BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION

DOCKET NO. 070098-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION TO DETERMINE NEED FOR FPL GLADES POWER PARK UNITS 1 AND 2 ELECTRICAL POWER PLANT

REBUTTAL TESTIMONY & EXHIBIT OF:

STEVEN R. SIM

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MARCH 30, 2007

Q. Please state your name and business address.

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

Q. Have you previously testified in this docket?

A. Yes.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond to various comments related to resource planning made by witnesses who have filed testimony in this docket on behalf of several environmental organizations and Ellen Peterson. The testimony is organized into four sections. In Section I, I discuss comments made by Mr. Furman. In Section II, comments by Mr. Schlissel are addressed. In Section III, I discuss comments made by Mr. Plunkett. Section IV will summarize my testimony.

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

A. Yes. I am sponsoring an exhibit consisting one document, SRS-16 which is attached to my rebuttal testimony.

I. COMMENTS REGARDING MR. FURMAN'S TESTIMONY

Q. What did Mr. Furman have to say regarding the relative economics of various coal technologies?

A. On page 9 of his testimony, Mr. Furman states: *"Exhibit RCF-5 shows that the costs of electricity for the three types of proposed Pulverized Coal (PC) Plants are higher than the cost of electricity for an IGCC plant using Petroleum Coke (Pet Coke) in Florida. Although the IGCC plant has a higher capital cost than the PC plants it has a significantly lower fuel cost when using petcoke."* The exhibit he refers to, RCF-5, is a cents/kwh comparison of three types of pulverized coal units (Sub Critical, Super Critical, and Ultra-Super Critical) assuming the units are fueled exclusively with coal, and of an IGCC unit with the IGCC unit first fueled exclusively with coal, then with the IGCC unit fueled exclusively with pet coke.

Q. Are there aspects of this exhibit with which you agree?

A. First, let me state that my comments to this one question are made taking Mr. Furman's exhibit at face value; i.e., one assumes his inputs and analyses are accurate, reasonable, and directly related to the FGPP filing. They are not, for reasons that I will explain later.

However, taking his analyses at face value, and based on the analyses of various coal technologies that were conducted in advance of FPL's filing for

FGPP approval, I would agree with several of the results and assumptions depicted on Mr. Furman's exhibit; specifically the following:

1) the ultra-supercritical pulverized coal technology is the most economical pulverized coal technology;
2) the ultra-supercritical pulverized coal technology is also more economical than IGCC assuming both technologies are utilizing the same fuel;
3) the IGCC unit has significantly higher capital costs than the ultra-supercritical pulverized coal unit; and,
4) in regard to the annual availability (depicted as "capacity factor" in the exhibit) of these coal-fired technologies, the availability of the IGCC unit (80%) is significantly lower than that of the ultra-supercritical pulverized coal unit (85%). (However, FPL's analyses indicate an even higher availability for the ultra-supercritical pulverized coal unit, 92%, than is assumed in Mr. Furman's exhibit.)

All of these results and assumptions indicate that the ultra-supercritical pulverized coal unit is the superior choice for coal-fired capacity when burning the same fuel (or fuel mix). On these points, FPL and Mr. Furman are in complete agreement.

Q. What is your reaction to Mr. Furman's assumption that IGCC is a less expensive choice when fueled 100% with pet coke compared to an ultra-supercritical pulverized coal unit fueled 100% with coal?

A. I have two reactions. First, the comparison he makes is irrelevant to the FGPP filing because FPL is not projecting to fuel the FGPP units with 100% coal. FPL is projecting to fuel these advanced technology coal units with a mix of 20% pet coke and 80% coal. Therefore, his cost projection for the ultra-supercritical pulverized coal unit in his exhibit is based on an assumption that does not match how the FGPP units are projected to be fueled, a projection clearly discussed in FPL's filing and, therefore, readily available to Mr. Furman prior to developing his testimony. Consequently, Mr. Furman's cost projection of the ultra-supercritical pulverized coal unit is irrelevant to this filing.

The second reaction is that while it is theoretically possible to fuel a power plant, such as the IGCC unit in Mr. Furman's exhibit, 100% with pet coke, it is extremely unlikely that any utility would plan to meet significant capacity and energy needs such as FPL's over an extended time frame solely with pet coke. This filing addresses FPL's plans to bring almost 2,000 MW of new capacity for a 40-year period onto its system. To imply, as Mr. Furman's exhibit does in this docket, that FPL should plan on fueling this very large amount of capacity for 40 years solely with pet coke strains credulity. Mr. Furman fails to provide any information supporting the availability of

sufficient amounts of pet coke to fuel 2,000 MW for 40 years at an economic price on a guaranteed delivery basis. In short, Mr. Furman's assumption that FPL should plan on fueling such a large amount of capacity for 40 years solely with pet coke is unrealistic. The rebuttal testimony of Mr. Schwartz further addresses this issue.

Q. You mentioned earlier that your comments above were based on an assumption that Mr. Furman's analyses and inputs could be taken at face value; i.e., that they were accurate, reasonable, and directly related to FPL's FGPP filing. Is this a safe assumption for one to make?

A. No. In addition to the issues discussed above, a careful review of his testimony and exhibit reveals at least two additional concerns.

The first concern is that Mr. Furman's testimony and exhibit simply do not provide enough information for a reviewer, such as the Florida Public Service Commission (FPSC), to know what assumptions were made in the analyses he is sponsoring. Conspicuously absent is a presentation of key inputs including: size (MW) of units, heat rate of units, in-service year of units, capital costs, fixed O&M costs, variable O&M costs, etc.

