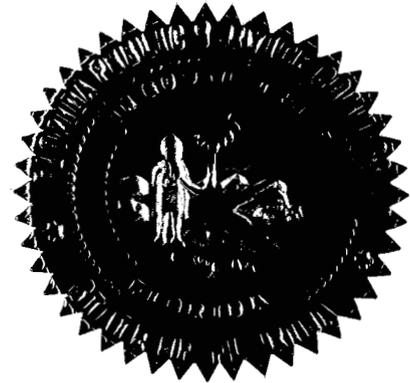


BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070098-EI

In the Matter of:

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



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VOLUME 8

Pages 1086 through 1194

PROCEEDINGS: HEARING

BEFORE: CHAIRMAN LISA POLAK EDGAR
COMMISSIONER MATTHEW M. CARTER, II
COMMISSIONER KATRINA J. MCMURRIAN

DATE: Thursday, April 26, 2007

TIME: Commenced at 9:36 a.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: LINDA BOLES, RPR, CRR
Official FPSC Reporter
(850) 413-6734

APPEARANCES: (As heretofore noted.)

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(Transcript continues in sequence from Volume 7.)

CHAIRMAN EDGAR: Okay. We will go ahead and get started. I call this hearing to order this morning.

Are there any preliminary matters before we call the first witness?

MR. ANDERSON: None that FPL is aware of.

CHAIRMAN EDGAR: Okay.

MR. GUEST: None that we have, Madam Chairman.

CHAIRMAN EDGAR: Okay. Let me just mention, as I said the other day and as I'm sure you all know, it is Take Your Child to Work Day. I do have my daughter, who will be in and out a little bit. I will try to minimize any disruption and I appreciate your understanding. And we will have a group of children come into the back of the room in a little while who are the children of other staff here at the Commission. So, again, your understanding. We will make every effort to continue professionally, but also wanting to, you know, recognize the day and the importance of that as well.

So with that, I'm ready. If you would like to call your first witness. And I don't believe he has been sworn; is that correct?

MR. ANDERSON: Madam Chairman, Florida Power & Light would call Dr. Steven Sim as the next witness. He has not been sworn.

1 CHAIRMAN EDGAR: Okay.

2 STEVEN R. SIM

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

5 DIRECT EXAMINATION

6 BY MR. ANDERSON:

7 Q Good morning, Dr. Sim.

8 A Good morning.

9 Q Would you please tell us your name and your business
10 address?

11 A Steve Sim, 9250 West Flagler Street, Miami, Florida
12 Power & Light.

13 Q By whom are you employed and in what capacity?

14 A Florida Power & Light as a Supervisor in the Resource
15 Assessment and Planning Department.

16 Q Have you prepared and caused to be filed 56 pages of
17 prefiled direct testimony in this proceeding?

18 A Yes.

19 Q Did you also cause to be filed errata to your
20 testimony on March 13, 2007?

21 A Yes.

22 Q Do you have any further changes or revisions to your
23 prefiled direct testimony other than the errata?

24 A No.

25 Q With those changes in the errata, if I asked you the

1 same questions contained in your prefiled direct testimony,
2 would your answers be the same?

3 A Yes, they would.

4 MR. ANDERSON: FPL would ask that Dr. Sim's prefiled
5 direct testimony be inserted into the record as though read
6 with errata.

7 CHAIRMAN EDGAR: The prefiled direct testimony will
8 be entered into the record with the errata.

9 BY MR. ANDERSON:

10 Q Dr. Sim, are you also sponsoring any exhibits?

11 A Yes.

12 Q Those consist of documents SRS-1 through SRS-15?

13 A Yes.

14 MR. ANDERSON: Madam Chairman, I'd note that
15 Dr. Sim's exhibits have been premarked for identification as 46
16 through 60.

17 BY MR. ANDERSON:

18 Q Dr. Sim, do you also have a copy in front of you of
19 the Need Study that FPL filed with its petition and testimony
20 in this case?

21 A That's correct.

22 MR. ANDERSON: Madam Chairman, this is one of the
23 prefiled exhibits that is just not on the exhibit list, but we
24 just need to give it a number and at the end of the witness
25 we'd like to offer that, too.

1 CHAIRMAN EDGAR: Okay. So that would be 182.

2 MR. ANDERSON: Yes, please.

3 (Exhibit 182 marked for identification.)

4 MS. BRUBAKER: Madam Chairman, may I ask for
5 clarification? That is the Need Study as well as the
6 associated appendices; correct?

7 MR. ANDERSON: Yes. That's exactly right.

8 MS. BRUBAKER: Thank you.

9 MR. ANDERSON: Thank you.

10 CHAIRMAN EDGAR: Okay. Need Study and Appendices.

11 MR. ANDERSON: Yes.

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1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **DIRECT TESTIMONY OF STEVEN R. SIM**

4 **DOCKET NO. 07 _____ - EI**

5 **JANUARY 29, 2007**

6
7 **Q. Please state your name and business address.**

8 A. My name is Steven R. Sim, and my business address is 9250 West Flagler
9 Street, Miami, Florida 33174.

10 **Q. By whom are you employed and what position do you hold?**

11 A. I am employed by Florida Power & Light Company (FPL) as a Supervisor in
12 the Resource Assessment & Planning Business Unit.

13 **Q. Please describe your duties and responsibilities in that position.**

14 A. I supervise a group that is responsible for determining the magnitude and
15 timing of FPL's resource needs and then developing the integrated resource
16 plan with which FPL will meet those resource needs.

17 **Q. Please describe your education and professional experience.**

18 A. I graduated from the University of Miami (Florida) with a Bachelor's degree
19 in Mathematics in 1973. I subsequently earned a Master's degree in
20 Mathematics from the University of Miami (Florida) in 1975 and a Doctorate
21 in Environmental Science and Engineering from the University of California
22 at Los Angeles (UCLA) in 1979.

1 While completing my degree program at UCLA, I was also employed full-
2 time as a Research Associate at the Florida Solar Energy Center during 1977 -
3 1979. My responsibilities at the Florida Solar Energy Center included an
4 evaluation of Florida consumers' experiences with solar water heaters and an
5 analysis of potential renewable resources including photovoltaics, biomass,
6 and wind power applicable in the southeastern United States.

7
8 In 1979 I joined FPL. From 1979 until 1991 I worked in various departments
9 including Marketing, Energy Management Research, and Load Management,
10 where my responsibilities concerned the development, monitoring, and cost-
11 effectiveness of demand side management (DSM) programs. In 1991 I joined
12 my current department, then named the System Planning Department, as a
13 Supervisor whose responsibilities included the cost-effectiveness analyses of a
14 variety of individual supply and DSM options. In 1993 I assumed my present
15 position.

16 **Q. Are you sponsoring an exhibit in this case?**

17 **A.** Yes. It consists of the following documents:

18 Document No. SRS-1 Projection of FPL's 2007 - 2015 Capacity Needs
19 (without New Resource Additions);

20 Document No. SRS-2 Additional FPL DSM Above DSM Goals: 2006
21 - 2015;

22 Document No. SRS-3 Economic Analyses of Coal Technologies;

1 Document No. SRS-4 Projection of FPL's 2007 – 2015 Capacity
2 Needs: with FGPP 1 and 2;

3 Document No. SRS-5 The Two Resource Plans Utilized in the
4 Analyses;

5 Document No. SRS-6 Fuel Cost Forecasts Utilized in the Analyses;

6 Document No. SRS-7 Environmental Compliance Cost Forecasts
7 Utilized in the Analyses;

8 Document No. SRS-8 Economic Analysis Results for One Fuel and
9 Environmental Compliance Cost Scenario:
10 Generation System Costs Only;

11 Document No. SRS-9 Economic Analysis Results for One Fuel and
12 Environmental Compliance Cost Scenario:
13 Generation System and Transmission System
14 Costs;

15 Document No. SRS-10 Calculation of Peak Hour Loss Cost for the Plan
16 with Coal Compared to the Plan without Coal;

17 Document No. SRS-11 Calculation of Annual Energy Loss Cost for the
18 Plan with Coal Compared to the Plan without
19 Coal;

20 Document No. SRS-12 Economic Analysis Results: Total Costs and
21 Total Cost Differentials for All Fuel and
22 Environmental Compliance Cost Scenarios;

1 Document No. SRS-13 Economic Analysis Results: the Plan with Coal
2 vs. the Plan without Coal Total Cost
3 Differentials for All Fuel and Environmental
4 Compliance Cost Scenarios;

5 Document No. SRS-14 Non-Fuel Cost Projections for the First 12
6 Months of Operation for FGPP 1 and 2; and,

7 Document No. SRS-15 Fuel Diversity Analysis Results: FPL System
8 Fuel Mix Projections by Plan.

9 **Q. Are you sponsoring any sections in the Need Study document?**

10 A. Yes. I am co-sponsoring Sections II, IV, V, VI, and VIII of the Need Study
11 document. I also sponsor Appendices B, G, K, and N, and co-sponsor
12 Appendix C.

13 **Q. What is the scope and purpose of your testimony?**

14 A. My testimony addresses eleven main points. First, I briefly discuss FPL's
15 integrated resource planning (IRP) process and note that the application of the
16 IRP process in 2006 focused on maintaining fuel diversity in FPL's system.
17 Second, I identify FPL's additional resource needs for 2007 - 2015, with
18 particular emphasis on the 2012 through 2015 time period, and explain how
19 these needs were determined. Third, I discuss why DSM cannot reasonably be
20 expected to eliminate these resource needs. Fourth, I discuss the results of an
21 economic analysis of several coal technologies and explain how those results
22 support FPL's selection of the ultra-supercritical pulverized coal technology
23 (advanced technology coal) proposed for FPL's Glades Power Park (FGPP)

1 site. Fifth, I present an overview of the analysis approach used to evaluate the
2 addition of the FGPP 1 and 2 advanced technology coal units to FPL's system
3 versus the most likely non-coal competing technology, natural gas-fired
4 combined cycle units, from both an economic and fuel diversity perspective.
5 Sixth, I discuss two resource plans: a fuel diversity resource plan selected by
6 FPL that includes advanced technology coal unit additions at FGPP and an
7 alternate resource plan without coal additions that was used to evaluate the
8 economic and fuel diversity impacts of adding FGPP 1 and 2. Seventh, I
9 discuss FPL's use of various fuel cost forecasts and environmental compliance
10 cost forecasts that were combined into 16 fuel cost and environmental
11 compliance cost scenarios that were used in the analyses of the two resource
12 plans. Eighth, I present the results of FPL's economic analyses of the two
13 resource plans. Ninth, I present the results of the fuel diversity analyses of the
14 two resource plans. Tenth, I discuss the negative system fuel diversity impacts
15 that would occur if a Need Determination for FGPP 1 and 2 were not
16 approved. Eleventh, I explain the conclusions I draw from the previously
17 discussed analyses and summarize my testimony. The conclusion I draw from
18 this information is that adding FGPP 1 to FPL's system by 2013, followed by
19 the addition of FGPP 2 by 2014, is the best choice for addressing FPL's future
20 capacity needs in the 2012 through 2015 time period and for maintaining fuel
21 diversity in FPL's system.

I. FPL's Integrated Resource Planning Process

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Q. What are the objectives of FPL's integrated resource planning process?

A. The fundamental approach used in FPL's IRP process was developed in the early 1990s and the process has been used since that time to accomplish three primary objectives: 1) determine the timing of when new resources are needed to maintain the reliability of the FPL system, 2) determine the magnitude (MW) of the needed resources, and 3) determine the type of resources that should be added. The analysis required to accomplish the first two objectives – determining the timing and magnitude of needed resources – is often referred to as the reliability assessment portion of FPL's IRP process and these analyses are relatively straightforward.

The analyses required to accomplish the third objective – determining the type of resources that should be added – is more complex and involves the consideration of both economic and what are often termed non-economic perspectives. From an economic perspective, the type of resources that should be added is primarily based on a determination of the resources that result in the lowest system average electric rates for FPL's customers. It should be noted that when only power plants or power purchases are the resources in question, the determination can be made on the basis of lowest total costs (cumulative present value of revenue requirements, CPVRR). The lowest total cost perspective (CPVRR) in these cases is the same as the lowest average

1 electric rate perspective, because the number of kilowatt-hours over which the
2 costs are distributed does not change, as would be the case when DSM
3 resources are being examined.

4
5 However, the type of resources to be added is also influenced by
6 considerations such as whether an option can be brought into service on FPL's
7 system in time to meet a projected capacity need and whether a given resource
8 option or plan is best suited to address system concerns that may have been
9 identified in the resource planning process. While these system concerns
10 usually have an economic component or impact, they are often discussed in
11 non-economic terms such as percentages, etc. rather than in terms of dollars.

12 **Q. What is meant by system concerns and how are they addressed in FPL's**
13 **IRP process?**

14 A. As previously mentioned, FPL developed its fundamental IRP approach in the
15 early 1990s. In the intervening years FPL's IRP process has evolved in order
16 to be able to address special system concerns that have been identified. In
17 recent years one of those system concerns has been maintaining a regional
18 balance between load and generating capacity, particularly in Southeastern
19 Florida. This concern has been satisfactorily addressed for the near-term with
20 the addition of Turkey Point 5, West County Energy Center (WCEC) 1, and
21 WCEC 2 generating units, all in Southeastern Florida.

1 Another system concern is that of maintaining system fuel diversity. FPL's
2 2006 IRP process has directly addressed this concern and, as a result, is
3 proposing advanced technology coal units to address FPL's next capacity
4 needs. Maintaining, and enhancing if possible, system fuel diversity will
5 continue to be an issue that FPL's resource planning work addresses in
6 coming years. The issue of fuel diversity is discussed in detail in Mr. Yupp's
7 testimony.

8
9 System concerns such as these are generally addressed in the IRP process in
10 regard to meeting the third objective described above - determining the type
11 of resources that should be added. The selection of resource options and
12 resource plans for analyses is done with these system concerns in mind. Then,
13 in conducting the analyses needed to determine which resource options and
14 plans are best for FPL's system, both the economic and non-economic
15 analyses are conducted with an eye to whether the system concern is
16 positively or negatively impacted by a given resource option or plan.

17 **Q. Did FPL utilize its IRP process in the analyses that led to FPL seeking**
18 **approval of a determination of need for two advanced technology coal**
19 **units, one each by 2013 and 2014?**

20 A. Yes. FPL utilized its IRP process to first determine the timing and magnitude
21 of resource needs. It was determined that FPL's first significant resource need
22 was in 2012 and that this resource need increased every year thereafter.
23 Second, FPL identified resource options that could meet these needs with

1 particular attention paid to options that could come in-service as close to 2012
2 as possible, and that could address the system concern of maintaining fuel
3 diversity on FPL's system. FPL then determined the best resource options to
4 add to both meet the resource needs and maintain system fuel diversity.

5 6 **II. FPL's Future Resource Needs**

7
8 **Q. How did FPL decide it needed additional resources and what was the**
9 **magnitude of the needed resources?**

10 **A.** FPL uses two analytical approaches in its reliability assessment to determine
11 the timing and magnitude of its future resource needs in order to continue to
12 provide reliable electric service to its customers. The first approach is to make
13 projections of reserve margins both for Winter and Summer peak hours for
14 future years. A minimum reserve margin criterion of 20% is used to judge the
15 projected reserve margins. The 20% reserve margin criterion is based on the
16 reliability planning standard FPL committed to maintain and the Commission
17 approved in Order No. PSC-99-2507-S-EU.

