations of four coal-based IGCC

6 plants.

7 A. Yes.

8 Q. Nuon in the Netherlands, which runs on coal

9 and biomass?

10 A. Well, it's actually chicken litter. It's not

11 what I would call biomass, but it has its own inherent

12 issues, being chicken litter.

13 Q. What fraction of chicken litter do you run in

14 this plant?

15 A. In Nuon?

16 Q. Yes.

17 A. I can't remember what the number was. The

18 Netherlands government paid them to have -- Nuon to add

19 in a special feeding system, because as you can imagine,

20 feeding coal is very different from feeding chicken

21 litter, so to do that, they had to modify their system,

22 which again is the issue of if you haven't designed for

23 it up front, you may have to make some very big changes

24 later.

25 Q. Okay. So we –

972

1 A. That's the reality of using chicken litter.

2 Q. Then you also talk about the Wabash River one

3 in Indiana.

4 A. Yes.

5 Q. And that runs on coal and coke. Do you mean

6 -- by coke, do you mean petcoke?

7 A. Petroleum coke, petcoke, yes.

8 Q. And then you've got the TECO one, which I

9 think you've talked about already, at Mulberry. That's

10 petcoke and coal.

11 A. At times.

12 Q. And then you also have -- do you know how to

13 pronounce that place in Spain?

14 A. Puertollano, P-u-e-r-t-o, like Puerto Rico,

15 Puerto, with then l-l-a-n-o, Puertollano.

16 Q. Puertollano. And that's coal and coke, coal

17 and coke, petcoke?

18 A. Yes, it is. It depends again for them on cost

19 too. It was not designed for petcoke. It was designed

20 for coal.

21 Q. And then we also have one in the Czech

22 Republic?

23 A. Yes. That's not exactly an IGCC unit. That

24 was put in to make what the industry calls town gas,

25 where you gasify coal and you pipe it around. That's

973

1 what we used to see before there were natural gas

2 pipelines. People all over the world made town gas, and

3 that's what lit the old street lamps when you see the

4 old movies in England. There was no natural gas

5 distribution line that went to that street lamp. It was

6 town gas that was made locally. And they converted

7 those units several years ago to make a little bit more

8 of that town gas, and when it's not being used for

9 heating, cooking, and lighting in the small Czech town,

10 they burn it in some combustion turbines, but it is not

11 an IGCC unit.

12 Q. I see. Are there two in China? Am I right

13 that there's two in China that have just come on?

14 A. I think those are proposed IGCC plants. They

15 are not in operation. There are many gasification

16 plants in China, but not IGCC.

17 Q. Do you know the one at Yankuang?

18 A. I don't know that one. I have read about it

19 and some of its plans.

20 Q. It makes methanol too, besides power?

21 A. Yes, that is one of the ones in the world that

22 is used for making chemicals, not electricity, as a

23 primary product. They actually use steam produced from

24 the methanol process to drive a steam turbine, not

25 syngas from the gasifier to drive gas turbines. It is

974

1 not an IGCC unit. It is a chemical plant. They only

2 use the waste heat to make power. As I noted, there are

3 only four coal-based IGCC plants in the world.

4 Q. But there's one proposed for Polk County?

5 A. There are only four today. I go back to that

6 word "presently."

7 Q. Okay. Right now?

8 A. Right now.

9 Q. And how many are proposed?

10 A. There have been so many proposed, and it

11 changes every day. I actually do some work for the

12 Gasification Technologies Council and EPRI in trying to

13 keep track of all the ones that are proposed, and every

14 day we add one, and every day we take one off, because

15 for whatever financial reasons or whatever, they go

16 away. I --

17 Q. Which one did you take off yesterday?

18 A. It was a confidential project that our firm

19 was working on.

20 Q. Okay. Which one did you add yesterday?

21 A. There was one announced in the -- I believe it

22 was in the Netherlands. It was for actually more

23 gasification than IGCC, using Shell technology.

24 Q. Can you give me the name of an IGCC plant that

25 was first proposed last week?

975

1 A. Yes. Well, TXU named two potential sites for

2 putting in IGCC about a week ago. They didn't give it a

3 name. They don't have a technology. They haven't

4 selected what kind of coal it is. But sometimes that's

5 all that proposed means, somebody has mentioned it, and

6 they haven't done any engineering at all.

7 Q. Okay. While we look around at that issue, I

8 would just like to just touch base on a few things about

9 the TECO Mulberry plant. I've got a photograph of that

10 I would like to distribute, which will be Exhibit Number

11 180, 179.

12 CHAIRMAN EDGAR: 179.

13 MR. GUEST: 179.

14 CHAIRMAN EDGAR: Photo, TECO Polk Power

15 Station?

16 MR. GUEST: Yes. Thank you. Well, IGCC power

17 station. Whatever. I'm sorry. I shouldn't do this.

18 (Exhibit 179 marked for identification.)

19 BY MR. GUEST:

20 Q. Okay. Can you describe where the stack that

21 the exhaust gases come out of -- where is this? Is that

22 that black thing in the foreground?

23 A. No. In the foreground is the syngas flare.

24 That is part of the chemical process. When you start up

25 and shut down, that flares.

976

1 Q. Then there's a little thing that's got some

2 steam coming out of it in the sort of center left.

3 A. Yes. That's part of the sulfuric acid plant

4 and auxiliary boiler.

5 Q. They use the sulfuric acid at this plant to

6 sell to the phosphate -- fertilizer companies to process

7 the phosphate?

8 A. At times. It depend on the price. At other

9 times they sell it to municipalities for use in water

10 treatment.

11 Q. Okay. So which one of these stacks is the

12 sort of smokestack here?

13 A. What do you mean by smokestack?

14 Q. Well, where the emissions that we all are

15 concerned about come out of.

16 A. Most of the emissions would come from the

17 heat -- outside of the heat recovery steam generator,

18 the stack which is -- I think it's about 80 or 120 feet

19 tall. It's on the upper left side of the picture. But

20 there's a -- you can see a little stack that kind of has

21 a twisty thing on the top of it. That's the stack from

22 the sulfuric acid plant. Just to the right of that in

23 the background is the actual stack from the combined

24 cycle plant.

25 Q. This plant appears to be in operation?

977

1 A. It looks to me -- and I think I was in the

2 helicopter when we took this picture, and we were

3 allowed to do that because the plant was not in

4 operation. This reminds me. Because the auxiliary

5 boiler is being fired, you can see where the steam is

6 coming out. It's releasing steam from the aux. boiler

7 during a startup. And as I recall, we took this picture

8 because the plant was not in operation.

9 Q. Okay. Now, another piece from your PowerPoint

10 presentation of five weeks ago was called the Status of

11 Commercial IGCC.

12 A. Yes.

13 Q. And you said that there's a new fleet taking

14 advantage of 10-plus years of operation in the U.S. and

15 Europe. When you were referring to fleet, were you

16 talking about a new fleet of IGCC plants?

17 A. Yes, the ones that will be going into service

18 in the 2012-2014 time frame.

19 Q. And then another part of the status of

20 commercial IGCC was that there was a range of suppliers

21 to choose from for a wide variety of coals and other

22 feedstocks.

23 A. Yes, that's what that says.

24 Q. Is this a guarded reference to your chicken

25 litter in the Netherlands and all those other exotic

978

1 fuels? Is that what this means?

2 A. Oh, meaning all the lessons learned over the

3 last 10 to 12 years at these four coal-based IGCC plants

4 have given us the basis of design for this new fleet of

5 600-megawatt units, things that we hope will be able to

6 prove higher availability, higher efficiency, things

7 like that.

8 But their design points, we don't know whether

9 or not they will actually work like that. You know, we

10 design for these things. And the plan is that when

11 these units go into service, after a couple of years,

12 these enhancements and lessons learned will pay off, and

13 we'll actually get -- hopefully, that IGCC will finally

14 be as efficient as supercritical pulverized coal, might

15 or might not have the same availability as supercritical

16 pulverized coal.

17 But these are -- we've got -- at Wabash River,

18 they advertise we have 1,600 lessons learned over the

19 last 12 years, and we want to put those into our

20 designs. And that's the kind of thing that I do when I

21 design IGCC plants to try and make them better. That's

22 my job.

23 Q. All right. Let's stay on that point. You

24 said there's a range of suppliers to choose from, for a

25 wide variety of coals and other feedstocks. Does that

979

1 mean supplies -- a wide range of fuel supplies that can

2 be used? Is that what you meant by that?

3 A. There are more -- it used to be that there was

4 only one or two gasification technologies that would

5 work on Powder River Basin coal or lignite, and now

6 there are a few more technology suppliers that are

7 available, like Mitsubishi Heavy Industries, possibly

8 like the KBR technology that Orlando Utilities will be

9 demonstrating at the Stanton B plant that Mr. Hicks

10 talked about previously if that works on Powder River

11 Basin coal. And again, they're going to be bringing in

12 coal from Wyoming all the way to Orlando to test this

13 technology. If it works, it will allow people out West

14 one more option for being able to use Western coals.

15 That would be a good thing. Having more competition

16 would be good.

17 Q. Now, what did you say the letters EPC stand

18 for?

