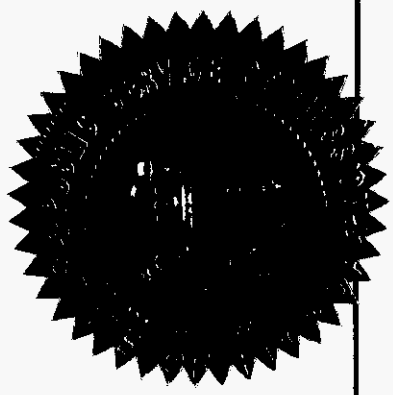
BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 090009-EI

In the Matter of:

NUCLEAR COST RECOVERY CLAUSE.
_____/



VOLUME 3

Pages 449 through 654

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PROCEEDINGS: HEARING

COMMISSIONERS
PARTICIPATING: CHAIRMAN MATTHEW M. CARTER, II
COMMISSIONER LISA POLAK EDGAR
COMMISSIONER KATRINA J. McMURRIAN
COMMISSIONER NANCY ARGENZIANO
COMMISSIONER NATHAN A. SKOP

DATE: Tuesday, September 8, 2009

TIME: Commenced at 2:20 p.m.
Concluded at 4:30 p.m.

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

ORIGINAL

REPORTED BY: RAY D. CONVERY
Court Reporter
(850) 224-0722

I N D E X

WITNESSES

EXHIBITS

NUMBER:		ID.	ADMTD.
40 through 45			470
46 through 60		588	600
61 through 69		522	546
70		601	601
71, 72		prev. marked	639
131			453
135	Gundersen District Court	532	---
136	Gundersen 11th Circuit	532	---

P R O C E E D I N G S

(Transcript follows in sequence from Volume 2.)

CHAIRMAN CARTER: We are back on the record, and before we continue with our cross-examination, I've spoken with the parties before I left and asked you to review the document on -- refresh my memory, staff, on that exhibit number. 131. Okay, let's hear the parties on the exhibit and also the objections, and then, Ms. Helton, I'll come your way.

MS. HELTON: Actually, Mr. Chairman, I think we could maybe avoid most of that. The parties, it's my understanding, have come to an agreement, and the cover page, pages 9, 12, and 31, everyone agrees that that should be admitted into the record, and with the exception of page 31 most of which is confidential, the rest of it is public information.

CHAIRMAN CARTER: Is there any objection? Okay, then --

MR. YOUNG: Mr. Chairman --

CHAIRMAN CARTER: Okay. For the record.

MR. YOUNG: Just for the record, I gave Mr. Steve Larson a copy for Commissioner Argenziano so she can have a copy.

CHAIRMAN CARTER: And for the record, make

sure that we have the version that will actually be entered in for the record.

MS. HELTON: Yes, sir. I think that's been distributed by Florida Power & Light just before we came back from lunch.

CHAIRMAN CARTER: Okay. Then without as modified, Exhibit 131 will be entered into the record.

(Exhibit No. 131 admitted into the record.)

CHAIRMAN CARTER: When we last left, I think, Mr. Moyle, you were up for cross-examination. You are recognized, sir.

CROSS EXAMINATION

BY MR. MOYLE:

Q Thank you, Mr. Chairman.

Mr. Reed, good afternoon. I'm John Moyle. I represent the Florida Industrial Power Users Group. I have some questions for you this afternoon.

Can you just tell us a little bit about your educational background, please?

A Certainly. I have a Bachelor of Science in economics and finance from the Wharton School at the University of Pennsylvania. I've also taken postgraduate work in securities as necessary to maintain my securities licenses, continued with the continuing education requirements for that.

Q Okay. One of the earlier FPL witnesses indicated that you had done a review. I think I had asked her about audits, and you're not an accountant or a licensed CPA; are you?

A No, we have CPAs on our staff but we would not assign a CPA to a construction audit or a management audit like this.

Q Okay. And so, with respect to the notion of any audit work, accounting audit work that was done above and beyond, y'all did not perform any such function, correct, as part of your scope of services?

A Not an accounting audit, that's correct.

Q Now I want to just follow up on some questions that were asked of you specifically with your Exhibit JJR-1, page 36 of 36.

A And again, that's JJR-1 to the May 1st?

Q Yes, sir. Now, you were here when Mr. Scroggs testified earlier; correct?

A Yes.

Q And I asked him what the costs were as he sat here today, and he gave a range of 16 to $18 billion. Do you recall that?

A Yes.

Q Okay. So, if you were looking at your chart there -- did you assume that those were all-in costs or

overnight costs?

A All-in costs.

Q So if you look at your chart there, you used a project cost of 14 billion; correct?

A And again, you're looking at page 36 of that document?

Q Yes, sir.

A Yes.

Q Given what a previous witness testified about a 16 to $18 billion range being the most current, wouldn't you agree that your all-in number, if you were going to pick a midpoint, would be $17 billion?

A Again, if you're trying to do an average of the -- what was the midpoint and the upper end of the range, I think you can do that; you can average the two figures. I would point out, by the way, that the range is captured on this, and the calculation in fact that I was doing earlier is shown here. The $8,071 per KW which is in the notes is the upper end of the range.

Q Yes, sir. And the date of the estimate that is reflected in this chart is October of 2007, correct?

A Yes, for Florida Power & Light.

Q All right. And that's approximately two years old, correct?

A Yes.

Q So just -- I'm just trying to get you to confirm that the better number for the purposes of use today would be, given Mr. Scrogg's testimony about the cost being between 16 billion and 18 billion, if you were to pick the midpoint of that, it would be 17 billion; correct.

MS. CANO: Excuse me, Mr. Chairman. I'm sorry. Could you clarify? Are you saying that Mr. Scroggs specified 16 to 18 because I think that may be a mischaracterization of his testimony?

MR. MOYLE: I thought that was his answer when I asked him, as we sit here today, what's your estimate as to the cost of the 6 and 7, and he said a range of 16 to 18 billion. I mean, the record would have it, but that was my recollection.

MS. CANO: Okay. Thank you.

BY MR. MOYLE:

Q So, just so the record's clear, you did answer that -- if Mr. Scroggs said 16 to 18, that, on current information, you would use 17 as a midpoint; correct?

A Yes, if you want to assume that those two figures represent the current bound.

Q And you don't have any reason to believe that those -- that range is not current, correct?

A No. I think Mr. Scroggs' testimony speaks for

itself. He said today the number would be closer to the upper end of the range. I'm not sure those two specific figures were the bounds, but --

Q You were asked some questions about an announcement made by Duke with respect to an Ohio project, and I'm not sure you indicated what that announcement was. Would you go ahead and clarify that for the record, please?

A Duke has announced its intention to build a new nuclear facility in Ohio using the EPR technology.

Q And did they announce that that was being suspended or halted?

A No. I think the -- there may be two different pieces of information going on here. They made an announcement with regard to proceeding with a new project in Ohio. They also made an announcement with regard to potentially delaying their commencement of operation for a plant in North Carolina.

Q Okay. And I was unclear as to that. So in North Carolina, they indicated they may slow down; is that correct?

A Yes, both a nuclear plant and two gas-fired plants.

Q On page 14, line 12 of your testimony --

A Again, is this the May or the March?

Q This is the May.

I found interest, your use of a phrase, "The best athlete should be utilized to undertake each portion of the Turkey Point 6 and 7 Development." What's the point you were trying to make by using the term "best athlete"?

A They're using a matrix organization for the staffing of the new nuclear program cutting across divisions and departments within the company and trying to tap into the best talent wherever they are within the organization.

Q Does that best-athlete analogy carry over with respect to outside vendors, third-party contractors, that the FPL project team should try to get the best athlete to undertake services?

A Yes. I think the concept is the same. You want to assemble the best team internally and externally to get the job done.

Q I had referred during some previous cross-examination to your report with respect to the strategies of retaining engineering services, and I want to spend a few minutes and just get your view and thoughts on that.

You would agree that the -- to the extent that work can be subjected to competitive bidding, that it

should be competitive bid if able to be done; right?

A I certainly agree there should be a preference for competitive bidding and that is the company's preference. There are a number of cases where both sole source and single source justification is warranted.

Q And with respect to the engineering work related to the license application, that process was competitively bid; correct?

A And by "license application," do you mean the COLA with the NRC?

Q Yes, sir.

A That's correct, it was.

Q And who were the companies that sought to do that work, if you recall?

A Initially there were six companies which got cut down to four, and those are identified on page 11 -- I'm sorry, it's referred to as page 15 of 36 of my report, which is JJR-1.

Q And ultimately that work was awarded to Bechtel, is that right?

A That's correct.

Q And Bechtel is an engineering company that's well respected in the industry?

A Yes.

Q And Bechtel would also be capable, would they

not, of doing the preliminary engineering work that was sole-sourced to Black & Veatch?

A It was single-sourced, which is a slight difference from sole sourcing, but yes; they could have done that as well.

Q And FPL made a decision to sole source that work to Black & Veatch largely so that Black & Veatch could develop experience with the AP1000 reactor, correct?

A I'd say it goes beyond that. As I said, they did it -- they used a single source justification largely because it would help develop a more competitive response later in the project to competitive bidding.

Q And they didn't do any kind of quantitative or qualitative analysis to make that determination, did they?

A They did a back-of-the-envelope calculation that said the costs that were being let in the BVZ contract were significantly less than one tenth of one percent of the total project cost, and if, by enabling more competition to bid for the larger EP contract or the EP&C contract, they felt they had the potential to achieve more than a hundred million in savings, a very large multiple of the cost of the BVZ contract.

Q What was the contract award of the BVZ contract, do you know? You said one tenth of one percent of 18 billion. What's the number for the contract?

A I said substantially less than that. I know the number. I'm just trying to make sure that it wasn't confidential, but let me just go with range. It was less than ten million.

Q And on page 22 of your report, you state, and I quote, "By single sourcing the procurement of engineering services from BVZ, this vendor will gain experience with the AP1000 reactor in the PTN 6 and 7 project and FPL will increase the competitive environment for constructions services for the AP1000." That's a true and accurate statement, correct?

A Can you just tell me again what page you were on?

Q Page 22.

A Twenty-two of 36?

Q I'm sorry. It's page 26 of 36. Page 22 at the bottom.

A Okay. Yeah, I think you captured that correctly.

Q Is it your understanding that part of a business model is to award contracts not necessarily on

the best price but in order to increase markets and increase competition? Is that a legitimate business practice in your judgment?

A If it will benefit the project overall. We're not looking a macroeconomic benefit for the entire industry, but if it would benefit the project to enhance competition for a later stage of bidding, yes; that's a viable objective.

Q And you talk about a back-of-the-envelope analysis. Did you see any kind of analysis that was performed?

A Mr. Scroggs made reference to those order of magnitude numbers in his testimony, as I recall.

Q You -- in response to some questions previously on cross-examination, you indicated I believe that you had shared your report with FPL prior to it being issued; is that correct?

A Yes.

Q And what was the purpose of that?

A We wanted to run our -- especially our draft conclusions by them before the report was filed here at the Commission.

Q Presumably that would -- there was a review done of that and some feedback was given to you prior to finalizing your report?

A That's correct.

Q And presumably the feedback was taken and some changes were made to the final report as compared to the draft report?

A I don't think there were any meaningful changes made to the final report. My purpose in having the review done was to make sure the company didn't disagree with our conclusions. If they were going to take a position in the case that said we disagree with Concentric's Conclusion No. 7, I wanted to know before we filed, but as I indicated, there was no disagreement with our recommendations.

Q And why would that be important to know that prior to filing?

A I would want to provide additional support and justification for why we felt that was appropriate.

Q Can I refer you to page 3 of 36 of your exhibit? And you were asked some questions, I believe, about this page earlier. Tell me when you're there, if you would.

A Page 3 of 36, I have that.

Q Okay. The last bullet down talks -- and I'll quote -- about "developing a clear process for ensuring vendors with similar scopes for work at FPL's affiliate, NextEra Energy's unregulated Point Beach Nuclear Power

Plant in Wisconsin appropriately bill NextEra Energy and FPL for the work being performed at each plant." Presumably that was an area that you identified some improvement could be made, correct?

A Yes.

Q And you're aware that FPL Energy has a number of nuclear units, correct?

A Yes, I am.

Q Are you aware of any power plant, of a nuclear power plant in the United States that has ever been built in which the construction portion was split from the engineering and procurement portion?

A Yes, there are some. I'd have to go back and review the construction from the '70s and '80s to give you names, but there were a number of plants where the utility themselves undertook the construction but they farmed out the engineering work. So certainly in those cases where the utility was their own, essentially, general contractor, they separated those two.

Q There hasn't been a situation in which, to use a general-contracting analogy, a general contractor was hired for -- directly with the utility for engineering and procurement and then the owner executed a separate and apart contract for the construction that you're aware of; correct?

A Not for nuclear. It has been the case for coal in the past and it is the case currently for coal and other new nuclear, but to date there hasn't been two separate contracts issued for EP&C for an existing nuclear plant.

Q Wouldn't you agree that splitting out the construction piece from the engineering procurement could potentially lead to greater disputes about scope of services and responsibility as to who was supposed to do what as compared to combining all three elements together?

A It could. I think it also could produce very substantial benefits. As I mentioned in my testimony, we're currently advising another client that's choosing the exact same strategy that FPL is, and we've carefully reviewed their basis for that decision and I fully support it. There are potentially very substantial customer benefits separating the EP work from the construction work.

Q Let me refer you to page 17 of 36 of your report, and tell me when you're there.

A I have that.

Q Under the observations, the third paragraph, you state, "Concentric has noted that four vendors were issued contracts that include similar scopes of work for

PSL-1 and 2 and PTN-3 and 4, as well as for the work concurrently progressing at FPL's affiliate, NextEra Energy's unregulated Point Beach Nuclear Power Plant."

I'm not clear as to what you were trying to capture when you indicated that there were four vendors doing work on contracts that contained similar scopes of work. Could you explain?

A Okay. There are uprates going on at, obviously, St. Lucie and at Turkey Point, and there also is a pair of uprates going on at Point Beach 1 and 2. The company is using the same vendors for four vendors at all six projects if you will. It's a matter of ensuring that the contractor is charging the right project. Obviously, making sure that any costs that should be charged to St. Lucie, which is the NextEra plant -- I'm sorry -- to Point Beach which is the NextEra plant, is very important. So we want to make sure that all the charges are properly captured and go to the right entity.

Q And I guess that was the point that we talked about earlier with respect to your recommendation to improve the capture of costs to make sure they're properly allocated, correct?

A Yes.

Q There's been some discussion about joint

venture operations or strategic partnerships. Are you familiar that some of the rating agencies and Wall Street have indicated that such strategic partnerships should be fully explored by utilities seeking to build nuclear power plants?

A I'm very familiar with the rating agencies' views on that, yes.

Q Do you concur with those views?

A Yeah, in general I do. It's especially important for smaller utilities to pursue those types of partnerships, and if you look at the ones that are being pursued today, it's largely the case they are companies with a market capitalization that's lower than FPL's, but to diversify risk and to make sure you have adequate access to capital, many of the smaller companies are pursuing those kinds of JVs.

Q And that analysis wouldn't necessarily be limited to small companies. To the extent that you can diversify risk even with companies with larger economic profiles, you still would be able to benefit and diversify risk if a strategic partnership were forged; correct?

A There are tradeoffs. You can diversify risk, but you also lose output to the facility. If you're a larger facility that needs all of the output by the

expected operation date, then your incentive to pursue a JV is obviously less.

Q Do you know how many units are currently proposed to be built in Florida, new nuclear power plants?

A Four units.

Q In your professional view, do you think it would make sense for there to be efforts to explore a joint venture so that risk between -- risk, as it ultimately falls on consumers, could be mitigated by possibly a joint venture relationship?

A I'm not going to offer a view with regard to Progress. I'm really here just talking about FPL. I'm very comfortable that FPL can pursue the two units it's pursuing on its own.

Again, the tradeoff there is, if they were to bring partners in, which is something they are considering, you have to understand that they'll be relinquishing part of the output and they'll need to replace that with other capacity.

Q Yes, sir, and I appreciate that. And I guess the point I was trying to make in terms of asking you the question is to ask you to consider that question from the point of view of consumers. You would agree that consumers potentially could be less at risk to the

extent that a joint venture type arrangement were forged and -- to develop nuclear power plants in the state of Florida, correct?

A Not necessarily. Consumers of any individual utility may have less financial risk, but to the extent you then have to replace that capacity with gas-fired capacity, you may have more fuel price risk. Consumers in the state as a whole aren't going to be affected, obviously, by the JV, assuming that there's JV partners in Florida.

Q Would it be correct to characterize, as to FPL's off-ramp strategy, that it is hedging its bets with respect to the development of a future nuclear power plant project in Florida?

A I don't think hedging. I think they're preserving maximum optionality, and I think that's appropriate.

MR. MOYLE: Mr. Chairman, if I could have one minute.

CHAIRMAN CARTER: Okay. Take a moment.

MR. MOYLE: That's all I have. Thank you.

CHAIRMAN CARTER: Thank you. Staff, you're recognized.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners? Redirect?

MS. CANO: No redirect?

CHAIRMAN CARTER: Exhibits? From Staff's Comprehensive Exhibit List, Nos. 40 through 43; is that correct?

MS. CANO: FPL moves Exhibits 40 to 43.

CHAIRMAN CARTER: Are there any objections?

Without objection, show it done.

(Exhibit Nos. 40, 41, 42 and 43 admitted into the record.)

CHAIRMAN CARTER: Anything else for this witness on direct?

Thank you, sir. You may be excused.

Call your next witness. Oh, Mr. McGlothlin, you're recognized, sir.

MR. McGLOTHLIN: OPC calls Dr. William Jacobs.

Dr. Jacobs arrived after you administered the oath earlier.

CHAIRMAN CARTER: Okay. Dr. Jacobs, would you please remain standing and raise your right hand.

Are there any other witnesses that were not here this morning that will be testifying in the FPL case?

Okay. Would you please stand and raise your right hand as well.

Whereupon,

WILLIAM REED JACOBS, JR.

was called as a witness on behalf of Office of Public Counsel, and, having been duly sworn, was examined and testified as follows:

CHAIRMAN CARTER: Thank you. Please be seated.

You may proceed Mr. McGlothlin.

DIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Please give us your full name and your business address, sir.

A My name is William Reed Jacobs, Jr. My business address is 1850 Parkway Place, Marietta, Georgia.

Q Dr. Jacobs, on behalf of the Office of Public Counsel, did you prepare prefiled direct testimony in this case?

A Yes, sir; I did.

Q Do you have that document before you?

A Yes, I do.

Q Do you have any changes or additions or corrections to make?

A No, I did not.

Q Do you adopt the questions and answers contained in this document as your testimony before the

Commission?

A Yes, I do.

MR. McGLOTHLIN: I request that the prefiled testimony of Dr. Jacobs be inserted at this point.

CHAIRMAN CARTER: The prefiled testimony of the witness will be inserted into the record as though read.

DIRECT TESTIMONY

Of

WILLIAM R. JACOBS JR., Ph.D.

On Behalf of the Office of Public Counsel

Before the

Florida Public Service Commission

Docket No. 090009-EI

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

A. My name is William R. Jacobs, Jr., Ph.D. I am a Vice President of GDS Associates, Inc. My business address is 1850 Parkway Place, Suite 800, Marietta, Georgia, 30067.

Q. DR. JACOBS, PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I received a Bachelor of Mechanical Engineering in 1968, a Master of Science in Nuclear Engineering in 1969 and a Ph.D. in Nuclear Engineering in 1971, all from the Georgia Institute of Technology. I am a registered professional engineer and a member of the American Nuclear Society. I have more than thirty years of experience in the electric power industry including more than twelve years of power plant construction and start-up experience. I have participated in the construction and start-up of seven power plants in this country and overseas in management positions including start-up manager and site manager. As a loaned employee at the Institute of Nuclear Power Operations ("INPO"), I participated in the Construction Project

Evaluation Program, performed operating plant evaluations and assisted in development of the Outage Management Evaluation Program. Since joining GDS Associates, Inc. in 1986, I have participated in rate case and litigation support activities related to power plant construction, operation and decommissioning. I have evaluated nuclear power plant outages at numerous nuclear plants throughout the United States. I am currently on the management committee of Plum Point Unit 1, a 650 MWe coal fired power plant under construction near Osceola, Arkansas. As a member of the management committee, I assist in providing oversight of the EPC contractor for this project. My resume is included as Exhibit WRJ-1.