18
19 The second approach is a Loss-of-Load-Probability (LOLP) evaluation.
20 Simply stated, LOLP is an index of how well a generating system may be able
21 to meet its demand (i.e., a measure of how often load may exceed available
22 resources). In contrast to the reserve margin approach, the LOLP approach
23 looks at the daily peak demands for each year, while taking into consideration

1 the probability of individual generators being out of service due to scheduled
2 maintenance or forced outages. LOLP is typically expressed in units of
3 “numbers of times per year” that the system demand could not be served.
4 FPL’s LOLP criterion is a maximum of 0.1 days per year. This LOLP
5 criterion is generally accepted throughout the electric utility industry.

6
7 For a number of years now, FPL’s projected need for additional resources has
8 been driven by the Summer reserve margin criterion. This again was the case
9 in FPL’s 2006 reliability assessment that was the basis for FPL’s projected
10 resource needs. Significant levels of additional resources (MW) are needed for
11 each year beginning in 2012 to meet the Summer reserve margin criterion of
12 20%. (FPL also projects a relatively small 167 MW need in 2011 that FPL
13 currently plans to meet with a short-term purchase(s), enhancements to its
14 existing generating units, and/or additional cost-effective DSM.)

15
16 Assuming that the 2011 need mentioned above is met by a one-year purchase,
17 the additional incremental MW needed by the Summer of 2012 is projected to
18 be 777 MW if the resource is to be provided by a supply side option (i.e.,
19 power plant construction or purchase) or, due to the 20% reserve margin
20 criterion, $(777 \text{ MW}/1.20 =)$ 648 MW if provided by a DSM-based reduction
21 to the forecasted peak load. The similar incremental need values for the
22 Summers of 2013 - 2015, respectively, are an additional 417 MW (supply) or

1 348 MW (DSM) for 2013, an additional 450 MW (supply) or 375 MW (DSM)
2 for 2014, and an additional 639 MW (supply) or 533 MW (DSM) for 2015.

3

4 These incremental annual resource need values add to a cumulative need
5 value for 2012 - 2015 of approximately 2,283 MW if the resource need is to
6 be met by supply options. The corresponding cumulative resource need for the
7 four-year period is approximately 1,903 MW if the resource need is to be met
8 by DSM. The projections of resource needs to meet the Summer reserve
9 margin criterion for 2012 - 2015 if the resource needs are to be met by supply
10 options are shown in Document No. SRS-1. This document also shows that, if
11 these levels of supply additions are added to meet the Summer needs, these
12 additions will also easily satisfy the smaller resource needs to meet the Winter
13 reserve margin criterion.

14

15 These projections rely upon FPL's IRP 2006 load forecast that was developed
16 in September 2006 and used in the economic and fuel diversity analyses
17 discussed in the remainder of my testimony. This load forecast is discussed by
18 Dr. Green in his testimony.

III. Demand Side Management

1
2
3 **Q. Do these projections of FPL's resource needs include all of the cost-**
4 **effective DSM currently known to FPL?**

5 A. Yes. These projections already incorporate all of the cost-effective DSM
6 currently known to FPL. This amount of DSM includes not only FPL's
7 current DSM Goals, but also a significant amount of additional DSM that FPL
8 has identified as cost-effective since the DSM Goals were approved. Mr.
9 Brandt's testimony provides detailed information regarding the DSM Goals
10 and additional DSM amounts.

11
12 In summary, FPL now projects implementing approximately 564 MW at the
13 generator of additional Summer demand reduction capability from 2006
14 through 2015 beyond FPL's current DSM Goals. The amounts of additional
15 DSM and the DSM Goals amount are presented in Document No. SRS-2. This
16 amount of additional DSM, plus FPL's DSM Goals, are incorporated into the
17 projection of FPL's resource needs presented in Document No. SRS-1 and
18 discussed above.

19 **Q. Could FPL meet its 2012 through 2015 resource needs with DSM?**

20 A. No. As discussed above, FPL's resource needs presented in Document No.
21 SRS-1 already account for all of the reasonably achievable, cost-effective
22 level of DSM for FPL between 2006 and 2015 that were presented in
23 Document No. SRS-2. As shown in this document, FPL's DSM activities will

1 result in approximately 802 MW at the generator (DSM Goals) plus
2 approximately 564 MW at the generator of additional DSM beyond FPL's
3 Goals for a total of approximately 1,366 MW of incremental DSM at the
4 generator from 2006 through 2015, a 10-year period. In other words, FPL's
5 reliability assessment has already captured the cost-effective DSM known to
6 be available on FPL's system. This reliability assessment determined that FPL
7 still needs a significant amount of additional capacity resources to meet its
8 resource needs.

9
10 As previously discussed, if the resource needs for just the years 2012 through
11 2014 were to be met solely by additional new DSM resources, FPL would
12 need to find an additional 1,371 MW of cost-effective DSM to meet these
13 resource needs (i.e., 648 MW for 2012, 348 MW for 2013, and 375 MW for
14 2014). It is unrealistic to conclude that FPL could first identify, and then
15 implement, another 1,371 MW of cost-effective, incremental DSM in the next
16 7 ½ years (2007 through mid-2014) to meet these needs, especially when
17 considering that this amount of DSM is virtually identical to the maximum
18 amount (1,366 MW) of cost-effective DSM known to FPL for the 2006 - 2015
19 time period, and that is already included in the projection of capacity needs.
20 Consequently, cost-effective DSM could not meet FPL's incremental resource
21 needs for this time period. These resource needs must be met by capacity
22 (construction and/or purchase) additions; i.e., the system resource needs

1 presented in this testimony are actually capacity needs and will be referred to
2 as such in the remainder of my testimony.

3
4 **IV. FPL's Selection of Advanced Technology Coal Units**

5
6 **Q. What evaluations of various coal technology options were conducted?**

7 A. There were three separate evaluations of coal-based technologies that were
8 conducted prior to FPL's filing for determination of need for its two advanced
9 technology coal units. The first of these evaluations was conducted by FPL in
10 2004 and early 2005. Mr. Hicks' testimony also addresses this technology
11 evaluation.

12
13 During this time period, FPL conducted both qualitative and quantitative
14 analyses of coal-based technologies in order to determine what the best coal-
15 based technology option was that could be brought into FPL's system to meet
16 a significant capacity need and maintain system fuel diversity starting at the
17 earliest possible date. Three coal-based technologies were examined in these
18 quantitative analyses: circulating fluidized bed (CFB) units, integrated
19 gasification combined cycle (IGCC) units, and advanced technology coal
20 units. The results of these analyses led FPL to conclude that the advanced
21 technology coal units were the best selection.

1 In 2006, using refined knowledge of the cost and characteristics of the various
2 coal technologies, FPL initiated two additional analyses to check or confirm
3 that the choice of advanced coal technology for FGPP was still the best
4 selection for FPL and its customers. These analyses included a fourth coal
5 technology, subcritical pulverized coal (PC). One of these "confirming"
6 analyses was conducted solely by FPL and one was conducted by Black &
7 Veatch (BV) in collaboration with FPL. The FPL-only analysis is discussed
8 below. The collaborative BV and FPL analysis is briefly summarized below
9 and is described in more detail in the testimony of Mr. Hicks who is a co-
10 author of the report on that analysis.

11 **Q. How was the FPL-only confirming analysis conducted?**

12 A. FPL's analysis was an economic evaluation by FPL's Resource Assessment
13 and Planning business unit of the previously mentioned four coal technology
14 options: PC, CFB, IGCC, and advanced technology coal units. FPL's
15 approach was a screening curve evaluation. This approach is commonly used
16 in the electric utility industry to compare competing generating unit or
17 technology options that are expected to be dispatched in a similar fashion on
18 a utility system (i.e., to be dispatched as baseload units, or as peaking units,
19 etc.). The approach first addresses capital costs, fixed operation and
20 maintenance (O&M) costs, and other fixed costs over the projected life of the
21 unit. These annual costs are calculated and then typically converted to a
22 levelized \$/kw and/or levelized \$/MWH (or the equivalent cents/kwh) fixed
23 cost that is independent of the capacity factor at which the unit will be

1 operated. Then, using different capacity factors ranging from zero to the
2 projected upper limit of annual availability for the unit, similar levelized \$/kw
3 or \$/MWH costs for variable costs such as variable O&M, fuel, etc. are
4 developed and added to the levelized fixed cost value to derive a levelized
5 total cost value for each capacity factor.

6
7 The levelized total cost values for each capacity factor are then graphed for
8 each capacity factor level considered. If a \$/kw data format is used, the
9 resulting values (cost lines) typically appear as straight lines with different
10 starting points and slopes. If a \$/MWH (or cents/kwh) data format is used, the
11 resulting cost lines typically appear as lines curving downward from the upper
12 left of the graph to the lower right.

13
14 Typically, one of two possible outcomes are shown by this graphic depiction
15 of the analysis results when two (or more) competing options are analyzed:

- 16 - One option's cost line may be lower than that of the second option for
17 all capacity factors up to a point (for example, up to a capacity factor
18 of 50%), then the first option's cost line will be higher than that of the
19 second option for the remaining capacity factors. This result means
20 that the first option is the more economical option if the two options
21 are expected to operate at capacity factors of less than 50%, but that

1 the second option is the more economical option if the two options are
2 expected to operate at capacity factors of 50% or greater.

3 - One option's cost line is lower than that of the second option for all
4 capacity factors considered. This result means that the first option is
5 the more economical option of the two over all possible capacity
6 factors.

7

8 For this confirming analysis, FPL's Engineering and Construction business
9 unit developed current cost and performance values for each of the four coal
10 technology types in capacity increments of approximately 980 MW (i.e.,
11 similar in size to one of the advanced technology coal units). The cost and
12 performance values for each of the four coal technologies were then utilized in
13 the screening curve analyses. Two analyses were conducted; one without the
14 inclusion of the cost of allowances to address each unit's sulfur dioxide (SO₂),
15 nitrogen oxides (NO_x), carbon dioxide (CO₂), and mercury (Hg) emissions,
16 and one with the inclusion of the allowance costs for these emissions.
17 Although CO₂ emissions are not currently regulated, the potential costs of
18 CO₂ allowances were included in this analysis to gauge the relative impact of
19 potential CO₂ regulation.

20 **Q. What were the results of FPL's screening curve analyses?**

21 A. Document No. SRS-3 presents the results of FPL's screening curve analyses
22 in a \$/MWH data format. As shown in this document, the advanced

1 technology coal unit's cost line is lower than the cost lines for each of the
2 other three technologies over the entire range of capacity factors in both the
3 analysis with, and the analysis without, allowance costs. This indicates that
4 the advanced technology coal unit is a more economical generation choice
5 than the other three technologies for all capacity factor levels.

6 **Q. Was the Black & Veatch and FPL collaborative confirming analysis**
7 **similar in nature to FPL's economic analysis that utilized a screening**
8 **curve approach?**

9 A. The approach taken in this analysis encompassed both a quantitative (i.e.,
10 economic) and qualitative or technical evaluation of the same four coal
11 technology options. In this sense, it was similar in scope to the analyses FPL
12 conducted in 2004/2005 that initially concluded that the advanced technology
13 coal option was the best selection for FPL's system. In both the economic and
14 qualitative portions of the BV and FPL evaluation, the most current technical
15 information regarding the four coal technology options was utilized.

16
17 In the economic portion of the BV and FPL collaborative analysis, a similar
18 approach (labeled as a busbar cost analysis) to that utilized in the FPL-only
19 confirming study was used and a similar conclusion was reached; i.e., the
20 advanced technology coal technology option is the most economic option for
21 FPL's system of the four technologies over all capacity factors.

1 As previously mentioned, Mr. Hicks' testimony addresses the BV and FPL
2 confirming analysis in more detail.

3 **Q. What conclusions did FPL draw from the two confirming analyses?**

4 A. The results of the confirming analyses conclusively show that the advanced
5 technology coal option is the most economical choice by a substantial and
6 meaningful margin among these four coal options and, therefore, is the most
7 cost-effective generation option available with which FPL can both meet
8 future capacity needs in the 2012 - 2015 time period and maintain fuel
9 diversity on its system.

10

11 **V. Overview of the Approach Used to Analyze the Advanced Technology**

12 **Units versus Non-Coal-Based Options**

13

14 **Q. Please provide an overview of the analysis approach FPL utilized to**
15 **evaluate the impacts of adding two advanced technology coal units to**
16 **FPL's system versus the most likely non-coal options, combined cycle**
17 **units.**

18 A. The analysis approach FPL utilized can be summarized as follows. First, as
19 explained above, FPL determined that advanced technology coal was the best,
20 most cost-effective option to both meet future capacity needs and maintain
21 system fuel diversity. FPL next developed one resource plan that includes the
22 two advanced technology coal units, the Fuel Diverse Resource Plan with
23 Coal (Plan with Coal). In this resource plan, FPL assumed that the two

1 advanced technology coal units would be added, one by June 2013 and one by
2 June 2014. FPL then developed an alternate resource plan that does not
3 include any coal unit additions, the Resource Plan without Coal (Plan without
4 Coal). Both resource plans included specific units at specific sites for the
5 earlier years and utilized generic unsited "filler" units for the later years.
6 These two resource plans are discussed in more detail later in my testimony.
7 Finally, economic and fuel diversity analyses were then carried out to
8 compare the alternate Plan without Coal to the Plan with Coal.

9 **Q. You mentioned above that "resource plans" were used in the analyses.**
10 **Why is it appropriate to perform the economic and fuel diversity analyses**
11 **based on multi-year resource plans?**

12 **A.** It is not only appropriate to do this, but also necessary if one is to capture and
13 fairly compare all of the economic and fuel diversity impacts of the various
14 capacity options included in the two resource plans designed to address FPL's
15 capacity needs for a specific time period (in this case, 2012-on) will have on
16 FPL's system.

17
18 For example, assume we are comparing Option A and Option B. Option A
19 offers 500 MW of capacity and has a heat rate of 7,000 Btu/kwh while Option
20 B has a 9,000 Btu/kwh heat rate, but offers 600 MW of capacity. Evaluating
21 these options from a resource plan perspective allows one to capture the
22 economic impacts of both the heat rate and capacity differences. The lower
23 heat rate of Option A will allow it to be dispatched more than Option B, thus

1 reducing the run time of FPL's existing units more than Option B will. This
2 results in greater production cost savings for Option A. However, Option B's
3 greater capacity means that it is better able to defer the need for future
4 capacity additions. Therefore, Option B will get greater capacity avoidance
5 benefits.

6
7 Only by taking a multi-year resource plan approach to the analysis can factors
8 such as these be captured and effectively compared. In the economic analysis,
9 the resource plans created addressed impacts to the FPL system through the
10 year 2054.

11 **Q. Why are "filler" units needed in a resource plan analysis?**

12 A. The two resource plans that FPL developed for use in the analyses each
13 contained various unit additions to address FPL's capacity needs starting in
14 2012. Specific unit types, sites for the units, and/or purchases were assumed
15 for the 2012 - 2016 time period as will be discussed later in my testimony.
16 The generic "filler" units are needed in a multi-year resource plan analysis as
17 a proxy resource added to meet FPL's capacity needs in later years. In these
18 analyses, filler units were generally used for 2017 – on (i.e., after the 2012 -
19 2016 options have been added). In this way the two resource plans being
20 compared both meet FPL's reliability criteria for each year in the analysis
21 period, ensuring both that the resource plans are comparable in regard to
22 meeting the 20% reserve margin criterion and that the results of the evaluation
23 of those plans are meaningful.

1 **Q. How were the economic analyses performed?**

2 A. The economic analyses were carried out using FPL's "integrated model." This
3 model primarily consists of a Fixed Cost Spreadsheet and the P-MArea
4 production costing model from P-Plus. The Fixed Cost Spreadsheet model
5 captures all of the fixed costs (capital, fixed O&M, capital replacement,
6 capacity payments for purchases, firm gas transportation, etc.) associated with
7 the two resource plans. The P-MArea model captures variable costs (such as
8 fuel and variable O&M) and projects the annual emission levels associated
9 with the resource plans, plus incorporating the effects of system transmission
10 transfer limits on the dispatch of generating units.