This is not only disappointing, but also a bit odd given the statement Mr. Furman makes twice in his Supplemental Direct Testimony. In that testimony on page 4, line 3, he refers to the Clean Coal Technology Selection Study included as part of FPL's filing and to a DOE study regarding IGCC

technology and states: *"..**it is necessary to evaluate the various input assumptions** that were used for both of these studies to determine what created the opposite conclusions."* (boldface supplied by Mr. Furman) He apparently strongly believes in this concept of full disclosure of input assumptions in other parties' analyses because he repeats this statement in his testimony on page 24, line 21. Yet he chose not to provide most of the key input assumptions that were used in his analysis of the various coal technologies.

Therefore, with the sole exception of the two assumptions he did choose to provide - availability and fuel price assumptions - all that is presented are the results with no way for a reviewer to readily gauge the accuracy or reasonableness of the results based on the many other assumptions used. In addition to choosing not to provide the actual values for his assumptions, he also chose not to explain the vintage of these values, particularly of capital costs. Projected capital costs for virtually all new power plants rose significantly in the last few months of 2006. Mr. Furman's testimony acknowledges that the capital costs for IGCC units are higher than for ultra-supercritical pulverized coal units. Therefore, the very recent general increases in capital costs for new plants would, all else equal, be expected to drive up costs for IGCC units more than they would for the less capital-intensive ultra-supercritical pulverized coal units. However, Mr. Furman does not inform a reviewer if the capital costs used in his exhibit are based on cost

estimates current as of year-end 2006, or on earlier cost estimates made prior to the cost increases.

However, in reviewing Mr. Furman's testimony submitted in this docket, much of it – including his Exhibit RCF-5 – seemed very familiar. A brief search revealed that he has used this exhibit before in other filings. In fact, he used it recently in Florida in his testimony in the Taylor Energy Center docket. A copy of this exhibit from that docket is presented as Exhibit No. SRS-16.

Q. Is his exhibit from the Taylor Energy Center docket the same as his Exhibit RCF-5 in FPL's docket?

A. The values used in the bar chart are identical in the two exhibits and he again provided no values for key assumptions for a reviewer to consider other than fuel costs and availability. In those regards, the exhibits are identical. However, in his Taylor Energy Center version of this exhibit he included more explanatory text. In this text is a listing of source material that provides some information regarding the vintage of his assumptions. For example, the fuel cost data is listed as being historical 2004 and 2005 fuel costs (and, therefore, do not represent fuel cost projections for either coal or pet coke for the years that the FGPP units would actually run.) It is curious that Mr. Furman chose not to provide this text information regarding the vintage of assumptions in his testimony in the current FGPP docket, a docket several

months removed from the Taylor Energy Center docket, especially when the rest of the exhibit is unchanged.

The rest of the assumptions used in his exhibit are listed as coming from two source documents: an EPA report published in July 2006 and a presentation dated October 4, 2006, respectively. The July EPA report is listed as the source for efficiencies and fuel consumption data. Because of the months it typically takes to prepare such a report, it is likely that the data sources used are from early 2006. The October 4th presentation is listed as the source for the capital and other non-fuel costs. Therefore, this presentation, and Mr. Furman's Exhibit RCF-5, could not have incorporated any of the significant capital cost increases that occurred later in 2006.

In summary, Mr. Furman's exhibit, whether from the Taylor Energy Center docket or the current Exhibit RCF-5 in this docket, is almost completely unsupported by information regarding the key assumptions used in his analysis except that we now know that the assumptions are dated. As a consequence, a reviewer is unable to determine the accuracy and reasonableness of the exhibit's assumptions and results.

By comparison, consider the Clean Coal Technology Selection Study that Mr. Furman makes reference to and that was presented by FPL as Exhibit DNH-2 in the testimony of Mr. Hicks. This comparison used a similar cents/kwh

format to present results. However, the results were supported by an extensive 110-page report prepared jointly by FPL and Black & Veatch that clearly laid out key assumptions. The results of this analysis – that the ultra-supercritical pulverized coal unit was the most economic choice – are presented so that a reviewer will fully understand the assumptions and methodology used in the analyses.

Mr. Furman's coal technology analysis clearly suffers in this comparison with FPL's analysis in terms of thoroughness, transparency of assumptions and methodology, and certainty regarding the vintage of key assumptions. A reviewer of his exhibit is simply unable to determine the accuracy and reasonableness of his exhibit's assumptions and results for use in this filing.

Q. What is the second concern that is apparent from reviewing Mr. Furman's testimony and exhibit regarding the relative economics of various coal technologies?

A. Mr. Furman's exhibit appears to have no direct relation to information included in FPL's FGPP filing. I previously mentioned that his exhibit assumes that the ultra-supercritical pulverized coal unit was fueled 100% by coal which does not match how FPL projects to fuel the FGPP units, a projection clearly visible in FPL's filing. Additional evidence for this conclusion that his exhibit has no direct relation to FPL's filing is found in one of the two assumptions he does reveal, the assumed cost of coal. His coal cost value of $2.38/mmBTU shown on the exhibit does not match any of the

fuel cost forecasts used in FPL's filing and presented in the filing documents. As noted above, the fuel assumptions he chose to use are actually from 2004 and 2005 and are holdovers from previous presentations of this same exhibit.

These two examples make it clear that this exhibit was not developed based on information contained in FPL's filing. Instead, the exhibit is a generic analysis that has been previously developed using dated assumptions that are almost completely unidentified and unrelated to information in this filing.

Q. Are there any other statements that Mr. Furman makes that you'd care to comment on?

A. Yes, there is one in particular. On page 6, line 14 of his Supplemental Direct Testimony, Mr. Furman states: *"If the future costs of additional emission controls or purchase of emission credits are also factored into the FGPP plant, then the result will be higher electric rates."* He repeats the statement on page 12, line 22.