19 A. Engineer, procure, construct. When you get a

20 contract with an EPC supplier, as we do with

21 ultra-supercritical pulverized coal units, a one-person

22 point of contact that you go to, you contract with them,

23 they do the engineering, they buy the stuff, they

24 construct it, and they turn it over to you with

25 guarantees. And I say that with ultra-supercritical

980

1 pulverized coal units. Unfortunately, we have not yet

2 been able to get that in the utility industry for IGCC.

3 Q. Well, then why did you write down as the third

4 advantage in the commercial status of IGCC that EPC

5 alliances can provide important guarantees?

6 A. Because that is a potential, what we're trying

7 to get to in the IGCC industry. You see, when you buy

8 an ultra-supercritical pulverized coal unit, the utility

9 benefits from being able to get that contract so that

10 things are date certain, performance, efficiency. We

11 want to be able to get that. And if Florida Power &

12 Light were to build an IGCC plant, they would want that

13 same kind of guarantee.

14 But as we found out with Duke Indiana, when

15 they filed with the Indiana Utility Regulatory

16 Commission on April 2nd, they said for that project,

17 EPC, a lump sum turn-key, meaning an EPC contract, is

18 not a viable option for them, because it was going to be

19 too costly, and they were unable to get those kind of

20 guarantees. It is something that we are working for in

21 the IGCC industry so that utilities can have something

22 more certain, schedule, cost, performance.

23 Q. Okay. I'm actually giving you this piece of

24 your PowerPoint presentation, page 46, from five weeks

25 ago. And I would like that marked if I might. Would it

981

1 be 181, Madam Chairman?

2 CHAIRMAN EDGAR: Yes, 181.

3 BY MR. GUEST:

4 Q. So I would refer you to the third dot -- is

5 that what you call that thing?

6 A. Yes. It's my third point on that, which says,

7 "EPC alliances can provide important guarantees." And

8 we sure hope they will be able to do that.

9 Q. Well, but you didn't say might. You didn't

10 say, you know, maybe can, may be possible in the future.

11 You said alliances can provide important guarantees.

12 A. Well, to me, when I said can, meaning the

13 potential to do. And it is their intent to do so, but

14 none of them to date have done that. In fact,

15 specifically, on the Duke Indiana case, they were not

16 able to get an EPC guarantee from the GE-Bechtel

17 alliance.

18 Q. So what you wrote in your PowerPoint was that

19 they can provide important guarantees, but what you

20 actually meant was that it might be possible at some

21 time in the future to get those potentially, but maybe

22 not?

23 A. Well, we certainly would like them to do that,

24 but so far they have not done that. We will find out a

25 little bit later this year when AEP goes a little

982

1 further and when the Mesaba project goes further if they

2 will be able to get these important guarantees from

3 their EPC supplier. Without that, there's a lot of

4 technical and economic risk for the utility.

5 Q. So now, we have -- you talked about there not

6 being any technology for IGCC with carbon capture.

7 A. That's correct.

8 Q. And I'm turning to page 48 of your PowerPoint,

9 and I see that you've listed three IGCC projects with

10 carbon capture.

11 A. Those are three proposed IGCC plants that will

12 not be in service until probably 2012 to 2013 that have

13 said they intend to find a way to incorporate CO2

14 capture into their projects. They have not yet found a

15 way to do that, the technology to do so, or the use of

16 the CO2. I have worked on two of those three projects

17 and am very familiar with them.

18 Q. So I take it they're using the Selexol

19 approach to carbon capture?

20 A. They have done so little engineering that

21 they're not even to the point that they have or have not

22 selected the Selexol process, which can be -- if beefed

23 up, can capture some of the CO2, but they have not made

24 that statement or choice yet.

25 Q. And then I'm turning to page 52 of your

983

1 PowerPoint from five weeks ago --

2 CHAIRMAN EDGAR: Mr. Guest, let me interrupt.

3 I apologize. I misspoke. I mislabeled the document, so

4 before I forget to do that, which does mean we're going

5 to take a break in a few minutes, because when I start

6 mislabeling, that means we need a pause. So to correct

7 my misstatement, the photo is Exhibit 179, and the

8 slide, Status of Commercial IGCC, page 48, will be

9 Number 180. And I apologize for the interruption.

10 MR. GUEST: Thank you.

11 (Exhibit 180 marked for identification.)

12 BY MR. GUEST:

13 Q. Okay. You had a slide about IGCC availability

14 improvements.

15 MR. ANDERSON: Chairman Edgar, there are a lot

16 of questions on this presentation. Has counsel given

17 the witness a copy of this presentation to follow along?

18 MR. GUEST: If you would like to, I would be

19 happy to.

20 MR. ANDERSON: Just a courtesy, I think that

21 might be useful.

22 MR. GUEST: Sure. I assumed that he knew it

23 pretty well.

24 THE WITNESS: Yes, I do.

25 MR. GUEST: Since he said he gave it all the

984

1 time.

2 CHAIRMAN EDGAR: Numerous times I think I

3 heard.

4 THE WITNESS: Yes.

5 CHAIRMAN EDGAR: Let's do that. And again, I

6 need to stretch and clear my head, so let's take about

7 15 minutes, and in the course of that. Thank you.

8 (Short recess.)

9 CHAIRMAN EDGAR: Okay. We will go back on the

10 record.

11 MR. GUEST: I'm sorry.

12 CHAIRMAN EDGAR: That's okay. Mr. Guest,

13 you're up.

14 BY MR. GUEST:

15 Q. Hi. We're back. We've given you all the

16 sheets, which I think you're extraordinary familiar

17 with.

18 A. Yes. I guess that's not all of my

19 presentation, but it's some of it.

20 Q. Yes. These are the ones that we're interested

21 in.

22 A. Okay.

23 Q. So we're on page 52.

24 A. Mine ends at 48, but I probably know what's on

25 page 52.

985

1 There we go.

2 Q. And this page is entitled "IGCC Availability

3 Improvements."

4 A. Yes.

5 Q. Now, when you say availability, are you

6 referring to the availability in the sense of the

7 fraction of the time that the plant is online? Is that

8 what you --

9 A. Yes. As you asked the same question to

10 Mr. Hicks, my answer would be the same in percentage of

11 the time. And this particularly is for the entire IGCC

12 plant, when it's in IGCC mode, not when you're firing

13 the backup fuel. That's availability of IGCC.

14 Q. Okay. I'm glad you raised that, because

15 that's one thing I wanted to get explained. Now, am I

16 right that at the TECO plant that when you say backup

17 fuel, they've got a natural gas line that runs up to the

18 turbine?

19 A. No, they don't.

20 Q. They don't? Are there ones that do have --

21 well, what is the backup fuel? Let's go straight to the

22 issue.

23 A. Where?

24 Q. At any IGCC plant.

25 A. Well, there are four of them, so one of them

986

1 uses fuel oil and three of them use natural gas.

2 Q. Okay. All right. Let's just use the natural

3 gas one to make life simple.

4 A. Okay.

5 Q. Which one would you like to talk about?

6 A. I don't have a preference.

7 Q. Okay. Well, let's just use fuel oil because

8 it's easier. So the concept is that -- the way the

9 combined cycle part works is that you have a turbine,

10 which is essentially like a jet engine on a DC-10;

11 right?

12 A. Yes.

13 Q. Okay. And what you do is, you get the syngas

14 that comes out of the gasification part of the plant.

15 That goes in there and makes that turbine spin like

16 crazy and gets some kinetic energy that you get to drive

17 a generator.

18 A. Yes.

19 Q. And when the gasification system is down for

20 maintenance or whatever reason, you can put some diesel

21 into that thing and make your jet engine spin around the

22 same way.

23 A. Yes, at Polk Power Station.

24 Q. Right. And so it costs more.

25 A. I'm sorry?

987

1 Q. Does it cost more to run the backup?

2 A. Oh, yes.

3 Q. It's like driving a peaking unit at a power

4 plant.

5 A. Yes, and even worse if you're using natural

6 gas, because we know what the price of natural gas is

7 now. If you were to use that backup fuel, the cost of

8 electricity when you go to backup fuel is -- you know,

9 if your coal is $2 a million Btus and your gas is 8,

10 you're increasing your cost of fuel by four times. And

11 you may not even run the unit like that because of the

12 cost of fuel. You're not going to dispatch a unit, go

13 from base load at $2 a million Btus, if that happens to

14 be the cost of your coal, to $8 a million Btus on gas.

15 Q. So you can really increase avail -- when you

16 talk about availability, are you including or excluding

17 the availability to backup using diesel or natural gas?

18 A. Exclude. That's called --

19 Q. Exclude?

20 A. Yes. IGCC availability is when it's in IGCC

21 mode, not when you take the gasification plant down.

22 Q. Okay. Now that I understand that, this piece

23 of your PowerPoint, page 52, is IGCC availability and

24 improvements, and you have -- the first bullet is

25 lessons learned from 10-plus years of experience.

988

1 A. Yes.

2 Q. And one is, you've got materials of

3 construction.

4 A. Yes. We've learned a lot about materials of

5 construction over the last 10 to 12 years, and we're

6 putting those design changes into this new fleet that we

7 talked about, and hopefully that will provide better

8 service.

9 Q. Why do you call them a fleet if they sit

10 still? I mean, is there some --

11 A. Well, it's like a fleet of ships, a fleet of

12 trucks. Well, okay. Everything is moving.