11
12 Additional spreadsheets are also used to develop two additional costs for each
13 resource plan. First, the annual emission levels projected in P-MArea are
14 downloaded to a spreadsheet and annual costs for these emissions are
15 calculated. Second, costs for transmission system losses associated with each
16 resource plan are also developed using two spreadsheets, one for peak hour
17 losses and one for annual losses.

18
19 This integrated model approach was used in FPL's last Request for Proposal
20 (RFP) evaluation work after FPL's EGEAS model was used to create the
21 various resource plans that resulted from the proposals received in response to
22 the RFP. The EGEAS model was not needed in the current economic analyses
23 because the resource plans to be compared were easily identifiable.

1 **Q. What were the bases of comparison for the economic and fuel diversity**
2 **analyses of the two resource plans?**

3 A. In regard to the economic analyses, the basis of comparison was the CPVRR
4 of the two plans over the life of the coal units (i.e., 40 years from their
5 respective in-service dates) using a number of combinations (or scenarios) of
6 forecasted fuel costs and environmental compliance costs.

7
8 In regard to the fuel diversity analyses, the basis of comparison was annual
9 system energy by fuel type for the two resource plans; i.e., a system fuel
10 diversity comparison, for the 2012 through 2016 time frame for the same fuel
11 cost and environmental compliance cost scenarios. This 5-year time frame
12 was chosen because it addresses the time period for both resource plans before
13 filler units are added.

14 **Q. Why did FPL utilize more than one fuel cost forecast and more than one**
15 **environmental compliance cost forecast in its analyses?**

16 A. In order to address the potential impacts of uncertainty in both future fuel
17 costs and environmental compliance costs on generating unit options –
18 advanced technology coal and combined cycle (CC) units - that use different
19 types of fuel, namely coal and natural gas, and which have different emission
20 profiles, 4 different fuel cost forecasts and 4 different environmental
21 compliance cost forecasts were used in the analyses. These 4 fuel cost
22 forecasts and 4 environmental compliance cost forecasts were combined to

1 allow FPL's analyses to address 16 different scenarios of forecasted fuel costs
2 and environmental compliance costs.

3
4 The specific fuel cost forecasts are discussed in detail in Mr. Yupp's and Mr.
5 Schwartz's testimonies and the specific environmental compliance cost
6 forecasts are discussed in detail in Mr. Kosky's testimony.

7
8 **VI. The Two Resource Plans Utilized in the Analyses**

9
10 **Q. Please describe the rationale for utilizing the two resource plans in the**
11 **analyses.**

12 A. FPL selected advanced technology coal units at the FGPP site as the best
13 choice to meet future capacity needs and maintain fuel diversity in FPL's
14 system. For analysis purposes, specific in-service dates are required and FPL
15 analyses assume that the two coal units will come in-service in June 2013 and
16 June 2014, respectively. However, in order to fully evaluate that selection,
17 FPL needed to develop a long-term resource plan that could be used to
18 analyze the long-term system impacts of the addition of the advanced
19 technology coal units. This is the Plan with Coal. In addition, FPL needed to
20 develop an alternative resource plan that did not include coal unit additions
21 that could be used in comparative analyses with the coal-based resource plan.
22 This is the alternate Plan without Coal.

23

1 In developing these resource plans, FPL had several criteria. First, each
2 resource plan chosen must meet FPL's system reliability criteria for all years,
3 especially the reliability criterion that currently drives FPL's resource needs,
4 the 20% Summer reserve margin criterion. This ensures that the resource
5 plans will be both meaningful and comparable in regard to system reliability.
6 Second, the cost and performance assumptions (heat rate, availability, etc.) for
7 the generating units that are included in each resource plan should be current
8 assumptions of comparable confidence levels. Third, the resource plans
9 should focus as much as possible on the assumed in-service or decision years
10 in question, 2013 and 2014 and the immediately surrounding years, and
11 should seek to minimize as much as possible influencing the cost and other
12 system impact differences between resource plans that could be caused by the
13 addition of units and/or purchases in other years.

14
15 In regard to meeting the first criterion listed above, the 20% reserve margin
16 criterion, the following discussion provides an example, using the Plan with
17 Coal, of how that criterion was met for the two resource plans. First,
18 Document No. SRS-4 presents a revised projection of FPL's capacity needs
19 assuming that the two advanced technology coal units are added, one in June
20 2013 and one in June 2014. By comparing this document with Document No.
21 SRS-1, it is clear that the capacity need for 2012 is the same, 777 MW. The
22 addition of the 2013 advanced technology coal unit with a Summer capacity
23 rating of 980 MW reduces the 2013 need from 1,194 MW to 214 MW. The

1 addition of the 2014 advanced technology coal unit, also with a Summer
2 capacity rating of 980 MW, fully meets the 2014 capacity need. The addition
3 of these two units also reduces the 2015 capacity need by half; i.e., from the
4 incremental need of (2,283 MW for 2015 – 1,644 MW for 2014 =) 639 MW
5 for 2015 presented in Document No. SRS-1 to 323 MW shown in Document
6 No. SRS-4. In order to meet the remaining capacity needs in 2012 and 2013,
7 FPL has assumed for the purpose of these analyses that a short-term
8 purchase(s) of 800 MW for 2012, and 200 MW for 2013, would be made. It
9 was assumed that each purchase would be made for 5 months, May through
10 September, of each year.

11
12 The two resource plans are presented in Document No. SRS-5. Both resource
13 plans meet all of the criteria discussed above.

14 **Q. Does the resource plan that includes coal generation, the Plan with Coal,**
15 **represent FPL's definitive long-term resource plan?**

16 A. No. FPL believes that the advanced technology coal units included in the Plan
17 with Coal represent the best choice for meeting FPL's capacity needs and for
18 maintaining fuel diversity in FPL's system. These units are the best options to
19 add by 2013 and 2014.

1 The short-term purchases for 2012 and 2013, and the remaining generating
2 units included in the Plan with Coal for the years following 2014, are
3 reasonable assumptions for meeting system capacity need requirements based
4 on the objective of maintaining system fuel diversity. However, because FPL
5 is not at this time making definitive selections for 2012, for the relatively
6 small additional capacity need in 2013, or for the years beyond 2014, these
7 other capacity additions included in the Plan with Coal would be re-evaluated
8 in the future using updated information when it is necessary to make those
9 resource decisions. Thus FPL believes that the Plan with Coal includes the
10 best generation options to add by 2013 and 2014, and includes reasonable and
11 representative capacity additions for all years, but that these other capacity
12 additions could change in the future due to re-evaluation and/or evolving
13 factors.

14 **Q. Does the alternative resource plan, the Plan without Coal, represent**
15 **FPL's definitive long-term resource plan that includes no coal?**

16 A. No. The generating units included in the alternative resource plan, the Plan
17 without Coal, would be reasonable choices for meeting system capacity need
18 requirements except for the fact that, as stated in Mr. Silva's testimony, these
19 units would not maintain system fuel diversity. In addition, FPL would not
20 have to make a final decision on gas-fired generation for a 2012 in-service
21 date until 2008 when updated information would be available. For these
22 reasons, although this alternate resource plan is well-suited for use as an

1 alternative, non-coal-based resource plan by which the Plan with Coal can be
2 compared, it is not a definitive long-term resource plan for FPL.

3 **Q. In developing the two resource plans, what assumptions were made in**
4 **regard to the near-term, 2012 - 2016, unit additions?**

5 A. In developing the two resource plans presented in Document No. SRS-5,
6 several assumptions were made regarding the capacity additions for 2012 -
7 2016 time period. First, it was assumed for analysis purposes that all new unit
8 additions in both resource plans would have a June 1 in-service date for the
9 respective year in which the capacity addition is needed to meet the reserve
10 margin requirement. For example, the first advanced technology coal unit
11 would be added to FPL's system on June 1, 2013 with the second advanced
12 technology coal unit added in June 1, 2014. Second, the FGPP site and a site
13 at/near the West County Energy Center (referred to in the analyses as the
14 South Florida site) would be the most likely sites for the next several FPL
15 generating unit additions. Third, it was assumed that the FGPP site would be
16 able to accommodate two large generating units, either coal-based or gas-
17 fired, and that the South Florida site would be able to accommodate one large
18 gas-fired generating unit. Fourth, it was assumed that the first gas-fired unit
19 addition would be located at the South Florida site because it would be more
20 economical. Fifth, in regard to the size of the likely gas-fired units (i.e., CC
21 units) included in the plans, FPL's recent analyses indicate that the most cost-
22 effective size for CC units is in the 1,100 to 1,200 MW range. Therefore, it

1 was assumed that the next several CC units added would be in the 1,100 to
2 1,200 MW range.

3
4 In regard to the 2012 - 2016 time period, the Plan with Coal thus includes the
5 previously mentioned short-term purchases of 800 MW (in 2012) and 200
6 MW (in 2013), plus two advanced technology coal units of 980 MW each,
7 FGPP 1 and 2, that come in-service in 2013 and 2014, respectively. A 1,219
8 MW CC unit is assumed to be added at the South Florida site in 2015 to meet
9 the 2015 need. This CC unit addition also satisfies the 2016 capacity need.

10
11 The Plan without Coal first addresses the 2012 capacity need by adding a
12 1,219 MW CC unit at the South Florida site in 2012. Because the cumulative
13 capacity need for 2012 and 2013 is 1,194 MW as shown in Document No.
14 SRS-1, this 1,219 MW unit also meets FPL's 2013 capacity need. FPL's
15 remaining capacity needs from 2014 through 2016 are addressed in the Plan
16 without Coal by a pair of 1,119 MW CC units sited at FGPP, one in 2014 and
17 one in 2016.

18 **Q. In developing the two resource plans, what assumptions were made in**
19 **regard to 2017 - on unit additions?**

20 A. Several assumptions were also made regarding the 2017 – on time period unit
21 additions for the two resource plans. First, each plan assumes that one nuclear
22 unit is added in 2018 and another is added in 2019. This assumption reflects
23 FPL's interest in addressing system fuel diversity in the future with new

1 nuclear capacity additions if such additions prove feasible. These new nuclear
2 unit additions are assumed, for planning purposes, to be sited in Southeast
3 Florida. Second, the remainder of FPL's capacity needs for 2017 and for
4 2020-on, are assumed to be met by the requisite number of unsited 2x1 CC
5 filler units to meet FPL's system reserve margin requirements. While the
6 timing of these filler units varies slightly between the two resource plans, the
7 number of filler units that is added from 2020-on is identical in each plan.

8
9 **VII. Fuel Cost and Environmental Compliance Cost Forecasts and Scenarios**
10 **Used in the Analyses**

11
12 **Q. Please discuss the use of different fuel cost forecasts in the analyses.**

13 A. When comparing generating technologies that burn different fuels, i.e., coal
14 units versus natural gas units, it is appropriate that different fuel cost forecasts
15 be utilized in order to determine the relative economics between the two
16 technologies. In this way the analyses can address the uncertainty that exists
17 regarding future fuel costs, particularly in regard to the future cost differential
18 between natural gas and coal.

19
20 Although there are virtually an inexhaustible number of possible future fuel
21 cost outcomes, a small number of forecasts that effectively reflect a
22 reasonable range of future fuel costs are sufficient to conduct a meaningful
23 economic analysis. Consequently, 4 different fuel cost forecasts that reflect a

1 reasonable range of future fuel costs were developed and used in these
2 analyses. These 4 fuel cost forecasts, referred to as Fuel Cost Forecast 1
3 through Fuel Cost Forecast 4, are summarized in Document No. SRS-6. Mr.
4 Yupp's testimony discusses these forecasts in more detail, including an
5 explanation of how the fuel cost forecasts were developed and why they
6 effectively reflect a reasonable range of future fuel costs.

7 **Q. Please discuss the use of different environmental compliance cost**
8 **forecasts in the analyses.**

9 A. Just as there is uncertainty in regard to the future cost of fuels, there is
10 uncertainty in regard to the future environmental regulations and the costs of
11 complying with those regulations. When comparing generating technologies
12 that burn different fuels and have different emission profiles, such as is the
13 case with coal and natural gas units, the future environmental regulations will
14 determine how the differences in the emission profiles of the generating
15 technologies will affect the relative cost of the technologies. Therefore, FPL
16 found it appropriate to conduct its analyses using different environmental
17 compliance cost forecasts to address the uncertainty that exists regarding
18 future environmental regulations and the costs of complying with those
19 regulations.

20
21 As is the case with future fuel costs, there are also a large number of future
22 environmental cost outcomes. However, a small number of forecasts that
23 effectively reflect a reasonable range of future environmental compliance

1 costs are sufficient to conduct a meaningful economic analysis. Therefore, 4
2 different environmental compliance cost forecasts that reflect a reasonable
3 range of future environmental compliance costs were developed and used in
4 these analyses. These 4 environmental compliance cost forecasts, referred to
5 as Environmental Compliance Cost Forecast A through Environmental
6 Compliance Cost Forecast D, are summarized in Document No. SRS-7. Mr.
7 Kosky's testimony discusses these forecasts in more detail, including an
8 explanation of how the environmental compliance cost forecasts were
9 developed and why they effectively reflect a reasonable range of future
10 environmental compliance costs.

11 **Q. How did FPL make use of the 4 fuel cost forecasts and 4 environmental**
12 **compliance cost forecasts in its analyses?**

13 A. FPL combined each of the 4 fuel cost forecasts with each of the 4
14 environmental compliance cost forecasts to develop 16 scenarios of forecasted
15 fuel costs and environmental compliance costs. Each of these 16 scenarios
16 was then utilized separately in both the economic and fuel diversity analyses
17 of the two resource plans.

18
19 Because the fuel cost forecasts are designated as 1 through 4 and the
20 environmental compliance cost forecasts are designated as A through D, the
21 16 scenarios of fuel costs and environmental compliance costs are designated
22 as Scenario 1A, Scenario 1B, etc. through Scenario 4D.

1 **VIII. Results of the Economic Analyses**

2

3 **Q. You previously indicated that FPL's IRP process was used in these**
4 **analyses. Was the economic analysis used to compare the two resource**
5 **plans similar to that used in FPL's last several determination of need**
6 **filings?**

7 A. Yes. The approach used in this economic analysis work was virtually identical
8 to the approach used in FPL's most recent Need filings (i.e., the filings for the
9 Turkey Point 5 and the West County Energy Center 1 and 2 generating units)
10 with one exception, the current utilization of multiple fuel cost and
11 environmental compliance cost forecasts. The rationale for the use of multiple
12 fuel cost and environmental compliance cost forecasts was discussed in the
13 prior section of this testimony.

14

15 The economic analysis approach addresses total system costs for the
16 generating system (including all fixed and non-fixed costs), transmission
17 system costs, upstream gas costs, and cost of capital impacts. In this particular
18 application of the approach, FPL has combined transmission capital costs for
19 both interconnection and integration into a transmission capital cost category.

20

21 In addition, there were no upstream gas costs and no cost of capital impact
22 (i.e., no equity adjustment) calculation was needed. The upstream gas cost
23 adder is essentially used to account for the combined effect of one or more

1 gas-fired option that is offered to FPL from an outside party for use in an
2 resource plan (such as when bids are received by FPL in response to a Request
3 for Proposals). Because FPL was assumed to supply all of the gas-fired units
4 in each resource plan and the amount of gas needed by, and timing of, those
5 units was known in advance when creating the resource plans, all gas-related
6 costs were accounted for in the unit cost information and no upstream cost
7 adders were needed.

8
9 Likewise, all cost of capital impacts were already accounted for by assuming
10 an incremental 55.8% debt / 44.2% equity investment in each new unit in each
11 resource plan. Therefore, no equity adjustment calculation was needed in
12 these economic analyses.

