862

 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 I N D E X

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 1

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 NUMBER ID. ADMTD.

 3

 4 25 through 38 896

 5 39 through 45 1082

 6 61 WLY-1 1017 1017

 7 62 WLY-2 1017 1017

 8 166 through 175 897

 9 176 Clean Coal Today, Issue No. 64 878 899

 10 177 Clean Coal Technology Selection Study 880 899

 11 178 Comparative Dollars per kW for 888 899

 Operating IGCC Facilities

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 179 Photo, Polk Power Station 975 1015

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 180 Status of Commercial IGCC 983 1015

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 181 Environmental Permitting for IGCC 1001 1015

 15 Power Plant Slides

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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?

 892

 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 –-

 893

 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?

 894

 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.

 897

 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

 899

 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.

 902

 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

 904

 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.

 906

 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?

 907

 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.

 908

 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.

 909

 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.

 910

 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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 944

 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

 947

 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.

 948

 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?

 950

 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?

 1043

 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

 1044

 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.

 1070

 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.

 25

 1072

 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

 1073

 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

 1074

 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

 1075

 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.

 1076

 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?

 1077

 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

 1078

 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

 1079

 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.

 1081

 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.

 1082

 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

 1083

 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

 1084

 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

 18

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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