13 Q. All those things move.

14 A. It's a fleet of power plant units. It's just

15 an industry term.

16 Q. Okay.

17 A. But they do not move, and if they do, there's

18 a big problem.

19 Q. All right. Just checking.

20 What have you learned. Can you give us one

21 example of improved materials of construction?

22 A. Yes. In the black water system -- and I know

23 this kind of sounds technical, but in the GE

24 gasification system, when you use coal and you gasify

25 it, there is naturally some chlorine in the coal,

989

1 particularly if the coal is from Illinois. The chlorine

2 in the coal during the gasification process turns to

3 chlorides, calcium chloride, ammonium chloride. It gets

4 into the water. And chlorides past a certain

5 concentration become corrosive, as when you have sea

6 water and metals on a house that sits on the shore, all

7 of a sudden you see corrosion. Chlorides do that.

8 So what we have learned is that the --

9 particularly at Polk Power Station, and at Wabash River

10 -- they don't have a black water system, but in that

11 same kind of a system, the materials of construction

12 needed higher quality, different alloys to be more

13 corrosion-resistant. And those are the kind of things

14 that we've learned. In this kind of system, carbon

15 steel is going to corrode. Don't use that. Use

16 something better, more expensive.

17 Q. And another illustration might be that at the

18 turn where the -- well, I'm not going to use another

19 illustration because this is so technical.

20 A. There's just many things we've learned on

21 materials of construction that will provide for and

22 should provide for better and higher availability in the

23 future. Those are the things that are going into this

24 new number of --

25 Q. Okay. And then another item is spare

990

1 equipment.

2 A. Yes.

3 Q. Can you give us a couple of -- one or two

4 illustrations of spare equipment?

5 A. Just certain pumps that we found where one was

6 not good enough, sometimes we'll put in two pumps on

7 critical system where we found that that will increase

8 the availability. One of the possible changes is in the

9 main slurry pump. They're about a million dollars, so

10 it's not something you say, "Well, let's go out and

11 spend another million dollars for this new pump." But

12 if it increases the availability of the unit to a point

13 where it's cost-effective, those are the things that you

14 do.

15 Q. And then another item is gasifier refractory?

16 A. Yes.

17 Q. What's that, and what's the improvement here?

18 A. As an example, the GE Energy, or what used to

19 be the Texaco, the gasifier is metal, and it's lined

20 with a refractory brick, several feet of it, and it

21 protects the metal from high temperature. And the slag

22 that is produced during the gasification, because it's

23 operating at 2,500, 2,600 degrees, you have molten slag

24 in there, and it is erosive and corrosive. So you

25 protect the gasifier metal by having this high chromium

991

1 refractory. It's an insulation material.

2 And what we found is that there were

3 improvements made -- we found that in gasifier

4 operation, since we didn't have a lot of gasifier

5 operation history to go with, the first set of

6 refractory at Polk Power Station eroded and corroded

7 much faster than designed.

8 So we went back to the manufacturers, and we

9 went back to Eastman Chemical that uses another

10 Texaco/GE gasifier and worked with them and found -- and

11 the manufacturers and said, "Is there something better,"

12 because when you change this out, you're down for 30

13 days and it costs you several million dollars. It's not

14 something you want to mess up.

15 But on startup, because we had -- as you can

16 see in the availability chart that you pointed out, on

17 the first couple of years at Polk Power Station, there

18 was very low availability, and that's because the unit

19 was started up, shut down, started up, shut down. And

20 refractory brick tends to crack, erode, corrode. And as

21 I recall, it was a three-year liner refractory that

22 lasted a year. So after the first year, we had to spend

23 a lot of money and time down, and it affected the

24 availability and the cost of the unit. We've learned a

25 lot more on that now and have better refractory

992

1 materials, as an example.

2 Q. And then burner design.

3 A. Yes. Even though it's not combustion in a

4 gasifier, it's kind of --

5 Q. Yes, that's my question.

6 A. We call it a burner. It's really a process

7 injector, and that's where the coal slurry and the

8 oxygen goes into the gasifier, in a GE gasifier, and

9 that's the materials that get gasified. And it used to

10 be that they would only last about 30 days from erosion

11 and corrosion. And we learned by making our own changes

12 and talking with the GE and Texaco people and other

13 gasifiers that we found improvements, and now Polk power

14 station is able to go 90 to 120 days without taking out

15 that process injector. When you take it down, you're

16 bringing the gasification portion of the plant down, so

17 that has a negative impact on availability.

18 So these are the things that we've learned.

19 We're doing better, and all these things are being put

20 into the new designs. And that's why I said in my

21 opening summary that we expect all these things that

22 we've learned to enhance the availability of IGCC in the

23 future, but we won't know for another six years if all

24 these things work.

25 Q. Okay. So let's turn to Exhibit 179, which is

993

1 the picture of the Mulberry plant.

2 A. Yes, got it.

3 Q. The gasifier is that great big fat tower that

4 looks like the top of a square 6-volt battery on the top

5 sort of in the center right?

6 A. It is the structural steel structure at about

7 the one o'clock position. It's a little over -- you

8 know, over 200 feet tall.

9 Q. Okay. Now, you say the next generation -- you

10 jumped ahead of me because you've got that in your hand

11 there. The next generation should achieve 85 percent

12 availability, 85 percent plus, over 85 percent. That's

13 what you've got shown here?

14 A. Yes.

15 Q. And it looks to me like you've given reasons

16 why, your three reasons why. Is that what I see there?

17 A. Yes.

18 Q. And so one is having a spare gasifier train.

19 A. Yes.

20 Q. Now, let me ask you a hypothetical question

21 here. Let's just say that you wanted to get to 2,000,

22 or 1,800 megawatts, and the way you decided to do it was

23 with six 300-megawatt units sitting side by side, sort

24 of the same way you have six locomotives pulling a giant

25 long train. Is that the context where you would have a

994

1 spare gasifier, so you would sort of have a seventh so

2 if any one of them went down, you could, you know, use

3 the spare? Is that the concept?

4 A. Not really, no, because actually, IGCC does

5 not come in 300-megawatt chunks. It's not commercially

6 available in that size.

7 Q. What sizes -- what's the big size that it's

8 available in?

9 A. Well, right now, all that has been

10 demonstrated is 250. What's being designed right now

11 are 600-megawatt IGCC, so we're really only about a

12 third of what the two units at Glades would do.

13 Q. Okay. So if you had three of those -- is this

14 the first concept of the spare gasifier? Would that be

15 the idea, that if you had three units to get you to

16 1,800, that you would add a fourth in as a spare? Is

17 that the concept?

18 A. You might add a fourth, you might add a fifth.

19 You have to do what's called reliability, availability,

20 maintainability, or RAM analysis to find out will it get

21 you to that point.

22 Q. But you think that a spare gasifier might get

23 you to 90 percent?

24 A. It's like the "can" and "potential." The

25 "may" is "might."

995

1 Q. Well, this one is definitely may.

2 A. Yes, this one says may, and it may, but we

3 won't know for about another six years. And of all the

4 IGCC plants being planned right now, only one, the

5 Mesaba plant, plans to include a spare gasifier train.

6 And in their calculations, they expect that it could

7 reach 90 percent availability, and they're paying a lot

8 of money -- it's about another $100 million to get that

9 expectation of 90 percent. They will find out when they

10 start up in 2011, 2012.

11 Q. That's about half the cost of the transmission

12 lines here?

13 A. I don't know that.

14 Q. Okay. Backup fuel. Did we talk about this

15 already, diesel?

16 A. We talked, you know, diesel, natural gas.

17 Q. Right. And that would be on top of the 85 or

18 90 percent; right?

19 A. It's possible that it could get you -- it

20 could help you get there. We don't know yet, because

21 none of these units are in service.

22 Q. You can't actually do that at a pulverized

23 coal plant, can you? You can't --

24 A. Oh, yes. In fact --

25 Q. Well, how do you do it?

996

1 A. When you start up a pulverized coal plant,

2 you're starting up on No. 2 fuel oil with the igniters,

3 and you raise your steam pressure, and you can actually

4 make enough steam where you can drive the steam turbine,

5 get to a low load if need be, and then -- before you

6 fire the coal to start up. So it is possible to do

7 that.

8 Q. But when a PC plant goes down, you can't run

9 it on diesel, can you?

10 A. Well, what do you mean by goes down?

11 Q. Well, stops working because you've got to work

12 on it or something is broken.

13 A. Okay. And the same thing could happen to the

14 combined cycle plant.

15 Q. Okay. But I think the concept that I'm

16 bringing is, you keep talking about the gasifier as

17 being a problem. Everything you've talked about has

18 been gasifier issues; right?

19 A. I've answered your questions about the

20 gasifier. If you want to talk about the reliability

21 problems with the combined cycle plant, we can do that.

22 Q. Okay. Well, we can get to that. I would like

23 to hear what you have to say, but let's finish this one.

24 I think you finished your answer by saying the options

25 have to be balanced against the cost of capital and

997

1 fuel.

2 A. Yes.

3 Q. So I think what you're telling us here is that

4 you've got a capital cost that you've got to put in, and

5 then you've got a fuel cost that you balance for the

6 backup, that is, you might -- you know, gas is really

7 expensive, and you might not want to do it at all.