Q. WERE YOU ASSISTED BY OTHER GDS PERSONNEL IN THIS EFFORT?

A. Yes I was. The GDS team involved in the review and evaluation of the requests for authorization to recover costs consisted of me, Mr. James P. McGaughy, Jr., a former nuclear utility executive with over 37 years or experience and Mr. Cary Cook, a Certified Public Account with extensive experience in utility regulation. The resumes of Mr. McGaughy and Mr. Cook are attached to my testimony related to Progress Energy Florida filed in this docket.

Q. WHAT IS THE NATURE OF YOUR BUSINESS?

A. GDS Associates, Inc. ("GDS") is an engineering and consulting firm with offices in Marietta, Georgia; Austin, Texas; Corpus Christi, Texas; Manchester, New Hampshire; Madison, Wisconsin, Manchester, Maine; and Auburn, Alabama. GDS provides a variety of services to the electric utility industry including power supply planning, generation support services, rates and regulatory consulting, financial analysis, load forecasting and statistical services. Generation support services

provided by GDS include fossil and nuclear plant monitoring, plant ownership feasibility studies, plant management audits, production cost modeling and expert testimony on matters relating to plant management, construction, licensing and performance issues in technical litigation and regulatory proceedings.

Q. WHOM ARE YOU REPRESENTING IN THIS PROCEEDING?

A. I am representing the Florida Office of Public Counsel.

Q. WHAT WAS YOUR ASSIGNMENT IN THIS PROCEEDING?

A. I was asked to assist the Florida Office of Public Counsel to conduct a review and evaluation of requests by Florida Power and Light (FPL) for authority to collect historical and projected costs associated with extended power uprate ("EPU") projects being pursued at Turkey Point Units 3 and 4 and St. Lucie Units 1 and 2, and historical and projected costs associated with FPL's Turkey Point Units 6 and 7, through the capacity cost recovery clause.

II. SUMMARY OF REQUESTS FOR AUTHORIZATION TO COLLECT COSTS

Q. PLEASE SUMMARIZE FPL'S REQUEST FOR COST RECOVERY IN THIS DOCKET UNDER THE NUCLEAR COST RECOVERY CLAUSE.

A. FPL is requesting to recover a net amount of $62,792,990 in 2010. This consists of 2010 projected costs of $151,610,759 and 2008/2009 over recovery of $88,817,769.

III. METHODOLOGY

Q. PLEASE DESCRIBE THE METHODOLOGY THAT YOU USED TO REVIEW AND EVALUATE THE REQUESTS FOR AUTHORIZATION TO COLLECT COSTS SUBMITTED BY FPL UNDER THE NUCLEAR COST RECOVERY CLAUSE.

A. I first reviewed the Company's filings in this docket and assisted in the issuance of numerous interrogatories and requests for production of documents. To evaluate the contracting process employed by the Company, I reviewed requests for proposals issued by the Company, the bid evaluations conducted on proposals received in response to the requests for proposals, and the contracts awarded to the winning bidders. For single or sole source contracts, I reviewed the single or sole source justifications to ensure that they met the requirements of the governing company procedures.

To evaluate the issues related to project schedule and risk management, I reviewed many internal documents, status reports and correspondence with regulatory authorities.

Q. HOW DID YOU DETERMINE IF THE COSTS REQUESTED FOR RECOVERY BY THE COMPANIES WERE PRUDENT AND REASONABLE?

A. The Company must employ prudent contracting and project management and risk management procedures and practices to ensure that the costs are prudently incurred. The scope of work must be reasonable and the Company must ensure that the costs are reasonable by means of competitive bidding or other methods, such as comparisons with similar projects for which the cost is known. I also reviewed the

project management procedures and practices that will be used in an effort to manage the projects prudently as they move into the implementation stage.

In addition to the above reviews, Mr. Cary Cook reviewed the requests to ensure proper accounting treatment and accurate calculation of the various amounts requested for recovery by the Company.

Q. PLEASE DESCRIBE YOUR REVIEW OF THE PROJECT MANAGEMENT PROCEDURES AND PRACTICES UTILIZED BY FPL.

A. As the projects move into the implementation phase, prudent project management and risk mitigation will be important to ensure that projects are completed on schedule and within budget. Project management procedures and practices that we reviewed include establishment of project budgets, monitoring of budget variances, corrective actions for budget variances, establishment of project schedules, and monitoring of project schedule variances, and corrective action for schedule variances.

IV. ISSUES AND CONCERNS

Q. HAVE YOU IDENTIFIED CONCERNS WITH FPL'S FILING?

A. Yes. I have identified three concerns with FPL's filing. The first is with FPL's decision to retain BVZ as the preliminary engineer and FPL's plan for a separate construction contractor for the Turkey Point 6 and 7 projects. My second concern is with the FPL's analysis of the long term feasibility of the Turkey Point 6 and 7 projects. My final concern is with FPL's refusal to conduct an analysis to identify equipment in the EPU projects that would meet the "separate and apart" criterion.

Q. PLEASE EXPLAIN YOUR CONCERN WITH FPL'S RETAINING BVZ AS THE PRELIMINARY ENGINEER AND FPL'S PLAN TO UTILIZE A SEPARATE CONSTRUCTION CONTRACTOR FOR TURKEY POINT 6 AND 7.

A. FPL has separated the construction function from engineering and procurement in its organization of the Turkey Point 6 and 7 project. FPL has retained a consortium of Black and Veatch and Zachry Constructors (BVZ) to provide pre-construction engineering. I believe that the hiring of BVZ and FPL's plan for a separate construction contractor may ultimately result in higher costs for this project. This approach is referred to as an EP and C approach rather than the Engineer, Procure, Construct (EPC) approach used by other AP1000 projects, in which all functions are performed under one contract.

Q. WHY ARE YOU RAISING THIS CONCERN AT THIS TIME?

A. I raise this issue now so that it is clear that the potential for increased costs was identified without the benefit of hindsight in future prudence determinations.

Q. PLEASE EXPLAIN THE BASIS FOR YOUR CONCERNS WITH FPL'S APPROACH TO CONTRACTING FOR THE TURKEY POINT 6 AND 7 UNITS.

A. The Turkey Point 6 and 7 project is a very large and complex project. The nuclear steam supply system (NSSS) supplier and designer, the secondary plant supplier and designer and the constructor must interface with each other frequently. The extremely complex work activities and interfaces between contractors could result in

numerous disputes between contractors. The use of separate contractors results in higher risk to the FPL and the potential for numerous scope disputes. The modular construction planned for TP 6 & 7, with over 250 separate modules, requires extremely close cooperation between the designer and construction contractor from a very early stage in the project. An EPC-type contract utilizing a turn-key approach with a single entity clearly reduces the risk for FPL. This type of contract places the burden and risk on the consortium (Westinghouse and Shaw Stone & Webster) to manage the interface between the engineering, procurement and construction areas. The consortium would be fully accountable for any delays resulting from these interfaces. In addition, under the EPC approach each member of the consortium could, in most circumstances, be jointly and severally liable for the actions of the others, thus reducing the risk to FPL if one entity fails to perform. Finally, the Westinghouse / Shaw consortium will have gained significant experience from earlier AP 1000 projects and will incorporate the lessons learned into the TP 6&7 project. The use of a construction contractor without familiarity with the AP1000 design and without the benefit of the earlier AP1000 projects will likely result in a repeat of the lessons learned on the earlier AP1000 projects and additional costs to the project.

Q. DOES BVZ FIT THIS DESCRIPTION?

A. Yes, they do. FPL's Single Source Justification for hiring BVZ contains a rather remarkable statement. Note: this is not a typo.

[redacted]

(Emphasis added). (FPL Response to OPCPOD 16 at FPL006691, Exhibit WRJ(FPL)-2.)

Q. HAVE ANY OTHER UTILITIES CHOSEN TO USE THE EP AND C CONTRACTING APPROACH SELECTED BY FPL?

A. No, they have not. All other U.S. utilities that have signed a contract for construction of a new nuclear power plant have chosen the EPC approach.

Q. PLEASE EXPLAIN THE CONCERN YOU HAVE WITH FPL'S FEASIBILITY ANALYSIS OF THE TURKEY POINT 6 AND 7 UNITS PROVIDED IN THIS FILING.

A. The detailed analysis of the long term feasibility of the Turkey Point 6 and 7 project is provided in the testimony of Dr. Steven Sim. Dr. Sim calculated the breakeven overnight capital cost for the new nuclear units based on five forecasts of key assumptions: (1) forecasted Summer peak load, (2) forecasted natural gas costs, (3) forecasted oil costs, (4) forecasted uranium costs, and (5) forecasted environmental compliance costs for carbon dioxide. Dr. Sim then compared the calculated break even cost for 9 different scenarios to FPL's non-binding estimated range of capital costs for the new nuclear units in 2007$ of $3,108/kw to $4,540/kw and concluded that the Turkey Point 6 and 7 project is still projected to be a solidly cost-effective addition for FPL's customers. My concern is that Dr. Sim only did half of the job. While he updated the break even cost based on updated assumptions and forecasts, he did not update the estimated cost of the nuclear units. Without an updated cost of the nuclear units, the comparison is of little value to this Commission in determining the long term feasibility of the units.

Q. PLEASE EXPLAIN THE CONCERNS THAT YOU HAVE WITH FPL'S FILING RELATED TO THE SEPARATE AND APART ISSUE.

A. A stipulation between OPC and FPL related to the separate and apart issue is shown on page 29 of the Final Order in Docket No. 080009-EI. This stipulation states:

> OPC and FPL stipulate that as it applies to nuclear uprate projects, the NCRC should be limited to those costs that are separate and apart from nuclear costs that would have been necessary to provide safe and reliable service had there been no uprate project.

FPL has steadfastly refused to conduct the necessary analysis to confirm that the uprate costs for which it is requesting recovery are separate and apart from nuclear costs that would have been necessary to provide safe and reliable service had there been no uprate project. FPL addresses the separate and apart issue in the March 2, 2009 testimony of Mr. Rajiv Kundalkar. In his testimony, Mr. Kundalkar rejects OPC's request that FPL conduct a study to identify each component that may need to be replaced during the 20 years of extended operation. Mr. Kundalkar states:

> This approach however, is inherently inconsistent with the true manner in which nuclear plants are maintained – which requires constant and real-time monitoring, surveillance, and maintenance decisions – and it was determined that such a study would not yield meaningful or useful results.

I agree that nuclear plant maintenance involves real time monitoring and maintenance decisions. However, in addition to day-to-day maintenance, nuclear utilities conduct long term capital spending studies to identify large capital expenditures many years in advance. These studies identify equipment that may need to be replaced many years in the future for reasons of economics, obsolescence or other factors. I do not agree that this type of study would not yield meaningful results related to the separate and apart issue. In my opinion, FPL has been uncooperative in resolving this issue and has not acted in the spirit of the stipulation in Docket No. 080009-EI.

V. CONCLUSIONS AND RECOMMENDATIONS

Q. WHAT ARE YOUR CONCLUSIONS CONCERNING FPL'S FILING IN THIS DOCKET?

A. 1. FPL's decision to use a contracting method that separates engineering and procurement from construction may result in significant additional costs.

2. FPL's feasibility analysis of the Turkey Point 6 and 7 project did not include a necessary update of the estimate cost of the project.

2. FPL did not conduct the "separate and apart" analysis envisioned by the settlement in Docket No. 080009-EI.

Q. WHAT ARE YOUR RECOMMENDATIONS CONCERNING FPL'S FILING IN THIS DOCKET?

A. I recommend the following concerning FPL's filing in this docket:

1. The Commission should take notice that additional costs may result from FPL's decision to retain BVZ and organize the project with a construction contract that is separate from the engineering and procurement contract, and inform FPL that FPL will be required to demonstrate that the project contracting and BVZ decision do not result in additional costs to the project.

2. The Commission should order FPL to prepare a revised estimate of the cost of the Turkey Point 6 and 7 project and incorporate the updated cost in a renewed analysis of the long term feasibility of the project.

3. The Commission should order FPL to conduct the "separate and apart" analysis that was requested by OPC and envisioned in the *stipulation in Docket No. 080009-EI.*

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

MR. McGLOTHLIN: And for the information of the court reporter, there are redacted and confidential versions of the testimony and exhibits.

CHAIRMAN CARTER: Okay.

BY MR. McGLOTHLIN:

Q Dr. Jacobs, did you also prepare the exhibits that are attached to your prefiled testimony?

A Yes, I did.

MR. McGLOTHLIN: Those have been identified as 44 and 45 in the prehearing order.

CHAIRMAN CARTER: Forty-four and 45, for the record, the Comprehensive Exhibit List.

(Exhibit Nos. 44 and 45 marked for identification.)

BY MR. McGLOTHLIN:

Q Are you prepared to summarize your testimony, Dr. Jacobs?

A Yes, I am.

CHAIRMAN CARTER: Dr. Jacobs, were you here when I -- no, you weren't, when I gave my little --

THE WITNESS: I don't believe I had the benefit of that, sir.

CHAIRMAN CARTER: Okay. Let me tell you about the lights is that green is always good. When the amber light comes on, you have two minutes. When the red

light comes on, you have 30 seconds, okay.

THE WITNESS: Yes. I don't think that will be a problem.

CHAIRMAN CARTER: Good. Mr. McGlothlin.

BY MR. McGLOTHLIN:

Q Dr. Jacobs, on your mark, please proceed.

A Thank you.

Good afternoon, Chairman Carter and Commissioners. Again, my name is William R. Jacobs. I'm testifying for the Florida Office of Public Counsel with regard to the FPL filing in this matter. I have identified three issues or concerns with FPL's filing, and I'll go over those very briefly.

First I believe that FPL is considering using a separate construction contractor separate from the engineering and procurement contractor for the Turkey Point 6 and 7 project. I believe that this could lead to additional costs when compared to more traditional EPC contracting methods that other AP1000 utilities are using.

This is a very complicated project. They're requiring a great deal of coordination between the engineering and procurement and construction, and between the engineer and constructor, and I believe that having a separate construction contractor certainly

opens the door for a lot of additional concerns about scope and responsibility in various areas.

As the Turkey Point units I believe are -- I refer to them as the second wave of the AP1000 projects. We heard a little bit earlier about waves, and I think there's -- the Westinghouse/Shaw Consortium building the initial wave is going to gain considerable experience in building these plants that would be valuable to the Turkey Point project.

I have not said that, by virtue of their retaining Black & Veatch and Zachry, that they have not foreclosed the EPC option, and I have not stated that that option has been foreclosed, but I raise the issue at this point in time just to ensure that it was brought up early in the process so that, if it does result in additional costs down the road, we wouldn't be accused of having identified this only with the benefit of hindsight.

My second concern is with FPL's feasibility analysis. I think they appropriately identified changes in the key parameters of the alternatives, such as gas prices, carbon tax, appropriately calculated the break-even capital costs for comparison with an alternative project; however, in my view they only did half the job. They did not update the potential cost of

the nuclear units.

Now, we've heard testimony earlier today that, well, they didn't think anything had changed, but I believe a number of the inputs have changed. There's been -- with the economy, I know labor rates have changed, and I believe it would have been worthwhile taking the effort to update or at least look at the capital cost concerns for the Turkey Point units and then compare an updated cost.

And, finally, last year we talked about the separate-and-apart analysis. I believe that FPL -- it was my understanding they agreed to provide a 20-year capital analysis of projects that might be needed in order for the plant to run for 20 years, and they have not provided that information.

That concludes my opening remarks.

MR. McGLOTHLIN: We tender the witness.

CHAIRMAN CARTER: Thank you. Mr. Davis?

CROSS EXAMINATION

BY MR. DAVIS:

Q I have just a couple of questions, Dr. Jacobs.

A Yes, sir.

Q First of all, you have a conclusion on page 11 of your testimony, or a recommendation, I should say, line 22, and that's your Recommendation 2. Can you read

that, please?

A Yes. I say, "The Commission should order FPL to prepare a revised estimate of the costs of the Turkey Point 6 and 7 Unit," their project, "and incorporate the updated cost in a renewed analysis of the long-term feasibility of the project."

Q Now, you understand that, under the Commission's rule for long-term feasibility, that they have the option of approving or not the long-term feasibility analysis presented by FPL?

A The Commission has that, is that your question?

Q Yes. It states that they approve or not.

A I believe the Commission has a lot of discretion in that area. I'm not aware that they have to give it an up-or-down vote.

Q If the Commission did not approve the long-term feasibility analysis presented by FPL, then FPL would have the option for coming back with a revised analysis; correct?

A Yes, I believe that's correct.

MR. DAVIS: Okay. Thank you.

CHAIRMAN CARTER: Mr. Moyle?

/ / / / /

/ / / / /

CROSS EXAMINATION

BY MR. MOYLE:

Q I just have one question with respect to the discussion about strategic partnerships. In your professional judgment and expert opinion, would it make sense for strategic partnerships to be explored by the two large investor-owned utilities in the state that are moving forward with nuclear projects?

A You know, I have not studied that issue at all. I would say it could make sense. I couldn't -- I'm not prepared to suggest one way or another how that would turn out.

MR. MOYLE: Thank you.

CHAIRMAN CARTER: Ms. Cano or Mr. Anderson?

MR. ANDERSON: Yes, I have some questions --

CHAIRMAN CARTER: You're recognized.

MR. ANDERSON: -- Chairman Carter, thank you.

CHAIRMAN CARTER: By the way, Ms. Cano, have I been mispronouncing your name? Did I get it right?

MS. CANO: Cano.

CHAIRMAN CARTER: Oh. I was in the neighborhood. Mr. Anderson.

MR. ANDERSON: Thank you, and I neglected to introduce my colleague, Ken Rubin, who was here earlier today, who will be back.

CHAIRMAN CARTER: For the record?

MR. ANDERSON: Yeah, but it's his first time appearing before the Commission. I intended to introduce you, but Ken Rubin will be back also.

CHAIRMAN CARTER: Looking forward to it.

Thank you.

CROSS EXAMINATION

BY MR. ANDERSON:

Q Good afternoon, Dr. Jacobs.

A Good afternoon.

Q I want to clarify something up front here. I just had walked down to page 29 from last year's nuclear cost recovery order. Do you have that there?

A Yes, I do.

Q Okay. It says Docket No. 080009EI, page 29, right?

A Yes.

CHAIRMAN CARTER: Do you have other copies, counsel?

MR. ANDERSON: No, but we'll just go on.

BY MR. ANDERSON:

Q The order states, doesn't it, about two thirds down the page, "We note that actions on the specific audit findings are in the scope of an additional stipulation that are not -- the stipulation was joined

by AARP and FIPUG and the stipulation reads --" and this is the stipulation -- "OPC and FPL stipulate that, as it applies to nuclear uprate projects, that NCRC should be limited to those costs that are separate and apart from nuclear costs that would have been necessary to provide safe and reliable service had there been no uprate project," right?

A Yes.

Q Okay. It goes on to say, "OPC and FPL will work with PSC staff to develop an NFR form for use in the 2009 hearing cycle that specifies information the utility will provide in support of its request in the uprated costs and its NFCR -- C filings are separate and apart from the costs that would have been necessary to provide safe and reliable service without the uprate," right?

A Yes.

Q And just to be real clear because we don't want any understanding -- you know, you're not stating that this information says that FPL agreed and then breached an agreement to do a 20-year analysis; right?

A That's correct.

Q Okay. Thanks.

And are you aware that the Florida Public Service -- I'm sorry -- Florida Public Service

Commission staff held a workshop after last year's hearings?

A I'm aware of that, yes.

Q I think in November of 2008, and Mr. McGlothlin was there. You weren't there, but he referred to you. You probably talked to him about that, right?

A Yes, I'm aware.

Q And you're aware that the separate-and-apart considerations were discussed at those meetings?

A Yes.

Q And that there were informal data requests made by staff of the utilities, FPL and Progress Energy; right?

A I believe that's correct, yes.

Q And FPL responded to those requests, right?

A Yes.

Q Okay. Would you agree that in business situations there are often more than one course of action that a manager could choose?

A That's correct.

Q And the role of a manager is to identify alternative courses of action, consider the benefits and detriments of alternatives based upon facts known at the time and make a reasonable decision based upon the

choices and information available; right?

A I think generally, yes. I don't disagree with that.

Q You --

A I don't disagree with that.

Q Thank you.

At page nine of your testimony, lines 6 to 7 --

A Yes.

Q -- you state at line 6 to 7, "All other U.S. utilities that have signed a contract for construction of a new nuclear power plant have chosen the EPC approach," right?

A That's correct.

Q You know that FPL has not signed a construction contract, right?

A I do know that, yes.

Q And we've not signed an EPC contract either, right?

A That's correct.

Q There are several other companies developing nuclear projects in the United States?

A Yes.

Q Specifically several other companies like FPL have selected the Westinghouse AP1000 design?

A That's correct.

Q Duke has a filed an application for NRC license review for an AP1000 design?

A Yes.