13
14 In order to show that the same cost categories were addressed in these
15 economic analyses as were addressed in FPL's most recent Need filings,
16 Document No. SRS-8 presents the economic evaluation results for the two
17 resource plans for one fuel cost and environmental compliance cost scenario,
18 Scenario 1A, using the same presentation format that FPL used in its most
19 recent Need filings. As discussed above, because the costs for Upstream Gas
20 Pipeline and Net Equity Adjustment are zero for both of the two resource
21 plans, these cost categories are not shown.

1 In this document, only the costs for the Generation System are presented.
2 These Generation System costs are broken out into two categories, Fixed
3 Costs and Variable Costs, and a list of what costs are included in these two
4 categories is shown on the page.

5 **Q. How were the environmental compliance costs captured in the economic**
6 **analyses?**

7 A. The environmental compliance costs were captured in the economic analyses
8 through 4 steps. First, for each fuel cost and environmental compliance cost
9 forecast scenario, the production costing analyses carried out with the P-
10 MArea model include a projection of the cost of allowances for each
11 applicable emission category. Using the emission rates for each generation
12 unit in FPL's system, P-MArea incorporates the allowance costs for each
13 emission into the dispatch cost for each generating unit and dispatches the
14 generating units on an economic basis to minimize system production costs.

15
16 Second, once the production cost projection was completed, the costs of the
17 allowances included in the production costs were subtracted from the
18 production cost projection. Third, the projected annual system emission levels
19 were extracted from the P-MArea results and compared to a projection of the
20 allowance levels for each emission that are assumed to be granted to FPL.
21 (For purposes of these analyses, FPL assumed that no CO₂ allowances would
22 be granted. This assumption serves to maximize the potential cost of

1 complying with potential CO₂ regulations.) The annual differences between
2 emissions and allowances for each emission type are then calculated.

3
4 Finally, for each year in which FPL's allowances are less than the projected
5 amount of emissions for each emission type, the net deficit amount of
6 allowances needed to cover emissions is multiplied by that year's projected
7 allowance cost to derive a compliance cost for that year. Conversely, for each
8 year in which FPL's allowances exceed the projected amount of emissions,
9 the net excess amount of allowances is multiplied by that year's projected
10 allowance cost to derive the value of the excess allowances that could be sold.

11 This value is entered as a negative compliance cost for that year. If the amount
12 of allowances exactly equals the projected emissions for a given year, there is
13 no net deficit or excess allowances for the year and, therefore, a zero
14 compliance cost is entered for that year. The compliance costs – positive,
15 negative, or zero – for each year are then summed over the analysis period and
16 the present value of that sum is calculated. This present value amount is then
17 added to P-MArea's fuel and variable O&M costs to derive the Generation
18 System Variable Costs for that scenario.

19 **Q. What conclusions can be drawn from these results shown in Document**
20 **No. SRS-8?**

21 A. It is important to remember that the results shown in Document No. SRS-8
22 provide a comparison of only the Generation System costs for the two
23 resource plans (i.e., the Transmission System costs are not yet included) under

1 only one of the 16 fuel cost and environmental compliance cost scenarios,
2 Scenario 1A.

3
4 Document No. SRS-8 shows that the Plan with Coal is approximately \$2,808
5 million CPVRR less expensive than is the Plan without Coal for Scenario 1A.

6 Although this exact result is valid for only one of the 16 fuel cost and
7 environmental compliance cost scenarios, these values do indicate two cost
8 results that will hold true for all of the analyses to follow involving the
9 remaining 15 scenarios.

10
11 The first such result is that the Plan with Coal has higher fixed costs and lower
12 variable costs than does the Plan without Coal. This is expected because the
13 Plan with Coal contains the advanced technology coal units while the Plan
14 without Coal does not contain coal units. Coal units have higher capital costs,
15 but have lower energy costs than combined cycle units so a resource plan
16 containing coal units is expected to have higher fixed costs and lower variable
17 costs than a comparable plan without coal units. The second such result is that
18 the Generation System Fixed Costs for each of the two plans are established
19 solely by the generation capacity additions in that resource plan and will not
20 change as fuel costs and/or environmental compliance costs change.
21 Therefore, the Generation System Fixed Costs shown in this document for the
22 two resource plans will remain unchanged for all 16 fuel cost and

1 environmental compliance cost scenarios while the Generation System
2 Variable Costs will change from one scenario to another.

3 **Q. How did these results change when the Transmission System costs are**
4 **included?**

5 A. Document No. SRS-9, using the same presentation format as Document No.
6 SRS-8, adds the Transmission System costs to the Generation System costs.
7 The resulting total costs for the two plans for Scenario 1A are also shown. The
8 addition of the Transmission System costs changes the result only slightly
9 with the Plan with Coal being \$2,792 million CPVRR less expensive than the
10 Plan without Coal for this scenario.

11
12 Similar to Generation System Fixed Costs, Transmission System costs are
13 driven by the units being added, the sites at which those units are added, and
14 the timing of the unit additions; i.e., by the resource plans themselves. These
15 costs are not affected by fuel costs and/or environmental compliance costs.
16 Therefore, the Transmission System costs shown in this document will remain
17 unchanged for all of the 15 remaining fuel cost and environmental compliance
18 cost scenarios because the two resource plans will not change.

19
20 In regard to the Transmission System costs presented in Document No. SRS-
21 9, there is relatively little difference in the costs between the two resource
22 plans. This fact, when added to the fact mentioned above that Transmission
23 System costs will remain unchanged for all fuel cost and environmental

1 compliance cost scenarios, results in a conclusion that transmission-related
2 costs are not a deciding factor in the analyses.

3 **Q. Please explain the nature of these Transmission System costs.**

4 A. The transmission capital costs are for new transmission facilities required to
5 connect the sited new plant additions in each resource plan to, and integrate
6 them with, the transmission system. Mr. Sanchez's testimony addresses what
7 those transmission facilities are and Mr. Coto's testimony addresses the
8 physical characteristics, schedule, permitting requirements, and estimated
9 costs associated with those facilities.

10

11 In addition, Mr. Sanchez's testimony also discusses, for each resource plan,
12 the calculation of losses for both FPL's system peak hour and annually that
13 were developed. These losses are then assigned costs to first represent the loss
14 of capacity at FPL's system peak hour that will eventually need to be
15 addressed by replacement capacity and then the loss of energy to FPL's
16 system during the year that will need to be met by increased energy delivered
17 by FPL's existing units.

18 **Q. How did FPL develop the costs that were assigned to both the peak hour
19 losses and the annual losses?**

20 A. FPL's approach to assigning costs to these losses is identical to that discussed
21 in Appendix E of FPL's last RFP issued on September 9, 2005. In regard to
22 assigning costs to the peak hour loss, FPL first assumed that replacement
23 capacity in the form of purchased power would be secured to address the peak

1 hour capacity loss. FPL assigned an initial proxy purchase cost of \$5/kw-
2 month, with an annual escalation rate of 2%, for that replacement capacity.

3
4 In assigning costs to the annual energy losses, FPL first had to convert the
5 peak hour losses (MW) and the average load losses (MW) into annual energy
6 losses (MWH) for all years in the analysis period. The peak hour loss (MW)
7 value for each portfolio was multiplied by 876 hours (FPL assumed 10 % of
8 the annual hours were on-peak) to obtain a peak hour energy loss (MWH).
9 This value was multiplied by an on-peak marginal energy cost to obtain an on-
10 peak energy loss cost. The average load loss (MW) value was multiplied by
11 the 6,570 annual hours (to reflect the fact that the units in the resource plans
12 are baseload units) to derive an off-peak energy loss (MWH). This value was
13 multiplied by an off-peak marginal energy cost to obtain an off-peak energy
14 loss cost. FPL used Fuel Cost Forecast 1 to develop marginal fuel costs for
15 both peak hours and off-peak hours.

16
17 The on-peak and off-peak annual energy loss costs were then summed to
18 derive a total annual energy loss cost. Document No. SRS-10 and Document
19 No. SRS-11, respectively, present the calculations of costs for the peak hour
20 capacity losses and annual energy losses for the Plan with Coal relative to the
21 Plan without Coal.

1 **Q. What were the results of the economic analyses in which all 16 of the fuel**
2 **cost and environmental compliance cost scenarios were included?**

3 A. Document No. SRS-12 presents the total costs for the two resource plans for
4 all 16 of these scenarios. In addition, the total cost differences between the
5 Plan with Coal and the Plan without Coal are also shown. The total cost
6 results shown on this document for Scenario 1A for the two resource plans are
7 the same as the total cost results presented for the two resource plans in
8 Document No. SRS-9.

9
10 The total cost results shown on Document No. SRS-12 for the remaining 15
11 scenarios have not been previously presented. However, by examining
12 Document No. SRS-9 and Document No. SRS-12 and considering that the
13 Generation System Fixed Costs and Transmission System Costs shown on
14 Document No. SRS-9 do not change as the scenarios change, it is clear that all
15 of the cost differences shown on Document No. SRS-12 are due to the
16 Generation System Variable Cost category on Document No. SRS-9; i.e.,
17 from changes in the fuel costs and/or environmental compliance costs.

18
19 In regard to the column titled Total Cost Difference in Document No. SRS-12,
20 a negative value indicates that the costs for the Plan with Coal are lower than
21 those of the Plan without Coal while a positive value indicates that the costs
22 for the Plan with Coal are higher than those of the Plan without Coal.

1 Document No. SRS-12 shows that, as expected, neither of the two resource
2 plans emerges as the economic choice under all scenarios of fuel cost
3 forecasts and environmental compliance cost forecasts. Both plans emerged as
4 the most economic choice in approximately half of the 16 scenarios; in 7
5 scenarios for the Plan with Coal and in 9 scenarios for the Plan without Coal.

6
7 Document No. SRS-12 provides a significant amount of cost and cost
8 differential data for the two resource plans (and I'll return to discuss the
9 information contained in this document later). In order to simplify this
10 comparison of costs for the two plans, the cost differentials for the two plans
11 that are shown in Document No. SRS-12 are reorganized and presented again
12 in Document No. SRS-13. The intent is to provide a somewhat more easily
13 understood summary of the Total Cost Difference column results in Document
14 No. SRS-12.

15 **Q. How would you summarize the information for each resource plan that is**
16 **presented in Document No. SRS-13?**

17 A. First, in regard to the Plan with Coal and the 16 scenarios:

- 18 - The Plan with Coal is the most economic plan in all scenarios that
19 included the High coal-gas differential Fuel Cost Forecast 1, regardless of
20 the environmental compliance cost forecast; i.e., in scenarios 1A, 1B, 1C,
21 and 1D.

- 1 - It is also the most economic plan in scenarios 2A and 2B that include the
2 Shocked coal-gas differential Fuel Cost Forecast 2 and the two lowest
3 environmental compliance cost forecasts (A and B).
- 4 - The Plan with Coal is the most economic plan in scenario 3A which
5 includes the Medium coal-gas differential Fuel Cost Forecast 3 and the
6 lowest environmental compliance cost forecast (A).

7

8 Second, in regard to the Plan without Coal and the 16 scenarios:

- 9 - The Plan without Coal is the most economic plan in all scenarios that
10 included the Low coal-gas differential Fuel Cost Forecast 4, regardless of
11 the environmental compliance cost forecast; i.e., in scenarios 4A, 4B, 4C,
12 and 4D.
- 13 - The Plan without Coal is also the most economic plan in scenarios 3B, 3C,
14 and 3D that include the Medium coal-gas differential Fuel Cost Forecast 3
15 and the three highest environmental compliance cost forecasts (B, C, and
16 D).
- 17 - The Plan without Coal is the most economic plan in scenarios 2C and 2D
18 that include the Shocked coal-gas differential Fuel Cost Forecast 2 and the
19 two highest environmental compliance cost forecasts (C and D).

20 **Q. What conclusions did FPL draw from the economic analysis results?**

21 A. As expected, no one plan emerged as the economic choice under all fuel cost
22 and environmental compliance cost forecast scenarios. The Plan with Coal
23 emerged as the economic choice in 7 of the 16 scenarios.

1 More specifically, the Plan with Coal emerges as the economic choice under
2 all 4 scenarios that include the High coal-gas differential fuel cost forecast
3 regardless of the environmental compliance cost forecast. Conversely, the
4 Plan without Coal emerges as the economic choice under all 4 scenarios that
5 include the Low coal-gas differential fuel cost forecast. As for the remaining 8
6 scenarios that include either the Shocked or Medium coal-gas differential fuel
7 cost forecasts, each plan emerges as the economic choice in two of the four
8 scenarios that include the Shocked fuel cost forecast while the Plan without
9 Coal generally emerges as the economic choice with the Medium coal-gas
10 differential fuel cost forecasts.

11
12 Another important conclusion can be drawn from examination of the Total
13 Cost column in Document No. SRS-12. In those scenarios that include the
14 Low coal-gas differential fuel cost forecasts in which the Plan with Coal was
15 not the economic choice, the total system costs for either plan are significantly
16 lower than the total costs for scenarios that include either the High or Shocked
17 coal-gas differential fuel cost forecasts. The same is true to a lesser extent for
18 the total costs in those scenarios that include the Medium coal-gas differential
19 fuel cost forecasts compared to the total costs for scenarios that include either
20 the High or Shocked coal-gas differential fuel cost forecasts.

21
22 These scenarios with lower total costs for both plans are primarily driven by
23 lower natural gas price projections. In these cases, because FPL will have very

1 significant amounts of natural gas generation even after FGPP is added, FPL's
2 customers will enjoy the benefits of lower natural gas costs after FGPP is
3 added to FPL's system.

4
5 This point is illustrated by the fact that the cost differential between the two
6 resource plans for Scenario 4D, \$4,037 million CPVRR, is much smaller than
7 the projected cost change in the cost of the Plan without Coal under two
8 scenarios that differ only by the projected fuel cost. This can be seen by
9 examining the total costs for the Plan without Coal for scenario 1D (\$182,917
10 million CPVRR) and for scenario 4D (\$106,154 million CPVRR). In this
11 example, this projected decrease in total costs of approximately \$77,000
12 million, or \$77 billion CPVRR is driven solely by the projected lower system
13 fuel costs in Scenario 4D, particularly lower natural gas costs. Of this
14 potential total cost savings to FPL's customers of \$77 billion CPVRR that
15 would occur if the Plan without Coal had been adopted, approximately \$73
16 billion CPVRR cost savings will still be realized with the implementation of
17 the Plan with Coal.

18
19 In other words, the Plan with Coal acts as a hedge or insurance against higher
20 natural gas costs.

1 **Q. Do these economic analysis results capture all comparative aspects**
2 **between the two resource plans for which costs could be assigned?**

3 A. No. There is one comparative aspect of the two resource plans that has not
4 been addressed in the economic analyses. This aspect involves system
5 reliability in the event of a significant fuel supply disruption.

6
7 As previously discussed, the two plans are comparable in regard to meeting
8 FPL's reserve margin criterion. However, the two plans are not comparable in
9 regard to their contribution to system reliability in event of a significant fuel
10 supply disruption. The advanced technology coal units at the FGPP site in the
11 Plan with Coal are designed to accommodate a 60-day supply of fuel on-site.
12 In comparison, the combined cycle unit additions in 2012 - 2016 in the Plan
13 without Coal contain on-site backup fuel (i.e., oil) capability of only several
14 days. Consequently, the Plan with Coal, due to the inclusion of the two
15 advanced technology coal units at FGPP, has a significant advantage in regard
16 to system reliability in the event of a significant fuel supply disruption.

17
18 In its economic analyses, FPL chose not to attempt to quantify this advantage
19 of the Plan with Coal because the quantification would be dependent upon a
20 number of subjective assumptions including: the likelihood of such a fuel
21 supply disruption occurring, the duration of the disruption, in which year(s)
22 the disruption might occur, etc. Therefore, this real advantage of the FGPP
23 advanced technology coal units is not addressed in the economic analyses.