Mr. Furman's statement leads me to conclude that he does not believe that the economic analyses contained in FPL's filing accounted for the *"purchase of emission credits"* or otherwise addressed environmental compliance costs in regard to the FGPP units. FPL's analyses definitely included various projections of environmental compliance costs for the entire FPL system, including the FGPP units, when comparing the Resource Plan with Coal to the Resource Plan without Coal. In regard to potential CO2 compliance costs,

FPL's analyses not only included a range of such costs, but also assumed that FPL would incur these compliance costs for all CO2 emissions; i.e., no CO2 allowances would be granted to utilities – a pessimistic assumption in regard to the potential costs of CO2. These facts regarding the inclusion of environmental compliance costs in FPL's analyses are well documented throughout FPL's filing and are readily apparent to anyone who reviewed the filing.

II. COMMENTS REGARDING MR. SCHLISSEL'S TESTIMONY

Q. Mr. Schlissel discusses FPL's integrated resource planning (IRP) process on pages 9-11 of his Supplemental Direct Testimony. Are his comments accurate?

A. No. His comments characterizing FPL's IRP process are alarmingly incorrect.

On page 9 of his Supplemental Direct Testimony he first quotes two paragraphs from page 9 of my direct testimony that discuss FPL's two reliability assessment criteria: reserve margin and loss-of-load-probability (LOLP). He then makes the following statement starting on line 23 of page 9 of that testimony: *"If these two analytical approaches constitute FPL's "IRP" process the Commission should absolutely not rely upon the results of this analysis, i.e., the choice between FGPP and natural gas generation."*

He apparently has concluded that FPL's entire IRP process consists solely of the use of reserve margin and LOLP to identify future needs. Such a statement gives the impression that Mr. Schlissel is not very knowledgeable regarding resource planning practices in general. Regardless of whether that impression is correct, it is surprising that Mr. Schlissel chose to forego a review of the numerous resource planning documents that FPL has filed over the years, such as FPL's annual Ten Year Power Plant Site Plan, that discuss FPL's IRP process in detail. FPL's IRP process has been successfully utilized by FPL, and reviewed by the FPSC, for approximately 15 years and it has been well documented repeatedly during that time. Reviewing any one of these planning documents would have educated Mr. Schlissel regarding what FPL's IRP process consists of.

Even more surprising is that he either ignored or did not read the summary of FPL's IRP process that appeared in FPL's filing in my direct testimony on pages 6-9, the pages immediately preceding the passages that he chose to quote. These pages clearly show that the passages that Mr. Schlissel refers to are merely the first step of a multi-step IRP process; i.e., the step in which the timing and magnitude of FPL's future resource needs are determined.

Q. What does Mr. Schlissel then say about FPL's resource planning work?

A. Starting on line 28 of page 9 of that testimony, he states: *"For example, it's possible that FPL simply looked at its load and resources projection which "has been driven by the Summer reserve margin criterion," saw that it needed*

capacity to meet its summer reserve margin requirement and chose baseload capacity even though that capacity may not operate in the winter months (because it may not be needed)." There are at least 3 problems with this statement by Mr. Schlissel.

First, Mr. Schlissel's statement attempts to give the impression that FPL projected a need and immediately chose a baseload power plant without considering other demand side or supply resources. This is completely inaccurate as evidenced by FPL's filing in this docket. FPL's on-going resource planning analyses considered numerous resource options prior to selecting the FGPP units to address the 2013 and 2014 capacity needs. In order to point this out, I'll start with demand side resources.

As stated on page 12, line 5 of my direct testimony, the resource need projections "already incorporate all of the cost-effective DSM currently known to FPL." Mr. Brandt's direct testimony (and other documents in FPL's filing) explains that FPL first undertook a comprehensive analysis of DSM options in late 2005 and 2006 that led to identifying approximately 564 MW of additional, cost-effective DSM above its current DSM Goals amount. His testimony then explained that in 2006 FPL subsequently filed for FPSC approval of modifications to 8 existing DSM programs and for approval to introduce 2 new programs in order to achieve these additional DSM MW. The FPSC granted its approval for all of these DSM initiatives later in 2006. FPL's

projection of FPL's resource needs presented in this filing incorporated all of this additional DSM that was identified and approved in 2006. Therefore, FPL had already evaluated and taken into account all cost-effective DSM prior to turning its attention to supply side resources.

Second, in regard to supply side resources, FPL did not decide to add a baseload generating unit without consideration of other generating options as Mr. Schlissel's statement implies. FPL's selection of baseload generating units in recent years is well chronicled in numerous documents leading up to the FGPP filing as well as in this filing. All of FPL's recent Need Determination filings, including several in which bids for a wide variety of new capacity options (including peaking, intermediate, and baseload capacity) were received from outside FPL in response to capacity RFPs, have demonstrated analytically that baseload units are generally the most cost-effective capacity additions for FPL's system. In addition, FPL now seeks coal-fired capacity to maintain its system fuel diversity. This is stated in numerous places in FPL's filing, including page 8 of my direct testimony starting on line 1. Therefore, because all of FPL's well-documented resource planning work has shown that baseload capacity is consistently the most economical type of capacity addition for FPL's system, and because FPL sought coal-fired capacity to maintain system fuel diversity, it is logical that FPL would select coal-fired baseload capacity to meet the earliest need that could be addressed by new coal capacity.

Third, the last part of Mr. Schlissel's testimony, *"...chose baseload capacity even though that capacity may not operate in the winter months (because it may not be needed)"* shows a lack of knowledge regarding resource planning and how utilities actually operate. Generating units that are designated as "baseload" units (such as nuclear or coal units) are units that operate as many hours as possible during the year because they are the least expensive units to operate on that utility system. Due to this economic advantage, they will operate as much as they are available to operate in all months, all seasons - even in Winter. The part of Mr. Schlissel's statement that the baseload capacity *"..may not be needed"* apparently refers to FPL's reserve margin projections that show that Summer reserve margin projections, and not Winter reserve margin projections, are driving FPL's resource needs. If so, Mr. Schlissel's lack of knowledge regarding resource planning is confusing him.