Q Also true for Progress Energy Carolinas?

A Yes.

Q The Tennessee Valley Authority?

A That's correct.

Q And FPL has filed an application for NRC license review for an AP1000 design, right?

A Yes.

Q None of Duke or Progress Energy Carolinas or TVA or FPL has entered into a construction contract for the AP1000 design, right?

A That's correct.

Q And none of those companies has signed an EPC contract to date either, right?

A That's correct.

Q So it would be accurate to state that, of the U.S. entities developing AP1000 projects, as of today, some have signed an EPC contract, some have not; right?

A That's correct, but the only companies who have actually signed contracts have in fact signed EPC contracts. That's my point in here.

Q And just to be clear, and my point is that

there are other people who are developing projects who haven't signed such contracts at this point; right?

A That's correct.

MR. ANDERSON: Good. That's all we have for this witness. Thank you.

CHAIRMAN CARTER: Staff?

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners?

Redirect, Mr. McGlothlin?

MR. McGLOTHLIN: Briefly.

CHAIRMAN CARTER: Yes, sir.

REDIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Dr. Jacobs, counsel for FPL referred you to the language of the stipulation that was contained in the last order, and it referred to the analysis of the equipment that would be necessary for safe and reliable service of an existing nuclear unit. Do you recall that language?

A Yes, sir.

Q What time horizon for analysis would you think would be adequate to identify such equipment that would be necessary for continued safe and reliable services?

A I believe that, in the context of this analysis, that the utility would need to look at a

20-year time horizon. That would be essentially the remaining lifetime, operating life of these plants, of the plants that are being uprated.

Q Is that possible to do?

A Yes, it is. I have seen such an analysis.

Q Can you identify anybody who has performed such an analysis?

A Yeah, I don't think it's --

MR. ANDERSON: I'd object. This is beyond the scope of the cross-examination which I very deliberately limited.

MR. McGLOTHLIN: The questions went to the language of the stipulation, and the implication was that there were horizons -- that FPL has satisfied the test laid out in that language, and Dr. Jacobs has just said that in his opinion it would require a 20-year analysis. I think it's a natural follow-through to ask if anyone has been able to do that which he recommends to be done.

MR. ANDERSON: And I'm sorry, but very, very briefly. My point was the assertion was made that we had agreed to do something which we did not do, and I wanted to point out what the stipulation said we did agree to do. Our point is we kept our word. We're not -- you know, we did not examine further on the

nature of his analysis, and that was the sole purpose and that's as far as it went.

CHAIRMAN CARTER: Ms. Helton. Well, at least we made it past lunch today.

MS. HELTON: I was thinking I would get off easy today.

Mr. Chairman, I think that Mr. Anderson opened the door and that Mr. McGlothlin's question is appropriate.

CHAIRMAN CARTER: Overruled. You may proceed.

THE WITNESS: Yeah, I saw a 20-year analysis in the context of one of our clients that was considering renewing the license of the plant, a nuclear plant for an additional 20 years, and it was the logical exercise that they undertook, before embarking on this license renewal project, to look at the equipment of the plant from an economic basis and determine which equipment would likely have to be replaced so that the plant could operate safely and reliably for that 20-year time frame, and that was the type of analysis that we were requesting FPL to conduct.

BY MR. McGLOTHLIN:

Q Counsel for FPL asked you about -- asked you to agree that one role of a businessman is to lay out alternative actions and choices, and you said

you generally didn't disagree with that. Do you remember that question and answer?

A Yeah. I thought that was sort of hypothetical, but, yes; I remember that.

Q Let's assume that the business in question is a regulated electric utility.

A Yes.

Q Do you think that a regulated utility that lays out alternative actions and choices and then makes a poor choice that results in unreasonably high costs should be a held accountable by that decision?

A Yes; yes, I agree with that.

Q Counsel for FPL asked you to agree that there are several other utilities in addition to FPL who are consider -- who are moving forward with the AP1000 technology. Do you recall that question and answer?

A Yes.

Q And you agreed that several have not signed an EPC contract. Do you remember that?

A Yes, sir.

Q Have they signed an alternative contract that separates out the construction company --

A No, they have not signed any contract at this point.

Q If they were to choose to do that, do you

think they would have the same exposure to increased costs as you've identified in this proceeding?

A Yes.

MR. McGLOTHLIN: No further redirect.

CHAIRMAN CARTER: Exhibits?

MR. McGLOTHLIN: OPC moves 44 and 45 which were attached to his prefiled testimony.

CHAIRMAN CARTER: Are there any objections?

MR. ANDERSON: No.

CHAIRMAN CARTER: Okay. Forty-four and 45 are entered.

(Exhibit Nos. 44 and 45 admitted into the record.)

CHAIRMAN CARTER: Okay. Anything further for this witness on direct?

Thank you. You may be excused.

Mr. Davis, call your next witness.

MR. DAVIS: Mr. Chairman, we have a little problem of a witness who hasn't arrived yet. We have two witnesses, and we would request to take Mr. Gundersen first and Mr. Cooper second.

CHAIRMAN CARTER: Let's take the one you've got. Thank you.

MR. DAVIS: So SACE calls Mr. Arnie Gundersen, and he has been sworn.

CHAIRMAN CARTER: He has been?

MR. DAVIS: Yes.

Whereupon,

ARNOLD GUNDERSEN

was called as a witness on behalf of Southern Alliance for Clean Energy, Inc., having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DAVIS:

Q Mr. Gundersen, good afternoon. Could you state your name and business address for the record, please.

A Good afternoon, Mr. Commissioner and Commissioners. My name is Arnold Gundersen, spelled with an E and not an O, and I work with Fairwinds Associates, with an E, in Burlington, Vermont.

Q What's your business address?

A 376 Apple Tree Point Road.

Q And, Mr. Gundersen, have you prepared prefiled testimony in this proceeding and have you also prefiled exhibits that were dated July 15th, 2009?

A Yes, I did.

Q And if you were to be asked the same questions as posed in your prefiled testimony today, would your responses be the same?

A Yes, they would.

Q Is there any exception to that that you wanted to state?

A Yeah, there was one word I typed wrong on page ten, line 12. The word "coal" should have been "fossil." and I apologize for that.

Q Okay. Now, with those corrections, would your testimony be the same or would your responses be the same if I were to ask you the questions today?

A Yes, they would.

MR. DAVIS: Okay. At this point, Mr. Chair, we ask that the testimony of Mr. Gundersen be entered into the record as though read.

CHAIRMAN CARTER: The prefiled testimony of the witness will be inserted into the record as though read.

IN RE: NUCLEAR PLANT COST RECOVERY CLAUSE

BY THE SOUTHERN ALLIANCE FOR CLEAN ENERGY

FPSC DOCKET NO. 090009-EI

DIRECT TESTIMONY OF

ARNOLD GUNDERSEN

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Arnold Gundersen. My business address is Fairewinds Associates, Inc, 376 Appletree Point Road, Burlington, VT 05408.

Q. Please tell us how you are employed and describe your background.

A. I am employed as a nuclear engineer with Fairewinds Associates, Inc and as a part-time college professor with Community College of Vermont. I have a Bachelor's and a Master's Degree in Nuclear Engineering from Rensselaer Polytechnic Institute (RPI) cum laude. I began my career as a reactor operator and instructor in 1971 and progressed to the position of Senior Vice President for a nuclear licensee. A copy of my Curriculum Vitae is attached as Exhibit AG-1. I have qualified as an expert witness before the NRC ASLB and ACRS, in Federal Court, before the State of Vermont Public Service Board and the State of Vermont Environmental Court. I have also given testimony in cases in Canada and the Czech Republic. I am an author of the first edition of the Department of Energy (DOE) Decommissioning Handbook.

I have more than 35-years of professional nuclear experience including and not limited to: Nuclear Plant Operation, Nuclear Management, Nuclear Safety Assessments, Reliability Engineering, In-service Inspection, Criticality Analysis, Licensing, Engineering Management, Thermohydraulics, Radioactive Waste Processes, Decommissioning, Waste Disposal, Structural Engineering Assessments, Cooling Tower Operation, Cooling Tower Plumes, Consumptive Water Loss, Nuclear Fuel Rack Design and Manufacturing, Nuclear Equipment Design and Manufacturing, Prudency Defense, Employee Awareness Programs, Public Relations, Contract Administration, Technical Patents, Archival Storage and Document Control, Source Term Reconstruction, Dose Assessment, Whistleblower Protection, and NRC Regulations and Enforcement.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. I have been retained by the Southern Alliance for Clean Energy (SACE) to evaluate the potential for scheduling delays and resulting uncertainty in the licensing and construction of four AP 1000 reactors proposed for construction in Florida by Progress Energy Florida (PEF) (Levy Units 1 and 2) and Florida Power and Light (FPL) (Turkey Point Units 6 and 7), and the effect of these delays and uncertainty on the long-term feasibility of completion of these reactors.

Q. Please summarize your findings.

A. In my opinion, there are numerous potential scheduling obstacles and resulting uncertainties, which will be faced by both FPL and PEF in the licensing and construction of their proposed AP 1000 nuclear units at Levy County and Turkey Point. These delays

and uncertainties have not been taken into account by PEF and FPL, and therefore, PEF and FPL have not shown the long-term feasibility of completing these new nuclear units.

Q. What are these obstacles?

A. These obstacles include:

1. Because the 10 CFR Part 52 licensing process for the AP 1000 is brand new and has never been applied before, there is definite scheduling uncertainty due to licensing delays.
2. Hurricanes Katrina and Rita demonstrated that major construction projects are subject to delays due to the worldwide demand for construction materials and skilled labor. It is very likely that those nuclear construction materials in highest demand will face shortages and procurement delays given the great number of nuclear power plants proposed for construction in the Southeastern U.S.
3. The nuclear industry as a whole is facing a labor shortage due to the limited qualified individuals capable of performing this work.
4. Building nuclear power plants is a complicated construction process in which scheduling delays, lengthy construction times, and delayed operation is routine.

Q. Are you sponsoring any exhibits to your testimony?

A. Yes, I'm sponsoring the following exhibits:

AG-1. CV

AG-2. NuStart Letter

AG-3. Moody's 2009

AG-4. Regulatory Risks

AG-5. COMSECY-09-0003

AG-6. NRC Jaczko Speech

AG-7. 2007 ANS Meeting

AG-8. Finnish Nuclear Trouble

III. LICENSING

Q. How does the newness of the 10 CFR Part 52 licensing process for the AP 1000 add to scheduling uncertainty?

A. The first obstacle involves the NRC licensing process itself. No AP 1000 reactor has successfully completed the NRC review and 10 CFR 52 licensing process and has been allowed to begin construction. Therefore there is no road map and clear administrative process for either PEF or FPL to follow during the licensing and construction of either the Levy County or the Turkey Point Units. It was anticipated that the NRC combined construction operating license process would enable the AP 1000 to move more quickly through licensing and construction, but instead the AP 1000 units have suffered numerous scheduling delays. In fact Westinghouse has already submitted 17 amendments to its standard application for the AP 1000 in response to questions from the Nuclear Regulatory Commission. Therefore, it is quite likely that additional amendments will occur before AP 1000's standard application is approved.

Currently there are 14 Westinghouse AP 1000 nuclear reactors planned for construction at seven sites throughout the South. NuStart, a consortium of U.S. utilities and energy companies preparing to build the newly designed AP 1000 reactor, planned for the leading AP 1000 nuclear reactors to be Bellefonte Units 3 and 4; however, NuStart decided to change the Westinghouse reference plant from Bellefonte Units 3 and 4 to

Vogtle Units 2 and 3 on April 28, 2009. This change in reference plant design further slows the NRC decision-making process. On April 28, 2009, NuStart, the AP 1000 Consortium, requested that the NRC use its own procedures to change the reference site. In Exhibit AG-2, NuStart Letter to NRC, NuStart wrote,

> *"We understand that an orderly transition of reference plant activities from Bellefonte to the VDGP will be necessary to fully effect this change in designation while ensuring efficient use of NRC resources please take the steps necessary to implement this change."* [Marilyn K. Ray, President of NuStart Energy, to U.S. Nuclear Regulatory Commission (NRC), Attention Document Control Desk, April 28, 2009]

My review of NRC documentation shows that NRC currently has no internal procedures with which to perform the change of a reference plant site from Bellefonte to Vogtle, thereby introducing additional scheduling uncertainty.

Q. Isn't this problem of licensing delay just an internal problem with the NRC?

A. No, the financial community, which provides the capital investment for the construction of nuclear power plants, is also expressing significant concern regarding the predictability of the NRC licensing process. In a 2009 report, Moody's Financial Services stated that, *"nuclear is a bet the farm risk"*. The Moody report, attached as Exhibit AG-3 Moody's 2009, noted that,

> *"...regulatory risk will persist over the longer term and we increasingly think it unlikely that everything will work out as intended we are concerned with the size of investments being made even before the NRC grants a COL".* [Moody's Global Infrastructure Finance Special Comment, New

Nuclear Generation: Ratings Pressure Increasing, June 2009]

Furthermore, a January 15, 2008 report in Power Magazine entitled "Regulatory Risks Paralyzing Power Industry While Demand Grows", attached as Exhibit AG-4, Regulatory Risks, quotes a 2007 Moody's report as saying that the NRC 42 month COLA (Combined Operating License Application) process *"remains untested"*. Power Magazine also said that, *"...opponents of the nukes are likely to litigate NRC decisions adding time money and doubt to the process."* [Kennedy Maize and Dr. Robert Peltier, Regulatory Risks Paralyzing Power Industry While Demand Grows, Power Magazine, January 15, 2008]

Q. Is the NRC concerned about issues with the COLA (Combined Operating License Application) evaluation process?

A. Yes, concerns about scheduling issues inherent in the COLA process are even evident within the Nuclear Regulatory Commission. The NRC Executive Director of Operations said in a February 4, 2009 memo to the NRC Commissioners, attached as Exhibit AG-5 COMSECY-09-0003:

> *"...the reviews to date have shown that the schedules and activities related to design reviews and COL applications are subject to changes that in turn require the staff to shuffle projects and establish new priorities."* [R. W. Borchardt, Executive Director for Operations to NRC Chairman Klein, Designation Of The Office Of New Reactors As Lead Office For New And Advanced Reactor-Related Rulemakings, COMSECY-09-0003, February 4, 2009]

Moreover, NRC Chairman Gregory B. Jaczko has clearly stated that the process is not fully vetted. In his prepared remarks to the Regulatory Information Conference on

March 11, 2009, attached as Exhibit AG-6, NRC Jaczko Speech, The Honorable Gregory B. Jaczko said,

> *"Finally, I'll touch on an area of new reactors in which I do not think we have fully learned the lessons of the past. The Commission made a strong effort to learn lessons from processes that did not work – so much so that we flipped the application process from 'build first and then license,' to 'license first and then build.' This greatly lessens the financial risk involved but unfortunately applicants have not used this process as intended.*
>
> *At the heart of this change was that the key to success is having completed designs done early. But we are right back into a situation where we have incomplete designs and less than high quality applications submitted for review. The very first application we received was on hold for a year and a half during which time we could only do minimal work on it. In fact, the NRC had to withdraw the hearing opportunity because that applicant was not ready and the agency was only able to re-notice it last month. Even today, almost a fifth (3 of 17) of the COL applications we have received are on hold at the request of the applicants themselves. Vendors are revising four of the new plant designs.*
>
> *The temptation is to plow on anyway and conclude that if plants got licensed in the 1960s and 1970s under less than ideal conditions, it won't be the end of the world if the current process begins to look more and more like that one. But everyone would be better served by focusing on the lesson of all those plants that never got built and concentrating on getting designs completed first. Of course, it is up to licensees to decide which process to*

follow. The Commission made it clear, however, that if licensees choose not to follow the new Part 52 process of referencing an early site permit and a certified design in their applications, they do so 'at their own risk.' I challenge the industry to focus on those projects that are most likely to go forward and get their design and environmental work done, so that success can be used as a model for others to follow."

The fact that the COLA process remains untested further adds to the scheduling and licensing uncertainty for the Turkey Point 6 & 7 and Levy County Units.

Q. Has the NRC elaborated on the issue of scheduling delays with the COLA?

A. No, the NRC has made several public comments, but has not published an overall analysis of the scheduling problems and delays inherent with a generic COLA.

Q. Please delineate any additional site-specific licensing process concerns for either the Levy Units or Turkey Point.

A. On a more specific case-by-case site-licensing basis, the schedule for the Levy County Units received a setback on July 8, 2009 when the NRC Atomic Safety and Licensing Board (ASLB) ruled that it would hear several contentions brought forward by The Green Party of Florida, the Ecology Party of Florida and the Nuclear Information and Resource Service. The ASLB granted standing to the three petitioners who challenged the proposed PEF nuclear power plant in Levy County and will hear petitioners on three of their legal arguments on why the plant should not be built. The arguments, which ASLB accepted for further analysis and review, are the Units' impact on wetlands, waterways, and habitat, and PEF's proposed disposal process for its

hazardous nuclear waste.

In the same way that the NRC ASLB has concerns, there are additional site-specific obstacles which will be encountered at both sites as part of the 10 CFR 52 licensing process. For instance, the generic COLA process has not taken into account the critical emergency planning issues involving other nuclear reactor units that are in close proximity or share the same site. In particular, no assessment has been conducted and no plan has been developed concerning the close proximity of the Levy County Units to the Crystal River reactor. The Levy County site is only 8 miles from the Crystal River reactor and therefore the Levy County Units and its surrounding communities must also be engaged in emergency planning considerations with Crystal River. The two proposed Turkey Point reactors share a site with two other nuclear reactors as well as three coal plants, and the complicated emergency planning issues resulting from so many power plants at one site have not been considered or addressed by the generic COLA process. Such emergency planning will require a lengthy interface with NRC as well as federal, state, and local emergency planning agencies which will necessitate public hearings and public comments before the process is complete.

Q. Are there additional site-specific licensing issues which may delay construction?

A. Yes. PEF requested a Limited Work Authorization at Levy County, meaning that the NRC allows the energy company or utility to begin construction work at the proposed nuclear plant site prior to NRC approval of the corporation's full application. In fact, when it became apparent that there might be unique geological problems associated with the Levy County site, PEF withdrew its Limited Work Authorization request. Currently, it is uncertain whether these geological discoveries may negatively impact the viability of

the Levy County site for operating any nuclear power plant. PEF has formally acknowledged that being unable to do work under its Limited Work Authorization request has already delayed its start up schedule by approximately 20-months, which implies inherent increases in cost, which costs have not yet been addressed in its application.

Q. Are there any additional concerns for delays for the construction of Turkey Point 6 and 7?

A. Yes, there are two significant problems that have already been uncovered at Turkey Point that must be reviewed and analyzed. Indeed, because the Turkey Point application is a more recent application, there may be other unique problems associated with this project, which have yet to be discovered by the NRC or FPL.

Grid stability is the first major problem of concern in evaluating the Turkey Point site, which once again, is an issue that has not been addressed in the generic COLA process. Grid stability is especially critical to nuclear power plants because an unstable grid will cause unanticipated shutdowns (SCRAMS) in operation and therefore challenge safety systems. The NRC has determined that safety systems frequently challenged by grid stability can be a precursor to a nuclear accident.

The Turkey Point site will have seven power plants occupying the same site, which is what presents the unique problems and significant concern regarding grid stability. To be more specific, the transmission corridor from the site is very limited because the ocean bounds the site on one side, which leaves a very narrow corridor through which the power from all seven units must be transmitted. Another major concern is that this narrow transmission corridor is subject to weather related problems that would impact the

availability of seven operating units let alone just one operating nuclear plant. Second, salt-water is currently used to cool the other five operating power plants, and it appears that this cooling canal connected to the cooling towers may be leaking salt-water into local aquifers thereby contaminating the entire area's fresh water supply. This problem is called salt-water intrusion and would most certainly be further compounded by adding two more nuclear power plants to this sensitive environmental area. Unfortunately the problem of possible salt-water intrusion into the ground water near the Turkey Point site has not yet been evaluated in the generic COLA process.

Q. Is there potential for additional delay and uncertainty in the licensing process as the units end the construction phase?

A. Yes, the industry is currently focused on the front end of the licensing process, but when construction nears completion, there are also many opportunities for further licensing delays. Delayed licensing means uncertainty in the form of delayed operation, delayed power generation, and increased costs to Florida's consumers. More specifically, 10 CFR 52.98 allows for new material to be considered after the reactor design has been certified. Every nuclear power plant that has ever been constructed has faced design changes as construction has proceeded; therefore it is completely unrealistic to assume that the initial AP 1000 reactors will not encounter design changes as construction progresses at various sites around the country. Therefore, in my opinion, it is clear that the multiple conditions delineated in Part 52.98, which allow for further delays to consider new information, will apply to these to projects and will introduce additional risk and uncertainty for scheduling delays.