8 A. That's correct.

9 Q. Is that the idea? Is that what you meant?

10 A. Right. And that's what Mesaba did in the

11 design of their plant for Minnesota. They decided

12 instead of using more backup fuel, they put in the extra

13 $100 million or so for the additional gasifier train to

14 try and get a higher availability. It's the economic

15 analysis that they did in their transmission system in

16 Minnesota, and for them, that's the decision they made.

17 Q. Now, Florida Power has mostly natural gas

18 plants, natural gas -- I mean Florida Power & Light has

19 mostly natural gas generating plants?

20 A. I think that's correct. I haven't looked at

21 their total mix.

22 Q. And how do those compare mechanically to the

23 way the combined cycle part of an IGCC plant works?

24 A. Well, if we take a general natural gas-fired

25 combined cycle plant and -- I hate to say general IGCC,

998

1 because we only have four we can look at. The

2 combustion turbine pieces are very different, because

3 syngas from a gasifier is a mixture of carbon monoxide

4 and hydrogen. That's what you turn the coal and water

5 into in a gasifier.

6 In a gas-fired combined cycle plant like

7 Florida Power & Light has, it burns natural gas, which

8 is methane. Methane is a completely different compound

9 from carbon monoxide and hydrogen that's in syngas, and

10 those are very different from fuel oil.

11 So in the design of the combustion turbine

12 part of the power block, the combustion nozzles or cans,

13 kind of like the cylinders of a car engine, have to be

14 designed for the fuel that you're burning. It's like

15 that jet engine that's burning jet A fuel is burning

16 something very different, and it's not natural gas. You

17 know, airplanes -- that DC-10 does not run off a natural

18 gas line, so its engine is a very different design and

19 the combustors are a very different design. That's the

20 basic difference.

21 Q. So the big picture, would it be a fair

22 characterization to say it's like trying to run a jet

23 engine on gasoline instead of on jet A? Is that the

24 concept?

25 A. The design, yes, very different design.

999

1 Q. Okay. All right. Let's turn to a couple more

2 things, unless you have something to add. Did you want

3 to get into -- I think you wanted to talk a little about

4 the turbine and heat recovery end of this thing about

5 the gasifier. Did you want to say something about that?

6 A. No. I kind of feel like I'm giving my

7 presentation.

8 Q. Okay. Well, let me move on to another

9 presentation of a little more than a year ago.

10 MR. ANDERSON: Chairman Edgar, at the outset

11 of this one, could the witness be given a copy of the

12 document he's going to ask about?

13 MR. GUEST: Yes. There's only two images from

14 this one. Well, maybe three. And tell me if you

15 recognize these, if you would. Do you want me to

16 distribute them all to see whether he remembers these

17 things?

18 CHAIRMAN EDGAR: If you've got copies, we'll

19 all take them.

20 MR. GUEST: We ought to give them out too, so

21 that's what we're going to do.

22 THE WITNESS: Yes, I do remember this

23 presentation in Houston with the Gulf Coast Power

24 Association.

25 BY MR. GUEST:

1000

1 Q. All right. While we're waiting for these to

2 get dished out, let me ask you a quick question. There

3 were problems with GE turbines, the GE jet engines? Are

4 you familiar with those?

5 A. GE jet -- I don't really work with GE jet

6 engines.

7 Q. Well, I mean with the turbines used in IGCC

8 units.

9 A. There have been problems with many GE

10 combustion turbines.

11 Q. And they were the 7F model?

12 A. Yes, 7F basis, or some of them, the newer ones

13 are 7FA, and now they're making 7FBs, which are larger.

14 Q. And what was happening is, they were cracking

15 the front disk in the turbine?

16 A. That was one of the problems that the GE

17 combustion turbines had.

18 Q. And it also had a problem with a vane in the

19 compressor?

20 A. As I recall, yes. There have been different

21 problems that have occurred at Wabash River and Polk.

22 Q. Right. Those problems have since been fixed?

23 A. Yes.

24 Q. And those are good illustrations of what you

25 were explaining to us, I think, are they not, of how you

1001

1 end up bringing this technology into full working order,

2 that you find things that go wrong and you fix them

3 along the way?

4 A. Yes. Sometimes the manufacturers find them,

5 and sometimes you find them for the manufacturers.

6 MR. GUEST: All right. I think these have

7 been handed out. Do I have one? I hope there's one

8 left for me. I guess we would like to -- can we mark

9 these together as --

10 CHAIRMAN EDGAR: We can mark them together.

11 MR. GUEST: 181.

12 CHAIRMAN EDGAR: 181, yes.

13 MR. GUEST: Consisting of three pages. And

14 let's just call it -- well, what would you like to call

15 it, Madam Chairman, because I never get it right.

16 MR. ANDERSON: A day, maybe?

17 CHAIRMAN EDGAR: Tempting, tempting. We will

18 call it three pages of environmental permitting for IGCC

19 power plants slides.

20 (Exhibit 181 marked for identification.)

21 BY MR. GUEST:

22 Q. All right. So the first page was what it was?

23 A. Yes.

24 Q. And now we're on another page which doesn't

25 have a number on it, and it's called "Comparison of

1002

1 Solid Wastes, IGCC Versus PC." PC means pulverized

2 coal?

3 A. Yes, it does.

4 Q. And so we've got three columns. Let's just go

5 through the three quickly. Solid wastes, IGCC you say

6 has small volumes of sulfur and slag.

7 A. It can, yes, in this example.

8 Q. And then pulverized coal has large volumes --

9 what does FGD stand for?

10 A. FGD is flue gas desulfurization. That's the

11 system on the back end commonly known as an SO2 scrubber

12 to remove the SO2 from the flue gas.

13 Q. What are the by-products?

14 A. Different systems have different by-products.

15 And what FGPP is planning to use is a system, an FGD

16 system that would produce a commercial grade by-product

17 gypsum that could be used in making wallboard and

18 cement, or even used as an agricultural additive like

19 Tampa Electric's FGD system does.

20 Q. Okay. And then the next the column is market

21 use, and under IGCC you say, "Excellent markets for

22 sulfur and slag." I think you've already talked about

23 slag; right?

24 A. Yes. And I think we talked about sulfur.

25 Q. Yes, you talked about sulfur too, and TECO in

1003

1 Mulberry is using some of it for the phosphate

2 fertilizer.

3 A. They make sulfuric acid, not sulfur.

4 Q. And some of it is used -- well, you've already

5 told us, so we don't need to go over it gain.

6 Now, I see that under pulverized coal, you

7 say, "Markets may or may not exist."

8 A. That's correct.

9 Q. Okay. And then under land requirements, you

10 only have temporary storage for IGCC, and pulverized

11 coal, you need hundreds of acres.

12 A. It's possible. If you can't market it, you

13 have to do something with it. As Mr. Hicks talked about

14 a little while ago, you would have to put in the double

15 lined storage area.

16 Q. Now, let's do the last page I've got for you.

17 A. Okay.

18 Q. Impacts of CO2 capture.

19 A. Yes.

20 Q. That's carbon dioxide capture.

21 A. Yes.

22 Q. And we've got two columns, IGCC plant versus

23 pulverized coal plant.

24 A. Yes.

25 Q. And the capture percentage is about the same.

1004

1 That's the first row.

2 A. Yes.

3 Q. Unit output derating, what does that mean?

4 A. That means the -- let's say you have a

5 500-megawatt unit, which is what they did here, and I

6 can discuss that a little further. How many of those

7 megawatts the unit is derated from that number when you

8 add the CO2 capture system in.

9 Q. So that means how much juice it takes to run

10 the capture process?

11 A. In this example, that's correct.

12 Q. And what is the 29, do you think? What does

13 the 29 refer to?

14 A. That is 29 percent --

15 Q. Percent. I see.

16 A. Yes.

17 Q. I see. Whereas an IGCC plant has less than

18 half that?

19 A. In this example.

20 Q. Okay. And heat rate increase, what's that?

21 A. The heat rate is Btus per kilowatt-hour. A

22 higher number is worse. It's the reciprocal of

23 efficiency. So if a heat rate goes up, that means the

24 unit is less efficient.

25 Q. Okay. And so in your presentation, you

1005

1 counted the IGCC plant as two and a half times more

2 efficient? Did I get that right?

3 A. The change in heat rate.

4 Q. Okay. So it's 40 percent more -- can you

5 frame it for me?

6 A. Well, if you had a heat rate to start with of

7 10,000 Btus per pound and it increased 40 percent, it

8 would now be 14,000 Btus per kilowatt-hour, the heat

9 rate.

10 Q. I got it. So it really makes a big difference

11 with a PC plant as compared to an IGCC plant?

12 A. In this example that Dr. Sikander Khan showed.

13 Q. And then a capital cost increase of 47 percent

14 versus 73 percent for a PC plant.

15 A. Yes.

16 Q. And then -- what does COE stand for?

17 A. Cost of electricity. That's the bottom line

18 of what it costs for the electricity production from

19 both the IGCC plant and the pulverized coal plant in

20 this EPA example.

21 Q. Okay. So that's 38 percent increase versus

22 66.