As summarized starting on page 6 of my direct testimony, among the main objectives in IRP work are to first determine the timing and magnitude of future resource needs, then determine the type of resources that should be added to address those needs. The reserve margin projections are part of the IRP process that determines timing and magnitude of resource needs. Once those needs are established, economic and non-economic analyses identify the type of resource with which to best address those needs. As discussed earlier, on FPL's system the most economic type of new generating unit to add is generally baseload capacity. For any utility, if the need is identified either by

Summer reserve margin projections or through the use of probabilistic criteria such as LOLP, and the best option is a baseload unit, then it does not mean that the baseload unit shouldn't operate in Winter just because the Winter reserve margin criterion was not driving the capacity need projection.

Contrary to Mr. Schlissel's apparent confusion, in IRP processes the analyses utilized to identify resource needs are completely different from the analyses utilized to determine which resource option is best to address that need.

Q. **On page 16 of Mr. Schlissel's direct testimony, he is asked the following question: *"Do any states require that utilities or default service suppliers evaluate costs or risks associated with greenhouse gas emissions in long-range planning or resource procurement?"* His testimony then responds in the affirmative. But hasn't FPL done exactly that in its analyses that are included as part of this filing?**

A. Yes. FPL has done precisely that by its inclusion of four CO2 environmental compliance cost forecasts in its analyses. The use of these environmental compliance cost forecasts is discussed in detail throughout FPL's filing documents.

In regard to this filing, I believe the important point in regard to this portion of Mr. Schlissel's testimony is that the State of Florida did not have to *"require"* FPL to evaluate potential CO2 costs. FPL did so voluntarily in order to ensure that a comprehensive analysis was part of its decision-making process.

Q. Mr. Schlissel also makes comments regarding FPL's 20% reserve margin criterion and suggests that FGPP approval be denied because a 15% reserve margin might be applicable. What is your reaction to this?

A. I have three reactions. First, Mr. Schlissel's comments include the following passage starting on page 10, line 18 of his Supplemental Direct Testimony: *"If the 20% reserve margin is not necessary in order to maintain the LOLP standard of 0.1 days per year, that is, if a 15% reserve margin could guarantee the same LOLP standard,..."*. What Mr. Schlissel appears to believe is that reserve margin criterion must/should be set to a level which would always yield an LOLP projection of 0.1 days per year. That is incorrect. If one were to do this, there would be no need for two reliability criteria – only one reliability criterion would be needed. Planning and operating experience over many years have resulted in utilities, commissions, and reliability councils utilizing more than one reliability criterion and/or utilizing a reliability criterion that does not automatically equate to an LOLP criterion of 0.1 day per year. The rationale for this approach will vary from one utility, commission, and/or reliability council to another, but often includes one or more of the following: uncertainty in load forecasts, uncertainty in generating unit forced outage forecasts, ensuring adequate time for scheduled maintenance outages (particularly for large utility systems), and concerns over the relative contributions of supply and demand options to the utility's projected reserve margin. Considerations of these issues can result in great variances in LOLP and/or reserve margin projections when addressed in

such analyses, and these issues are often operational concerns as well. Consequently, the designation and use of reliability criteria have both resource planning and operational aspects, and represent a far more complex topic than Mr. Schlissel believes is the case.

Second, Mr. Schlissel's footnote 6 on page 11 of his Supplemental Direct Testimony correctly indicates that the FPSC approved a change in the reserve margin criterion to 20% in 1999. However, he apparently did not research the reason for that change or simply decided not to consider that information in his testimony. The change in the reserve margin criterion to 20%, directly affecting FPL, Progress Energy Florida, and Tampa Electric, was a direct result of assertions that the peninsular Florida electric system was not sufficiently reliable with a 15% reserve margin criterion. In order to address those reliability concerns, a joint stipulation was approved by the FPSC to increase the reserve margin criterion for these three utilities starting in the Summer of 2004. This reliability assessment criterion has been utilized since that time by these three utilities. The utilities and/or the FPSC may decide in the future to re-examine the suitability of maintaining the 20% criterion, but such an effort should not be driven by a desire to affect a specific resource decision that one is unhappy with. Mr. Silva's rebuttal testimony also addresses problems inherent in Mr. Schlissel's call for a sudden lowering of the reserve margin criterion.

Q. What is the third reaction to these comments regarding a 15% reserve margin of Mr. Schlissel's?

A. The third reaction is that even if one were to assume that a change to a 15% reserve margin criterion were to be implemented so that Mr. Schlissel's desired outcome – to delay or avoid building FGPP – were to occur, there would be two undesirable results for FPL's customers. Our customers would find themselves with a less reliable system (due to smaller reserves from the deferral of new capacity additions) and with an increasing reliance on natural gas and its price volatility (due to not adding these advanced technology coal units). This is not a desirable pair of results for FPL's customers.

III. COMMENTS REGARDING MR. PLUNKETT'S TESTIMONY

Q. Mr. Plunkett makes a number of statements pertaining to resource planning. Do you find fault with any of these?

A. Yes. There are a number of statements he makes that are incorrect, misleading, or both. Let me start with the statement starting on page 6, line 1 in which he says: *"These additional efficiency savings would cost significantly less than the levelized (life-cycle) cost of the units. For example, the Massachusetts and PG&E residential efficiency programs cost or are expected to cost between 5 and 6 cents/kwh; commercial/industrial savings in the range of 3 to 4 cents/kwh levelized. By comparison, the Company projects that the Glades units will cost between 8 and 10 cents/kwh, depending on the*

scenario[1]*."* The footnote refers the reader to the projected "all-in" cost of the FGPP units projected in the joint FPL and Black & Veatch study included in FPL's filing.