Q. What are your conclusions regarding the Licensing process for FPL Turkey Point Units 6 and 7 and PEF Levy County Units 1 and 2?

A. In my opinion, the licensing process is strewn with obstacles for both Levy County and the Turkey Point projects. Some of these obstacles are generic Westinghouse AP 1000 issues while others are clearly site-specific. Nevertheless, it appears that neither FPL nor PEF have allowed for the impact of significant licensing delays and other uncertainties in either of their applications or in their planning processes for the licensing and construction of Turkey Point Units 6 and 7 and Levy County Units 1 and 2. Therefore, in my opinion, neither FPL nor PEF have shown the long-term feasibility of completing Turkey Point Units 6 and 7 and Levy County Units 1 and 2.

IV. CONSTRUCTION MATERIALS

Q. In your opening summary, you said, "Hurricanes Katrina and Rita demonstrated that major construction projects are subject to delays due to the worldwide demand for construction materials and skilled labor. It is very likely that those nuclear construction materials in highest demand will face shortages and procurement delays given the great number of nuclear power plants proposed for construction in the Southeastern U.S." Please explain how construction materials may cause construction delays and uncertainty.

A. In my opinion, the second major obstacle for FPL and PEF in meeting their proposed construction schedules involves the availability of nuclear grade materials to be used in the construction of these projects. There is already a significant international shortage in quality nuclear grade construction materials, which I believe will be compounded by the need to obtain both quality construction materials, but also to obtain materials that are

nuclear grade American Society of Mechanical Engineering certified.

In the Department of Energy's (DOE) October 22, 2005 report entitled "Nuclear Power Plant Construction and Infrastructure Assessment", DOE states,

> "*The most significant manufacturing concern and the associated construction schedule risk is that reactor pressure vessel fabrication could be delayed by the limited availability of nuclear grade large ring forgings. These forgings are currently available from one Japanese supplier.*" [Page iv]

A sole-source supplier of such a critical component presents significant problems and concerns including but not limited to: labor issues, quality issues, and Acts of God. More specifically, given that the only facility in the world to manufacture these forgings is located in Japan, an earthquake or typhoon could hamper the facility's production and delivery of these forgings for months if not years.

An extensive amount of time at the American Nuclear Society (ANS) 2007 convention was spent discussing supply-chain challenges, according to Power Engineering Magazine, attached as Exhibit AG-7 2007 ANS Meeting. For instance, in 1980 "*more than 500 companies in the United States carried N-stamps [Nuclear Stamps]...Today that number is around 100.*" [Teresa Hansen Associate Editor, The Nuclear Renaissance's Future, Power Engineering, September 2007, Pages 46 to 50] Additionally, Power Engineering's review of the ANS convention noted that,

> *"Few companies in the United States can provide large complement castings and only one US company can manufacture large nuclear grade components. ...This lack of US-based manufacturing means that constructors/owners of new US nuclear reactor plants will be competing*

with nuclear plant constructors/owners around the world."

The Power Engineering article also emphasized that as compared to 1980,*"Today, the competition and supply chain are international."*

Furthermore, in its summary of the ANS convention, Power Engineering Magazine added that,

> *"Competition from overseas markets and plans to increase nuclear plant building in the United States will cause supply problems in 2013 and 2014. ... the supply of concrete, reinforced steel, large bore piping, small bore piping, structural steel and conduit will be constrained."*

The Power Engineering Magazine analysis also emphasized that, *"... high demand and limited supply will cause material prices to increase."*

Many nuclear grade component and material suppliers have dropped out of the business during the past 30 years due to the stringent manufacturing requirements, the high cost of trained personnel, and the lull in nuclear power plant construction. Now, since there is a broad international demand for these limited resources, I believe that the schedule for these units will be adversely impacted by shortages in nuclear grade materials. In my opinion, PEF and FPL have not considered equipment shortages when considering the long-term feasibility of these reactors.

V. NUCLEAR PERSONNEL

Q. Do you anticipate skilled labor shortages during the time period in which these reactors are being designed and constructed?

A. Yes, the third obstacle to implement the proposed construction schedules involves the availability of trained engineers and construction personnel to support the construction of

these projects. In its October 22, 2005 report entitled "Nuclear Power plant Construction and Infrastructure Assessment" DOE said,

> *"Hiring the highly skilled and highly valued construction workers needed to build nuclear units is expected to be a challenge. Qualified boilermakers, pipefitters, electricians, and ironworkers are expected to be in short supply in local labor markets. The use of workers from other communities and states travelers will be required for these construction trades."*

Given that all of the AP 1000 reactors are presently in the southern states, and that four of the AP 1000 reactors will be in Florida, I believe there will undoubtedly be a regional drain of qualified construction personnel therefore making it challenging to complete any of these projects on time and within budget.

In its September 2007 issue, Power Engineering Magazine had an extensive report on the American Nuclear Society's (ANS) annual conference. Attached as Exhibit AG-7. In regards to skilled labor, the report noted that:

> *"Edward Wick of Shaw Stone and Webster also spoke during the session and said that he believes the challenges faced by companies looking for craft labor are much larger than those faced by companies looking for engineers and scientists ...The labor shortage is very real for the construction industry... not only are there limited numbers of skilled craft workers available, but multiple industries are courting those workers.... The nuclear industry is competing with fossil plants, refineries, manufacturing and other industries for skilled labor."*

Power Engineering also noted that shortages are not only in the crafts but affect engineers and technicians as well. "*During the opening plenary Art Stahl said one of the biggest challenges is finding qualified people -- including craft labor, technicians, engineers and*

scientists -- to support construction and operation ...40% of the current nuclear power plant workers are eligible to retire within the next five years". He also added, "... *only 8% of the current nuclear plant workforce is under 32 years old.*"

My experience as an expert for the State of Vermont leads me to concur with Mr. Stahl's comments above. The Vermont State Legislature appointed me to the Vermont Yankee Nuclear Oversight Panel (VYNOP). The VYNOP was created by the Legislature to assist it in its evaluation of Vermont Yankee's application to extend its license for 20 more years. As a VYNOP member, I determined that shortages in engineering personnel were likely to adversely impact Vermont Yankee beginning as early as 2010.

I believe that the shortage of craft labor within the state of Florida will be a problem in and of itself. However, it is my opinion that this problem is exacerbated due to the simultaneous planned construction of numerous power plants in the Southeastern U.S. Additionally, in my opinion, further pressure will also be added by the ongoing and extensive growth in international nuclear power markets, which may also cause a drain on technical and engineering personnel. Since the international power market pays extensive bonuses and all living expenses to technical and engineering personnel, this may be a unique enticement to a segment of technical and engineering employees who may wish to work outside the U.S. for several years. Furthermore, the 100 nuclear reactors presently in operation are nearing 40 years of operating history and most of their experienced technicians and engineers are nearing retirement. Because these plants are seeking 20-year life extensions, they are recruiting heavily from colleges and drawing heavily on the newly minted engineers and technicians in order to meet staffing requirements. I believe that the addition of several dozen new advanced reactors will place a significant burden on staffing of engineers and technicians for the foreseeable

future. In my opinion, FPL and PEF have not anticipated the shortage of skilled craft, engineering, and technical personnel in their consideration of the long-term feasibility of these Florida units.

VI. CONSTRUCTION DELAYS

Q. Should the COLA's be approved, do you anticipate construction delays?

A. Yes, building a nuclear power plant is an extraordinarily complicated process. During my 38 years of experience in the nuclear industry, I have never seen a nuclear power plant meet its construction schedule without repeated modifications and delays. The corollary to that statement is that I have never seen a nuclear plant be built faster than its schedule anticipated. Since the AP 1000 design is brand new, the evidence from previous radically new designs has shown that delays should be anticipated in the initial units to be built, including Levy County and Turkey Point. These AP 1000 projects will encounter scheduling delays inherent in any large construction project. While some of these problems will be site specific, many others will most likely be due to problems encountered as other AP 1000 reactors are licensed and constructed.

I've been following the problems with new the Generation 3 Finnish reactors in Olkiluoto, Finland for several years. A May 29, 2009, New York Times article entitled In Finland, Nuclear Renaissance Runs into Trouble, encapsulates these problems in a single contemporaneous article attached as Exhibit AG-8 Finnish Nuclear Trouble. In its report, the New York Times noted that this power plant design "was supposed to be the showplace of a nuclear renaissance… its modular design was supposed to make it faster and cheaper to build. And it was supposed to be safer too." However, the Finish reactors ran into numerous delays. The report noted that construction delays included:

poor concrete, inexperienced contractors, and the lack of professional knowledge by some of the contract personnel. Times reporter James Canter wrote that as a result of these delays the estimated prices climbed by 50% and that the utility is no longer willing to make certain predictions on when or if the plant will ever go online. He added that this Finnish reactor was part of a new fleet of reactors that were to be standardized "down to the carpeting and the wallpaper", and that this "early experience suggests that new reactors will be no easier or cheaper to build than the ones of a generation ago when cost overruns ...ended the last nuclear construction boom."

In this article, Professor Paul Joskow of MIT is quoted as saying that "a number of US companies have looked with trepidation on the situation in Finland... the rollout of new nuclear reactors will be a good deal slower than a lot of people were assuming." "To streamline construction, the Nuclear Regulatory Commission in Washington has worked with the industry to approve a handful of designs. Even so, the schedule to certify the most advanced model from Westinghouse has slipped during the ongoing review of its ability to withstand the impact of an airliner," according to Canter.

The New York Times ended its in-depth expose with two important quotes. First, a Morgan Stanley financial analyst said, "The warning lights now are flashing more brightly than just a year ago about the cost of new nuclear". The second expert, a project manager at the Finnish plant, quoted by The Times said, "We have had it easy. This is at least a geologically stable site... earthquake risk in places like China and the United States or even the threat of a storm surge means building these reactors will be even trickier elsewhere."

I believe there are significant construction risks that will be faced by the proposed new Florida reactors. Based upon these risks, it is my opinion that neither FPL nor PEF have

shown the long-term feasibility of completing the Levy County units or TP 6 and 7.

VII. CONCLUDING TESTIMONY

Q. Are there indications that FPL and PEF are aware of the issues you have identified?

A. Yes, careful reading of documents provided by both FPL and PEF indicate that their executives are aware of the very obstacles I have identified in this report.

PEF executive Daniel Roderick stated, on page 6 line 9 of his Need Docket testimony, that the Levy County schedule "...estimates are based on the best information available to the company at this time." Additionally, he stated that there are a number of factors including but not limited to: permitting and licensing delays, labor and equipment availability, and "imposition of new regulatory requirements" " to name only a few" factors that would adversely "affect the project cost". This testimony suggests that Mr. Roderick is indeed aware of many of the problems I anticipate impacting the Levy County Units. However, despite being aware of the issues, it is my opinion that PEF has not adequately addressed these problems in the information provided to the State of Florida.

In his May 1, 2009 testimony, FPL executive Steven Scroggs said that the construction schedule for the Turkey Point Units was "... the earliest practical deployment schedule." (Page 2, line 14). On page 14, Mr. Scroggs briefly touched upon some of the same cost concerns as Mr. Roderick did in his testimony. Scroggs said, "market forces, such as demand from other international and US nuclear projects, keep the qualified nuclear supply chain highly utilized, maintaining elevated price levels... or changes to the number or capabilities of qualified vendors in the nuclear supply chain will impact pricing". On

page 17 Scroggs also said, "Due to the unique contracting challenges presented in the new nuclear deployment ...FPL may not obtain terms, conditions, scope and payment schedules that represent an acceptable expenditure plan given the economic, legislative, and regulatory environment." It is my opinion that Scroggs is suggesting that FPL's schedule is simply unachievable, as the "earliest practical" schedule does not imply that it is the most likely schedule to be achieved, especially given the international market forces he identifies in his testimony.

In summation, I believe that the scheduling assumptions used for the four AP 1000 reactors proposed to be constructed in Florida are not prudent, as there appears to be no contingency for the obstacles and uncertainty that I have discussed above which are highly likely to occur. Therefore, in my opinion, neither FPL nor PEF have shown the long-term feasibility of completing these reactors, nor have they shown that these very optimistic schedules are even achievable and it is most likely that cost overruns and schedule delays are unavoidable.

Q: Does this conclude your testimony?

A: Yes.

MR. DAVIS: And we also request that the prefiled exhibits that are labeled for Mr. Gundersen as --

CHAIRMAN CARTER: For identification, Nos. 61 through 69 --

MR. DAVIS: Yes.

CHAIRMAN CARTER: -- from staff's comprehensive exhibit list.

MR. DAVIS: Thank you.

CHAIRMAN CARTER: Okay. You may proceed.

(Exhibit Nos. 61, 62, 63, 64, 65, 66, 67, 68 and 69 marked for identification.)

BY MR. DAVIS:

Q Okay. Do you have a summary of your testimony, Mr. Gundersen?

A Yes, I do.

Q Could you present that, please.

A Thank you.

Mr. Chairman and Commissioners, in my prefiled testimony I applied 35 years of industry experience in nuclear power plant engineering and construction, and I've looked at the long-term feasibility of the Florida Power & Light Turkey Point Units 6 and 7.

My testimony is focused on the fact that there are a number of major obstacles to a timely licensing

and construction of the units which results in significant uncertainties in regards to scheduling and costs. These obstacles were foreseeable, they are foreseeable, and they will be foreseeable. They're not unique to Florida Power & Light. Such obstacles are being faced in the nuclear industry throughout the world.

I've identified four major obstacles which confront Florida Power & Light in what I believe is an overly optimistic and unrealistic assessment of Turkey Point's licensing, construction and operation timeline.

The first is that there will be licensing delays due to the lengthy and necessary Nuclear Regulatory Commission review of these new AP1000 designs. The second is that there will be equipment bottlenecks due a limited supply chain of qualified nuclear grade vendors. The third is that the nuclear industry is already experiencing significant labor shortages, and those labor shortages are likely to continue or worsen because of an aging work force, and also because of a lack of experience of nuclear qualified construction personnel. And, finally, the sheer complexity of building something as complicated as an AP1000 design is a problem in itself.

FPL plans to construct a plant that is newly

designed. The design has not been licensed yet -- has not been approved yet by the Nuclear Regulatory Commission. Industry history is clear that such scenarios have always caused significant construction and operational delays.

Based on these obstacles, it's my opinion that the schedule is not realistic, and not only is the schedule likely to slip, which I perceive as pushing it sideways, but it's also likely to elongate because of problems once the construction process gets going.

The net effect of the four obstacles makes it extremely unlikely that the Turkey Point units will be completed in the overly optimistic schedule that Florida Power & Light has presented.

In its testimony, Florida Power & Light has acknowledged the same four obstacles that I did; however, despite the fact that Florida Power & Light acknowledged these obstacles, their rigid urgent schedule and other assumptions have neglected to accommodate the obstacles in the form of scheduling delays and other contingencies. Because of the fact that the schedule has not accommodated these schedules -- potential schedule slippages, I believe Florida Power & Light has not demonstrated the long-term feasibility of the reactors.

The process that all the reactors to date, including Turkey Point 1 and 2 and St. Lucie were built under was 10 CFR 50. Well, 10 CFR 50 plants are no longer being licensed. This is a 10 CFR 52 plant that is brand-new and, in fact, no plant has ever made it through that process. So we've got a new process with a new plant that's never been licensed, operated or constructed, and yet we have a very tight construction schedule which I deem to be overly optimistic.

Finally, it's not just the licensing of these units that's an issue, it's the construction pipeline which is dry and needs to be re-primed. It's the fact that an aging work force, including guys like me -- 40 percent of the people in the industry are eligible for retirement in the next five years, and it's the fact that this is a very complicated process.

The net effect of all of this is that the obstacles I've discussed were foreseeable in '02 and in '07 and '08 and now in '09. They will continue to be foreseeable in the future. They're not unforeseeable events which just fall from the sky.

A realistic schedule for Turkey Point would include allowances for delays and uncertainties which I have identified and would make it obvious to this commission that the so-called urgent schedule proposed

by Florida Power & Light is not feasible. The scheduling ratchet can only turn one way, toward a longer schedule and not a shorter one.

Thank you.

CHAIRMAN CARTER: Thank you. Mr. Rehwinkel?

MR. RHEWINKEL: No questions.

CHAIRMAN CARTER: Mr. Moyle?

CROSS EXAMINATION

BY MR. MOYLE:

Q One question.

So, in terms of what you're asking this commission to do, would you clarify that, please?

A I think that the process you're going through now -- in the process you're going through now, Florida Power & Light should be required to add contingencies into the schedule which then, of course, would lengthen the schedule and, of course, then increase the price, and I think that the feasibility analysis should be based on a realistic schedule which, of course, then would have a realistic price.

MR. MOYLE: Thank you. That's all I have.

CHAIRMAN CARTER: Staff, you're recognized.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners, any questions?

MR. ANDERSON: I have a few.

CHAIRMAN CARTER: Oh, sorry, Mr. Anderson. Mr. Anderson.

MR. ANDERSON: I'll admit to trying to go super-fast --

CHAIRMAN CARTER: No, that's okay. Go ahead. I must have had a brain cramp.

MR. ANDERSON: May I proceed?

CHAIRMAN CARTER: Yes, sir. You're recognized.

CROSS EXAMINATION

BY MR. ANDERSON:

Q Thanks.

Mr. Gundersen, you filed your testimony on July 15; is that right?

A That's correct.

Q You were hired by SACE about two weeks before your testimony was due, correct?

A Yes, that's correct.

Q Your testimony about both FPL and Progress' projects, right?

A Yes, that's correct.

Q Prior to filing your testimony, your total work time was 31 hours?

A Correct.

Q About 20 percent of that time was preparing testimony, right?

A Correct.

Q So about six hours, right? Twenty percent of 31 is roughly six, is that right.

A Yes, that's correct.

Q Thank you.

You swore an oath today that the information in your testimony is true and correct, right?

A That's correct.

Q Please open your testimony with me to page ten, lines 11 to 12.

A Yes, that's correct.

Q Directing your attention to page ten, lines 11 to 12, you state that the two proposed Turkey Point reactors share a site with two other nuclear reactors as well as three coal plants, right?

A That's correct.

Q Turn to page 12.

A That was --

Q Okay. I'm sorry?

A I corrected that in the errata at the very beginning of my testimony today.

Q Okay. You state at page 12, lines 2 to 4 --

A Okay.

Q -- that salt water is currently used to cool the other five operating plants, right, and it appears that this cooling canal connected to the cooling towers may be leaking salt water into local aquifers thereby contaminating the entire area's fresh water supply. You say that, right?

A Yes, that's what it says.

Q All the statements that you put in your prefiled testimony in your six hours of writing that I just read, they're all wrong; aren't they?

A No. That's a poorly worded sentence, and four of the five units are cooled on the --

Q Let me ask some general questions.

A It's a poorly worded sentence, and I wish I had time to write it better, but it's not all wrong. No, I disagree.

Q Well, there are no coal plants at Turkey Point?

A I corrected that with my counsel like a day after I wrote this. My counsel said that we could correct it in an errata today.

Q No cooling towers at Turkey Point Units 1 through 4?

A Unit 5 is the one with the cooling towers. The other ones are on the serpentine path that runs

through the swamp.

Q As Mr. Scroggs points out in his rebuttal testimony, right?

A I said it was a poorly worded sentence, but there is a serpentine path that crawls through the swamp, and there is a cooling tower there for the other unit, and I'm sorry that they got combined.

Q Okay. Look at page 11, lines 20 to 23.

A I'm on page 11. What lines?

Q Lines 20 to 23. You state that the existing units are connected to the transmission grid through a single coastal transmission corridor, correct?

A No, I don't say it's a single transmission corridor. I said there's a narrow transmission corridor.

Q A narrow transmission corridor --

A Yeah.

Q -- right. Isn't it a fact though that there are actually two independent transmission corridors that go in entirely different directions from the plant?

A Well, the load is to the north, so the transmission corridors go to the north, and there's a several-mile gap between them, but I think the point still stands that they are -- grid stability is an issue anyway.

Q You're not testifying here today as an expert on grid stability, are you?

A The topic of that paragraph was grid stability, and putting two transmission lines relatively close together geographically causes grid stability issues.

Q You've never worked as a system operator for a utility, is that right?

A I worked for a utility, but I wasn't a system operator.

Q You didn't work in transmission system operations, correct?

A That's correct.

Q So you were not responsible for proper voltage regulation and all those types of things in that type of system operation, right?

A No, I was a licensing engineer on a nuclear unit so --

Q Exactly, good.

I'm going to pass out two exhibits. To save time, I'll pass them out at the same time.