23 A. Yes.

24 Q. And that's not quite twice.

25 A. Yes. But I think it's interesting to note on

1006

1 this that when Dr. Khan, who I've spoken with many time,

2 prepared this information, it was done by a consulting

3 firm that had no experience in the design, operation, or

4 construction of either IGCC or PC plants, and they did

5 it based on a 500-megawatt plant. A 500-megawatt is not

6 a commercial size for IGCC. The proper size should have

7 been 600. And I sat down and discussed this with

8 Dr. Khan, and he realized that there would be a problem

9 with this information when it became public because it

10 was not on a correct basis.

11 Since then, the EPA, Environmental Protection

12 Agency, has put together an Advanced Clean Coal

13 Technology Work Group. They have asked me to be on that

14 work group along with some -- there are about 30 of us

15 from industry, from Sierra Club, from NRDC, from Green

16 Peace, from boiler and IGCC manufacturers, and they have

17 asked us -- one of the things to do is to update this

18 report, because EPA has found that nobody is using these

19 numbers because they were not done on a credible basis.

20 And this information was taken from Dr. Khan about a

21 month after EPA released its report. Some of the same

22 numbers are in this environmental footprints report, and

23 EPA has determined that it is outdated and inaccurate

24 and needs to be completely revised. And I will be

25 working with EPA over the next few months to put in some

1007

1 of the newer numbers that we were talking about earlier

2 this morning.

3 Q. So you're saying that this is outdated, but it

4 hasn't been updated? Is that the short story?

5 A. That's correct. Nobody really uses these

6 numbers anymore because there is a realization in the

7 EPA and in the industry that these numbers are no good

8 anymore.

9 MR. GUEST: Okay. No further questions.

10 Thank you.

11 CHAIRMAN EDGAR: Mr. Krasowski, do you have

12 questions for this witness?

13 MR. KRASOWSKI: Yes, ma'am, I have a few.

14 CHAIRMAN EDGAR: Okay.

15 CROSS-EXAMINATION

16 BY MR. KRASOWSKI:

17 Q. Hi, Mr. Jenkins.

18 A. Hi, Mr. Krasowski.

19 Q. You worked on the TECO Tampa plant, right?

20 A. Yes, I did. I was deputy project manager.

21 Q. And that's the plant that was identified

22 earlier as costing twice the amount that was originally

23 projected, 303 million, and ultimately it cost

24 606 million; is that correct?

25 A. It's actually 609 million, but it's close

1008

1 enough.

2 Q. What happened there?

3 A. Well, as Mr. Hicks was talking about, on other

4 IGCC plants that we were looking at, at this new fleet,

5 before you do all of your preliminary engineering, you

6 do a cost estimate. And since we had no large scale

7 IGCC plants to use as a go-by, we did what we knew how

8 to do, and we worked with the DOE and Texaco at the

9 time. We did a preliminary estimate. We filed that

10 with DOE. And when it came time to do all the detailed

11 engineering -- and when you do detailed engineering, you

12 refine that cost estimate. And we found when things got

13 real, so to speak, that the cost was considerably more

14 than we first thought.

15 And then that $609 million number also

16 includes some additions after the unit went into service

17 in 1996, and DOE partially co-funded some of those cost

18 overruns. You can see that in the Polk Power Station

19 final report that is publicly available from DOE.

20 Q. How did the cost of operations estimates work

21 out ultimately?

22 A. As I noted, some of the availability in the

23 up-front years was poorer than designed for. The

24 operating and maintenance costs were higher. Things

25 like replacing that refractory when it was supposed to

1009

1 last three years and lasted one, putting in new

2 corrosion-resistant or better corrosion-resistant piping

3 in the black water system, changes in the brine

4 concentration, the fixes on the combustion turbine that

5 had -- you know, some were warranty and some were not.

6 So overall, the operating and maintenance costs were

7 higher than we had planned. It's a chemical plant tied

8 to a power plant. It's not an easy thing to run,

9 although they do a fine job at Polk Power Station.

10 Q. And that was a 250-megawatt facility?

11 A. Yes, 250 net.

12 Q. Okay. I don't know if it was you, but a while

13 back I saw a presentation. Somebody that had worked

14 there or was working there had spoken about that

15 facility, and they mentioned something about the

16 reliability where this IGCC component operated like 35

17 or 37 percent of the time, and they did have to go to

18 backup pretty -- you know, if only 30 percent of the

19 time this was working. And I guess they mentioned -- I

20 believe they mentioned using gas. Is that your

21 understanding? How much -- how reliable was that

22 facility?

23 A. The backup fuel at Polk Power Station is fuel

24 oil, and the reason we did that is because there was no

25 natural gas line at Polk Power Station. Now there is,

1010

1 and there are several gas-fired simple cycle combustion

2 turbines there, peakers. I believe in the exhibit that

3 Mr. Guest passed out was one of my slides that shows the

4 availability of all of the IGCC plants in the world, all

5 four of the coal-based ones, and it shows what the

6 actual numbers for Polk Power Station were in the early

7 years, and we had very low availability, 30s. I think

8 it took three years to get to 60 percent. And there

9 were times when we did use fuel oil as a backup fuel to

10 keep the combustion turbine online and generating power,

11 particularly in the summer months when you could

12 dispatch that higher priced power.

13 Q. Okay. On the solid waste category, is that

14 municipal solid waste, or are you talking about a

15 specific -- like tires or wood waste, a dedicated stream

16 of a specific material, or are you talking about general

17 garbage?

18 A. This is a solid by-product coming out of the

19 gasification system in contrast to what's going in, the

20 slag, the ammonium chloride brine. Those would be

21 considered solid by-products.

22 Q. Okay. I'm sorry. So it's not the use of

23 solid waste materials to generate syngas?

24 A. Correct.

25 Q. Okay. Does this gasification process – I

1011

1 don't know if you're familiar with this, but a few years

2 back, there were proposals floating around to process

3 solid waste through a syngas, a gasification type of

4 operation, and they had their main base in Wollongong,

5 Australia, was one, Brightstar?

6 A. Yes.

7 Q. You know --

8 A. I'm very familiar with the Brightstar

9 technology.

10 Q. Is this -- excuse me. Is it the same type of

11 operation? Would you use the same gasifier designed for

12 waste, the one, you know, the one you're designing for a

13 certain type of coal. Is this the same machine?

14 A. It is a very, very different machine.

15 Designing to handle municipal solid waste, which has a

16 lot of moisture, a lot of metals, a lot of glass, and

17 has very low heating value, the gasifiers for municipal

18 solid waste are a completely different universe than the

19 type of gasification equipment that is used for coal

20 and/or petcoke. We have GE, CococoPhillips, and Shell

21 as the big three, we call them in the IGCC industry.

22 None of those companies are involved in municipal solid

23 waste gasification. And then we have companies like

24 Brightstar, who unfortunately are no longer in business,

25 but other –-

1012

1 Q. It all depends on how you look at it,

2 fortunately, unfortunately.

3 A. Okay. Yes, but they are no longer in

4 business.

5 Q. No longer in business.

6 A. The Wollongong, Australia, plant was an

7 economic failure for them, not a technical one. But you

8 have a completely different universe of companies that

9 are involved in municipal solid waste gasification than

10 are in coal. Those are much smaller, 10 to 20

11 megawatts, where here we're talking 600. But then

12 again, that's only a piece -- that's only a fraction of

13 what we do with ultra-supercritical pulverized coal,

14 where we're talking about 1,800 megawatts, very --

15 municipal solid waste gasification, 20; 1,800 megawatts

16 with supercritical coal.

17 Q. The Wollongong facility never worked for more

18 than eight days in a row. It was a technical failure as

19 well as an economic, the technical inability. But

20 that's off the track. Excuse me. I'm sorry.

21 To get back on track, as was mentioned

22 earlier, if you have these 250-megawatt units, why not

23 put eight of them side by side and then have two in

24 reserve, and then you could design and dedicate two of

25 them to coal, one to gas, one to tires, you know, one to

1013

1 biofuel. If you could design, and then you have the

2 cross -- as they say in the space industry -- what is

3 that, you know, where you back up, you have multiple

4 backups? But that would be very expensive, I suppose.

5 A. Yes, it would.

6 Q. Okay. So forget that.

7 A. Spare gasifiers, as I noted, are about $100

8 million, a gasifier train. That's a lot of money.

9 Q. And beyond that, the ratepayer would be

10 floating this if some people get their way. It's not a

11 very attractive idea to me.

12 A. Yes. Well, you either pay for the spare

13 gasifier train or you pay for a lot of natural gas and

14 the gas transmission line to bring it in. And every

15 time you fire backup natural gas in your non-working

16 IGCC plant, somebody has got to pay for that high cost

17 power.

18 Q. You know, earlier you said -- and this is not

19 a trick question, but earlier you said that the

20 technology is evolving at an amazing rate. I think you

21 were referring to the capture and sequestration

22 elements, those separate elements or together. And I

23 understand you're not speaking as an expert in

24 efficiency or conservation or environmental; right? But

25 from your position here, what would be wrong, if it's

1014

1 possible -- well, what would be wrong, if it's possible,

2 with delaying building either one of these technologies

3 for two and a half, three years, until we can take

4 advantage of what's going to happen in the next year or

5 two? Are we in that much of a hurry with this to --

6 A. Well, on the technical side, obviously, we

7 don't know, as I said, that all of these changes are

8 going to be proven from six years from now, not two or

9 three, but six years from now. I don't think you can

10 plan to wait on what might come.