There are at least three fundamental problems with his statement. First, his comparison is incomplete. Therefore it is inaccurate and meaningless. The comparison he attempts to make is that, according to him, one can remove energy from a utility system through DSM at a cost of 3 to 6 cents/kwh and FGPP will provide energy to FPL's utility system at 8 to 10 cents per kwh. Since he provides no information regarding the DSM values (an issue I'll return to), let me focus on the FGPP cost and discuss the error he made with his use of this value.

The cost he quotes of building and operating a unit such as the FGPP units is correct. However, it does not represent the total FPL system cost of adding and operating a unit such as the FGPP units. Recall that these advanced technology coal units will operate as baseload units with capacity factors at or above 90%. The only reason they will operate this much is that they are less expensive than operating a number of existing units on FPL's system. Consequently, these older, less efficient existing units will not operate as much during the year because FGPP will operate. Therefore, the FPL system will not incur the fuel and variable O&M costs that it would have if these existing units had operated. Mr. Plunkett did not account for these very large

system fuel and variable O&M savings that would be realized by the FGPP units. If he had, the 8 to 10 cents per kwh value he professes represents FGPP's cost would have been significantly reduced.

His mistake is driven by his use of a busbar or screening curve cents per kwh approach in an attempt to compare two resource options that will operate very differently on a utility system. In fact, he is making the classic error that I have seen beginning resource planners, and inexperienced analysts, make of trying to utilize a screening curve cents/kwh approach to two resource options that will operate very differently on a utility system. This type of analysis is only useful if one is comparing two options that are very similar in how they will operate or be dispatched on the utility system. Furthermore, this type of analysis is typically used merely as an initial, or screening, step in a more comprehensive analysis. That's why it is commonly referred to as a screening curve analysis.

For example, Mr. Furman's use of this approach at least made sense (despite the problems inherent in his particular application as previously noted) in comparing ultra-supercritical pulverized coal and IGCC units. This is because both units are baseload units that will operate at reasonably similar capacity factors (80% and 85% in his example).

However, this type of analysis makes no sense when one is trying to compare baseload units to non-baseload resources such as DSM. DSM options are not traditionally discussed in terms of capacity factor, but they can be thought of in similar terms by dividing their projected annual kwh reduction by their peak hour kw reduction. The resulting hours per year value, which I'll call an equivalent capacity factor, is roughly equivalent to a generating unit's capacity factor value because it measures how many hours per year the resource will impact the utility system. DSM options typically operate with equivalent capacity factors that range from 1% or less to approximately 40%, a far cry from the 80% plus level of baseload units. In other words, DSM options impact a utility system as a peaking or intermediate resource; not as a baseload resource as the FGPP units will.

This is important because a screening curve analysis does not account for how a resource option actually operates on a given utility system and, therefore, does not account for the impact on total utility system costs. This is not a critical factor when comparing two baseload, or two peaking, options because it can be safely assumed that two options that operate in similar fashion on a utility system will have system fuel and variable O&M impacts that are reasonably similar.

However, this becomes critical when comparing peaking/intermediate options (such as DSM resources) to baseload units (such as FGPP). In Mr. Plunkett's

statement, the 8 to 10 cents/kwh cost value is a gross operating cost of the FGPP units by themselves, but their actual net cost to the FPL system and its customers will be significantly lower when one nets out the cost of gas/oil (the marginal fuels on FPL's system) not consumed in other existing units, plus the variable O&M costs not incurred by the other existing units, due to the operation of the FGPP units.

Q. What is the second fundamental problem with Mr. Plunkett's comparison?

A. The second fundamental problem is that the FGPP units are supplying a known amount of capacity, 1,960 MW, that will be available at FPL's Summer peak hours. However, in regard to the DSM values Mr. Plunkett uses, there is no mention of what the cost per kw reduction would be; he only discusses cost per kwh reduced. It is the peak hour kw reduction value of DSM options that enable them to avoid the need for new generation additions.

In order for DSM to meet FPL's resource needs through 2014, the DSM options would have to supply an additional 1,371 MW of Summer peak reduction as was stated on page 13, line 12 of my direct testimony. He provides no comparable DSM cost value of "cents per Summer kw reduced" that would provide 1,371 MW at FPL's Summer peak hour that could be used for comparison. Also, in order to make such a calculation meaningful, it would have to address 1,371 MW of additional DSM over and above the

1,366 MW of cost-effective DSM that FPL already plans to implement for the 2006 – 2015 time frame.

Q. What was the third fundamental problem with Mr. Plunkett's statement?

A. The third fundamental problem with his statement is similar to the problem I noted earlier in regard to Mr. Furman's exhibit: there is no attempt to supply a reviewer, such as the FPSC, with an explanation of how his cost estimates – in this case for DSM - were derived. He does not present the assumptions used, the vintage of his assumptions, nor does he explain the methodology used including what costs and/or system impacts were included in the calculation. (However, by his use of Massachusetts and PG&E values for DSM, he does inform us that these DSM values are not based at all on Florida DSM programs, Florida utility load shapes, Florida weather, etc.)

A reviewer is asked to assume at face value that the DSM assumptions, calculations, and resulting values are accurate and current. However, by not providing Florida-specific values, it is clear that the only direct relation in his cost comparison to the information contained in FPL's filing is the FGPP cost assumptions and calculations (even though he uses them incorrectly as previously discussed). In contrast to Mr. Plunkett's DSM values, the FGPP values and their derivation are explained in great detail in a 110-page report.

Q. On page 5, Mr. Plunkett refers to his belief that *"...tripling the peak demand reductions FP&L plans to realize over the long-term from its DSM portfolio"* is possible on line 10. Then, on line 18, he suggests that this can be achieved by judging a DSM portfolio by a standard of *"..kwh per dollar of portfolio expenditure"*. How do you view his testimony of these two concepts?