CHAIRMAN CARTER: Do you need numbers?

MR. ANDERSON: Yes, sir.

CHAIRMAN CARTER: The first would be 135.

Short title, please.

MR. ANDERSON: Gundersen District Court.

CHAIRMAN CARTER: 135, Gundersen District Court. And 136.

MR. ANDERSON: Gundersen 11th Circuit.

CHAIRMAN CARTER: Gundersen 11th Circuit. Okay. Let's make sure all the parties get them before you go.

MR. ANDERSON: And I've marked on these in yellow for everybody to make it a little easier to see.

CHAIRMAN CARTER: You may proceed.

(Exhibit Nos. 135 and 136 marked for identification.)

MR. ANDERSON: Thank you. Looking at Exhibit 135 --

MR. DAVIS: I haven't gotten a copy of those yet.

Okay. I'm sorry. They were left up here.

Is this a time to offer an objection, Mr. Chair, to the use of those exhibits as being --

CHAIRMAN CARTER: Sure. You're recognized to speak to the objection.

MR. DAVIS: Thank you. Mr. Chair, these

sorry. I don't know who is --

CHAIRMAN CARTER: I was just telling him, Commissioner, to check and make sure his microphone was on because I can barely hear him myself.

COMMISSIONER ARGENZIANO: And I'm not sure who it is.

MR. DAVIS: I'm sorry.

CHAIRMAN CARTER: It's Mr. Davis from SACE.

COMMISSIONER ARGENZIANO: Okay. Thank you.

MR. DAVIS: I'm sorry, Commissioner, this is Gary Davis representing SACE.

These are two exhibits that are court opinions about Mr. Gundersen's testimony in a wholly different matter that relate to whether his testimony was admitted. It has nothing to do with the matters in this case or certainly not with his qualifications, and I'm sure Mr. Gundersen can explain this. It happens to have been a case against Florida Power & Light FPL in which he was proffered as an expert witness, and it was a tort claim having to do with the operation of a nuclear power plant, but other than that, it has nothing to do with the matters in this case and do not -- and neither of these exhibits go to his credibility because they relate to a very specific set of circumstances and what's called the Daubert Test under the Federal Rules of

Evidence.

CHAIRMAN CARTER: Before I go to Mr. Anderson, any other parties want to be heard on the objection?

Mr. Anderson, to the objection to 135 and 136.

MR. ANDERSON: Sure. At page 12, lines 2 to 4 that we just read, the witness talked about how cooling towers which, by the way, are not serving four of the units at the site he points to, may be leaking salt water into local aquifers thereby contaminating -- and it goes on.

The District Court in the *Finestone* case, which I've handed you the District Court order and the 11th Court affirmance order, specifically discusses and rejects Mr. Gundersen's qualifications to testify as to soil or water movement around a nuclear site. So it's absolutely dead on, and in fact in that case all of Mr. Gundersen's expert witness report was rejected under the Daubert Standard which is established so people properly qualify their expert witnesses. It's the exact same issue he's raising here. This is the exact same type of point that the United States district judge here in Florida heard what he had to say, found he did not have the qualifications, and it was upheld by the 11th Circuit Court of Appeals as the kind of scientifically unsupported leap of faith condemned by Daubert. So this

is clearly relevant to the opinions of the witness and the credibility that this commission should attach to the opinion of Mr. Gundersen.

CHAIRMAN CARTER: Ms. Helton.

MS. HELTON: Thank you, Mr. Chairman. In our order establishing procedure, we have some standard language in there, and that requires, "and each party's prehearing statement shall set forth the following information in the sequence listed below," and one of the items mentioned is any objections to a witness' qualifications as an expert. "Failure to identify such objection will result in restriction of a party's ability to conduct voir dire absent a showing of good cause at the time the witness is offered for cross-examination at hearing.

Now, I haven't -- admittedly have not looked at Florida Power & Light's prehearing statement to know whether they have made such an objection or not.

MR. ANDERSON: The distinction is --

MR. DAVIS: They have not.

CHAIRMAN CARTER: Hang on a second. Mr. Anderson, to the --

MR. ANDERSON: Our obligation under the prehearing order is, if we wish to exclude his testimony entirely from the evidence and to bring a motion to

strike, for example, we'd need to do that in advance. What I'm cross-examining is as to the weight the Commission should give this witness based upon qualifications. It's always appropriate to interrogate a witness concerning their qualifications and particularly where you have something, you know, so specific.

We're not opposing the admission of his evidence. You didn't hear us do that. That's what that portion of the prehearing order says, but the prehearing order and the order establishing procedure do not limit cross-examination on the qualifications of a witness.

CHAIRMAN CARTER: Commissioner Skop.

COMMISSIONER SKOP: Thank you, Mr. Chairman.

Just to Mr. Anderson, so I understand, the objection is basically that FPL is has not objected to the witness testifying as an expert as they would have properly done in the prehearing order, but they are objecting to the admission via -- of these two exhibits as a contemporaneous objection based upon the lack of meeting the Daubert Standard; is that correct?

MR. ANDERSON: I'm sorry. I don't quite follow you, Commissioner Skop, but what --

CHAIRMAN CARTER: Just reframe your objection.

MR. ANDERSON: Good, and I'm not objecting,

I'm cross-examining. And the point is that, whereas here you have so thoroughly a vetted consideration by a district court and a court of appeals of a specific issue as a person not having qualifications that could be relied upon, the point is that that is worthy of consideration as the Commission decides how much weight to given evidence. That's all.

And just to be clear, we're happy Mr. Gundersen is here today. The purpose of these hearings is to be as transparent as we can, have people from different backgrounds provide their testimony so it could be subject to consideration because we're all -- you know, as a state, we're all in this together in these hearings as we go forward, but in weighing the evidence, the point is is some opinions are better than other opinions because of qualification or otherwise. That's just what we're showing by cross, and I would have been done with the exam by now.

MR. DAVIS: I object to Judge Anderson giving the statement of how to weigh evidence to the Board of Commissioners here.

CHAIRMAN CARTER: Ms. Anderson -- Ms. Helton. That was a little more specific than before.

MS. HELTON: Well, you know, I see the requirement in our order establishing procedure a little

bit differently than Mr. Anderson does. It's my understanding for as long as I've been here at the Commission, Mr. Chairman, that witnesses, unless they're clearly testifying to facts, are presumed to be experts, and if a party wishes to challenge whether someone is offering expert testimony and therefore giving opinion testimony, they need to do that up front, and the reason being so that we can timely prepare for the proceedings and make sure that enough time is allotted to allow voir dire to happen in the case.

From what I've heard, it seems to me that, yes, we do allow the companies and the parties to go into the expert qualifications a little bit to give you the flavor, but in my mind this has gone beyond that.

CHAIRMAN CARTER: Anything further, before I rule, from either of the parties?

MR. ANDERSON: No.

CHAIRMAN CARTER: Your recommendation, Ms. Helton, on Exhibit 135 and 136?

You remember it was Mr. Davis' objection.

MS. HELTON: No, I'm not -- I do. I'm just trying to --

MR. DAVIS: May I raise one other objection?

CHAIRMAN CARTER: No, no, no, not yet. I think we're -- Ms. Helton, do you need to hear more?

MS. HELTON: I think the point's been made, Mr. Chairman, and these are court cases and not the typical type of evidence that we'd admit into an administrative proceeding.

MR. ANDERSON: And you just made a good point because these are actual court decisions. So there's really no need for them to be admitted in the record. The Commission could take notice of them or, you know, I can just brief them. So that may make it that much simpler.

CHAIRMAN CARTER: Okay. Let's make it that much simpler then. So they're not --

MR. DAVIS: Thank you, Mr. Chairman.

CHAIRMAN CARTER: I think I followed your logic, Ms. Helton, but based upon the reason given, not admitted at this time.

Mr. Anderson.

MR. ANDERSON: That was going to be my last line of questioning, and we'll make those points based upon the court documents in the brief. So we have nothing further for the witness.

CHAIRMAN CARTER: Okay. Now staff.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioner McMurrian, you're recognized?

COMMISSIONER McMURRIAN: Thank you.

Mr. Gundersen, in your summary you talked about the AP1000 being I think you said a complicated design. Did I get that right?

THE WITNESS: Yes.

COMMISSIONER McMURRIAN: Is there a design that you think is more appropriate than the AP1000?

THE WITNESS: No, I think -- you know, all of these -- a nuclear reactor or a nuclear power plant is a complicated design, and I think the point I was trying make is that, you know, if you're building a house, a schedule can slip, and this is clearly a significantly more complicated piece of hardware than that. No, I don't believe that the boiling water or the French design is any less complicated than the AP1000.

COMMISSIONER McMURRIAN: So is it your position that new nuclear plants should not be built? Is that what you're saying?

THE WITNESS: No, I don't think I said that.

COMMISSIONER McMURRIAN: No, I don't think you did say that. I'm just trying to understand what --

THE WITNESS: What I'm saying is right now, depending on which schedule you look at, it's about -- if they get an LWA, they'll probably -- they're planning on building the thing in about four years after the --

because the LWA allows them to do some site prep. If they don't, it might be five or six, but the net effect of all the uncertainties that I talked about, the licensing delay potentially impacting LWA or the broader issue of the AP1000 design can delay this. Once they get to the field, especially given that there's no engineering in an EP contract or an EPC contract at this point, to assume that the plants are going to be built by 2018 I think is overly optimistic. So I think that they really owe you a realistic schedule which then is going to be reflected in a realistic price and not a schedule that's so compressed.

Mr. Scroggs had a great line in his rebuttal testimony, and he said that the -- Florida Power & Light's approach was that they wanted to approach the schedule with a, quote, "sense of urgency," and then he went to say that the most likely schedule, which was the one that I proposed, was a vehicle to, quote, "introduce an excuse." Well, I don't think the most likely schedule is a vehicle to introduce an excuse. I think the most likely schedule is the most likely schedule, and to go in overly optimistic or with a sense of urgency has the effect of, one, dropping the price significantly and, two, making the time at which the plant is really going to wind up on line significantly

greater in time than what they have got proposed.

Now, I'm not suggesting that the plants be -- not be built. I am suggesting that I think they owe the people of Florida a real schedule which will then drive a real cost.

COMMISSIONER McMURRIAN: Okay. So if I'm hearing you right, you're saying that -- Madam Chair, that you think the schedule ought to take into account the delays that will come with the design that they've chosen, but you're also not saying that there's any other design that they should have chosen that would have mitigated that kind of risk of delay?

THE WITNESS: I think any one the problems are eventually surmountable. There are no show-stoppers, but what I am saying is that there are many problems and the net effect is that the schedule as proposed is overly optimistic and is, in fact, very short.

COMMISSIONER McMURRIAN: Okay. Thank you. That helped me. Thank you.

ACTING CHAIRMAN EDGAR: Did I hear no questions from staff? I did.

Okay. That brings us to redirect.

REDIRECT EXAMINATION

BY MR. DAVIS:

Q Brief redirect.

Mr. Gundersen, you were asked by Mr. Anderson about, you know, the amount of time you spent on your analysis for this matter. Other than the time that you spent analyzing the FPL long-term feasibility analysis, what did you rely upon for your opinions in this case?

A I've been following the issue of these second -- this new generation, the Part 52 reactors, you know, since the late 1990s when the industry got on top of it. So, you know, essentially I'm relying on a background of 35 years experience. I've worked at about 70 nuclear reactors, all of which have come in late and all of which have come in over budget. I'd like to think I'm not the cause of that. So I'm relying on the experience of my professional background, plus the fact that I've been following this Part 52 process extensively for ten years now.

Q You were asked about the typographical error you made in your testimony about coal versus fossil, and you were also asked about how many cooling towers there are at the Turkey Point site. Did either of those issues have any influence on your opinions in this case?

A No, no. The opinions don't -- wouldn't change, and, in fact, you know, probably those -- that particular sentence could be struck and it wouldn't change the opinion one iota.

Q And then there was an inference in the impeachment questions that Mr. Anderson was asking you that somehow or other your testimony was unreliable in another case and therefore you weren't allowed to testify. Can you explain that?

MR. ANDERSON: I'd object to that question because I was not permitted to ask that question on cross-examination.

MR. DAVIS: I believe he certainly asked the question. He just wasn't permitted to place the court opinions into evidence.

MR. ANDERSON: That line of questioning was foreclosed and denied, and it's not appropriate to redirect when a person doesn't get a chance to ask their questions and get an answer.

ACTING CHAIRMAN EDGAR: Ms. Helton.

MS. HELTON: My recollection is, Madam Chairman, that he did not answer the question.

ACTING CHAIRMAN EDGAR: That is my recollection as well.

BY MR. DAVIS:

Q Okay. I'll withdraw the question then. Thank you.

You were just asked a question by Ms. McMurrian about other designs. Are you aware of similar

problems with other reactor designs around the world that are causing delays such as you projected for the FPL Turkey Point 6 and 7?

A Yeah. The most onerous problems right now are occurring in Finland with a -- it's a pressurized water reactor, but it's not the Westinghouse design. It's the French design. The project's at least three years behind and the budget is now at least twice what it would -- when it was originally proposed. And, worse than that, they had fixed price contracts with the nuclear vendor, and the nuclear vendor has now basically refused to complete the job unless the remainder of the work is renegotiated. It's a Finnish reactor with lots of O's and I's in the name and I don't dare say it.

MR. DAVIS: Thank you. That's all the redirect we have.

ACTING CHAIRMAN EDGAR: Thank you. That brings us to exhibits.

MR. DAVIS: Okay. Yes, at this point we would like to --

ACTING CHAIRMAN EDGAR: Hold on. I need you to hold on for a moment longer. Thank you. It won't be long, at least I don't think so.

MR. DAVIS: We would like to move Exhibit 61 through 69 from Mr. Gundersen into --

ACTING CHAIRMAN EDGAR: Let's start there. 61 through 69, any objections?

Hearing none, 61 through 69 are entered into the record at this time.

(Exhibit Nos. 61, 62, 63, 64, 65, 66, 67, 68 and 69 admitted into the record.)

ACTING CHAIRMAN EDGAR: And then is my recollection correct that the Chairman's ruling were that documents 135 and 136 were marked Gundersen District Court, 136, Gundersen 11th Circuit, 136, but they were not to be entered but as records of decisions were to be taken judicial notice of? Okay.

MR. DAVIS: Okay. Thank you.

ACTING CHAIRMAN EDGAR: And then I think that concludes us with this witness at this time. Thank you very much.

And I believe that brings us to your next witness --

MR. DAVIS: Yes, Dr. Mark Cooper, please.

COMMISIONER EDGAR: And he may came forward.

MR. DAVIS: Madam Chair, I don't believe that Dr. Cooper has been sworn.

ACTING CHAIRMAN EDGAR: That was going to be my question. If you would, raise your right hand with me.

Whereupon,

MARK COOPER

was called as a witness on behalf of Southern Alliance for Clean Energy, Inc., and, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DAVIS:

Q Good afternoon, Dr. Cooper.

A Good afternoon.

Q And I'm glad you made it in this afternoon.

Can you state your full name and give your business address for the record, please.

A My name is Dr. Mark Cooper. My business address is 504 High Gate Terrace, Silver Spring, Maryland.

Q And, Dr. Cooper, have you prefiled testimony in this proceeding and prefiled exhibits on July 15th, 2009?

A Yes, I have.

Q And if I were to ask you the same questions as posed in your prefiled testimony today, would your responses be the same?

A Yes, they would be.

MR. DAVIS: And if -- at this point then, we would request that the prefiled testimony be admitted.

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

/ / / / / @@@@@INSERT PREFILED 39 PP

IN RE: NUCLEAR PLANT COST RECOVERY CLAUSE

BY THE SOUTHERN ALLIANCE FOR CLEAN ENERGY

FPSC DOCKET NO. 090009-EI

DIRECT TESTIMONY OF

DR. MARK COOPER

Introduction and Qualifications

Q. Please state you name and address.

A. My name is Dr. Mark Cooper. I reside at 504 Highgate Terrace, Silver Spring, Maryland.

Q. Briefly describe your qualifications

A. I have a Ph.D. from Yale University and have been providing economic and policy analysis for energy and telecom for almost thirty years. I have been the Director of Energy and the Director of Research at the Consumer Federation of America for 27 years, although the opinions I express in this testimony are my personal opinions and not those of the Consumer Federation. I am a Fellow at various universities on specific issues, including the Institute for Energy and the Environment at Vermont Law School. I have testified over 100 times before public utility commissions in 44 jurisdictions in the U.S. and Canada on energy and telecommunications issues and about twice as many times before federal agencies and Congress on a variety of issues, including energy and

electricity. A copy of my resume with energy related activities is attached as Appendix A.

Purpose and Summary of Testimony

Q. What is the Purpose of your testimony?

A. I have been asked by the Southern Alliance for Clean Energy ("SACE") to examine the long-term feasibility of Florida Power & Light's ("FPL") Turkey Point 6 & 7 Reactors ("Turkey Point") and Progress Energy Florida's ("PEF" or "Progress") Levy Nuclear Reactors ("Levy") (collectively "reactors" or "projects") as required by F.A.C. Rule 25-6.0423(5)(c)5.

Q. Please summarize your findings.

A. I have identified dramatically changed circumstances since affirmative determinations of need were made by this Commission for these reactors and present in my testimony evidence on the current marketplace, regulatory, technological, and financial risks of these reactors proposed for construction in Florida by Progress and FPL. These changed circumstances and resulting risks lead me to conclude that completion of the Turkey Point and Levy reactors is no longer feasible in the long term and that incurring additional costs on these reactors would not be prudent.

The decisions by Progress and FPL to build these nuclear reactors were based on four important assumptions that have been called into question in the time since the evidence was filed in their petitions for determination of need ("Need Docket").

(1) They assumed a high rate of demand growth.

(2) They downplayed the contribution that efficiency and renewables can make to meet the need for electricity.

(3) They assumed high prices for fossil fuels based on both commodity prices and the belief that public policy would put a high price on carbon.

(4) They used a low estimate of the cost of nuclear reactors.

The impact of the changed factors on these assumptions that have developed since the Need Docket can be summarized as follows:

Market Factors	
Declining Demand	Eliminates need for large quantity of new generation
Falling price of natural gas	Makes natural gas more attractive
Regulatory Factors	
Efficiency/renewable standards	Reduces need for non-renewable generation
Carbon cost reduction	Makes low carbon resources less attractive
Technological Factors	
Nuclear cost uncertainties	Raises prospects of cost overruns
Growing confidence in cost and availability of alternatives	Makes alternatives more attractive
Financial Factors	
Tight Financial markets	Makes finance more difficult
Increasing concerns on Wall Street about Nuclear reactors	Makes finance more expensive

Any of these changed factors alone could demonstrate that completion of these reactors is not feasible in the long term Taken together, these factors thoroughly undermine the case that the companies have tried to make to demonstrate the long-term feasibility of these nuclear reactors at this time. The evidence presented by the companies to the Commission does not take these changed factors fully into account and does not reflect the highly uncertain future that nuclear reactors face.

If the Commission were to merely conclude that the changes in conditions make the future highly uncertain, that conclusion alone would argue strongly against continuing with these reactors. In an uncertain environment, the assets a prudent person acquires should be flexible, have short lead times, come in small increments and not involve the sinking of large capital costs. The characteristics of nuclear reactors are the antithesis of those best suited to an uncertain environment. They are large, "lumpy" investments that require extremely long lead times and sink massive amounts of capital. Therefore, it would be imprudent to allow the companies to incur any more expenses or recover those costs from ratepayers at this time because the companies have failed to demonstrate the long-term feasibility of completing the reactors.

There are other factors that will be documented by other witnesses that reinforce the conclusion that the reactors are no longer feasible in the long-term, including the failure of some of the projects to obtain regulatory approvals, which were being counted on to stay on schedule and uncertainties and delays in the Nuclear Regulatory Commission ("NRC") licensing process. While one can point to some positive developments in the policy space, such as the possibility of the creation by the U.S.

Congress of a Clean Energy Development Authority, these are vastly outweighed by the negative developments.

Q. How is your testimony organized?

A. First, I set forth how I approach the analysis of the long-term feasibility of these proposed nuclear reactors. Next, I define the conditions that have developed since the Need Dockets that have changed the terrain of nuclear reactors and describe in qualitative terms how these conditions impact the long-term feasibility of the nuclear reactors. Then I provide quantitative evidence to support my conclusions. The bulk of my analysis focuses on the FPL evidence because FPL has presented a recent recalculation of its need analysis. I also raise some concerns that the changes in the economic landscape highlight some aspects of the methodology that FPL has developed specifically to evaluate nuclear reactor economics that may be distorting the picture presented to the Commission.