11 The other issue on the whole issue of when the

12 capacity is needed, that's for someone at Florida Power

13 & Light to talk about. I mean, that's not my area of

14 expertise, in the generation planning and meeting

15 capacity additions.

16 Q. So in your view, it's kind of six years out

17 before we get a solid answer on the IGCC option?

18 A. Yes. And my job, it says gasification

19 services in my title. I want these IGCC plants to work

20 and work reliably and have high efficiency, or else I'll

21 have to find something else to do. But my expectation

22 is, all these things that we're learning we're going to

23 put in these designs, but it will be six years before we

24 know whether they'll really work or not. You know, I'm

25 waiting, and I'm optimistic.

1015

1 MR. KRASOWSKI: Well, thank you very much,

2 Mr. Jenkins.

3 THE WITNESS: Thank you.

4 CHAIRMAN EDGAR: Are there questions from

5 staff?

6 MS. FLEMING: No questions.

7 CHAIRMAN EDGAR: Commissioners? No questions.

8 Mr. Anderson. No? Okay. Let's do the

9 exhibits.

10 MS. BRUBAKER: I believe there are no direct

11 exhibits for Mr. Jenkins, and so that leaves us with

12 Exhibits 179 through 181 proffered by Sierra.

13 CHAIRMAN EDGAR: Thank you. Mr. Anderson, any

14 objection?

15 MR. ANDERSON: No objection.

16 CHAIRMAN EDGAR: No objections? Okay. Then

17 seeing no objections, we will enter 179, 180, and 181,

18 into the record. Thank you.

19 (Exhibits 179, 180, and 181 admitted into the

20 record.)

21 MR. ANDERSON: Chairman Edgar, just as a

22 procedural matter, we have a number of witnesses

23 available. If people have comparatively little for

24 Mr. Yeager, if it would work for people, we would like

25 to take him next.

1016

1 CHAIRMAN EDGAR: Mr. Beck, Mr. Guest,

2 Mr. Krasowski, are you amenable to taking Mr. Yeager out

3 of order to be the next witness?

4 MR. GUEST: Of course, we're amenable to

5 whatever people want to do. I just had one of my

6 witnesses ask me if we don't make it tomorrow, do you

7 think we'll spill over to Friday or spill over to

8 another day?

9 CHAIRMAN EDGAR: We will not spill over to

10 Friday, because there are conflicts on Friday. However,

11 we do have some time available Monday, which is the

12 30th.

13 MR. GUEST: Monday the 30th. Okay. That

14 bears on what we do, so may I confer?

15 CHAIRMAN EDGAR: Of course.

16 (Off the record briefly.)

17 MR. GUEST: I think if you give us two

18 minutes, we might be able to speed things up.

19 CHAIRMAN EDGAR: Oh, okay. We will take two

20 minutes.

21 (Short recess.)

22 CHAIRMAN EDGAR: Yes, sir?

23 MR. GUEST: We have elected to stipulate the

24 witness's testimony.

25 CHAIRMAN EDGAR: Okay. Mr. Guest, are you

1017

1 referring to Mr. Yeager?

2 MR. GUEST: Yes.

3 CHAIRMAN EDGAR: Mr. Krasowski, Mr. Beck. Mr.

4 Beck concurs, and Mr. Krasowski.

5 Staff, I think I asked you that earlier, but

6 remind me. No questions. Okay.

7 Commissioners, you're okay with that.

8 Okay. Then I think that -- I'm sorry. I

9 didn't even ask you, did I? I apologize. Mr. Anderson.

10 MR. ANDERSON: That's delightful. I just

11 wanted to make sure we offer his exhibits into the

12 record as well.

13 CHAIRMAN EDGAR: Okay. Well, then in the

14 interest of me not forgetting something else, let's go

15 ahead and enter Mr. Yeager's prefiled rebuttal and

16 direct, direct and rebuttal testimony into the record.

17 And I need to find the numbers of the exhibits. Thank

18 you. Exhibits 61 and 62 will be entered into the record

19 as well. Ms. Brubaker, does that take care of that?

20 MS. BRUBAKER: I believe it does.

21 (Exhibits 61 and 62 marked for identification

22 and admitted into the record.)

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1 CHAIRMAN EDGAR: All right. Thank you

2 everyone, for your cooperation. And should we move to

3 Mr. Kosky?

4 MR. ANDERSON: Yes, please.

5 CHAIRMAN EDGAR: Mr. Guest, does that work for

6 you?

7 MR. ANDERSON: FPL would call as its next

8 witness Mr. Ken Kosky.

9 CHAIRMAN EDGAR: Okay.

10 Thereupon,

11 KENNARD F. KOSKY

12 was called as a witness on behalf of Florida Power &

13 Light Company and, having been duly sworn, testified as

14 follows:

15 DIRECT EXAMINATION

16 BY MR. ANDERSON:

17 Q. Mr. Kosky, have you been sworn as a witness?

18 A. Yes, I have.

19 Q. Will you please tell us your name and your

20 business address?

21 A. My name is Kennard Kosky, and my business

22 address is 6241 Northwest 23rd Street, Gainesville,

23 Florida, 32653.

24 Q. By whom are you employed, and in what

25 capacity?

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1 A. I'm employed by Golder Associates, Inc., and

2 I'm a principal in the Gainesville office.

3 Q. Have you prepared and caused to be filed 21

4 pages of prefiled direct testimony in this proceeding?

5 A. Yes, I have.

6 Q. Do you have any changes or revisions to your

7 prefiled direct testimony?

8 A. No, I do not.

9 Q. If I asked you the same questions contained in

10 your prefiled direct testimony, would your answers be

11 the same?

12 A. Yes, they would.

13 MR. ANDERSON: FPL would ask that Mr. Kosky's

14 prefiled direct testimony be inserted into the record as

15 though read.

16 CHAIRMAN EDGAR: The prefiled direct testimony

17 will be entered into the record as though read.

18 BY MR. ANDERSON:

19 Q. You're sponsoring some exhibits to your direct

20 testimony?

21 A. Yes, I am.

22 Q. These are documents KFK-1 through KFK-7?

23 A. Yes, they are.

24 MR. ANDERSON: Madam Chairman, we would note

25 that Mr. Kosky's exhibits have been premarked for

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1 identification as Numbers 39 through 45.

2 CHAIRMAN EDGAR: Thank you.

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1 BY MR. ANDERSON:

2 Q. Mr. Kosky, do you have a summary of your

3 testimony?

4 A. Yes, I do.

5 Q. Would you please provide it at this time.

6 A. Good afternoon, Madam Chairman and members of

7 the Commission. My name is Kennard Kosky.

8 Over the past 30 years, I've been an engineer

9 responsible for the evaluating and environmental aspects

10 of electric power generating projects. I've performed

11 projects in more than 28 states and 22 foreign countries

12 and have been involved in the construction and/or

13 operation of over 100,000 megawatts of electric

14 generating capacity.

15 Concerning FP&L's project in this proceeding,

16 I signed and sealed the site certification application

17 for the FPL Glades Power Park, FGPP, which is the

18 subject of this proceeding. I'm an independent

19 professional engineer responsible for directing and

20 managing all environmental compliance aspects of the

21 project.

22 My role today is to provide assurance that

23 FGPP will be environmentally compliant and that the

24 expected costs of environmental compliance have been

25 included and properly considered by FPL.

1067

1 Here are some key points concerning FGPP.

2 FGPP will utilize highly efficient generating technology

3 combined with a suite of state-of-the-art air pollution

4 control equipment. The FGPP environmental controls are

5 based on proven and demonstrated technologies and will

6 result in the lowest air emission rates of any

7 pulverized coal plant in Florida, as well as one of the

8 lowest emission rates in the United States. FGPP will

9 also result in minimal impacts to the environment.

10 Concerning FGPP's environmental compliance, I

11 have shown in document number KFK-3 the maximum impacts

12 of FGPP compared to the regulatory standards. For ease

13 of reference today, I prepared a separate large chart

14 for each of the four emissions on document number KFK-3.

15 Let's look at the first chart, which is for

16 sulfur dioxide. The blue bar on the left of the chart

17 shows the ambient air quality standards for sulfur

18 dioxide. The ambient air quality standards were

19 developed by the United States Environmental Protection

20 Agency and adopted by the State of Florida to protect

21 public health and welfare and the environment with an

22 adequate margin of safety. The middle bar shown as a

23 mustard color represents what is called the prevention

24 of significant deterioration increments or PSD

25 increments. The PSD increments apply to new facilities

1068

1 like FGPP and to modified facilities to protect air from

2 degradation. The next bar on the right shows the

3 maximum sulfur dioxide impacts of FGPP, also shown by

4 the arrow.

5 As you can see, the maximum impact of FGPP is

6 much lower than the environmental standards that will

7 apply to the plant. In fact, the maximum FGPP impacts

8 are more than 50 times lower than the ambient air

9 quality standards to protect public health and more than

10 17 times lower than the regulatory standards to protect

11 air from degradation.

12 The second chart shows the maximum impacts for

13 nitrogen dioxide. Again, you can see the blue bar for

14 the ambient air quality standard, and the next bar, the

15 mustard color, for the PSD increment. The right bar for

16 FGPP is much lower than the standards for nitrogen

17 dioxide. In this case, FGPP's maximum impacts are 145

18 times less than the public health standard and 36 times

19 less than the degradation standard.