A. I believe that Mr. Plunkett's testimony has two primary objectives: (1) to convince the FPSC to deny approval for the FGPP units by suggesting that massive amounts of DSM can do away with the need for generation additions; and (2) that Florida can reach this DSM promised land by dropping the RIM test and adopting a standard that judges DSM by how many kwh are reduced per dollar spent.

In hopes of achieving these objectives, his testimony repeatedly talks about "aggressive", "industry leading", etc. DSM program practices from other utilities or states that FPL should employ that would "triple" FPL's peak demand reductions, thus attempting to cast doubt on the need for the FGPP unit additions.

Mr. Plunkett is either unaware, or chooses to disregard in his testimony, the fact that FPL is ranked nationally by DOE as first in conservation MW achieved and fourth in load management MW achieved. Yet, somehow he asserts that FPL could greatly boost its planned DSM peak reductions by

adopting practices from these "industry leading" utilities (that, inconveniently, almost certainly rank behind FPL nationally in proven DSM achievements). Mr. Brandt's direct and rebuttal testimony provide more detail regarding FPL's industry-leading DSM position.

Mr. Plunkett attempts to explain that this great leap forward in DSM could really be done if FPL and Florida would only adopt a new standard to guide efforts to achieve these tremendous increases in peak hour reduction: kwh per dollar spent on DSM. As I discussed above in regard to his DSM cents per kwh value, any kwh-based cost value provides no information regarding the cost of providing kw reductions, the DSM attribute that actually avoids the need for new generation. Mr. Brandt's rebuttal testimony discusses how FPL's conservation efforts compare to the conservation efforts of one of Mr. Plunkett's favorite examples, PG&E, on the more meaningful cost per kw basis.

Mr. Plunkett's suggestion that Florida should adopt a kwh-based standard by which DSM efforts are guided and judged will shift a utility's DSM focus away from the DSM attribute, kw reduction, that actually avoids the need for new power plants. Such a standard will ensure that the utility will focus on DSM measures that reduce kwh or energy consumption, and not focus on peak hour demand reduction that is needed for DSM to actually avoid new generation additions. Faced with such a standard, a DSM program manager

will be motivated to direct his/her efforts to projects such as streetlight conversions and similar measures that produce the greatest amount of annual kwh reductions regardless of what time of day or season those reductions occur. Any peak hour reductions that are obtained would be a simple (but probably not meaningful) coincidence.

In reality, this aspect of Mr. Plunkett's testimony is little more than the old "the less stringent TRC test should be used" argument being dressed up in a new suit of clothes. It still ignores, by design, the very real negative impact on electricity rates that would result from the implementation of any such standard that is kwh reduction driven. I don't believe any change in how FPL's, or other Florida utilities', DSM programs are evaluated/judged is needed. Florida's DSM successes are admirable. However, if a potential change was to be considered, this docket is not the appropriate place to consider such a change because such a consideration could potentially impact resource planning activities by many Florida utilities, not just FPL.

Q. Mr. Plunkett states on page 7, line 7, that *"FP&L's planned DSM will defer the need for the capacity from the new units by 2-3 years".* Does he correctly understand why FPL is implementing DSM in years prior to the projected in-service dates of the FGPP units?

A. No. As FPL's filing stated, the earliest the FGPP units could be added to FPL's system is after the Summer of 2012; i.e., by 2013 and 2014 for resource

planning purposes. Consequently, the presence or absence of DSM MW would not change the projected in-service dates of the FGPP units.

FPL's DSM implementation plans are part of FPL's overall long-term resource planning. As previously discussed, DSM options are evaluated first in order to cost-effectively address as much of FPL's projected resource needs as possible. The DSM MW in FPL's resource plan prior to the 2013 and 2014 in-service dates of the FGPP units are there to address FPL's resource needs before 2013 that otherwise would have had to be addressed by supply options. These DSM MW were not implemented to defer the FGPP units.

Q. On page 7, starting on line 24, of Mr. Plunkett's testimony, he discussed "front-end loading" as it pertains to DSM in resource planning? Where in FPL's IRP process does FPL evaluate DSM?

A. The statement in Mr. Plunkett's testimony is: *"California utilities are in some cases tripling their DSM investment to comply with state regulators' "first-order loading" imperative for cost-effective DSM before pursuing more expensive supply."* From the inception of FPL's IRP process more than 15 years ago FPL has always evaluated DSM as the first option with which to meet projected capacity needs.

Mr. Plunkett's statement makes it appear that this is something new for California - that California state regulators felt compelled to issue a DSM-first

order in order to get their utilities to more seriously consider DSM. Such an order has never been needed in Florida.

Q. Mr. Plunkett's testimony makes several statements to the effect that DSM resources could cost-effectively avoid the need for the FGPP units. Do you agree with that conclusion?

A. No. I've already pointed out the fundamental errors in his use of a cents per kwh screening curve approach to compare the baseload coal unit to DSM options. To summarize that discussion, Mr. Plunkett's cents per kwh comparison of these two resource options is incomplete and therefore meaningless. One cannot draw a meaningful conclusion about the relative economics of the two options based on his analysis.

On page 13, starting on line 15, Mr. Plunkett makes one of these statements: *"I conclude that the Glades units are probably not needed because of the likely availability of additional DSM that would be cost-effective compared to building and operating them."* When someone not very familiar with utility resource planning looks at the high capital costs of coal units, their first assumption is likely to be that DSM should easily be cost-effective versus such units. This limited perspective – evident in the use of a simplistic cents/kwh comparison – completely misses the enormous annual system fuel savings that baseload units such as the FGPP units will have on a utility system like FPL's.

A comparison of utility options, whether demand or supply, must include all known utility costs in order to determine which resource option is best for a given utility. Furthermore, one also needs to keep in mind that each utility system is different; the best option for utility A may not be the best option for utility B. One should strive to avoid leaping to conclusions until one has included all costs in the evaluation, and has ensured that all costs and other assumptions are specific to the utility system in question.