1 **Q. Has FPL developed cost estimates for providing a comparable level of**
2 **system on-site fuel storage for the Plan without Coal?**

3 A. Yes. These costs are estimated to be approximately \$1.4 to \$1.5 billion
4 CPVRR. Mr. Yupp's testimony addresses these estimated costs.

5 **Q. Has FPL calculated the non-fuel costs for the first 12 months of operation**
6 **for FGPP 1 and 2?**

7 A. Yes. These costs are presented in Document No. SRS-14. The costs presented
8 in Document No. SRS-14 of \$708.5 million for FGPP 1 and \$469.0 million
9 for FGPP 2 assume a June 1, 2013 in-service date for FGPP 1 and a June 1,
10 2014 in-service date for FGPP 2. The costs are also based on the in-service
11 costs and financial assumptions used in the economic analyses discussed
12 above. As discussed in the testimony of Mr. Yeager, the actual in-service
13 costs are subject to change for a variety of reasons. If the in-service costs were
14 to change from those assumed in these analyses, the values projected in
15 Document No. SRS-14 would also change.

IX. Results of the Fuel Diversity Analyses

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Q. How were the effects of the two plans on FPL's system fuel diversity evaluated?

A. The effects of the two resource plans on FPL's system fuel diversity were evaluated by projecting the annual percentage of system energy that is supplied by each fuel type - coal/petroleum coke, natural gas, oil, nuclear, and other (primarily purchases such as from waste-to-energy facilities) - for both resource plans for the 2012 - 2016 time period; i.e., a system fuel mix projection. This 5-year time period addresses the years before filler units are added to the resource plans.

Generation unit dispatch is affected by the types of generating units available, the fuels they use, and the relative fuel costs and/or environmental compliance costs. Because unit dispatch determines the relative amount of energy that is supplied by each unit, and consequently by each fuel type, the system fuel mix is also affected by the types of generating units available, the fuels they use, and the relative fuel costs and/or environmental compliance costs. Consequently, the fuel diversity results will be presented for each resource plan for two scenarios, Scenarios 1A and 4D, selected to represent the entire range of fuel cost and environmental compliance cost forecasts.

1 **Q. What were the differences in the FPL system fuel mix between the two**
2 **resource plans?**

3 A. Document No. SRS-15 presents the annual projection for 2012 - 2016 of the
4 percentage of energy produced by coal/petroleum coke, natural gas, oil,
5 nuclear, and other for the two resource plans for the two scenarios. The
6 document also presents the annual differences in these percentages for each
7 fuel type between the Plan with Coal and the Plan without Coal for the two
8 scenarios for the same time period.

9
10 As shown in Document No. SRS-15, the Plan with Coal holds a significant
11 advantage in regard to fuel diversity compared to the Plan without Coal. There
12 is little difference between the two plans in regard to the percent of FPL's fuel
13 mix that is supplied by oil, nuclear, or other, but significant differences exist
14 for coal/petroleum coke (coal) and natural gas. When looking at the results for
15 Scenario 1A for the year 2016, it is projected that the Plan with Coal will
16 result in FPL's system supplying approximately 18% of its energy with coal
17 and 60% with natural gas. By comparison, it is projected that the Plan without
18 Coal will result in FPL's system supplying only 7% of its energy with coal
19 and 71% with natural gas. Thus the Plan with Coal is projected to result in a
20 10-to-11% increase in the contribution from coal, and a corresponding 10-to-
21 11% decrease in the contribution from natural gas, in 2016. A similar change
22 in the percentage contribution from these two fuels is also shown for 2015,

1 another year in which both advanced technology coal units are in-service for a
2 full year.

3
4 For Scenario 4D, the contribution from coal is also projected to increase by
5 approximately 10%, while the contribution from natural gas is projected to
6 decrease by approximately 10%, for the Plan with Coal.

7
8 Therefore, the Plan with Coal is projected to have a significant fuel diversity
9 advantage over the Plan without Coal, resulting in the FPL system being 10-
10 to-11% more reliant on coal, and 10-to-11% less dependent on natural gas.

11

12 **X. Adverse Consequences of Not Approving FGPP 1 and 2**

13

14 **Q. Would there be adverse consequences if a Need Determination for FGPP**
15 **1 and 2 was not approved?**

16 A. Yes. If FPL's request for a Need Determination for FGPP 1 and 2 is not
17 approved, there would be a significant negative impact in regard to
18 maintaining fuel diversity in FPL's system.

19 **Q. Please discuss the negative impact to FPL's system in regard to**
20 **maintaining fuel diversity if a Need Determination for FGPP 1 and 2 is**
21 **not approved.**

22 A. As evidenced by the fuel diversity results presented in Document No. SRS-15
23 and discussed above, the FPL system is projected to be 10-to-11% more

1 dependent on natural gas, and 10-to-11% less reliant on coal, if the FGPP 1
2 and 2 units included in the Plan with Coal are not approved.

3
4 Therefore, if FGPP 1 and 2 advanced technology coal units are not added by
5 2013 and 2014 as projected in the Plan with Coal, FPL's system will be
6 significantly more dependent upon natural gas. Such an occurrence would
7 represent a significant reduction in system fuel diversity, thus increasing the
8 exposure of FPL's customers to greater fuel price volatility and resulting in a
9 less reliable system.

10
11 Inherent in this discussion and in the analysis results is the assumption that, if
12 a Need Determination for FGPP 1 and 2 is not approved, it would take an
13 extended period of time before other coal-based capacity could be added to
14 FPL's system. It would take a significant amount of time for FPL to be able to
15 propose new coal-based capacity.

16
17 A consequence of FGPP 1 and 2 not receiving Need Determination approval
18 in this docket is that the window of opportunity for bringing new coal-based
19 capacity into FPL's system by 2013 will likely have passed. FPL would then
20 have to seek other, non-coal-based new capacity options for meeting the 2013
21 capacity needs. Such capacity would likely come from new gas-fired options.
22 At best, the earliest new coal-based capacity could be considered for additions
23 to the FPL system would be 2014.

- 1 2) An economic comparison of a Plan with Coal (that included FGPP 1
2 and 2) versus a Plan without Coal for 16 scenarios of fuel costs and
3 environmental compliance costs showed that neither resource plan
4 had a distinct advantage throughout the range of scenarios. Each
5 resource plan was the economic choice in approximately half of the
6 scenarios, 7 for the Plan with Coal and 9 for the Plan without Coal.
- 7 3) However, when comparing the CPVRR total cost differential between
8 the two resource plans for those scenarios in which the Plan without
9 Coal was the economic choice, the total cost disadvantage of the Plan
10 with Coal versus the Plan without Coal, a maximum of approximately
11 \$4 billion CPVRR, is significantly lower than was the total cost
12 differential for the Plan without Coal when comparing total costs for
13 the High and Low fuel cost forecasts for the same environmental
14 compliance cost forecast, a difference of approximately \$77 billion
15 CPVRR. Therefore, FPL's customers will experience significant total
16 cost savings if actual fuel costs more closely match Fuel Cost
17 Forecast 4 (Low coal-gas differential) than Fuel Cost Forecast 1
18 (High coal-gas differential). These savings of approximately \$77
19 billion CPVRR would only be reduced by a comparatively small
20 amount, \$4 billion or less CPVRR, if the Plan with Coal had been
21 selected, still resulting in savings of approximately \$73 billion
22 CPVRR. Therefore, the Plan with Coal can be viewed as a reasonable

1 cost hedge or insurance against high fuel costs, primarily high natural
2 gas costs.

3 4) The Plan with Coal has a significant advantage in regard to system
4 fuel diversity. The projected system fuel mix values for 2015 and
5 2016, the first years that include a full year's operation of both FPGG
6 units, show that the Plan with Coal would increase the FPL's
7 system's use of coal by 10-to-11%, while reducing its dependence on
8 natural gas by 10-to-11%, compared to the Plan without Coal.

9 **Q. Please summarize your testimony.**

10 A. FPL's 2006 resource planning work determined that FPL has future capacity
11 needs starting in 2012 through 2015 that total 2,283 MW of incremental
12 capacity (power plant construction and/or new purchases) or 1,904 MW at the
13 generator of additional cost-effective DSM. All DSM that is known to be cost-
14 effective has already been reflected in FPL's 2006 resource planning work.
15 Therefore, in order to meet FPL's Summer reserve margin criterion of 20%
16 through 2015, FPL needs 2,283 MW of new capacity (power plant
17 construction and/or purchase).

18
19 FPL also determined that a key objective during this resource planning cycle
20 was to select a capacity option that would maintain FPL's system fuel
21 diversity. Because FPL's future capacity needs begin starting in 2012, coal
22 technology options were the options of choice both to address these relatively
23 near-term future capacity needs and to maintain system fuel diversity. FPL

1 subsequently analyzed 4 coal technologies and selected ultra-supercritical
2 pulverized coal technology as the best, most cost-effective choice to meet its
3 capacity needs and maintain system fuel diversity.

4
5 FPL developed a Plan with Coal that included the two FGPP advanced
6 technology coal units, and an alternate Plan without Coal, in order to
7 determine the economic and fuel diversity impacts of adding the advanced
8 technology coal units. FPL's analyses compared the Plan with Coal to the
9 alternate Plan without Coal under 16 scenarios of forecasted fuel costs and
10 environmental compliance costs.

11
12 The economic analyses showed that from a total CPVRR cost perspective
13 each resource plan emerged as the lower cost plan in approximately half of the
14 scenarios, 7 for the Plan with Coal and 9 for the Plan without Coal. However,
15 when comparing the total CPVRR cost disadvantage of the Plan with Coal in
16 the scenarios in which it was not the lower cost plan, this disadvantage was
17 significantly less than the total cost difference for the Plan without Coal
18 between the High and Low fuel cost forecasts for the same environmental
19 compliance cost forecast. Therefore, the additional cost of the Plan with Coal
20 can be seen as a reasonable cost to pay for a hedge or insurance against high
21 fuel costs, especially high natural gas costs.

1 The fuel diversity analyses showed that the Plan with Coal has a significant
2 advantage in regard to system fuel diversity. This plan results in a projected
3 FPL system fuel mix that would be 10-to-11% more reliant on coal, and 10-to-
4 11% less dependent on natural gas, compared to the Plan without Coal.

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

6 A. Yes.

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

Docket No: 070098-EI

ERRATA SHEET

DIRECT TESTIMONY OF STEVEN R. SIM

<u>PAGE #</u>	<u>LINE #</u>	<u>CORRECTION</u>
34	10	<u>Replace "55.8 % debt /44.2% equity" with "55.8 % equity/44.2% debt."</u>
Document No. SRS-5		<u>Replace existing spreadsheet with attached new version.</u>
Document No. SRS-12		<u>Replace "more expensive" in first line of the footnote with "less expensive."</u>

1 BY MR. ANDERSON:

2 Q Dr. Sim, do you have a summary of your testimony?

3 A I do.

4 Q Would you please provide that?

5 A Yes. Good morning, Chairman Edgar and Commissioners.

6 In regard to FPL's 2006 integrated resource planning
7 or IRP work there were two main issues that stood out. We
8 first identified an additional resource need for the 2012
9 through 2015 time frame of 2,283 megawatts if this need were to
10 be met by supply options, either construction or purchase, or a
11 need of 1,903 megawatts if met by DSM. However, this
12 projection already accounted for all of the known
13 cost-effective additional DSM in this time frame. That amount
14 was 1,366 megawatts. Consequently, DSM cannot meet FPL's 2012
15 through 2015 resource needs.

16 The second main item was that our IRP work focused on
17 maintaining system fuel diversity in this time frame, and in
18 that time frame coal options are the primary fuel diversity
19 capacity options.

20 In regard to FPL's approach for analyzing the coal
21 options, three separate analyses of various coal options were
22 conducted. The coal options evaluated included subcritical
23 pulverized coal, circulating fluidized bed or CFB, integrated
24 gasification combined cycle or IGCC, and ultra-supercritical
25 pulverized coal. All three of these analyses consistently

1 found that the ultra-supercritical pulverized coal was the
2 best, most cost-effective coal option.

3 In order to evaluate the impact of these advanced
4 technology coal additions on FPL's system we developed two
5 resource plans. One resource plan, the plan with coal,
6 included the two coal units at the FGPP site. The other
7 resource plan, the plan without coal, assumed no coal
8 additions.

9 We then conducted economic and fuel diversity
10 analyses on these two resource plans. Four fuel cost forecasts
11 were developed by FPL and four environmental compliance cost
12 forecasts from ICF International were selected, thus allowing
13 16 scenarios of forecasted fuel costs and environmental
14 compliance costs to be used in these analyses.

15 In regard to the results of the economic analyses, as
16 expected, neither of the two resource plans emerged as the
17 economic choice for all scenarios of fuel costs and
18 environmental compliance costs. Each resource plan was the
19 economic choice in approximately half of the 16 scenarios,
20 seven for the plan with coal and nine for the plan without
21 coal, prior to evaluating the additional impact of gas storage
22 to bring the two resource plans into equilibrium on that case.

23 The plan with coal is the economic choice in
24 scenarios with relatively high natural gas prices. Those
25 scenarios in which the plan with coal is not the economic

1 choice generally assume relatively low natural gas prices. In
2 those low gas price scenarios, FPL's customers still enjoy
3 significant cost savings with the FGPP units due to the still
4 very large usage of natural gas on FPL's system. Therefore,
5 the FGPP units can be viewed as a reasonable hedge against high
6 natural gas prices.

7 In regard to the second analysis, the fuel diversity
8 analysis, the addition of the FGPP units will significantly
9 improve FPL's system fuel diversity and reduce reliance on
10 natural gas as a fuel. With both FGPP units in place, FPL's
11 system fuel mix is projected to be 10 to 11 percent less
12 dependent upon natural gas than would be the case if gas-fired
13 units were added instead of the advanced technology coal units.

14 In conclusion, the addition of FGPP 1 and 2 is FPL's
15 best option for addressing its capacity needs and maintaining
16 system fuel diversity in this time frame. Thank you.

17 CHAIRMAN EDGAR: Thank you.

18 MR. ANDERSON: Dr. Sim is available for
19 cross-examination.

20 MS. PERDUE: No questions.

21 CHAIRMAN EDGAR: No questions?

22 Mr. Beck.

23 MR. BECK: No questions.

24 CHAIRMAN EDGAR: Mr. Guest.

25 MR. GUEST: Thank you, Madam Chairman.

CROSS EXAMINATION

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BY MR. GUEST:

Q Let me turn -- excuse me. Good morning, Dr. Sim.

A Good morning, sir.

Q I'm going to turn first and most importantly to the portion of your testimony concerning your evaluation of IGCC, and I just have a handful of questions for you on that subject.

I'm going to show you a document from Mr. Charles Black. Do you know who that is?

A I do not.

Q Vice President of, for Energy Supply for Tampa Electric. I'm sorry. He's President now I'm told. That doesn't ring a bell?

A I don't know the individual.

Q Okay. Have you heard of him?

A No.

MR. GUEST: Okay. If I might distribute these. Actually let's start with the witness so that the witness has more time to look at it.

Does everyone have one except me? Oh, okay.

CHAIRMAN EDGAR: Okay. So this will be 183. And, Mr. Guest, what is it that we have?

MR. GUEST: What we have is the witness testimony of Mr. Charles R. Black, who is now the President of Tampa Electric Company, on the subject of options for generation of

1 electricity from coal made to the United States Congress just a
2 few years ago.