In contrast, Progress has presented little tangible evidence that it is actually conducting any ongoing analysis, other than the statement of its witnesses that they are thinking about the relevant issues. However, all of the concerns raised about the proposed FPL reactors apply with even greater force to the Progress reactors. The case for building reactors was weaker in the case of Progress than FPL. Progress had higher reserve margins, a more diverse fuel mix, and higher costs for the Levy nuclear reactors, because it is a site that does not have an existing reactor. While all of the changes I have discussed in the case of FPL also affect Progress, Progress has suffered a unique setback, having been forced to shift its schedule by 20 months and renegotiate its EPC contract with the vendor.

Q. Are you sponsoring any exhibits to your testimony?

A. Yes, I am sponsoring the following exhibits:

MNC-1:Impact Of Declining Demand On Summer Peak Load

MNC-2: Natural Gas Wellhead, Henry Hub And Futures Prices

MNC-3: Projected Natural Gas Prices Compared To Nymex Futures Prices

MNC-4: Projections Of Carbon Compliance Costs

MNC-5: Estimates Of Potential Mid-Term Efficiency Savings: By State

MNC-6: Estimates Of Costs Of Alternatives To Meet Electricity Needs

MNC-7: Impact Of Climate Policy On Peak Load: FPL

MNC-8: Impact Of Climate Policy On Peak Load: Progress

MNC-9: Estimates Of Nuclear Reactor Overnight, Costs: 2001-2009

MNC-10: Nuclear Operators, Reactor Cancellations And Moody's Downgrades

MNC-11: Standard And Poor's Credit Profile Considerations

MNC-12: Diversity Of Resource Under Various Technology Scenarios

MNC-13: The $1/Kw Cost Factor

MNC-14: The Narrow Margin In FPL's Breakeven Analysis

ANALYZING THE RISK FACTORS

Approach

Q. How do you approach the analysis of the long-term feasibility of the nuclear reactors?

A. The rule adopted by the Commission requires an assessment of the long-term feasibility of the projects. I believe a thorough review of the projects is vital to protect the public interest. In a competitive marketplace firms must constantly review whether their investment decisions continue to be economically viable and justified in light of the changing market, technological, financial and regulatory conditions. For utility services that are offered under franchise monopoly conditions subject to regulatory oversight, the commission is charged with protecting the public from imprudent actions by the utility. It must ensure that utilities exercise the same vigilance with respect to the prudence of their actions as firms in a competitive market.

This regular review of the long-term feasibility of a project is particularly important in the case of nuclear reactors, which are, by their nature, extremely vulnerable to these four types of risk. As very large investments that take a long time to construct, and produce large quantities of electricity, they represent a huge quantity of inflexible, sunk costs. These investments are incapable of responding to change. They are inherently "go-no-go" decisions that should be made before costs are incurred. Because of their size and nature, the Commission needs to address the long-term feasibility of the projects before additional, substantial costs have been incurred.

The companies are well aware that this proceeding requires an affirmative showing of the long-term feasibility of completing these reactors. FPL has redone its breakeven analysis under new sets of assumptions. Progress states that it is considering a wide range of factors that affect the decision to proceed. However, Progress has presented no "detailed analysis" as required by Rule 25-6.0423(5)(c)5 demonstrating the long-term feasibility of completing the Levy project.

The factors that FPL has reanalyzed are appropriate for a decision on whether these projects should proceed, and these are the factors that the Commission should be looking at as the ultimate arbiter of prudence and long-term feasibility. Exercising this judgment before money is spent is infinitely preferable to arguing about it after the money has been spent. Both companies assert that, having reviewed recent changes in the factors that affect the decision to build these reactors, it is prudent to continue and that the completion of the reactors is feasible. However, the companies' review of the changes now faced by these reactors is cursory and insufficient to justify that conclusion.

MARKETPLACE CONDITIONS

Demand

Q. Have there been changes in the marketplace that affect the long-term feasibility of these nuclear reactors?

A. Yes. There has been a dramatic change in the marketplace since the companies prepared their need analyses in the respective need dockets. The nation has plunged into the worst recession since the Great Depression. Some even call it a depression. Moreover, there is a growing recognition that this change is not simply a severe dip in the business cycle, but rather a major shift in the economy. The spending binge on which the U.S. embarked for a decade, in which households and business became highly leveraged, is likely over. A massive amount of household wealth was destroyed when the housing market bubble burst. Retirement accounts have been devastated by the collapse of the stock market.

Ironically, the decade on which the projections were based in the need docket coincided almost exactly with the decade in which the housing and consumption bubbles were pumped up by excessive leverage. That level of growth was unsustainable. It is my opinion that the shift in consumption is permanent and signals slower growth in the future. However, even if this were just a severe downturn in the business cycle, it would affect the demand for electricity sufficiently to raise questions about the long-term feasibility of these new nuclear reactors.

FPL

Q. Is there evidence that load growth has changed in the FPL service territory?

A. Yes there is strong evidence of a dramatic reduction in consumption that should sharply reduce projected load growth. FPL provides sufficient detail to examine closely the problem of excess capacity created by the nuclear reactors, as shown in Exhibit MNC-1, page 1. The reduction in peak demand between the 2008 and 2009 feasibility analysis is striking. In 2017, which is a crucial year in the 2008 analysis because that was the year the reserve margin hit the limit of 20 percent, the 2009-projected peak is 11 percent lower than the peak projected in 2008. Under the 2009 projection, the FPL does not reach the 2017 peak projected in 2008 until 2022, five years later. By 2040, the projected peak is 20 percent lower.

Q. Is this dramatic shift in demand fully reflected in the 2009 Economic Analysis?

A. With a dramatic decline in demand, averaging between 10 and 11 percent in the decade between 2010 and 2020, all else equal, one would expect to see an equally dramatic increase in FPL's reserve margins. That is not the case. With a drop in the summer peak of more than 10 percent in 2017, FPL shows only a 1 percent increase in reserve margin. In order to achieve that level, it must use the flexibility of natural gas plants to react to the decline of projected peak demand. Comparing Schedule 8 in the 2008 and 2009 10-year plans, we can see natural gas plants moved back a year or two, reduction of inactive reserves and elimination of some additions altogether, while making room for the Turkey Point reactors. Thus in contrast to the ten year time horizon needed for nuclear reactors, the short time frame for deploying gas alternatives is much more flexible for dealing with the uncertainties in demand.

Progress Energy

Q. Is the Progress demand projection similar to that of FPL?

A. The demand reduction projected by Progress is substantial, but much lower than that projected by FPL, as shown in Exhibit MNC-1, page 2. From the peak in 2007 to the trough in 2010, Progress shows a 2.5 percent decline in peak, compared to FPL, which shows a 6.2 percent decline. FPL assumes a more vigorous growth of peak from 2010 forward, but the depth of the decline in the recession still leaves it with a projected peaks in 2017 that is almost 10 percent lower than in the 2008 10-yer plan. For Progress, the reduction in the projected peak for 2017 is only about 2.6 percent lower.

To put these declines in demand into perspective, I note that taken together, the reduction in projected peak summer demand between the 2008 and 2009 10-year plans is

almost 3500 MW, which exceeds the combined capacity of three of the four reactors. Since these utilities represent just under three quarters of the total statewide peak summer demand, and assuming the other utilities in the state have suffered similar reductions in demand, the lowering of the peak statewide in the past year would exceed the capacity of all four plants being considered in this docket.

There are two important implications from this change in demand. First, a lack of demand can undermine the long-term feasibility of the reactor. This played a critical role in the cancellation and abandonment of nuclear reactors in the 1970s and 1980s. Back then, it was oil price shocks and rate shock that undermined demand. Today it is the great recession and, as I describe below, climate policy, that can undermine demand, but the historical experience teaches us that inadequate demand can definitely render nuclear reactors infeasible in the long term. Second, hoping to sell pieces of the plant – either with off system sales at wholesale or equity stakes – in an attempt to salvage failing economics brought on by declining demand may not be feasible with a state-wide reduction in demand.

NATURAL GAS PRICES

Q. Are there other market changes that the Commission should consider?

A. Yes, the price of gas, which plays a central role in Florida, bears close scrutiny. Natural gas was the best alternative to nuclear in the economic analysis of the FPL Need Docket, and FPL has focused on gas in this proceeding. In that Need Docket analysis, the variable cost of gas accounts for 90 percent of the difference between the nuclear

scenario and the gas scenario, and the cost of natural gas is the single largest determinant of the variable cost by far.

In this proceeding, FPL concludes that the prospects for nuclear reactors have actually brightened because of rising fossil prices – both commodity prices and carbon compliance costs. "The primary reasons for the projected general increase in the economic advantage of the Turkey Point 6 & 7 project, compared to the 2007 Need Determination filing, are: (i) currently projected higher natural gas costs, particularly in the early years; and (ii) higher projected environmental compliance costs." (Florida Power & Light Company, Docket No. 0900009-EI, Responses to Staff's Second Set of Interrogatories, Interrogatory No. 45, page 1 of 1).

This conclusion does not comport with the emerging reality. As shown in Exhibit MNC-2, page 1, the price of natural gas has not only tumbled, but it has separated from the price of oil. There are a number of reasons that natural gas might not continue to track oil as closely in the future as it has in the past. It is much more of a regional market than oil. There is increasing optimism about natural gas resources. There are efficiency programs targeted at natural gas consumption in the climate change legislation moving through Congress, which may free up supply and put downward pressures on price. Finally, there is considerable evidence that a significant part of the volatility in the natural gas market over the past decade was caused by excessive speculation brought on by excessive deregulation. The rise in prices and volatility was coincident with the creation of what is known as the Enron loophole and the entry of index traders into the market. There are strong regulatory and legislative measures being put into place to

prevent excessive speculation from again afflicting energy markets. In short, the past decade should be the exception, rather than the rule in natural gas markets.

FPL

Q. Please provide empirical evidence to support your concerns about the natural gas projections employed by FPL.

A. The evidence relies on futures prices. As shown in Exhibit MNC-2, page 2, the Henry Hub futures price, which is the standard base for natural gas pricing, is a near perfect predictor of natural gas wellhead prices. As shown in Exhibit MNC-2, page 3, the Henry Hub price is a near perfect predictor of Florida prices for gas for electric utilities.

Exhibit MNC-3, page 1 shows that the dramatic change in natural gas prices is not reflected in the FPL's analysis. The price of natural gas shown in FPL's "Key Assumption" analysis, is a cross between the mid and the high estimates from the Need Docket. These very high price projections stand in sharp contrast to the prices that prevail in the natural gas futures market. Exhibit MNC-3-page 1 shows the August futures price for Nymex Henry Hub natural gas, in years matching those used in the need docket. On average, the natural gas price in the "Key Assumption" page is about 50 percent higher than the Nymex price.

Needless to say, overestimating the single most important factor in the economic analysis can have a huge impact on the economic calculation made by the company. The Nymex futures prices are a lot closer to the low gas cost scenario from the FPL 2007 Need Docket than they are to the "Key Assumptions" prices used by the company in this

feasibility assessment. In the Need Docket, two of the three nuclear cost scenarios had higher overnight costs than the break even capital cost point in the low gas case.

PROGRESS ENERGY

Q. Do Progress Energy's natural gas prices raise similar concerns?

A. Yes. The assumed natural gas prices used by Progress suggest a dramatic shift in the relationship between the price of natural gas for utilities in Florida and the futures price of gas, as shown in Exhibit MNC-3, page 2. For most of the past decade, the price of gas for electric utilities in Florida tracked the futures price closely, but in the past three years the gap between Florida utility gas prices and futures prices grew, then declined. Compared to Nymex futures prices, the natural gas prices used by Progress suggest a gap between Florida prices and futures prices of $2 to 3$ per mmbtu greater than the historical pattern. The differences represent 20 to 30 percent of the assumed price.

Q. Did the low gas cost scenario also have low environmental costs?

A. Yes it did and I will examine the issue of compliance cost in the analysis of regulatory conditions.

REGULATORY CONDITIONS

Q. Should regulatory conditions enter into the Commission's evaluation of the long-term feasibility of these reactors?

A. Yes. The companies' Need Docket analyses were driven by assumptions about federal regulatory policy. The companies have put a high price on carbon in their

economic analyses. Without the high price on carbon, the economics of nuclear reactors would look very different. To my knowledge, the state of Florida has not put a price on carbon, nor is it contemplating doing so. Thus, the companies have decided to pursue these projects and the Commission has allowed cost recovery based, in part, on assumptions about federal climate change policy.

Q. Are you suggesting that the Commission should not take future climate change policy into account when considering the long-term feasibility of these reactors?

A. Quite the contrary. I believe the Commission should take federal policy into account when considering the long-term feasibility of these reactors, since that is a major source of regulatory risk to state decisions. However, I believe the Commission must take the **entirety** of federal policy into account. The prospect of federal climate change legislation is growing. The idea of putting a price on carbon is only a part of the legislation that is moving through the Congress. H.R. 2454, the American Clean Energy and Security Act, the first piece of climate change policy legislation to pass a house of Congress, does not simply put a price on carbon directly. Rather, it establishes an elaborate scheme of allowances to emit carbon, which will indirectly set a price on carbon. Moreover, policies other than putting a price on carbon, particularly policies to promote efficiency and renewables, play a large role as well.

Q. Please describe the full suite of federal policies that affect the long-term feasibility of these nuclear reactors.

A. On the supply-side, the legislation has a renewable energy standard that would require utilities to meet an increasing part of their load with renewables. Within a decade, they would be required to get 20 percent of their generation from renewables, with as much as 8 percent of that total coming from efficiency. At the same time, the legislation includes a number of provisions that have sharply lowered projections of the cost of carbon credits, such as efficiency and renewable mandates, subsidies for carbon control technologies and domestic and international offsets. All of these lower the demand for allowances and therefore the price. This means that the assumed compliance costs of fossil fuels are lower than projected by the companies in prior proceedings and this proceeding.

On the demand side, there is a substantial mandate for energy efficiency. This is embodied, in part, in the ability to meet 40 percent of the renewable resource standard with efficiency and, in part, in dramatic improvements in building codes and appliance standards. Mandates to improve the energy efficiency of new buildings by 30 percent in the near term and 50 percent in the longer term will have a substantial impact on energy demand over the life of the reactors being considered in this proceeding. Funds from certain allowances are set-aside to improved efficiency, particularly for natural gas. Similarly, the American Recovery and Reinvestment Act of 2009 includes a huge increase in funding to improve the energy efficiency of existing buildings. As the efficiency of buildings and appliances improves, the demand for electricity and natural gas declines.

These regulatory factors – increased renewables, lower demand through efficiency, and a lower price on carbon – must be considered in the evaluation of

alternative scenarios for future supply of electricity. Extracting only the price of carbon from the policy landscape and inserting it in the economic analysis, while ignoring the other aspects of policy, distorts the picture being presented to the Commission. These other policies would further undercut the claim that nuclear reactors are feasible in the long-term. Many of these other aspects have been part of the climate change policy debate for quite some time. Taken together, these changes on the demand side, as well as the renewable standard, will have a substantial impact on the need for new non-renewable generation and undermine the long-term feasibility of building these reactors.

FPL

Q. Would the cost of compliance of fossil fuels be affected as a result of these policies?

A. One would expect that it would. Decreasing demand for allowances due to the efficiency and renewable policies and access to low cost offsets would depress the price. In its "Key Assumptions" FPL has increased the price of carbon compliance above the highest level from the 2007 analysis. As Exhibit MNC–4, page 1 shows, the long run price under all the environmental scenarios has more than doubled. As Exhibit MNC-4, page 2 shows, the "Key Assumption price" is roughly equal to the Env II price. In 2040 the price is almost 50 percent higher than the EPA estimate of carbon costs in the wake of HR 2454. Over the 25-year period, the key assumption price on carbon is over 35 percent higher than the EPA price. In fact, the EPA prices are close to the Env I price.

Progress

Q. Does the compliance cost assumption of Progress suffer from similar problems?

A. Yes. As shown in Exhibit MNC-4, page 3, the EPA compliance costs associated with HR 2454 are slightly lower than those listed in the Progress prudency filing. The high cost scenarios are way above the most recent projections. Focusing attention on the low range of estimates dramatically alters the perspective the Commission should take on the proposed reactors. In the case of Progress, the reactors were as likely to fail the economic test as pass it with carbon compliance costs in the low range.

Q. Would the cost of natural gas be affected by the suite of federal policies?

A. Yes. The EPA analysis indicates a 20 percent reduction in the cost of gas in 2025. The delivered cost of gas for electricity in 2025 is lower that the Henry Hub futures price in 2021.

TECHNOLOGICAL CONDITIONS

Efficiency and Renewables

Q. Should changing technological conditions factor into the analysis of the long-term feasibility of these reactors?

A. Yes. While climate policy is seen as giving a direct advantage to reactors by putting a price on carbon, that policy does much the same for other technologies. In fact, there are ways in which the alternative technologies are likely to receive an even larger boost. There are also many programs targeted at various technologies that are in earlier

stages of development that may enjoy larger cost reductions as the science advances and the scale of production ramps up.

I believe there are three technological developments that are shifting the terrain in ways that disfavor nuclear reactors – the availability and cost of conserved energy, the availability and cost of renewables, and the availability and cost of nuclear reactors.

Q. Please describe the emerging terrain for efficiency technologies.

A. There is a growing consensus that the cost of many alternatives is lower than that of nuclear reactors. For efficiency, the change in the terrain is largely a matter of increasing confidence that substantial increases in efficiency are achievable at relatively low cost. The detailed analysis of potential measures and the success of some states at reducing demand through energy policies have increased the confidence that efficiency is a reliable option for meeting future needs for electricity by lowering demand, as shown in Exhibit MNC-5.

I believe that the technology of efficiency has come into much sharper focus in the past year. Numerous studies of the potential for and cost of improvements in efficiency in the residential, commercial and industrial sectors have shown that large quantities of energy can be saved at relatively low cost, as summarized in Exhibit MNC-5. One study was done specifically for Florida, which found that aggressive policies to reduce energy consumption could lower demand by 20 percent at a cost of less than 3.5 cents per kWh.

Thus, independently of any regulatory mandate, as the technology of efficiency is proven out, the Commission should consider greater reliance on it as part of the least cost

approach to meeting the need for electricity. The combination of regulatory and technological changes will drive efficiency into the electricity sector, undermining the long-term feasibility of the reactors.

Q. Please describe the emerging terrain of renewables.

A. The concern with climate change has sharpened the focus on the cost and availability of renewable technologies. For renewables, the change is in strong cost reductions that are expected as new technologies ramp up production. As shown in Exhibit MNC-6, paged 1 and 2, in half a dozen studies the cost of alternatives that included renewables and/or efficiency, every analyst found several non-fossil resources less costly than nuclear.

The only two technologies on which there is a wide difference of opinion about cost are solar photovoltaics and nuclear, as shown in Exhibit MNC-6, page 3. The other technologies included in recent studies there is much better agreement. The combination of regulatory and technological changes will drive renewables into the electricity sector, undermining the long-term feasibility of the reactors.

Q. How do the regulatory and technology changes alter the context for assessing the long-term feasibility of these reactors?

A. They dramatically alter the context. HR 2454 intends to lower demand for nonrenewable generation resources. It could do so significantly. The renewable energy standard ("RES") builds to 20 percent by 2022. Improvements in the building codes start quickly with a 30 percent reduction in consumption from new buildings by 2010 and

build to a 50 percent reduction by 2014 for residential building and 2015 for commercial buildings. Additional improvements of 5 percent are called for every three years after 2017/2018. Revenue for retrofitting of existing buildings would begin when the allowances go into force. Appliance efficiency standards will unfold over time. Studies by the American Council for an Energy Efficient Economy suggest that the building codes, appliance standards and retrofitting of existing buildings could lower demand by as much as 7 percent. The renewable energy standard would be on top of the building code, appliance standards and retrofit impacts, pushing the theoretical total reduction of demand for nonrenewable generation past 25 percent, but there are a number of mechanisms that would lower that impact. In particular, states that cannot or choose not to expand renewables can make alternative compliance payments of $25 per MWh to states that exceed the combined efficiency renewable energy standard.