20 Shown on the next chart are the maximum

21 impacts for particulate matter. Again, the right-hand

22 bars for FGPP with the arrow are much lower than the

23 regulatory standards for particulate matter that protect

24 health and air quality.

25 The final chart shows the very low impacts of

1069

1 FGPP for carbon monoxide. For this air emission as well

2 as others, the maximum impacts of FGPP are well below

3 the standards to protect public health, welfare, and the

4 environment, and those standards that ensure that our

5 air remains clean.

6 I've also evaluated the maximum impacts from

7 mercury, which are so small as to be measurable. Those

8 results are in a chart I submitted in my rebuttal

9 testimony, and I wish to review those at that stage of

10 the hearing.

11 In conclusion, I thought it might be of

12 benefit to the Commission to know that taken together,

13 the efficiency of the ultra-supercritical technology,

14 the state-of-the-art environmental controls, proposed

15 emission levels, and the environmental impacts, FGPP

16 will be the cleanest solid fuel fired power plant that

17 I've seen in my career and that I'm aware of in the

18 electric utility industry. Thank you.

19 MR. ANDERSON: Mr. Kosky is available for

20 cross-examination.

21 CHAIRMAN EDGAR: Mr. Beck.

22 MR. BECK: Thank you, Madam Chairman.

23 CROSS-EXAMINATION

24 BY MR. BECK:

25 Q. Good evening, Mr. Kosky.

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1 A. Good evening.

2 Q. Could you turn to your Exhibit 7, page 5 of 5?

3 A. Sure.

4 Q. That exhibit shows projected environmental

5 compliance costs for carbon taxes, does it not?

6 A. It shows environmental compliance costs for

7 actually four pollutants, sulfur dioxide, nitrogen

8 oxides, mercury, and carbon dioxide.

9 Q. But page 5 of 5 is just carbon dioxide

10 environmental compliance costs, is it not?

11 A. Yes, page 5 of 5 are.

12 Q. And you have -- four different scenarios are

13 included in your graph; is that right?

14 A. Four different scenarios of potential costs

15 are presented; that's correct.

16 Q. And the A scenario is the scenario where there

17 will be no carbon taxes or cap-and-trade system in place

18 at any time through the life of the plants; is that

19 right?

20 A. Yes, in that scenario, there is no carbon tax.

21 Q. And so the A scenario simply shows a straight

22 line along the zero axis; is that right?

23 A. That's correct.

24 Q. Okay. And then the B scenario is the low

25 carbon tax; is that right? And when I say carbon tax, I

1071

1 include cap and trade in that.

2 A. Cap and trade, we called it a mild cost of CO2

3 credits or allowances.

4 Q. And what is the C scenario?

5 A. The C scenario was a moderate.

6 Q. And the D?

7 A. And D was the more stringent.

8 Q. And these scenarios were provided to you by a

9 firm named ICF International; is that correct?

10 A. Yes. These were developed by ICF

11 International in a report that they prepared related to

12 the allowances of all the pollutants that I had

13 mentioned, sulfur dioxide, nitrogen oxides, mercury,

14 which are currently regulated or will be regulated.

15 There are regulations for those, and potential costs for

16 carbon dioxide.

17 Q. And FPL has a witness coming on later who will

18 be able to talk about the forecasts provided by ICF, do

19 you not?

20 A. Yes. Mr. Rose will be presenting more detail

21 on their specific analysis.

22 MR. BECK: Thank you. That's all I have.

23 CHAIRMAN EDGAR: Mr. Guest.

24 MR. GUEST: Just a few questions to clarify.

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1 CROSS-EXAMINATION

2 BY MR. GUEST:

3 Q. You don't have a Clean Air Act permit, do you,

4 for this plant?

5 A. No. That's currently under review by the

6 Department of Environmental Protection.

7 Q. They've actually -- also, the Department has

8 asked you to consider the IGCC option in connection with

9 air pollution issues, has it not?

10 A. I don't think that's correct. They had a

11 question related to information that Florida Power &

12 Light developed in its proposal for the

13 ultra-supercritical technology. And in fact, Mr. Hicks

14 testified as to that particular report, and that

15 information was submitted to the Florida Department of

16 Environmental Protection.

17 Q. The superintendent of the Everglades National

18 Park has objected strenuously to the issuance of an air

19 permit for this facility, has he not?

20 A. That's not correct.

21 Q. Well, please correct me.

22 A. I'll be happy to. The National Park Service

23 has provided actually two comment letters to the Florida

24 Department of Environmental Protection basically asking

25 for more information. In the first letter, they had

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1 particular concerns, which we addressed to the Florida

2 Department of Environmental Protection in what's called

3 their completeness determination. They reviewed that

4 information. They had some additional questions, which

5 they supplied in another letter, and we are currently

6 meeting with the National Park Service to address their

7 technical concerns regarding any analyses or impacts

8 that might occur.

9 Q. So are you saying that the status of things

10 right now is that the National Park Service, that the

11 superintendent of the Everglades National Park is

12 neutral or in favor of this plant?

13 A. Well, I think that they right now are

14 evaluating information. They justifiably had some

15 interest in the potential impacts and expressed those

16 twice, and we provided information, for example, in the

17 first letter, in which we fully addressed many of their

18 concerns. In fact, their second letter was essentially

19 acknowledging that now they understood some of the

20 things about the project. So it's an ongoing process.

21 Q. I notice that you don't have anything about

22 mercury here in the exhibits that you've handed out

23 here. Is there a reason for that?

24 A. In the exhibits that I handed out?

25 Q. Yes. You talk about some parameters, you

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1 know, sulfur dioxide, small particles, nitrogen dioxide,

2 carbon monoxide. You didn't include mercury.

3 A. Mercury does not have an ambient air quality

4 standard, nor does it have a degradation or clean air

5 standard. However, in my direct testimony, I provided

6 document number KFK-6, which showed the emission rates

7 of FGPP compared to the latest new source performance

8 standards that were promulgated by EPA as of June 2006.

9 In fact, the emission rate proposed by FGPP is one half

10 the more recent standard that EPA had promulgated.

11 In my rebuttal testimony, I do present

12 information more detailed on mercury.

13 CHAIRMAN EDGAR: Mr. Guest, can I jump in with

14 a question?

15 MR. GUEST: Sure.

16 CHAIRMAN EDGAR: Referring back to a question

17 or so ago that Mr. Guest was asking, I guess, Mr. Kosky,

18 in your experience or opinion, does a superintendent of

19 a national park have the authority to speak on behalf of

20 the National Park Service as far as comments on a

21 proposed permit?

22 THE WITNESS: Yes. They are the federal land

23 manager of the class 1 area, the Everglades National

24 Park, and they evaluate what's called the air quality

25 related values of the park. Typically it's the impacts

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1 on sensitive species and deposition. We supplied a

2 considerable amount of information to the park, as well

3 as other analyses, and in fact, that's still ongoing

4 related to the review of the air construction permit by

5 the Florida Department of Environmental Protection.

6 CHAIRMAN EDGAR: And so -- and I'm just trying

7 to refresh my memory as to the process, the federal

8 agency review process of a proposed permit to be issued

9 by the environmental state agency. Would the

10 superintendent then of a national park that has the

11 potential to be impacted, in this case, Everglades

12 National Park, would it be the superintendent that would

13 be issuing comments, the agency review comments?

14 THE WITNESS: He would be reviewing comments

15 to the Florida Department of Environmental Protection.

16 It may also be through the Department of Interior.

17 CHAIRMAN EDGAR: Thank you.

18 MR. GUEST: Thank you for that clarification.

19 BY MR. GUEST:

20 Q. So you're aware, are you not, that a number of

21 parties have joined the issue in the Power Plant Siting

22 Act process that goes before the administrative law

23 judge and that the matter of compliance with the Clean

24 Air Act is one of the issues in play?

25 A. Yes, I'm aware of that.

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1 MR. GUEST: No further questions.

2 CHAIRMAN EDGAR: Mr. Krasowski, do you have

3 questions on cross?

4 MR. KRASOWSKI: Yes. Thank you.

5 CROSS-EXAMINATION

6 BY MR. KRASOWSKI:

7 Q. Hi, Mr. Kosky. I happen to have that letter

8 from the Park Service here, and they express concern and

9 do ask questions about IGCC.

10 But let me ask you, this whole issue of

11 environmentalism, do I understand correctly that you're

12 here today to speak to how this project will comply with

13 existing rules as far as emissions, EPA rules?

14 A. Emissions as well as the ambient air quality

15 standards, the PSD increments. The foundation of this

16 starts in 1970 with the Clean Air Act Amendments, and

17 that has been the foundation of air quality management,

18 as it were, in the United States since that time.

19 Q. But you're not here on the broader scale,

20 comprehensive commentary on environmental impacts as far

21 as -- you've avoided mercury as an issue for the reasons

22 you've stated, but there's mercury in the fish, and this

23 contributes to more mercury, this project, and then also

24 the global warming is a big environmental -- do you

25 believe in global warming?

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1 MR. ANDERSON: Chairman Edgar, we have

2 multiple questions and a mischaracterization of avoiding

3 mercury, so perhaps if we were to --

4 MR. KRASOWSKI: Apologies for doing that.

5 I'll try to clear that up.

6 BY MR. KRASOWSKI:

7 Q. Okay. So maybe you didn't avoid mercury, but

8 you explained. You explained yourself that mercury is

9 not included in your handout because it isn't under the

10 same -- well, could you restate that? Why isn't mercury

11 included in your handout?