3 And I have -- to make it easier to review this, we
4 have printed it with three color codes so we don't have to wade
5 through the document and find the part we're looking for. The
6 color code red that is the printing in red indicates that the
7 subject is pollution emissions. The green is the subject of
8 availability, which has been a big item in the case, as you, as
9 you know. And the blue concerns efficiency, fuel flexibility,
10 commercial sizes, et cetera. And those are really the three
11 subjects that we bounce into when we talk about this
12 technology.

13 CHAIRMAN EDGAR: Okay. So we will, again, number it
14 183, and I will label it Black Testimony, U.S. House Committee,
15 June '03.

16 (Exhibit 183 marked for identification.)

17 BY MR. GUEST:

18 Q Now turning first -- are you with me here in the
19 document, Dr. Sim?

20 A Which page are you on, sir?

21 Q Let's start with page -- well, let's just start with
22 availability, and that would be Page 5. Have you had an
23 opportunity to review the part that's in green on Page 5?

24 A I'm doing so now. Okay.

25 Q Okay. Turning now to the first area in green, it

1 says that an important point undervalued by many is that the
2 overall availability of the plant, including operation on
3 backup fuel and combined cycle mode, is very high.

4 Now that means, does it not, that when you combine
5 the operation of the gasifier with the operation of a secondary
6 backup fuel and when it's in backup mode, you get very high
7 availability? Isn't that what that means?

8 A I don't know what he is referring to in regard to
9 overall availability. There's no number attributed here.

10 It does point out the fact that they are relying, it
11 appears to me, somewhat heavily on backup fuel, not coal, to
12 supply much of this availability.

13 I do notice on Page 3 that in green the availability,
14 I quote, the availability of the gasifier is now in the
15 80 percent range, which to me indicates that this component of
16 the plant is somewhere in the 80 percent range, which means
17 that would be the limiting factor for the overall plant, and
18 its availability would be that or less. So I'm assuming from
19 this that the availability of the unit operating on coal is
20 80 percent or lower.

21 Q Okay. So now what -- this is 2003 testimony, and
22 what Mr. Black, who's now the President of TECO, is saying
23 here, if you look at the underlined portion, is that with this
24 demonstration project they're getting 80 percent. And then he
25 says, if you look at the underlined portion on Page 3, that if

1 you add in some backup fuel, the overall availability gets into
2 the mid 90 percent range. That's actually higher than the,
3 than the proposed Glades plant, is it not?

4 A It means that the unit itself is capable, if I take
5 this at face value, of running in the mid 90 percent range.

6 Q Okay.

7 A However, I point out that TECO is a heavily
8 coal-dependent utility. They have a lot of coal in the system.
9 It's of much less importance to them if a unit runs on non-coal
10 fuel than it is for FPL, which is heavily dependent upon
11 natural gas, and wants a coal-fired unit to run at a very high
12 availability on coal. Two different utilities, two different
13 objectives. That's what I make of this.

14 Q Well, but, but let me raise another issue when you
15 talk about that, which is that -- and I think you said that,
16 that you may only get 80 percent in this demonstration unit,
17 80 percent availability, so you've got to pick up some of the
18 slack with, with backup fuels. But if you're using a really
19 cheap fuel like pet coke, you're actually saving a whole lot of
20 money in that 80 percent, leaving some extra money out for
21 your, for your backup. So that ends up being a big plus,
22 doesn't it?

23 A I think taken by itself that would be, that would
24 carry some weight. But, again, they're two different utility
25 systems. FPL is looking to maximize the fuel diversity on its

1 system and, therefore, is looking for a coal unit which can
2 operate at a very high ability on coal and pet coke and not
3 rely on a significant portion of backup fuel coming from
4 natural gas, which appears to be -- or fuel oil, which appears
5 to be the case here.

6 Q Okay. Let's turn to Page 5 now where I had start --
7 I had started.

8 CHAIRMAN EDGAR: Mr. Guest, let me go ahead and
9 interject now, I apologize, but I did mention that we would do
10 this. And I would like to take just a moment, and then we will
11 continue with the questions, to recognize the children who have
12 joined us in the back of the room. Welcome, all children of
13 staff who are Public Service Commission members. And we are so
14 glad that you are with us. And I'm quite impressed at how
15 quiet you were entering the room. So thank you for that as
16 well.

17 As I mentioned, it is Take Your Child to Work Day and
18 the public school system of Leon County has recognized that for
19 children in third grade or above. And my daughter is in third
20 grade and she's in the back of the room. Hello, Samantha, who
21 is sinking down in the back very embarrassed right now.

22 And I also recognize that Governor Crist has issued a
23 resolution today and has authorized state agencies to
24 participate. So, again, thank you all for your understanding
25 as, as we follow through with the mission and the intent. And

1 my daughter commented this morning on her way here that it was
2 a whole lot of work getting to work, so I think that we all
3 have accomplished something at my house already.

4 Children, we are in the middle of a hearing, which is
5 a formal proceeding where we have witnesses testify and we have
6 attorneys who ask questions. We have with us an expert witness
7 right now, Mr. Sims, who is speaking on behalf of Florida Power
8 & Light, a utility, and we have questions being asked by Mr.
9 Guest, who is an attorney representing an environmental
10 organization. And we are so grateful for your interest in the
11 work that we are doing here. And with that, Mr. Guest, thank
12 you, and you can proceed.

13 MR. GUEST: Thank you, Madam Chairman.

14 BY MR. GUEST:

15 Q If you would be so kind, Dr. Sim, I would like you to
16 turn to the, to the text on Page 5 that is highlighted and
17 underscored in green. And when you've had an opportunity to
18 review that, would you let me know?

19 A Okay.

20 Q Now I see there the second sentence of the first
21 portion that's highlighted in green, it says, "Gasifier
22 availability can be engineered to be as high as the particular
23 project economics dictate." Now that means that it's the
24 opinion of the, the guy who was managing this, this
25 demonstration project that if you spend some real money on

1 engineering, you can get very high gasifier availability.

2 MR. ANDERSON: I would object to form. It assumes
3 facts not in evidence. You know, this is a lengthy recitation,
4 more than four years ago, of some testimony concerning what
5 Mr. Black did or did not do, and now we're getting counsel
6 attributing other characteristics. And so if we're going to
7 interrogate concerning the document, we'd request that that be
8 the case.

9 CHAIRMAN EDGAR: Mr. Guest.

10 MR. GUEST: Well, I think what I'm saying is that's
11 what that means, isn't it? That's really my question. Isn't
12 that what he's saying?

13 CHAIRMAN EDGAR: I'll allow.

14 THE WITNESS: I'm sorry. Can you repeat the
15 question, please?

16 MR. GUEST: Well, I will try.

17 BY MR. GUEST:

18 Q I think what he's saying here is that based on, on
19 Dr., I'm sorry, Mr. Black's experience managing the TECO IGCC
20 demonstration project, it was his opinion expressed to the
21 Congress that you could engineer the gasifier to get a very
22 high level availability, of availability. I think -- isn't
23 that what he's saying?

24 A That's what he's saying.

25 Q Okay.

1 A However, also what he has said prior to that is
2 they've seen gasifier availability going no higher than
3 approximately 80 percent.

4 Q Okay.

5 A I assume that one could, if they were willing to
6 spend enough money, increase the availability of the gasifier
7 through redundant gasifiers, put in a second gasifier if you're
8 not concerned about project costs. I think all of the
9 testimony that we heard yesterday and all of the economic
10 analysis that we've done shows that the starting point cost for
11 an IGCC begins with a single gasifier approximately 40 percent
12 higher than the ultra-supercritical unit that we have. If
13 you're willing to spend more with a redundant gasifier, you'll
14 simply drive that cost wedge even greater.

15 Q Were you -- okay. Let's just turn for one second in
16 response to that last answer. Were you here, were you present
17 when we went through the costs per, per kilowatt yesterday and
18 we found that it was 2,700 for this particular proposed coal
19 plant and 26, 26 for the proposed TECO IGCC plant both using
20 the same future dollars?

21 MR. ANDERSON: I object to form. I'm not sure that's
22 what the record shows.

23 MR. GUEST: Well, I think the record does show that
24 the answer that we produced, Madam Chairman, was \$2,700 for --
25 we divided 5.5 million by 860 watts at a 90 percent rate and we

1 came up with 2,700. And when we went to --

2 MR. ANDERSON: And -- I'm sorry.

3 MR. GUEST: I mean, that's what we did.

4 MR. ANDERSON: And in what year's dollars though
5 also? That's important.

6 MR. GUEST: They were -- the testimony was that it
7 was both in the same year's dollars. And that was, that's the
8 evidence in the record. So the objection that this is, this
9 assumes a fact not in evidence is incorrect. That fact is in
10 evidence.

11 CHAIRMAN EDGAR: Is this where we're recognizing
12 mathematical computation again?

13 MR. GUEST: No, it wasn't actually. That was where I
14 went off and tried to show what 1.38 cents, 1 point --

15 CHAIRMAN EDGAR: I meant conceptually.

16 MR. GUEST: I suppose, yeah. I suppose that I did, I
17 did have to do a computation to get from 5.5 billion down to
18 2,700. That is true. But, but I think I gave the witness this
19 calculator and I used the same calculator and we both came out
20 to the same number. I think that's what played out. So I
21 think that on the -- is it a fact not in evidence? No. No. I
22 think I win that one. That's -- let me rephrase that.

23 (Laughter.)

24 I think the evidence actually is there.

25 CHAIRMAN EDGAR: Okay. Ms. Brubaker, do you have any

1 additional insight?

2 MS. BRUBAKER: You know, honestly I don't really have
3 anything to add that hasn't been said.

4 If it's a question of sheer computation, we can, of
5 course, agree that the math is what it is. But if it's an
6 underlying question of the underlying facts, then I think
7 there, there is merit to the objection there.

8 CHAIRMAN EDGAR: Mr. Anderson.

9 MR. ANDERSON: When the computations were gone over,
10 the points were made that there was transmission in there, that
11 there were land costs, a whole lot of different things.
12 Because we're considering the costs of different resource
13 alternatives, what we're doing is encouraging CAIR (phonetic)
14 and apples-to-apples comparisons of dollars. The challenge
15 presented is if a document, if a question is not stated
16 accurately with what the assumptions are, then the risk is
17 having a misleading record upon which to base the decision.

18 We have no problem with interrogation on this subject
19 and support the subject. We're just cautioning that if, that
20 either different questions should be asked which do not require
21 the type of foundational computations that counsel is assuming
22 or else -- and that's the end of the point. Thank you.

23 CHAIRMAN EDGAR: Okay. Then this is my direction.
24 I'll allow the line of questioning. But, Mr. Guest, I would
25 ask you to be careful to include the assumptions that are

1 included within the computations and other related as you pose
2 your question, please.

3 MR. GUEST: May I, may I actually just state all the
4 numbers? That might even be easier just to state what the
5 numbers are along the track and then let the computation stand
6 as its own.

7 CHAIRMAN EDGAR: Let's try that.

8 MR. GUEST: Okay. All right.

9 BY MR. GUEST:

10 Q Now where were we? I think you had said that it was
11 40 percent more expensive, and I had engaged you saying that
12 the previous day that we had found that the proposed Glades
13 plant was more expensive than the proposed TECO plant. And I
14 think we can just leave that there and not engage that again.

15 And so where we were was we were on Page 5, and the
16 second area that's highlighted or that's printed and
17 underscored in green is that -- the second sentence reads, "We
18 believe that the demonstration plants, including Polk, have
19 shown that the availability issue can be effectively managed,
20 particularly in the next generation of plants."

21 Now this is the guy from TECO who was basically
22 overseeing this whole project. They ran their demonstration
23 project and then made a decision to invest billions of dollars
24 in the next generation. Why do you think that you know any
25 more than they do when they were on the demonstration project

1 and decided this is a good idea, we should go forward with it?

2 A I think what you're asking is a question as to how
3 would one contrast one's view if you were sitting in TECO's
4 shoes versus sitting in FPL's shoes?

5 If FPL had a lot of coal-fired generation and really
6 didn't, it didn't matter nearly as much as to whether the
7 availability of your next coal unit was 70 percent, 80 percent
8 or 90 percent, I might be, or one might be a bit more amenable
9 to taking the risk, knowing that you had plenty of coal-fired
10 generation to fall back on, and, in fact, when the gasifier or
11 the IGCC unit failed and you ran on natural gas, you were
12 actually diversifying your fuel mix.

13 FPL is in a completely different situation. As the
14 record shows, we are very heavily dependent upon natural gas.
15 We will be down to approximately 7 percent of our fuel mix on
16 coal from a current 18 percent if these units are not approved.
17 Therefore, we seek a coal unit or two coal units that have
18 proven very high availability while operating on coal. We
19 don't want units that have to fall back on lower availabilities
20 forcing us to return to more natural gas usage. So it's a
21 different situation at TECO than it is at FPL.

22 Q Well, let's turn to that issue then, which is -- what
23 you're saying is that you really need some fuel diversity;
24 right? Isn't that where you're going with that? Down to
25 8 percent. You're talking about overdependence on natural gas;

1 isn't that right? Isn't that what you just said?

2 A In general, yes.

3 Q Okay. Well, I'd like you to turn -- let's turn now
4 to the blue highlighted portions of Exhibit Number 183, and I
5 would like to start with Page 4. And when you have had an
6 opportunity to review the blue printed part on Page 4, would
7 you let me know?

8 A Okay.

9 Q Now you just spoke about fuel flexibility. This
10 explanation by the now President of TECO says that Polk, that
11 is the IGCC plant at Mulberry, has demonstrated the flexibility
12 of using a number of different solid fuels, including 15 coal
13 types, pet coke, petroleum coke, and biomass. What in the
14 world more could you want in fuel flexibility than a plant that
15 runs on those three different things?

16 A Higher availability. As this document points out,
17 all of these fuels would be run through the gasifier. Your
18 gasifier availability is capped at somewhere around 80 percent
19 by this gentleman's own document. We want a unit that can run
20 off non-gas, non-oil, essentially coal-based fuels at a much
21 higher availability, and that's what FGPP gives us.

22 Q Well, my question wasn't about availability. We've
23 already dealt with that. My question was your contention is
24 that you've got to get out of gas into something else. And the
25 question was here you've got a technology that lets you have 15

1 coal types, not just Central Appalachian or Colombian coal, pet
2 coke and biomass. Why doesn't that satisfy your diversity
3 interest with so much flexibility in fuel type?

4 A Because I can satisfy it better for FPL's system with
5 a unit that is designed to run on different coal types and pet
6 coke with a 92 percent availability rather than an 80 percent
7 availability.

8 Q So you're going back to availability. Now just -- we
9 keep repeating this point and I'm only going to do this once
10 more, but you do agree with me that pet coke has been about
11 half the price of coal.

12 A At certain points of time it's been, it has been
13 substantially lower than coal. As the testimony demonstrated
14 yesterday, there have been times when it has approached and
15 even exceeded the price of coal.

16 Q But what happened is we -- are you aware of the fact
17 that we have in evidence a document of FPL's own projections of
18 the relative costs of pet coke and coal?

19 A Forecasted prices, yes, I'm aware of that.

20 Q And what they show is that, that they run roughly
21 half price of coal for pet coke; pet coke runs roughly half in
22 the projections?

23 A I don't recall whether the 50 percent number is, is
24 accurate. However, I do recall that our forecasted prices for
25 pet coke are lower than our forecasted prices for coal.

1 Q Okay. We'll let the record speak for itself.

2 Now let's go to one final issue on this. If you look
3 at Page 4, slipping over to Page 5 of Exhibit Number 183, and
4 then going over to Page 5. What it says here is that the
5 demonstration unit -- wait a minute. Have you had an
6 opportunity to review that yet, Dr. Sim?

7 A Which color text?

8 Q Blue.

9 A Okay. Okay.

10 Q Now what, what Mr. Black from TECO is saying here is
11 that the demonstration project established that you can use
12 these things on a commercial scale for power generation and
13 that IGCC generally has a higher cycle efficiency than other
14 coal-fired technologies. That was based on his experience at
15 the demonstration project; is that right?