On a national average basis, the EPA projects a 10 percent reduction in demand and growth in renewables equal to 1.1 percent of demand.[1] An earlier analysis suggests the weatherization program in the American Recovery and Reinvestment Act would lower demand by 1.4 percent.[2] The impact varies from state-to-state, however. The American Council for an Energy Efficient Economy estimated the impact of the improvement in building codes and appliance standards in Florida would be 20 percent

[1] EPA Analysis of toe American Clean Energy and Security Act of 2009 H.R. 2454 in the 111th Congress, 6/23/09, p. 26

[2] Contrast EPA Analysis of toe American Clean Energy and Security Act of 2009 H.R. 2454 in the 111th Congress, 6/23/09, p. 26, with EPA Preliminary Analysis of toe Waxman Markey Discussion Draft: American Clean Energy and Security Act of 2009 H.R. 2454 in the 111th Congress, 4/20/09, p. 23. the former includes the effect of the ARRA in the reference case, the latter does not. I attribute the difference to the ARRA

above the national average.[3] In a state where so much efficiency is available at less than 2.5 cents per KWh, it would make sense to petition for the maximum efficiency contribution to the RES (8 percent) and develop as much renewable energy as is economic, before sending money to California, Washington, Minnesota and Massachusetts. Combining these factors, a reasonable range for the impact on Florida would be a 10 to 20 percent reduction in the demand for non-renewable generation.[4]

FPL

Q. What impact does including the efficiency and renewable policies in HR 2454 have on FPL's projections for load growth and demand for nonrenewable resources such as nuclear reactors?

A. They would have a major impact. The 20 percent scenario is described in Exhibit MNC-7, page 1. Under this scenario, FPL does not reach the peak for 2017 projected in the Need Docket until 2036. Exhibit MNC-7, page 2 presents the 10 percent scenario, and under this scenario, FPL does not reach the peak projected in the Need docket for 2017 until 2028. The combination of the great recession and H.R 2454 climate policy extends the decision horizon by one to two decades. In an uncertain environment, that is a lot of breathing room. Utilities should be managing their resources to accommodate this

[3] Energy Savings from Codes and Standards Count Towards EERS Savings Goals, available at http://www.aceee.org/energy/national/EERScssavings.pdf

[4] The American Council for and Energy Efficient Economy puts the savings from Title I and Title II of HR2454 at 5.4 quds in 2020 and 12.2 quads in 2030. These savings work out to 12.2 percent of the energy consumed in the electricity sector and in 2020 and 25.6 percent of the energy consumed in 2030 (see HR. 2454 Addresses Climate Change Through a Wide Variety of Energy Efficiency Measures, available at http://www.aceee.org/energy/national/HR2454_Estimate06-01.pdf)

shift and the first thing they should do is take the least flexible projects out of the queue, such as new nuclear reactors.

Progress

Q. What is the impact of including the efficiency and renewables scenarios on Progress Energy's load growth and demand for nonrenewable resources?

A. It is in the same direction, but smaller because the company assumes a smaller near term impact of the recession on the growth of demand, as shown in Exhibit MNC-8. The peak load for 2017 projected in the 2008 10-year plan does not occur until 2034 under the 20 percent scenario (Exhibit MNC-8, page 1) and 2026 under the 10 percent scenario (Exhibit MNC-8, page 2). Moreover, the 2017 peak has considerable excess capacity above the reserve margin requirement of 20 percent, which adds several years to a projection of when generation resources become constrained.

Q Do the analyses presented to the Commission by the companies reflect these developments?

A. It does not appear to. The demand projections appear to reflect the effects of the "great recession" to differing degrees, but not the aggressive efficiency policy embodied in the legislation that passed the House of Representatives. There is no hint of a renewable energy standard of 12 to 20 percent.

NUCLEAR REACTOR COSTS

Q. Pleases describe the uncertainties about the cost of nuclear reactors.

A. For nuclear reactor costs, the evidence on technology points in the opposite direction. Early in this decade vendors and contractors at the Department of Energy produced very low estimates of the cost of nuclear reactors, claiming that things have changed since the first generation of reactors. In the eight years since those initial, promotional studies were released, the estimate of the cost of nuclear reactors has increased dramatically, especially among Wall Street and independent analysts. As long as the costs placed before the Commission are "non-binding," the Commission must be aware of the growing uncertainty about the cost of nuclear reactors. As long as they are "non-binding," the prospect of cost escalation places ratepayers at risk, especially where costs for construction work in progress is being granted.

In fact, the extreme uncertainty about nuclear reactor costs has caused FPL to create a whole new framework for evaluating options. As FPL put it in the Need Docket:

> The second difference in the economic analysis approach step that developed the CPVRR costs for the resource plans is that no generation or transmission capital costs associated with Turkey Point 6 & 7 were included in the analysis. The reason for this is that *FPL does not believe it is currently possible to develop a precise projection of the capital cost associated with new nuclear units with in-service dates of 2018-on.* Consequently, FPL's economic analysis approach normally used to evaluate generation options has been modified to include a second economic analysis step." ("Need Study for Electrical Power, Docket No. 07-0650-EI, Florida Power and Light Company, October 16, 2007, pp. 104-105, emphasis added).

In the 21 months since that statement was made, there have been dozens of studies of the projected costs of nuclear reactors. The cost in 2008 $ have ranged from a low of just under $2400/kW to a high of just over $10,000/kW, as shown in Exhibit MNC-9.

As described in the FPL need study, FPL's cost estimate was derived from an early low estimate for a different type of reactor and its current estimates remain in the low range of projections. Each of FPL's estimates (low, middle and high) is in the bottom quarter of the comparable estimates. The wide range of cost scenarios considered within each of the studies attests to the uncertainty that afflicts all of the studies and to which FPL has testified.

The two conclusions I would draw from this analysis are (1) the range of costs considered by FPL is narrow and too low and (2) the uncertainty is huge. This only reinforces my opinion that the prudent course would be to avoid rigid, expensive choices, especially if there is time to let the uncertainties diminish before decisions must be made.

FINANCIAL CONDITIONS

Q. What financial factors are affecting the long-term feasibility of these reactors?

A. There are two categories of factors – the general financial environment and the specific plant finance. The general environment for raising large sums of money has clearly deteriorated. Money is tight. How long that will last and the nature of the long-term environment remains to be seen.

In a sense, the marketplace, regulatory and technological risks combine with the nature of nuclear reactors to create the severe financial risk that nuclear reactors face. The financing of the construction of large nuclear reactors has also come under greater scrutiny by Wall Street.

A recent special comment by Moody's underscores the challenges that these huge projects pose. Moody's identifies the developments in the project and regulatory areas that are positives for nuclear reactor construction, but still concludes that the negatives are a great concern and declares that it "is considering taking a more negative view for those issuers seeking to build new nuclear power plants" (p. 1) because "We view nuclear generation plans as a "bet the farm" endeavor for most companies, due to the size of the investment and length of time needed to build a nuclear power facility." (p. 4).

Moody's goes on to outline the complex factors affecting nuclear reactor construction and operation.

> Project risks are somewhat more clear today than during the last build cycle, in the 1970s, since we now have a track record that measures nuclear power's operating performance; strong plant economics due to low fuel cost; proven efficient and safe operating capabilities; new and refined regulatory procedures; and more certainty over reactor designs before construction begins. (p. 2)
>
> Much has changed since the last major nuclear-generation construction cycle (1965-1995). The industry has learned from experience, including up-front regulatory oversight of development and investment; streamlined

federal NRC approval procedures; and enhanced construction cycles and techniques.

In addition, new environmental regulations, specifically those aimed at reducing carbon dioxide emissions; appear well positioned for near-term implementation. These environmental developments should otherwise bolster the case for new nuclear generation, as it is viewed as one of the only large-scale generation technology with a no-carbon footprint. (p. 7)

On the other side, there are a host of issues and challenges in Moody's view that weigh in the opposite direction. In each of the important areas of risk, uncertainties and challenges abound.

The inherent nature of the projects continues to be a challenge and creates marketplace and technological risk.

The sheer size, cost and complexity of new nuclear construction projects will increase a utility's or power company's business and operating risk profile, leading to downward rating pressure. The length of a nuclear construction effort also entails lengthy regulatory reviews and potential delays in recovering investments, changing market conditions, shifting political and policy agendas, and technological developments on both the supply and demand side. (p. 5)

Notwithstanding the fact that public policy has created favorable conditions for reactor construction in some aspects of regulation, there are other aspects that pose continued risk at in both execution risk and regulatory risk.

> While a constructive regulatory relationship will help mitigate near-term credit pressures, we will remain on guard for potential construction delays and cost overruns that could lead to future rate shock and/or disallowances of cost recovery. Given the lengthy construction time needed for nuclear projects, there is no guarantee that tomorrow's regulatory, political, or fuel environments will be as supportive to nuclear power as today's. (p. 7)
>
> Less clear today is the effect that energy efficiency programs and national renewable standards might have on the demand for new nuclear generation. National energy policy has also begun eyeing lower carbon emissions as a key desire for energy production—theoretically a huge benefit for new nuclear generation—but the price tags associated with these development efforts are daunting, especially in light of today's economic turmoil. It isn't clear what effect such shifts, or changes in technology, will have for new nuclear power facilities. (p. 2)

The result of these market, regulatory and technological uncertainties and risks is to create financial pressure on projects, pressures that are reflected by project specific concerns and the general turmoil in the credit markets.

> Given these long-term risks, a company's financial policy becomes especially critical to its overall credit profile during construction. In general, we believe a company should prepare for the higher risk associated with construction by maintaining, if not strengthening, its balance sheet, and by maintaining robust levels of available liquidity capacity. (p. 5)

Credit conditions are yet another question. Few, if any, of the issuers aspiring to build new nuclear power have meaningfully strengthened their balance sheets, and for several companies, key financial credit ratios have actually declined. Moreover, recent broad market turmoil calls into question whether new liquidity is even available to support such capital-intensive projects. (p. 2)

Moody's continues to see execution risk in these projects and points to the history of the financial difficulties that utilities building reactors in the 1970s and 1980s as instructive for evaluating current projects.

Moody's is considering applying a more negative view for issuers that are actively pursuing new nuclear generation. History gives us reason to be concerned about possible significant balance-sheet challenges, the lack of tangible efforts today to defend the existing ratings, and the substantial execution risk involved in building new nuclear power facilities. (p. 2)

Q. Do these concerns apply to the nuclear reactors proposed by FPL and Progress?

A. Yes. As I have shown above these marketplace, regulatory and technology risks weigh heavily on the proposed Florida reactors. The execution risk remains a serious concern as well. In the case of Florida, where both of these reactors before the commission are still awaiting approval for the 16th and 17th revision in its "standard" design, where the NRC has determined that one utility could not proceed under a Limited Work Authorization ("LWA") and therefore has been forced to delay the project and renegotiate its EPC contract, paying fees just to stand in line, and where the developer of

the prototype has shelved its plans to make its project the "model," Moody's concerns seem well founded and the assumption that execution risk has been solved deserves to be questioned.

The downgrades of utility ratings cut to the heart of the problems encountered by the industry during "the last major nuclear-generation construction cycle (1965-1995)." As shown in Exhibit MNC-10, I have identified 68 firms that engaged in the construction or operation of nuclear reactors in the U.S. Of those 68 firms, three quarters endured cancellation of at least one plant and half suffered a ratings downgrade. Both of the utilities involved in this proceeding suffered downgrades. Cancellations are the ultimate proof of that reactors can become infeasible and financial risk plays a key role in triggering the cancellation.

Moody's is not the only Wall Street firm to recognize the challenges facing nuclear reactors, as shown in Exhibit MNC-11. Even at a promotional conference, Standard and Poor's noted that "challenges for the industry participants abound" (p. 18). Even recognizing that there are positive aspects of the current environment, as Moody's did, Standard and Poor's identifies more aspects of the current situation that are negative. Interestingly, even with a loan guarantee, Standard and Poor's sees significant financial issues. The utilities proposing the reactors in Florida are not on the list for the first round of loan guarantees, so the challenges facing these projects are even greater.

Thus, the Commission needs to be sensitive to the potential financial risks of these plants. Credit downgrades raise the cost of capital and can have a significant impact on the cost of electricity and undermine not only the long-term feasibility of the reactors, but also the viability of the utility.

Let me stress again that the importance of uncertainty is a key fact for the Commission to take into account and the importance of demand projections. One of the key factors contributing to the bust of the nuclear boom of the 1970s was the inability or unwillingness of utilities that had become committed to nuclear construction to cope with reduced demand growth. The oil price shocks of the 1970s and the rate shock of the 1980s destroyed the demand that the nuclear reactors were intended to supply.

Today we have a similar demand shock created by the great recession and the pending climate change policy. It is highly unlikely that demand will reach the levels predicted in the Need Dockets for decades. Between the two utilities, FPL and Progress have lowered their projection of peak demand for 2017 by almost 3700 MW. That is equivalent to the capacity of three of the four units they are planning to build. Climate change policy could reduce the need for nonrenewable capacity by another 3300 to 6600 MW in their service territories in the next two decades. The chance that Florida will actually need these four reactors should climate change legislation be enacted along the line of HR 2454 is virtually zero. If climate change legislation were not enacted now or in the future, the carbon compliance prices assumed by the companies would not come to pass. In that case, the reactors could not be justified on economic grounds. Either way, these reactors are not feasible in the long-term.

DIVERSITY

Q. Do the other goals the Florida legislature has set for the electricity sector alter you conclusion?

A. Not at all. The goal of promoting diversity of resources to lower vulnerability to a variety of threats argues for efficiency and renewables just as much as nuclear. Efficiency is the most reliable form of meeting needs because it is always on. Lowering demand lowers the reliance on all other forms of energy. Renewables also provide diversity.

To evaluate the effect of alternatives on the diversity of sources, I have calculated an index known as the HHI index. The index is used frequently in economics to evaluate the concentration of markets. In fact, the Merger Guidelines of the Department of Justice and the Federal Trade Commission are written in terms of the HHI. The index is calculated by taking the share of each entity making up the market (in this case the share of the resource in the total) squaring it, summing the squares and multiplying by 10,000 to clear the fraction. A monopoly or utility reliant on a single source would have an HHI of 10,000 [(1 * 1) *10,000].

Exhibit MNC-12 shows the HHI for three scenarios for both FPL and Progress. It has the nuclear and gas scenarios from the Need Docket and contrasts this to an efficiency and renewables scenario in which HR 2454 induced efficiency and renewables are at 15 percent (half way between the 10 and 20 percent scenarios discussed above). Efficiency is assumed to be 12 percent of the total resource, while incremental renewables are set at 3 percent. In both cases, the efficiency and renewable mix is more diverse than either the nuclear or the gas scenarios, when one counts efficiency as a "resource."

ECONOMIC ANALYSIS

FPL's Breakeven Analysis

Q. Is the breakeven analysis the common approach to making the comparison between alternatives?

A. No. Because FPL is unsure of the cost of nuclear reactors it has created a new methodology to evaluate one option, whether or not to build nuclear reactors. The typical methodology is a levelized cost comparison of the different alternatives.

Q. Are there aspects of the break-even analysis that bear close scrutiny in light of the changed conditions you have identified?

A. Yes there are several aspects. At a general level, the breakeven analysis improperly narrows the scope of the review. Generally, analysts calculate the projected cost per kilowatt-hour. Each alternative would be considered on its merits. In the breakeven analysis, FPL compares two or three large-scale alternatives. It does not ask whether other alternatives would be less costly.

More specifically, there are two aspects of the breakeven framework that FPL has developed which should be examined carefully in light of the changing conditions I have identified. These aspects are escalation and excess capacity.

Q. Please describe your concerns about escalation.

A. The wide variation in the projected costs of power from nuclear reactors stems from a difference of opinion over the overnight costs and escalation of construction costs. In the FPL analysis cost escalation is equal to one-quarter of the overnight costs and it is

1 treated separately form overnight costs. FPL assumes a zero real cost escalation. That is,
2 the rate of increase in the cost of construction equals the rate of inflation. Many other
3 studies assume significant, real cost escalation.
4 FPL calculated a fixed cost recovery factor, which is the cumulative present value
5 of the revenue requirement per $1/kW of overnight capacity (the $1/kW factor). It is not
6 clear to me how the escalation of construction costs is included in the calculation of the
7 revenue requirement. It could have been embedded in the stream of costs as a percentage
8 of the construction cost. If one wants to test an alternative escalation rate, one would
9 have to modify the calculation of the $1/kW recovery factor. The $1/kW factor has
10 changed significantly between 2007 and 2009, as shown in Exhibit MNC-13. The
11 decline in the implicit $1/kW factor accounts for between one-tenth and one-quarter of
12 the increase in the breakeven capital figure.
13
14 **Q. Please describe your concerns about excess capacity.**
15 A. The breakeven analysis essentially calculates how much nuclear capacity can be
16 purchased with the variable cost savings from building new nuclear reactors. Over 90
17 percent of the savings comes from variable costs, largely fuel costs. In other words,
18 nuclear capacity is paid for with fuel cost savings. The analysis proceeds in two steps.
19 First, the system costs are calculated with and without nuclear capital costs, then the cost
20 of building nuclear reactors is compared to the amount of money available from the
21 savings.
22 The operating cost estimates should not include excess production and the
23 variable costs associated with that production. If capacity is idled because of excess, then

the carrying cost of that excess should be subtracted from the savings. These are costs that would not be incurred if the system were "right" sized. Because nuclear reactors come in larger units and have higher capital costs, while natural gas units are small, lower in capital cost and have higher operating costs, ensuring that the model takes these differences into account become more important when demand declines and excess capacity increases.

Absorbing excess capacity with "off-system" sales raises two issues. First, to the extent that off-system sales are claimed, the net costs of production and net revenues should be deducted from the system cost total for purposes of the breakeven analysis. Second, in an environment where demand is slackening and reserve margins are rising all around, the assumption that off-system sales can take place should be examined.

The cost of operating the system is driven by assumptions about plant capacity, capacity factors and heat rates. The 20 percent reserve margin creates a circumstance in which the implicitly capacity factor (80 percent) is lower than the assumed capacity factors for the major alternatives being compared. The reserve margin is the insurance premium that Floridians pay to ensure that the lights stay on. Reserves in excess of the reserve margin are excessive. Over a long time horizon, the ability to match supply and demand (plus the reserve margin requirement) should be rewarded. If excess capacity is used to make off-system sales, those revenues should be subtracted from the system costs in the break-even analysis.

While the excess capacity is a few percentage points spread over a number of years, it can make a difference if it is handled properly. The economic advantage claimed for nuclear is actually quite small, when compared to the total costs of the

system. As shown in Exhibit MNC-14, using the high capital costs and the 2007 $1/kW factor, but leaving all other assumptions alone, the cost advantage of nuclear is less than five percent in eight of the nine cost cases. The handling of excess capacity in the context of such a small difference between system costs with and without nuclear reactors could be quite important.

Progress

Q. Does the economic analysis offered by Progress raise similar concerns?

A. Yes. While Progress has pursued a more traditional approach to assessing the economics of nuclear reactors compared to other options, its analysis raises concerns that are similar to those I have expressed for FPL. The excess capacity question is important in the case of Progress because its base case already has a large excess above the reserve margin requirements and the large project creates even greater excess.

This is particularly important in the case of Progress because it has argued that the construction periods of the two reactors must be kept close together to achieve cost savings. Since the economic analysis is done at the average cost of the two reactors and the link between them in time is so tight, this project is not really two 1100 MW reactors, it is one 2200 MW project. If the decision were made to drop the second reactor, the cost of the first reactor would rise and the Commission would have to redo the whole economic analysis at a much higher cost. Slackening demand growth drives a time wedge between the first and second units, as it takes more time for demand growth to reduce the excess capacity resulting from the addition of large units. Progress does not

need the second units as quickly and capturing the cost economies of the rapid build creates excess capacity that last longer.

This obviously ties directly to the cost escalation issue. Progress used a single point estimate for cost, which was between FPL's mid and high point, but the cost is nonbinding from the Commission's point of view and is being renegotiated in light of the long slippage in schedule. The Commission is being asked to allow the recovery of hundreds of millions of dollars of costs from a project, whose total cost, and therefore long run feasibility, are unknown in the context of an industry that suffered severe cost overruns in the past and is exhibiting a rapid run up in cost projections.

Q. Please summarize your conclusions.

A. The small cost advantages claimed for these nuclear units in the future underscores how important all of the changing conditions I have identified are. The Florida legislature has created an environment that provides incentives for nuclear reactors, but it has not written a blank check nor created a blindfold. The utilities and the Commission must act prudently within the confines of the incentive structure the legislature has established. In this prudence review the utilities ask for cost recovery for these proposed nuclear reactors by constructing an economic analysis that gives nuclear a slight, or 4-5 percent, cost advantage. However, that analysis rests on a series of assumptions that are no longer consistent with reality, if they ever were – high demand growth, very little contribution from efficiency and renewables, high fossil fuel costs, and low nuclear reactor costs.

My testimony has identified seven factors that are moving strongly against nuclear reactors. Any one of the seven could reverse the conclusion reached by the utilities that nuclear reactors are less expensive.