12 A. Well, we submitted a site certification

13 application that has environmental impacts, evaluations

14 on mercury. We've provided additional information.

15 It's probably close to three or four feet deep.

16 My purpose here today was really to provide

17 the Commission information relative to the basic

18 structure of environmental controls for FGPP that are

19 included to comply with the environmental requirements,

20 as well as to look at the regulations that are currently

21 adopted by the DEP for mercury, sulfur dioxide, and

22 nitrogen dioxide, as well as the potential for any

23 future regulation, which it hasn't been so far, of

24 carbon dioxide.

25 Q. Okay. I guess I just wanted to clear up the

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1 point that your comments here are bracketed by the

2 relevancy of this body's relationship to the

3 environmental impacts, economic environmental impacts of

4 the project, not environmental concerns.

5 A. Correct. The venue for that would be through

6 the Florida Department of Environmental Protection,

7 which will have a public hearing related to those

8 aspects. My purpose today was to provide the Commission

9 with a overview of the environmental controls, as well

10 as in the charts that I've shown, the very low impacts,

11 for which we haven't had any concern or comments related

12 to those from DEP of the project.

13 Q. But you're not here to speak of the inadequacy

14 of these standards and controls in terms of their impact

15 on global climate change; is that a correct statement?

16 A. Well, first, there's --

17 MR. ANDERSON: I would just interpose that

18 that's way beyond the scope of our hearing tonight, and

19 we're getting late.

20 MR. KRASOWSKI: Madam Chair --

21 CHAIRMAN EDGAR: Mr. Krasowski.

22 MR. KRASOWSKI: Excuse me for interrupting.

23 You had something to say.

24 CHAIRMAN EDGAR: You may. I was going to

25 comment that there are numerous hearings ongoing around

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1 town, the state, the nation, and the world on global

2 warming, and we're probably not going to solve it this

3 evening. And I didn't mean that to be disrespectful, by

4 the way, but we're not going to solve it this evening.

5 So I would ask you to keep your questions pointed to the

6 testimony of this witness.

7 MR. KRASOWSKI: That was my final question,

8 and all I was hoping to make clear was that -- was to

9 ask Mr. Kosky if he would agree that his testimony here

10 today did not go outside of the purview of the economic

11 environmental points to this body and did not even

12 attempt to address the broader issue of what might be

13 the inadequacies of these standards to address broader

14 environmental issues.

15 BY MR. KRASOWSKI:

16 Q. Is that correct, Mr. Kosky? You're not here

17 to speak about -- did I do it again? Okay. Well, I'll

18 end there then.

19 CHAIRMAN EDGAR: You did.

20 MR. KRASOWSKI: I'll stop.

21 CHAIRMAN EDGAR: However, with the

22 clarification, I'm going to allow the witness to

23 respond.

24 A. Well, first, my testimony did address

25 potential regulations of CO2, and in fact, in my

1080

1 rebuttal testimony, I provided more information to the

2 Commission.

3 The one thing, as testified by Mr. Hicks, as

4 well as my opinion, is the fact that FGPP does address

5 CO2 or climate change potential by the efficiency. It

6 will be the most efficient power plant in the country.

7 As far as the other particular pollutants that

8 I've shown on the charts, these particular standards are

9 developed through peer review, independent, by EPA,

10 established initially in 1970. They rereview these

11 standards to protect health and welfare. So there isn't

12 any inadequacy related to the air standards that I'm

13 presenting. These are actually evaluated by EPA on a

14 regular basis, and in fact, made more stringent as

15 necessary. In fact, there are some more stringent

16 standards being developed and have been developed for

17 pollutants all the time.

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

19 CHAIRMAN EDGAR: Thank you. And I'll note

20 that Mr. Kosky will be back, so you can maybe try again,

21 Mr. Krasowski.

22 Are there questions from staff?

23 MS. BRUBAKER: None from staff.

24 CHAIRMAN EDGAR: None from staff.

25 Mr. Anderson.

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1 MR. ANDERSON: We have no redirect. We would

2 offer Exhibits 39 to 45. If we could pause for a

3 second.

4 Please pardon my confusion. Nothing about

5 redirect, just some points of order. We wanted to make

6 sure that we offered Exhibits 39 to 45, which are

7 Mr. Kosky's exhibits.

8 CHAIRMAN EDGAR: And that's what we would be

9 doing next.

10 MR. ANDERSON: Exactly. The other thing was,

11 we just wanted to confirm that Mr. Yeager's direct and

12 rebuttal was entered into record. I know I offered the

13 exhibits and they were admitted, but with the prior

14 witness, we wanted to make sure that that was entered

15 in.

16 CHAIRMAN EDGAR: Okay. I think that we did

17 that. Ms. Brubaker?

18 MS. BRUBAKER: Yes, that's my recall also.

19 MR. ANDERSON: And those were the points.

20 CHAIRMAN EDGAR: That's fine. That's fine.

21 MR. ANDERSON: Thank you very much.

22 CHAIRMAN EDGAR: It's late. I do not mind

23 being asked to double-check.

24 Okay. So Exhibits 39 through 45 will be

25 entered into the record.

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1 (Exhibits 39 through 45 admitted into the

2 record.)

3 CHAIRMAN EDGAR: And, Mr. Kosky, you are

4 excused until we will see you again for rebuttal. Thank

5 you very much.

6 And I think we can keep going with one more

7 witness if --

8 MR. ANDERSON: Good.

9 CHAIRMAN EDGAR: -- everybody is up to it.

10 MR. GUEST: Your Honor, I am flat dog tired.

11 I truly am.

12 CHAIRMAN EDGAR: I understand. Does that mean

13 you would like a break, or are you offering that we

14 adjourn for the evening?

15 MR. GUEST: It would be my hope that you might

16 do that, adjourn for the evening, like right now.

17 CHAIRMAN EDGAR: Note that one of the reasons

18 we were pushing forward was to make sure that we got to

19 your witnesses tomorrow. However, realizing that we

20 were able to stipulate Mr. Yeager, and then we have

21 Mr. Sim. The next four witnesses, as pointed out

22 earlier, will be stipulated, have been agreed to be

23 stipulated, and their testimony will be entered in when

24 we come to that. That then leaves just Mr. Furman and

25 Mr. Plunkett, and then Mr. Schlissel's testimony and

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1 exhibits to be entered. And I guess this is more for my

2 benefit than anybody else's to see where we are. So is

3 there -- Mr. Litchfield.

4 MR. LITCHFIELD: Madam Chairman, I was going

5 to note that I think if we were to take Mr. Sim, we

6 stand a reasonable chance of finishing tomorrow. I

7 think if we don't take him up, those chances diminish

8 significantly.

9 My understanding -- and maybe it has changed,

10 but my understanding was that counsel for the Sierra

11 Club had few, if any, questions for Mr. Sim on his

12 direct testimony, but they had some on his rebuttal.

13 He's only going to be sponsoring or addressing his

14 direct testimony right now. So depending on the number

15 of questions from other parties, we may not talking

16 about very much time in order to get through Mr. Sim

17 this evening, at least on his direct.

18 MR. KRASOWSKI: Madam Chair --

19 CHAIRMAN EDGAR: Hold on. Yes, Ms. Brubaker.

20 MS. BRUBAKER: I would like to note that we do

21 have some cross for Mr. Sim. Depending on how quickly

22 we can get through it, I would estimate between 20 and

23 30 minutes, however. So --

24 CHAIRMAN EDGAR: Well, there you have it.

25 MS. BRUBAKER: I don't wish to be the sticky

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1 thorn, but I didn't want to be ignored either.

2 CHAIRMAN EDGAR: That's not a label that I

3 would use, Ms. Brubaker.

4 Okay. Yes. Who else? Mr. Krasowski, yes,

5 sir.

6 MR. KRASOWSKI: I just wanted to mention that

7 Ms. Brubaker won't be the only sticky thorn. I as well

8 had some questions of Mr. Sim, but don't want to keep

9 the gentlemen up any --

10 CHAIRMAN EDGAR: I understand. I understand.

11 I appreciate you working with us.

12 Mr. Litchfield, nice try. Thank you.

13 Okay. We will go on break. I know it's been

14 a long day, and we will being back at 9:30 in the

15 morning. We are done for the day.

16 (Proceedings recessed at 6:10 p.m.)

17 (Transcript follows in sequence in Volume 8.)

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1 CERTIFICATE OF REPORTER

2

3 STATE OF FLORIDA:

4 COUNTY OF LEON:

5 I, MARY ALLEN NEEL, Registered Professional

6 Reporter, do hereby certify that the foregoing

7 proceedings were taken before me at the time and place

8 therein designated; that my shorthand notes were

9 thereafter translated under my supervision; and the

10 foregoing pages numbered 862 through 1084 are a true and

11 correct record of the aforesaid proceedings.

12 I FURTHER CERTIFY that I am not a relative,

13 employee, attorney or counsel of any of the parties, nor

14 relative or employee of such attorney or counsel, or

15 financially interested in the foregoing action.

16 DATED THIS 26th day of April, 2007.

17

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