16 A I do not know that. I assume that's the case.

17 Q Okay. All right. Let's turn to another matter,
18 which is the, the matter of pollutant emissions, very briefly.
19 Well, actually let me separate those items out and let's
20 continue on the two topics that we've, that we have talked
21 about up until now. And I would like to, to bring out another
22 document to show the witness, which is a PowerPoint
23 presentation.

24 CHAIRMAN EDGAR: And you have the whole presentation?

25 MR. GUEST: I have, in fact, the entire presentation.

1 CHAIRMAN EDGAR: Great.

2 MR. GUEST: And this is a presentation that -- we're
3 going to hand it out here. This is a presentation from TECO,
4 TECO Energy in January of 2007, just a few months ago, and it
5 came off the World Wide Web. And I see here on the second page
6 it says, "Safety First, Safety Tip for the Day." And I believe
7 --

8 CHAIRMAN EDGAR: Mr. Guest, I am on 184. I think you
9 said January '07, but I don't see a date.

10 MR. GUEST: Let me -- well, you know what we can do
11 with that probably is -- may I confer with my expert for a
12 moment and see if we can figure that out?

13 CHAIRMAN EDGAR: You may.

14 (Pause.)

15 MR. GUEST: What we'd like to do to fully enter the
16 new age is authenticate by giving the Web address that's got
17 the date on it.

18 CHAIRMAN EDGAR: So I'm going to look to Ms. Brubaker
19 or Mr. Harris because, quite frankly, I don't know that I've
20 done that before.

21 MR. GUEST: We actually did this in federal court
22 recently to our stunned amazement. That's why we did this.

23 MR. HARRIS: I'm not sure if I understand exactly
24 what you're asking for. Could you repeat that for me?

25 MR. GUEST: Well, what we, what we would do for

1 authentication, by way of authentication, is to give the
2 address on the World Wide Web that goes with this that
3 identifies the date. So this is the equivalent of -- maybe one
4 way of looking at it would be to say that this is the book and
5 page number in the official record, if you think of the Web as
6 the official record. Another way of thinking of it might be
7 that this is the Library of Congress and that the World Wide
8 Web is like the Library of Congress, and this is the shelf and
9 book and page number in the Library of Congress that shows
10 this. And so it's a mechanism to use the real-world
11 technologies that we have to authenticate documents.

12 And the interesting -- why we bring this up is that
13 we had -- excuse me. Oh, yes, a better metaphor, which is that
14 this is the equivalent of having a citation to a case,
15 233 So.2nd 771, and, you know, 1st DCA 1972. And so you refer
16 to the place and people can verify it very, very easily.
17 That's the purpose of using the Web.

18 CHAIRMAN EDGAR: Okay. The, the -- I get the
19 metaphors, both of them actually, I think. My question though
20 is, that I am grappling with is if that actually authenticates
21 the date of the information that is contained within.

22 Mr. Harris or Ms. Brubaker?

23 MR. HARRIS: Madam Chair, my initial thoughts on this
24 are I agree that a World Wide Web address provides a locator
25 for specific information. That specific information may -- on

1 that Website, on that Web page may or may not have some date
2 attached to it. I do not believe that there's any argument
3 that can be made that it is authenticated. Because, as we
4 know, anybody can make any Web page that they want to and put
5 anything they want on it. And because the Web page purports to
6 have a date and specific information, I think it is readily
7 ascertainable that that address does, in fact, have certain
8 information attached to it. And I believe that you could admit
9 it, you know, saying this Website purports to have this
10 information. That does not authenticate that the information
11 is, in fact, true. I think unless there's somebody there who
12 can authenticate that information from the Website, we can't do
13 it.

14 I would have the same concern whether this was, you
15 know, my MySpace.com page or the Department of Energy, because
16 presumably at the Department of Energy any low-level employee
17 can put something up there and until somebody checks it we
18 don't know that it's actually verifiable.

19 So I would suggest to you that if he's offering a
20 document and saying this document can be found at this
21 location, that's admissible. Hearsay is admissible in these
22 proceedings. But it needs to be given the weight it deserves,
23 and I don't think we can say that it has been authenticated
24 simply because it exists at some Web address.

25 MR. GUEST: May I respond to that?

1 CHAIRMAN EDGAR: You may.

2 MR. GUEST: Well, I think that we all, of course,
3 agree that people can create websites that say essentially
4 anything. That much is, is agreed. But I don't feel that it
5 is a fair analogy to say that the Website of Tampa Electric
6 Company is equivalent to a MySpace Website, unless you're
7 willing to accept the proposition that that may have, that
8 TECO's Website may actually be fraudulent and that there's a
9 series of -- that there's a group of hacker vandals out there
10 that are creating a full PowerPoint as you would in maybe
11 YouTube to create the false impression that IGCC is a valid
12 technology.

13 And I think that if one examines the authentication
14 rule, which is 90.902, Florida Statutes, to which I think
15 you're referring, the standard is -- well, the standard in the
16 case law is that is there a reasonable basis to believe that
17 this thing is authentic?

18 And if I might just digress for 30 fascinating
19 seconds for our audience, which is now gone -- okay. What you
20 need is evidence sufficient to support a finding that the
21 material in question is what it purports to be.

22 The origin -- if I might digress for one moment.

23 CHAIRMAN EDGAR: I'm waiting for the fascinating
24 part.

25 MR. GUEST: Okay. The fascinating part is that where

1 this came from, where the requirement of authentication came
2 from is that in the days before Xerox machines and carbon paper
3 what happened was the only way that you had a second copy of a
4 deed, a document, a contract or anything like that was by
5 hiring a scrivener who made a copy, and for the right amount of
6 money the scrivener would make a change. And so there was
7 always a very realistic reason to think that this document that
8 was being brought into court might have been diddled with. And
9 so for that reason there was a requirement that someone had to
10 appear under oath and establish that this really was the real
11 thing and that the scrivener had not made a mistake or had
12 deliberately changed it.

13 So what we have now in the next stage is we have
14 Xerox copies of things. And when you have a Xerox copy of a
15 letter with, you know, a postmark or something on it that shows
16 that it arrived, we've gone a very long distance away from
17 fixing it up with a scrivener. And when we get all the way up
18 to the World Wide Web where you can look at, you can walk into
19 your office and find this thing in ten seconds, we are so far
20 away from that that a practical application of the
21 authentication requirement is reasonable evidence that a
22 reasonable person would rely on to think that this is what it
23 purports to be. So that the question that's presented to you
24 here is as between the two propositions, A, that this is a bona
25 fide January 2007 TECO PowerPoint presentation on their Website

1 or, B, that a group of vandals and hackers got in and created a
2 phony PowerPoint about IGCC, I think there isn't a reasonable
3 conclusion that could be drawn as that this is the latter. And
4 for that reason, we satisfy the authentication requirement
5 here.

6 MR. ANDERSON: May we be heard very briefly?

7 CHAIRMAN EDGAR: You may.

8 MR. ANDERSON: Okay. Foremost under the law, what
9 counsel is referring to has nothing to do with the doctrine of
10 self-authentication as provided for under Florida law, which
11 lists no fewer than 11 different ways to properly authenticate
12 a document, not one of which is this, and these are the rules
13 that govern. Let's put that aside for the moment.

14 Second, the idea that you can just come in, do
15 Internet research and, you know, throw things into the
16 record -- you know, this is not like a scientific journal or
17 treatise or engineering article where you can take a look at it
18 and see the reasoning and the transparency in terms of the
19 assumptions and things. I think PowerPoint type material is
20 among the worst type of offenders for that because it is
21 designed to communicate quick points without the assumptions.

22 Third, and most fundamentally, we've been sitting
23 here for a long time this morning. I think what's happened is
24 counsel has gone far afield from anything having to do with
25 anything within the direct scope of Dr. Sim's testimony.

1 What's occurred here is counsel has done some Internet
2 research, could have brought it up with Mr. Jenkins yesterday,
3 instead is electing with the last FPL direct witness to try to
4 just drag this through. It's inappropriate, it's beyond the
5 scope of the witness's direct testimony. We should hear no
6 further.

7 MR. HARRIS: Madam Chair, I'm sorry.

8 CHAIRMAN EDGAR: Mr. Harris.

9 MR. HARRIS: Yeah. I think maybe we're talking at
10 cross-purposes. Mr. Guest is correct. He's offering a
11 document that purports to be located on a Website and he can
12 offer you the address, we can all look that up. I think we all
13 agree with that. I think that that is admissible as a hearing
14 exhibit because it is something anyone can say, but it's
15 hearsay. It's an out-of-court statement. I don't know whether
16 it's being offered for some truth or not, but it's an
17 out-of-court statement.

18 Hearsay is admissible in administrative proceedings.
19 It is not self-authenticating under the Evidence Code, 90.901.
20 I think that he can offer it. He can say this is a document
21 that is purported to be on the TECO Website. He can ask
22 questions. If Mr. Sim can answer them, great. If Mr. Sim says
23 I don't know anything about this, I haven't produced this
24 document, I haven't talked to TECO, I don't know, so be it.

25 At the end of the day you, the Commissioners, will

1 give it the weight it deserves. But it's hearsay. I think he
2 can question on it, but it's not self-authenticated and,
3 therefore, there is no, in my mind, legal way that the facts
4 contained in that document can be considered proven just
5 because it has a Web address. And that's my opinion to you,
6 Commissioners, Chairman.

7 MR. GUEST: May I? I have a short answer to that
8 one. What we've given you -- the dispute here is whether or
9 not the Web address is evidence of authentication. The
10 self-authentication rule which follows the authentication rule
11 is ones that don't require extrinsic evidence. The Website is
12 the extrinsic evidence. So --

13 CHAIRMAN EDGAR: Okay.

14 MR. GUEST: And the court -- I mean, we can consider
15 hearsay in any event which is corroborative of other admissible
16 evidence. And so under that standard this comes in anyway and
17 you give it whatever weight it deserves.

18 CHAIRMAN EDGAR: Okay. Then I think this is the way
19 that I would like to proceed at this point.

20 I am persuaded by the discussion that Mr. Harris has
21 presented. What I would like to do is go ahead and allow some
22 limited questions on the document. We have marked it 184. We
23 will title it here in a moment. Allow some limited
24 questioning. I do agree with Mr. Anderson that we have gone a
25 bit far afield. I have allowed that to a certain extent. I

1 would like to make every effort to refocus to the issues and
2 testimony that are before us. We will take up whether it will
3 be admitted in the record at the end of the cross and redirect.

4 MR. GUEST: Thank you.

5 CHAIRMAN EDGAR: So we do need a label, and I don't
6 think Safety First is it, so.

7 MR. GUEST: Pardon me?

8 CHAIRMAN EDGAR: Would you help me label this
9 somewhat accurately?

10 MR. GUEST: Okay. Well, it shouldn't be called
11 Welcome, should it, or Safety First?

12 CHAIRMAN EDGAR: Exactly.

13 MR. GUEST: Let's call it TECO Energy PowerPoint
14 Describing IGCC Plant.

15 CHAIRMAN EDGAR: Okay.

16 (Exhibit 184 marked for identification.)

17 MR. GUEST: So having taken your instructions in
18 mind, I will pick up the pace here.

19 BY MR. GUEST:

20 Q And let's just turn to the one, two, three, four,
21 five, six, seven, eighth page. It looks like this. Oh, there
22 are page -- oh, yeah. Okay. It's also Page 8. Did you have a
23 chance to read that?

24 A Yes.

25 Q Okay. So the short of it is that TECO says you get

1 advantages -- IGCC driver, that is why you do this is low
2 emissions, cheap feedstocks and low cost electricity. That's
3 their claim. Do you agree that that's their claim?

4 A I agree that's their claim. However, I don't know
5 what they based this on, I don't know how dated the information
6 is, although it appears to be at least several years old, and I
7 don't know what they're comparing it to.

8 Q Okay. Page 2 says -- nine -- claims that this was
9 rated the cleanest coal-fired power plant in North America by
10 the Energy Probe Research Foundation.

11 MR. ANDERSON: FPL objects. This is just reading of
12 a hearsay exhibit into the record on an environmental point,
13 which is far beyond the scope of Dr. Sim's testimony.

14 MR. GUEST: Okay. Well, what happened -- I guess why
15 this is relevant -- I mean, I think this is relevant to the
16 testimony. Is that the issue?

17 MR. ANDERSON: Mr. Kosky was here yesterday. He'll
18 be back again. He is the engineer of record with respect to
19 all environmental compliance aspects of this plant. If there
20 are environmental questions, it's within his scope, not Dr.
21 Sim's.

22 MR. GUEST: The testimony was that they examined all
23 the options. I mean, they examined, you know, subcritical,
24 ultra-supercritical, IGCC and everything else.

25 CHAIRMAN EDGAR: I think what I'm hearing from

1 Mr. Anderson is that there is a more appropriate expert witness
2 to ask these questions and that opportunity remains. Is that
3 correct, Mr. Anderson?

4 MR. ANDERSON: That is correct.

5 CHAIRMAN EDGAR: Okay. In that case --

6 MR. GUEST: So we'll have an opportunity to examine
7 that witness on this issue?

8 MR. ANDERSON: Mr. Kosky will be back. That's right.

9 MR. GUEST: Okay. All right. Well, then I will just
10 leave out all the emissions items then.

11 CHAIRMAN EDGAR: Okay.

12 MR. GUEST: Okay.

13 MR. ANDERSON: Just to speed things up, if there are
14 TECO operations issues, please recall that Mr. Jenkins was the
15 assistant responsible for construction of that plant and
16 operated it, so those should really be going to him also.

17 CHAIRMAN EDGAR: And he will be back?

18 MR. ANDERSON: Yes, he will.

19 BY MR. GUEST:

20 Q Okay. Now turning now to Page 14. Are you with me?

21 A I'm sorry. Is there a question?

22 Q Page 14.

23 A Is there a question?

24 CHAIRMAN EDGAR: Not yet.

25

1 BY MR. GUEST:

2 Q I'm trying to give you an opportunity to read it
3 before I ask you a question.

4 A I'm on Page 14.

5 Q Okay. Fuel flexibility, that TECO says that they
6 operate on 20 different fuels. Do you believe that to be true?

7 MR. ANDERSON: Same objection, please.

8 MR. GUEST: The testimony on direct was about fuel
9 flexibility. This is simply asking about confirmation that 20
10 different fuels could be used at the TECO plant.

11 CHAIRMAN EDGAR: Mr. Anderson, I'm sorry, what
12 exactly is your objection?

13 MR. ANDERSON: The objection is that I don't believe
14 that Dr. Sim has testified to anything about slagging gasifiers
15 and use of low rank fuels and all those things. He is the
16 economic expert who took the various inputs, ran the models and
17 came up with all the cost information. He is not here as an
18 expert on what coals may be used, what coal blends may be used.
19 It would be fair to ask him what coal blends and things did FPL
20 consider. That would be a good question. But basically
21 reading the TECO exhibit or TECO slides concerning generating
22 performance, again, is not what Dr. Sim was here for.

23 CHAIRMAN EDGAR: Mr. Guest, I tend to agree.

24 MR. GUEST: Pardon me?

25 CHAIRMAN EDGAR: I tend to agree with Mr. Anderson.

1 MR. GUEST: Well, I would ask you for a, for a
2 liberal scope of --

3 CHAIRMAN EDGAR: I think we've done that.

4 MR. ANDERSON: And Mr. Jenkins will be back, too.
5 Mr. Jenkins will be back.

6 MR. GUEST: Okay. Do you -- so I think what you're
7 saying, you want me to do this fuels issue with Mr. Jenkins.
8 Is that what I'm hearing?