Q. Also on page 13, Mr. Plunkett describes the RIM test as follows: *"..a rough and inaccurate indicator of distributional equity between groups of ratepayers. It is not a valid indicator of economic efficiency".* What is your reaction to that description of the RIM test?

A. My reaction is that the terms he uses in his comment are somewhat amorphous concepts that he does not attempt to define. In any event, the entire comment is irrelevant to, and inconsistent with, the objective of integrated resource planning and established precedent in Florida.

FPL has concluded, and the FPSC concurred in its first DSM Goals docket, that a combination of the RIM and Participant tests was the best choice with which to analyze DSM options versus supply options. When generation options are compared to each other, all utility costs are accounted for and both the system cost and electric rate perspectives are addressed. The RIM test is the only DSM cost-effectiveness test that accounts for all of the utility's costs for DSM options and addresses both the system cost and electric rate

perspectives. Because a primary objective of integrated resource planning is to evaluate competing options on a level playing field, the RIM test is the logical choice for evaluating DSM options versus supply options. FPL and the FPSC have made the correct choice with the RIM test.

Q. Mr. Plunkett says that FPL should develop *"..an aggressive DSM portfolio capable of deferring the need for additional generation by at least five years(2018)."* on page 14, line 4. Is such a concept realistic in a high growth state like Florida?

A. In my opinion, no. FPL's peak load is forecast to grow between 500 and 700 MW a year, largely due to increasing population. For example purposes, let's assume that the average growth in peak load is 600 MW per year. Therefore, with a 20% reserve margin criterion, 500 MW of additional cost-effective DSM would have to be implemented each year just to keep pace with the projected rate of growth of FPL's peak load. This represents approximately 4 times the DSM achievement that FPL's industry-leading DSM efforts achieve annually. To believe that it is possible to quadruple the amount of cost-effective utility DSM peak reduction in a state which has persistently and aggressively implemented DSM for almost 30 years is completely unrealistic.

In fact, not even Mr. Plunkett seems to believe this is really possible. The most optimistic (and unrealistic) DSM projection for FPL he made in his testimony was a tripling of FPL's current achievement pace, not a quadrupling. So even with his most optimistic projection, FPL would still

need additional generating units and would still need to maintain fuel diversity on its system.

IV. SUMMARY OF TESTIMONY

Q. Would you please summarize your testimony?

A. Yes. I'll summarize my testimony in four points.

1) In regard to resource planning aspects of their testimonies, these witnesses exhibit several common elements. One common element is that these three testimonies each exhibit a lack of knowledge about Florida-specific circumstances, the FPL system, and even FPL's filing itself. Another common element is that the few comparisons and analyses these witnesses offered in their testimonies generally appear not to have been based on information contained in FPL's actual filing, but on information previously obtained from or about other states. A third common element is that the assumptions and methodologies used in their comparisons/analyses are generally not provided so that a reviewer, such as the FPSC, cannot judge the accuracy of the assumptions and methodologies, the vintage of the data used, and - because of this lack of information – the relevance of their results to FPL's filing.

2) Mr. Furman offers testimony and Exhibit RCF-5 in an attempt to reach a conclusion that IGCC is more cost-effective than ultra-supercritical pulverized coal technology. However, his testimony and exhibit actually point out that the ultra-supercritical pulverized coal technology option is lower in capital cost than IGCC, has significantly higher availability than IGCC, and has lower total costs except in one case in which it is assumed that an IGCC unit would be fueled 100% by pet coke. This pet coke assumption is completely unrealistic for an analysis of a 2,000 MW capacity addition that will operate for 40 years.

Furthermore, Mr. Furman's analysis of ultra-supercritical pulverized coal technology has no direct relation to the FGPP units that FPL proposes to construct because his assumption of an ultra-supercritical pulverized coal unit such as the FGPP units being 100% fueled by coal is not how FPL plans to fuel the FGPP units (which is clearly explained in FPL's filing).

Finally, Mr. Furman states that the inclusion of emission costs would make the FGPP units more expensive. He does not seem to realize that FPL's analyses incorporated a wide range of environmental compliance costs. (This too is clearly explained in FPL's filing.)

3) Mr. Schlissel's testimony demonstrated confusion regarding a number of aspects regarding FPL's IRP process and about certain resource planning and utility operation fundamental concepts. These led him to several erroneous conclusions and statements.

Mr. Schlissel also suggested that the need for the FGPP units would be deferred if the 20% reserve margin criterion for FPL were suddenly and arbitrarily reduced to 15%. While mathematically correct (as was previously shown in FPL's filing in Exhibit No. SRS-1 to my direct testimony), the need would only be deferred one year (as is also shown in Exhibit No. SRS-1). Furthermore, he presents no evidence or even an explanation to show that a lowering of FPL's reserve margin criterion - or a deferral of the FGPP units - would be desirable for FPL and its customers. The avoidance of the FGPP advanced technology coal units due to a reduction in the amount of required reserves would leave FPL's customers with both a less reliable system (due to less reserves) and with steadily increasing reliance on natural gas delivery and its price volatility (due to not adding the FGPP units).

4) Mr. Plunkett's testimony contained a number of incorrect and/or misleading statements. An abbreviated version of that list is discussed here. One is a flawed cents per kwh analysis that he used to try to convince a reviewer that the FGPP units are approximately twice as

expensive as DSM options; a conclusion that is incorrect. His testimony also included numerous statements that DSM could cost-effectively avoid the need for the FGPP units. Because his cents per kwh analysis is flawed and produced no meaningful result, these statements are completely unsupported.