9 MR. ANDERSON: That would not be objectionable.

10 CHAIRMAN EDGAR: That sounds like a better course.

11 MR. GUEST: Okay. And that we will have an
12 opportunity to do that?

13 CHAIRMAN EDGAR: Yes.

14 MR. GUEST: Okay. All right. May I have a moment?

15 CHAIRMAN EDGAR: Yes.

16 MR. GUEST: I'm in the process of winnowing my
17 document pursuant to the instructions.

18 (Pause.)

19 BY MR. GUEST:

20 Q Having winnowed my questions dramatically, I would
21 like to turn now to Page 20. Are you with me?

22 A I'm on Page 20. Yes, sir.

23 Q Thank you. Okay. You testified on direct that it
24 had a higher installed cost.

25 A Those are the estimates we were given to analyze.

1 Yes, sir.

2 Q And here TECO is saying 10 to 20 percent higher.

3 A That's what it says.

4 Q Okay. Then, then we have the question of performance
5 guarantees: Can you get a supplier that will guarantee that
6 this thing will really work, like getting a warranty on your
7 vacuum cleaner?

8 This was -- this is about perceptions, and the claim
9 here by TECO is that you can actually get performance
10 guarantees.

11 A I believe Mr. Hicks or Mr. Jenkins would be the more
12 appropriate witness for those.

13 Q Okay. And then the third, third item -- well, I
14 don't need to do that.

15 We've already talked about availability. And you
16 know that TECO is planning on building another one based on
17 their experience; TECO is planning on building another IGCC
18 unit based on its experience on the 1996 one.

19 A I believe that's what they are reporting in their
20 Ten-Year Site Plan. Yes.

21 MR. GUEST: That's everything. Thank you.

22 CHAIRMAN EDGAR: Mr. Krasowski, do you have questions
23 for this witness?

24 MR. KRASOWSKI: Yes, Madam Chair, I do.

25 CROSS EXAMINATION

1 BY MR. KRASOWSKI:

2 Q Good morning, Mr. Sim.

3 A Good morning, sir.

4 Q Mr. Sim, you state in your testimony -- and, Madam
5 Chair, may I ask a question? Is Mr. Sim doing his, his initial
6 testimony and his, his rebuttal at the same time?

7 CHAIRMAN EDGAR: No, that will be separate. This is
8 on his direct, and he will be back, Mr. Sim, for rebuttal.

9 MR. KRASOWSKI: Okay. Thank you very much. Excuse
10 me.

11 BY MR. KRASOWSKI:

12 Q Mr. Sim, you state that the near-term energy needs
13 for Southeast Florida have been addressed through recent
14 additions, West 1 and 2 and Turkey Point 5, in your testimony
15 on Page 7, Line 19 to 21. Now what do you mean by "near-term,"
16 Mr. Sim? Could you explain that to me?

17 A I'm sorry. What page and line numbers?

18 Q I'm sorry. Page 7, Line 19 and 21.

19 A Okay. And your question again, sir?

20 Q I'm asking what you meant by "near-term" in your
21 statement. You were saying that FPL has addressed its
22 near-term needs through the additions of West 1 and 2 and
23 Turkey Point 5.

24 A What we mean by that is the Turkey Point 5 unit,
25 which is coming on within days, then the two West County Energy

1 Center units that will come on respectively in 2009 and 2010,
2 those power additions in the Southeast Florida region will
3 address the southeast, what we call the southeast imbalance
4 issue for at least several years beyond the 2010 in-service
5 date of West County 2.

6 Q Thank you. Is, is Turkey Point 5 a fossil fuel coal
7 plant or is that a nuclear plant?

8 A All three of those units are gas-fired combined
9 cycles.

10 Q Gas-fired. Okay.

11 A Yes, sir.

12 Q Thank you. On Page 11, Lines 15 through 18, your
13 load forecast projections are based on future growth
14 projections applied by Dr. Green. Other economists are
15 questioning as to whether the population projections should be
16 downsized based on slowing growth and a housing bubble.

17 So let me ask you a question here. Did you refer to
18 the BEBR report in developing your population projection
19 estimations? And BEBR is the Bureau of Economic and Business
20 Research. Was that -- were their numbers included in your
21 analysis?

22 A I would have to say that Dr. Green would be the more
23 appropriate witness. But it's my understanding that Dr. Green
24 bases his load forecast work in part upon BEBR.

25 Q Would you know, Mr. Sim, if Dr. Green used low,

1 medium or high BEBR projections in his analysis?

2 A No, sir, I would not.

3 Q Okay. Mr. Sim -- is it Dr. Sim?

4 A I'll answer to either.

5 Q Either. Okay. Well, I didn't want to be
6 disrespectful.

7 Dr. Sim, in your testimony you refer to an adequate
8 amount of DSM.

9 A Can you cite me page and line, please?

10 Q Okay. Page 12, Lines 3 through 23.

11 A And can you point me to the words "adequate amount of
12 DSM"?

13 Q No. If you'll excuse me for a second, I'm trying to
14 narrow this down myself.

15 This cites Page 12, Line 3 through 23, and says
16 Mr. Brandt's PSC testimony of April 17th, he gave the number of
17 participants in the listed DSM programs offered by FP&L. Can
18 the participation rate be raised? That's a question I have of
19 you.

20 A Based on the latest analyses we've done, the answer
21 would be, no, not, not to any significant measure if DSM is to
22 remain cost-effective.

23 Let me try to put this page of my testimony in a
24 little bit of context. What it refers to is that we identified
25 prior to this need filing 564 megawatts of cost-effective DSM

1 in addition to the amount of DSM that was approved as FPL's DSM
2 goals in 2004.

3 What happened next was in 2005 we saw a truly
4 significant increase in load the summer of 2005. We had been
5 experiencing what is really a normal substantial amount of
6 growth on average of about 675, 650 megawatts a year of growth
7 from one summer to the next. In 2005, our summer load jumped
8 1,800 megawatts. What it did was it moved our projected next
9 capacity need or next resource need from approximately 2009 and
10 2010 to backwards to 2006. So it not only increased the need,
11 it moved it much closer to us.

12 In response to that, we, FPL initiated a couple of
13 activities. One was an attempt to sign up the most economical
14 short-term purchases we could. The second was because of a
15 higher capacity need and a much closer capacity need more DSM
16 was potentially cost-effective. So we went back and went
17 through all of our programs and all additional DSM measures to
18 try to identify what might be cost-effective over and above
19 what we were already committed to do in our goals. And what we
20 found was there was another 564 megawatts of DSM over this time
21 period that was cost-effective. We came before the Commission,
22 we sought approval for modifications to eight or nine existing
23 programs and approval for two new ones. We were granted
24 approval for those, and we're in the process of implementing,
25 which will give us the 564 megawatts over and above the 802 in

1 the DSM goals that were already approved.

2 So based on the currency of that analysis to this
3 need filing, I would say, no, FPL is satisfied that it has
4 identified all of the known available cost-effective DSM in
5 this time period.

6 Q Thank you, Mr. Sim.

7 Additionally on the DSM issue, FP&L, is it not true
8 that FP&L works with the PSC to identify and structure their
9 DSM program and components?

10 A I'm sorry. Could you repeat the question, please?

11 Q Is it not true that FP&L works in concert with the
12 Public Service Commission to develop the DSM programs and the
13 components of those programs?

14 A My understanding of your question, I would have to
15 answer no. We don't work in concert. And I guess that's the
16 phrase I'm having a little bit of difficulty here.

17 What FPL's responsibility is is to identify all of
18 the cost-effective DSM on its system, to develop programs which
19 can supply that DSM, and then we bring that before the
20 Commission and the staff where we are asked questions about it
21 in hopes, in FPL's hopes of getting program approval for those
22 programs. So if that's what you meant by "in concert," then I
23 would agree. Otherwise, I would term it slightly differently.
24 Each of us have different roles in this.

25 Q Okay. That, that's satisfactory, your answer is

1 satisfactory to my question. I was just trying to link you and
2 the PSC together. Whatever word you want to use as far as
3 program, how that's done, is fine.

4 So am I to understand that what FP&L does in terms of
5 their DSM programs is done in-house?

6 A Certainly the responsibility for it is done in-house.
7 We have on occasion used consultants from the outside to do
8 such things as providing engineering estimates, to provide
9 program monitoring, that type of thing. But the responsibility
10 certainly lies inside FPL to develop the programs and to
11 finalize them and then bring them before the Commission.

12 Q Is there any external independent analysis that you
13 know of that is done by another group that would -- that may
14 identify additional DSM programs FP&L could use to more
15 effectively manage demand side?

16 A As, as I view the question, I would say that because
17 we are in front of the Commission at least every five years for
18 the DSM goals docket, it's an open hearing, all parties are
19 free to participate, that certainly provides a regular,
20 consistent opening for someone to come in and examine FPL's DSM
21 programs at that point.

22 Q Mr. Sim, all the DSM programs FP&L has are voluntary;
23 is that not correct?

24 A Yes.

25 Q Or is it correct? I'm sorry.

1 A That is correct.

2 Q Okay. Do you analyze the potential that changes in
3 law would have for maximizing efficiency above and beyond what
4 you offer within your DSM programs as, as, in consideration in
5 your planning?

6 A The answer to that would be yes, and at least in two
7 areas. I think Dr. Green has testified that he's already
8 accounted for approximately 1,250 megawatts of additional
9 efficiency that will take place due to the Energy Policy Act of
10 2005. And Mr. Brandt, I can't recall whether he got into this
11 in his testimony, but I know that they regularly look at
12 efficiency standards and regulations in trying to see if their
13 programs are achieving its goals. And, as necessary, they have
14 modified programs or reformatted them to adjust for changes in
15 appliance efficiency standards or building standards.

16 Q And one other question. Your, your efforts at
17 diversification, diversity are, are going from gas to coal on
18 this particular project. But coal is still a fossil fuel with
19 its benefits but, as well, its problematic emissions.

20 Let's see. Renewable energy, clean energy like
21 solar, wind, those types of energies, and, and placing solar
22 collectors at individual homes and businesses of various types,
23 they represent true diversity, wouldn't you say, as -- let me,
24 let me rephrase my question.

25 But would you not agree that solar and wind and

1 decentralized solar represent, more clearly represent true
2 diversity?

3 A I would agree only in part that it represents one
4 aspect of diversity. But as our prior witnesses have
5 testified, the solar and wind resources in this state are not
6 as great as one might think due to low wind speeds, due to, in
7 terms of solar, high humidity and cloud cover. Those limit us
8 considerably in this state for achieving any significant amount
9 of energy or capacity that could be delivered anywhere near
10 cost-effectively in Florida.

11 Q And that position has been developed in-house as
12 required -- as part of your responsibility to -- that position
13 has been developed in-house.

14 A I think that position has been developed both
15 in-house and outside of FPL using data from EnRel, using data
16 from the Florida Solar Energy Center where I used to work, as
17 well as in-house. We all tend to reach the same conclusion
18 that Florida is limited in wind speed, Florida is limited in
19 the availability of the solar resource and, therefore, it has a
20 role to play. It's very difficult to show that it's
21 cost-effective under, in today's climate and, but it -- and,
22 therefore, it cannot play a significant role in the near term.

23 Q Mr. Sim, if I may, I just have another -- being that
24 you brought it up that you worked at the Solar Energy Center,
25 they have a Zero Energy Homes Program. Are you familiar with

1 that?

2 A In general, yes.

3 MR. KRASOWSKI: And may I, may I provide this to
4 Mr. Sim?

5 BY MR. KRASOWSKI:

6 Q I don't think this will be very difficult for you to
7 understand by looking at that. It's only a two-page printout
8 from the Solar Energy Center describing their program. And in
9 their Zero Energy buildings, and this relates to residential
10 homes, they show a 70 percent reduction in energy need or usage
11 in the, in their home, in their solar-built home. And they're
12 not just restricted to, to solar. They use Energy Star®
13 appliances, the home is built according to best practices as
14 far as efficiency, lighting, and many aspects of efficiency are
15 incorporated into this. And the Florida Solar Energy Center
16 seems to do the best job at representing efficiency
17 opportunities. And being that you're familiar with them,
18 you'll see also that the 70 percent doesn't include the
19 photovoltaic component there. With the photovoltaics --

20 CHAIRMAN EDGAR: Mr. Krasowski, I'm sorry. I have to
21 ask you --

22 MR. KRASOWSKI: I'm testifying.

23 CHAIRMAN EDGAR: Yes.

24 MR. KRASOWSKI: I'm sorry.

25 CHAIRMAN EDGAR: I have to ask you to pose questions

1 that the witness can answer.

2 BY MR. KRASOWSKI:

3 Q Mr. Sim, do you think the representation in that
4 docket is an accurate, valid representation as far as comparing
5 the efficient home to the control home?

6 A I have no reason to think it's not accurate. I note
7 two things though: The information contained is quite dated,
8 it refers to 1998 data, and there is no indication of the
9 additional cost to the homeowner or to the builder for this,
10 massive amounts of, I'll call it, building energy efficiency
11 measures as well as a photovoltaic system on the roof of the
12 home.

13 Q Yes, you are correct. I was just presenting this to
14 get some kind of comment from you regarding this project of the
15 Florida Solar Energy Center. The cost hopefully I'll be
16 addressing later. And this is a bit dated. I'm sorry.
17 There's a more recent copy. But that's interesting you -- I'm
18 glad you saw that. But thank you. I'm done with the
19 questions. Thank you very much.

20 CHAIRMAN EDGAR: Thank you.

21 Are their questions from staff?

22 MS. BRUBAKER: Thank you. Yes, staff does have some.

23 CROSS EXAMINATION

24 BY MS. BRUBAKER:

25 Q Good morning, Dr. Sim.

1 A Good morning.

2 Q I'm going to be referring through my questions to two
3 documents that have been previously identified on the first day
4 of hearing. One is a yellow cover document, Number 155, you
5 should have there in front of you. If you don't, please let me
6 know.

7 MR. GUEST: May we have a moment to fish it out?

8 MS. BRUBAKER: To?

9 MR. GUEST: Fish it out.

10 MS. BRUBAKER: Certainly.

11 And also there's a blue cover document, Exhibit
12 Number 156.

13 BY MS. BRUBAKER:

14 Q What, in essence, Exhibit 155 represents is we've
15 pulled together information from various sources, from your
16 direct exhibits, from various interrogatory responses. I will
17 try to identify with each question that relates to this that
18 source material. If you are willing to look at the information
19 on 155 and accept it subject to check, that's great, we can
20 move on. However, I want you to be comfortable. And if you do
21 need a moment to look at the source documentation, I'm happy to
22 walk you through that, too. And so with that, if I could
23 please have you refer to Page 2 of Exhibit 155.

24 A I'm sorry. I don't see page numbers. Are you
25 counting the cover page?

1 Q Oh, certainly. I'll identify that, too. With the
2 yellow document there are Bate's stamp numbers at the bottom of
3 each page, lots of zeros, and then you'll see a one, lots of
4 zeros, and then you'll see a Page 2. And so for that document,
5 when I say page numbers, my apologies, that will be what I'm
6 talking about. With the blue document you'll note that there
7 are hand-numbered page numbers in the lower right-hand corner.

8 A Yes.

9 Q And there are also Bate stamps. The Bate stamps --
10 the information in the blue document is pulled from staff's
11 composite Exhibit 2, and the Bate stamp numbers you see there
12 reflect the Bate stamp numbers from that larger document. This
13 is just pulled for ease and convenience.

14 A Okay.

15 Q So when I refer to the blue document, I will refer to
16 the hand-numbered numbers in the lower right-hand corner. And
17 certainly if you have any confusion or concern, please speak
18 up. I'll be happy to make sure we're literally all on the same
19 page.

20 (Transcript continues in sequence with Volume 9.)

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