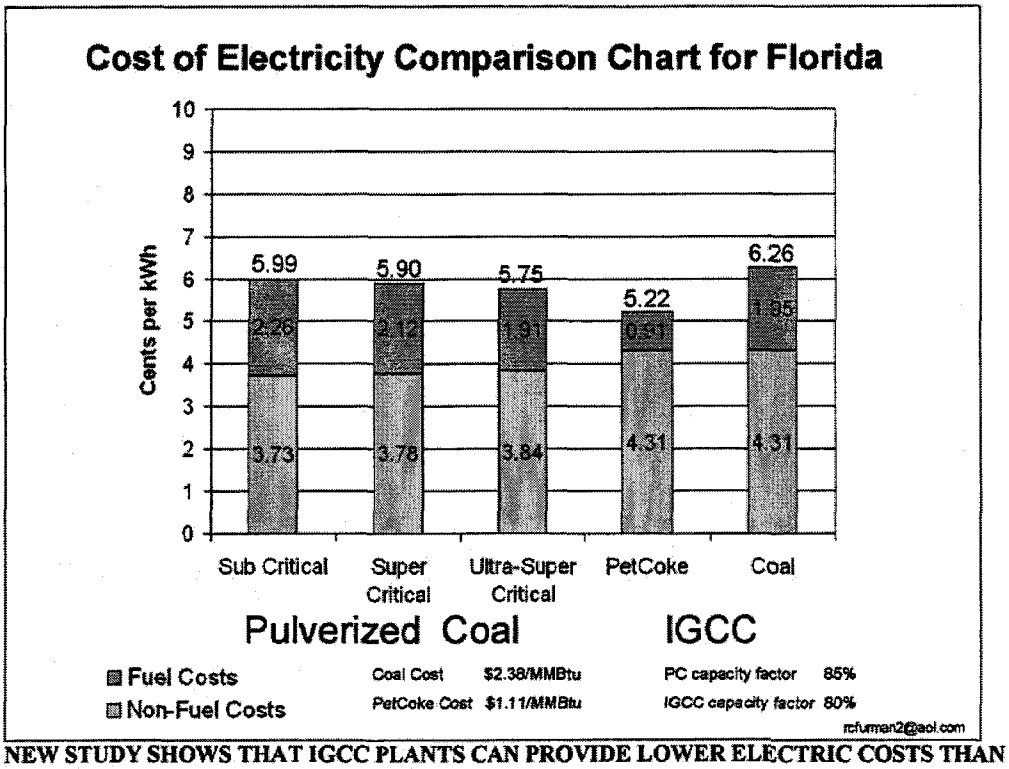
Mr. Plunkett championed the use of a "kwh per dollar spent on DSM" standard that would supposedly lead to tripling FPL's DSM peak hour savings. However, focusing on kwh savings does not avoid new capacity, only achieving cost-effective kw reduction – as is FPL's DSM objective – avoids new capacity. Also, the use of the "kwh per dollar spent on DSM" standard is really just a way to attempt to avoid the RIM vs TRC test debate and to convince the FPSC to adopt a standard that would leave Florida with DSM measures that the use of the flawed TRC test would have allowed; i.e., measures that are not cost-effective to all of FPL's customers.

Finally, Mr. Plunkett called on the FPSC to effectively require a quadrupling of FPL's already aggressive DSM achievements in peak reduction demand in order that FPL would not need any more new plants for 5 years. This directly contradicted his own most optimistic (and unrealistic) assumption that FPL might triple its DSM achievement.

Q. Does this conclude your testimony?

A. Yes.

Richard C. Furman Exhibit from Taylor Energy Center Docket



NEW STUDY SHOWS THAT IGCC PLANTS CAN PROVIDE LOWER ELECTRIC COSTS THAN PULVERIZED COAL PLANTS

This chart shows that the costs of electricity for any of the proposed three types of Pulverized Coal (PC) Plants are higher than the cost of electricity for an IGCC plant using Petroleum Coke (PetCoke) in Florida. Although the IGCC plant has a higher capital cost than the PC plants it has a significantly lower fuel cost when using petcoke. The U.S. petroleum refineries in the Gulf coast produce over 25 million tons per year of fuel-grade petcoke that can be used by IGCC plants. This petcoke can provide over 10,000 MW of new generating capacity in the U.S. At the present time almost all of this petcoke is exported to other countries that allow the higher emissions of SO2 that petcoke produces. The use of petcoke in the U.S. requires the installation of additional FGD systems to PC plants which is usually cost prohibitive. IGCC plants can effectively remove the sulfur from petcoke and sell it as a value added product. Florida's proximity to the Gulf coast refineries enables Florida's utilities to make use of this waste material while reducing emissions and lowering their cost of electricity. Therefore the lowest cost alternative for Florida is the use of IGCC plants utilizing petcoke.

For the past 10 years Tampa Electric has been using petcoke in their 250 MW IGCC plant and have recently announced that they will build an additional 630 MW IGCC plant for operation in 2013. Tampa Electric's President Chuck Black was recently quoted as saying: **"IT'S OUR LEAST COST-GENERATING RESOURCE, SO WE COUNT ON IT AND USE IT EVERY DAY AS PART OF OUR SYSTEM"** in the November 2006 issue of Time Magazine, Inside Business.

Sources of data for Cost of Electricity Comparison Chart for Florida:

1. Capital, O&M and all non-fuel costs are based upon: **Department of Energy/NETL Presentation, Federal IGCC R&D: Coal's Pathway to the Future, by Juli Klara, presented at GTC, Oct. 4, 2006.**
2. Efficiencies and fuel consumption calculations are based upon: **EPA Final Report, Environmental Footprints and Costs of Coal-Based Integrated Gasification Combined Cycle and Pulverized Coal Technologies, July 2006.**
3. Fuel costs are based upon: **Department of Energy, Energy Information Administration, Average Delivered Cost of Coal and Petroleum Coke to Electric Utilities in Florida, 2005 and 2004.**