(1) Slowing demand growth due to a major shift in the economy

(2) Moderating natural gas prices

(3) Federal policies to require a growing role of efficiency and renewables

(4) Moderating CO2 compliance costs

(5) Improving technology and cost of efficiency

(6) Improving technology and cost of renewables

(7) Escalating nuclear reactor costs.

Given that all seven of these factors are moving strongly against nuclear reactors, it is highly likely that the reactors will cost consumers much more than the alternatives. And, given that relatively little has been spent on the proposed reactors now, this is the moment for the Commission to take the required hard look at the long-term feasibility of the completion of these reactors. Spending more on nuclear reactors and allowing the utilities to recover those costs from ratepayers would be imprudent.

Q. Does this conclude your testimony?

A. Yes it does.

MR. DAVIS: And Dr. Cooper has exhibits which are marked and prefiled as Exhibits 46 through 60.

COMMISIONER EDGAR: So noted. Thank you.

(Exhibit Nos. 46 through 60, both inclusive, marked for identification.)

BY MR. DAVIS:

Q Thank you.

Have you prepared a summary of your testimony today?

A Yes, I have.

Q Okay. Please provide it.

A Mr. Chairman, Commissioners, the Florida Legislature's cost recovery incentive for development of nuclear power plants does not require the Public Service Commission to penalize ratepayers by ignoring dramatically-changed circumstances since the certificate of need decision. Utility investment still must be found prudent and the reactors must be determined to be feasible in the long term.

I show in my testimony that, in light of recent developments in a number of critical areas, the reactors proposed by Florida Power & Light FPL are neither. Since the certificates of need were issued for the proposed reactors, there have been dramatic changes in four areas that undermine the long-term feasibility

of the FPL reactors. Demand projections have declined sharply. The cost of reactors has risen and are still largely unknown. The cost of natural gas has plummeted and is uncertain. The nature and scope of carbon mitigation and compliance costs have yet to be defined.

As a result, the financial risk of these plants has grown dramatically. Moody's now considers the decision to build new nuclear reactors a, quote, "bet the farm decision." The last time utilities made such huge bets on nuclear reactors, half of them went bad and consumers were left holding the bag for huge cost overruns and abandoned and cancelled plants. Because of the dramatic slowing of load growth, there are much lest costly, much less risky options available in the near term to meet the need for electricity and to buy time for greater certainty before a commitment is made to place the burden of major nuclear construction costs on ratepayers.

The economic analysis presented by Florida Power & Light does not fully reflect the economic reality that the Turkey Point 6 and 7 reactors face today. The economic recession and the unfolding transformation of economic activity have pushed any possible need for the new reactors out half a decade or more. The reduction in the capacity and need by FPL in

2017 to meet their reduced demand projection is 3800 megawatts, the equivalent of Turkey Point 6 and 7 plus one and a half reactors of similar size, and that is without any major changes in federal policy regarding efficiency. In fact, federal climate policy, which was central to the original justification for the reactors, has changed direction dramatically, increasing the likelihood of requirements for efficiency and renewables which will delay any need for reactors even longer.

If the full target of a 20-percent reduction in demand from non-renewable generation is achieved in Florida, the peak load projections for 2017 in the 2008 ten-year plan would not be reached until two decades later. The pending legislation also will decrease the cost of carbon as compared to Florida Power & Light's analysis. The price of natural gas has tumbled and separated from the price of oil while estimates of natural gas resource base have increased dramatically, further undermining the long-term economic feasibility of the reactors.

There is also a growing concern about the execution risk of building a new generation of reactors.

These dramatic changes in the decision-making environment mean that the analysis presented by Florida Power & Light is centered on a set of assumptions that

do not reflect the current or likely future reality in which the reactors would proceed to completion. If the economic analysis were centered on a more realistic set of assumptions, the preponderance of the outcomes would be negative and the logical conclusion would be that the project is not economically feasible. This does not mean that the Commission and the utilities should stop evaluating the projects as options. On the contrary, I stress that prudent action requires constant evaluation and reevaluation, and I recommend a number of measures that the Commission should take and require Florida Power & Light to take to improve the evaluation process to avoid making a huge mistake.

These include ensuring that critical economic assumptions are up to date and reflect the full range of possible outcomes, factoring excess capacity into the decision framework so that the cost of carrying excess capacity is fully recognized in the economic analysis, integrating resource planning into the feasibility analysis, and pinning down the cost of nuclear reactors with binding cost estimates. Only if we have these sorts of detail in the decision can we ensure that we make a prudent, reasonable decision about building these reactors.

Thank you.

MR. DAVIS: I tender Dr. Cooper.

ACTING CHAIRMAN EDGAR: Thank you. Thank you, Dr. Cooper.

Mr. Rehwinkel, no questions?

I am going to presume that this means no questions from FIPUG.

Mr. Anderson.

CROSS EXAMINATION

BY MR. ANDERSON:

Q Thank you.

Dr. Cooper, your degrees are in English and in sociology, correct?

A Yes.

Q You've never been employed by a utility?

A No.

Q You do not have a Bachelor's, Master's or Doctorate degree in economics; right?

A No. I have 30 years experience doing economic analysis.

Q You don't have a Bachelor's, Master's or Doctorate degree in engineering?

A I do not.

Q You've never been employed to forecast economic growth in Florida or performed any independent economic growth studies for Florida?

A No.

Q Or on a national level?

A Well, I've done national analysis of load growth and factors like that in my national studies.

Q You've not conducted any study of economic growth in Florida over the 40-plus-year expected life of Turkey Point 6 and 7 which extends until roughly 2060 or beyond, right?

A I have only reviewed the load projections and analyzed the impact of a renewable -- or an energy efficiency standard and federal legislation on load growth in Florida.

Q So the answer to my question was no, you haven't done the type of study I asked you about; right?

A Well, again, there's analysis in here of the projected load growth in Florida under a federal mandate for energy efficiency. That is an analysis of load growth in Florida.

Q Are you in the fuel price forecast business?

A I analyze fuel prices on a regular basis, analyze the natural gas market very intensively, particularly the speculative bubble, testified numerous times before Congress, prepared reports on the natural gas market for attorneys general of Iowa, Missouri, Illinois and Wisconsin.

Q Are you prepared to tell us here today what natural gas prices will be between 2020 and 2060?

A No. I'm prepared to tell you what the NYNEX price is, as I've done in my testimony, which is an indicator that many utilities use for future gas prices.

Q You've never designed an energy efficiency program for a utility, right?

A I have not.

Q You've never administered an energy efficiency program for a utility, right?

A I have not.

Q Or developed renewable energy resources for a utility?

A I have not.

Q Or engaged in purchase power contracting from renewable resource providers for a utility, right?

A I have not.

Q You've never been responsible for developing a nuclear plant?

A I have not.

Q Or any type of generating plant?

A I have not.

Q You've not been responsible for licensing, permitting, cost estimating, contracting, scheduling or any other aspect of nuclear plant development; right?

A I have not.

Q You're not an expert in computer modeling of utility systems?

A No, I am not.

Q Never been responsible for resource assessment and planning for a utility?

A Not for a utility. I have done national studies examining the potential for efficiency as it affects demand, particularly in light of the federal legislation.

Q You have not prepared or presented any production or resource plan modeling with respect to FPL's system, right?

A I have not.

MR. ANDERSON: That's all the questions we have. Thanks.

ACTING CHAIRMAN EDGAR: Are there questions from staff?

MR. YOUNG: No questions.

ACTING CHAIRMAN EDGAR: Commissioners?

Hearing no questions, redirect.

REDIRECT EXAMINATION

BY MR. DAVIS:

Q Dr. Cooper, I think I agree that economists shouldn't design nuclear power plants, but can you

describe your qualifications in relation to the specific types of opinions you offer in this case?

A Well, economic analysis is something I have been engaged in for about 30 years. I've testified a couple of hundred times with respect to economics before public service commissions, Florida included, and my testimony has always been entered into the record.

The interesting thing about economics -- I've been a member of economic societies, the American Economic Society, the Southern Economic Society, but the really interesting thing about economics today is, if you pick up a the newspaper, you will read about behavioral economics challenging the degrees of the institutional profession of economics because what has happened is that psychology has come into economics. The assumptions that the Ph.D.s in economics in America walk around with actually don't fit reality very well. And I suggest that the best degree to study the economic marketplace is actually a degree in sociology because sociology lies at the intersection of psychology and structural economics, and that is exactly what I've been practicing for 30 years.

Q You were asked about your expertise for projecting natural gas prices in the future. Can you describe that?

A Well, I've been analyzing natural gas or the natural gas market for almost 30 years, and the interesting question that I raise in my testimony and the subject of a great deal of rebuttal testimony was: What was the price of natural gas doing in 2007 and 2008 which were the basis for the certificate of need? And in fact the continuing -- the analysis that we get here today, that is, 2007 and 2008 natural gas prices were very high and they continued to influence the utilities' decisions to move forward with these projects. In fact there's a very good case, and I was the first one to make it in a report for the four attorneys general I mentioned. There's a very good case that can be made that there was a speculative bubble in natural gas and that bubble has burst. So those two years were the exception rather than the rule. And if you look out at the natural gas price today, it bears no relationship to that bubble. As I said, I was the first to make that declaration, testified before Congress. The Congress has in fact had several reports to that effect finding a speculative bubble. The Congress has passed legislation to attempt to prevent that spec -- another speculative bubble from occurring. I participated in the workshops at the CFTC, the Commodity and Futures Trading Commission, about that. And so, with respect to natural

gas prices, being -- consulting predicting natural gas prices may be one thing. Being an analyst, looking at the market realistically and understanding what's going on is another, and I have done an awful lot of that.

Q You were asked about your qualifications to evaluate legislation to determine what the likely costs of carbon or carbon dioxide emissions would be for electric utilities in the future. What are your qualifications for that?

MR. ANDERSON: I'd object because I had that question on my list but I didn't ask it.

MR. DAVIS: Well, I think you asked about --

ACTING CHAIRMAN EDGAR: I'm going to allow.

BY MR. DAVIS:

Q Thank you.

A Well, the question was about efficiency and renewables, and in fact I've been analyzing energy efficiency in the utility sector, again, for almost 30 years, lately have been looking very, very carefully at the implications of particularly the building energy performance standards which would be the first federal mandate, and the very, very powerful effect it would have on the demand for electricity. And it turns out the first thing I worked on in Washington 29 years ago was building energy performance standards, and if you'll

look at my research, my analysis shows that a 20-percent reduction over the next decade or two is in fact entirely achievable in Florida and across the nation. So with respect to efficiency, I have certainly been analyzing that for quite some time.

The price of carbon, I rely primarily on recent estimates by the Energy Information Administration and the Environmental Protection Agency who are looking at the policy, what the price of carbon would be under the policy that's moving its way through Congress. And let's be clear, the price on carbon assumed in the certificate of need docket and repeated in this feasibility docket is a critical assumption about -- which deeply affects the economics of these reactors. Without that carbon price, the reactors would not be economic. The current analysis of the policy that's emerging in the United States has a much lower price on carbon than what's assumed and had been assumed a number of years ago, and in insignificant measure, that's because of the increase of efficiency that the Congress has now discovered, thank goodness, as a potential source, a way to meet our need for electricity. So with respect to that, I'm relying on those entities that are looking at the actual policy that's moving it's way through the Congress as we speak.

MR. DAVIS: Thank you, Dr. Cooper. That's all I have on redirect.

ACTING CHAIRMAN EDGAR: Thank you. Exhibits, I have 46 to 60.

MR. DAVIS: Yes, we move those into evidence, please.

ACTING CHAIRMAN EDGAR: Thank you. Any objection?

Hearing none, Exhibits 46 through 60 are entered into the record at this time.

(Exhibit Nos. 46 through 60, both inclusive, admitted into the record.)

ACTING CHAIRMAN EDGAR: Okay. And hold on --

MR. YOUNG: Madam Chairman.

ACTING CHAIRMAN EDGAR: Yes.

MR. YOUNG: We're up to staff's witness Fisher and --

COMMISIONER EDGAR: Okay. Hold on just a moment. I'm sorry. Okay. I see what I was looking for. So you are excused, and I understand that we will see you back at a later point in time. So thank you very much.

And, yes, sir, my understanding is that that brings us to staff witnesses' joint testimony Fisher and Rich and that there has been agreement to stipulate?

MR. YOUNG: Yes, ma'am. I'm sorry for jumping ahead.

COMMISIONER EDGAR: That's okay.

MR. YOUNG: And we move -- we ask that the prefiled testimony be inserted into the record as though read along with the Exhibit RF-1 which is No. 70 on staff's -- on the Comprehensive Exhibit List, page 11.

ACTING CHAIRMAN EDGAR: Okay. And I hear no objection, and again my understanding is that there has been previous agreement to stipulate. So the prefiled testimony of Witnesses Fisher and Rich and the exhibit Marked No. 70 will be entered into the record at this time.

MR. YOUNG: Thank you, ma'am.

(Exhibit No. 70 was marked for identification and admitted into the record.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

COMMISSION STAFF

DIRECT JOINT TESTIMONY OF LYNN FISHER AND DAVID RICH

DOCKET NO. 090009-EI

JULY 27, 2009

Q. Mr. Fisher, please state your name and business address.

A. My name is Lynn Fisher. My business address is 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850.

Q. By whom are you employed?

A. I am employed as a Government Analyst II by the Florida Public Service Commission in the Bureau of Performance Analysis within the Division of Regulatory Compliance.

Q. What are your current duties and responsibilities?

A. I perform reviews and investigations of Commission-regulated utilities, focusing on the effectiveness of management and company practices, adherence to company procedures, and the adequacy of internal controls. Mr. Rich and I jointly conducted the 2009 review of Florida Power & Light Company's project management internal controls for the nuclear plant uprate and new construction projects underway at the St. Lucie and Turkey Point sites.

Q. Please describe your educational and relevant experience.

A. In 1972, I graduated from Florida State University with a Bachelor of Science degree in Marketing. My relevant background includes twenty years with the Florida Public Service Commission in management auditing, performance analysis, process reviews, and complaint

investigation. Since joining the Commission, I have participated in numerous reviews of utility operations, systems and controls, each of which culminated in a written audit report similar to the one attached as an exhibit to this testimony. I also participated in the 2008 review of FPL's project management controls for FPL's nuclear plant uprate and new construction projects and filed that audit report as testimony in Docket No. 080009.

Q. Have you filed testimony in any other dockets before the Commission?

A. Yes. In addition to the testimony filed in Docket No. 080009, I previously filed testimony during 2005 in Docket No. 050045. This testimony consisted of an audit of distribution electric service quality for Florida Power & Light Company's Vegetation Management, Lightning Protection, and Pole Inspection processes.

Q. Mr. Rich, please state your name and business address.

A. My name is David Rich. My business address is 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850.

Q. By whom are you employed?

A. I am employed as an Operations Review Specialist by the Florida Public Service Commission in the Bureau of Performance Analysis within the Division of Regulatory Compliance.

Q. What are your current duties and responsibilities?

A. I perform reviews and investigations of Commission-regulated utilities, focusing on the effectiveness of management and company practices, adherence to company procedures and the adequacy of internal controls. I jointly conducted the 2009 review of Florida Power &

Light's project management internal controls of its Uprate and new construction projects underway at the St. Lucie and Turkey Point sites.

Q. Please describe your educational and relevant experience.

A. In 1978, I graduated from the United States Military Academy at West Point with a Bachelor of Science degree with a concentration in Engineering. A Masters of Arts degree in National Security Affairs from the Naval Postgraduate School followed in 1987. I am a graduate of both the US and Republic of Korea Command and General Staff Colleges. My relevant work experience includes six years with the Florida Public Service Commission in management auditing, utility performance analysis, process reviews, and trend analysis. Since joining the Commission, I have participated in numerous reviews of utility operations, processes, systems and controls, each of which culminated in a written audit report similar to the one attached as an exhibit to this testimony.

Q. Have you filed testimony in any other dockets before the Commission?

A. No.

Q. Please describe the purpose of your testimony in this docket.

A. Our testimony presents the attached audit report entitled ***Review of Florida Power & Light's – Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects*** (Exhibit FR-1). This review was requested by the Commission's Division of Economic Regulation to assist with the evaluations of nuclear cost recovery filings. The report describes key project events and contract activities completed during April 2008 through June 2009 for the Uprate projects and Turkey Point Units 6 & 7. The report also presents detailed descriptions of the current project management internal controls employed

by FPL.

Q. Please summarize the areas examined by your review of controls.

A. The Bureau of Performance Analysis conducted a review of the internal controls and management oversight of the nuclear projects underway at Florida Power & Light. We examined the organizations, processes, and controls being used by the company to execute the Extended Power Uprate of St. Lucie Units 1 & 2 and Turkey Point Units 3 &4 and the construction of the new Units 6 & 7 at Turkey Point. This is the second review of the company's controls for its nuclear uprate and construction projects. The first report, *Florida Power and Light Company's Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects*, was published in August 2008 and filed in docket 080009.

The primary objective of this review was to document project key developments, along with the organization, management, internal controls, and oversight that FPL has in place or plans to employ for these projects. The internal controls examined were related to the following areas of project activity: planning, management and organization, cost and schedule controls, contractor selection and management, and auditing and quality assurance.

Q. Are you sponsoring any exhibits?

A. Yes, our completed audit report is attached as Exhibit Number FR-1.

Q. Does this conclude your testimony?

A. Yes.

ACTING CHAIRMAN EDGAR: Thank you. My understanding is that that concludes the direct portion of this docket, and that brings us to rebuttal; am I correct?

MR. YOUNG: Yes, ma'am.

ACTING CHAIRMAN EDGAR: Okay. Let's take ten minutes to mentally shift gears and stretch, and we will come back -- I'm going to call it at five after on the hour by the clock on the wall to begin with the first rebuttal witness. We are on break.

(Recess.)

CHAIRMAN CARTER: We are back on the record, and when we left, we were getting ready to go into our rebuttal phase of the hearing, and with that, Mr. Anderson.

Whereupon,

STEVE SCROGGS

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

DIRECT EXAMINATION

BY MR. ANDERSON:

Q Thank you, Chairman Carter.

Mr. Scroggs, you have been sworn?

A I have.

Q You testified earlier today?

A Yes, I have.

Q Remind us of your name, address and position and employer.

A Steve Scroggs, 700 Universe Boulevard, Juno Beach, Florida. I am the Senior Director of Project Development for Florida Power & Light.

Q Did you prepare and cause to be filed 28 pages of prefiled rebuttal testimony in this proceeding on August 10?

A Yes, I have.

Q Did you filed any errata.

A Yes.

Q Do you have any further charges or revisions to your rebuttal testimony?

A No, I do not.

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

A Yes, they would.

MR. ANDERSON: Chairman Carter, FPL asks that the prefiled rebuttal testimony of Mr. Scroggs be inserted into the record as though read.

CHAIRMAN CARTER: The prefiled testimony of the witness will be inserted into the record as though

read.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF STEVEN D. SCROGGS

DOCKET NO. 090009-EI

August 10, 2009

Q. Please state your name and business address.

A. My name is Steven D. Scroggs and my business address is 700 Universe Blvd., Juno Beach, FL 33408

Q. Have you previously provided testimony in this docket?

A. Yes.

Q. Are you sponsoring any rebuttal exhibits in this case?

A. Yes. I am sponsoring the following exhibits that are attached to my rebuttal testimony:

SDS – 5: FPL-BVZ Engineering Services Agreement Scope of Work and BVZ Costs by Scope and Year

SDS – 6: Excerpt from Witness Gundersen's deposition by Progress Energy Florida

Q. What is the purpose of your rebuttal testimony?

A. My rebuttal testimony addresses the direct testimony provided by Witness William R. Jacobs on behalf of the Office of Public Counsel, Witness Arnold Gundersen on behalf of Southern Alliance for Clean Energy (SACE) and Witness Mark Cooper on behalf of SACE as such testimony relates to the Turkey Point 6 & 7 project.

Q. Please summarize your rebuttal testimony.

A. During 2008 FPL carefully considered, decided and implemented a strategy which provides an alternative to an Engineering, Procurement, and Construction (EPC) contract for the Turkey Point 6 & 7 project but does not preclude later entering into an EPC contract. FPL's approach creates greater flexibility and optionality for itself and its customers, as well as the potential for significant cost savings for FPL's customers. As explained in this testimony, a part of this strategy is the retention of several qualified engineering firms to perform early specific scopes of work that are necessary in order to continue orderly progress on the project, to create a pool of credible vendors for future competitive bidding. FPL has also deferred the decision to enter into a large single or sole source Engineering Procurement (EP) or EPC contract that in FPL's view does not offer an acceptable balance of costs and risks under current market conditions.

OPC Witness Jacobs claims that FPL has committed unalterably to a plan that separates the EP and C functions and finds that FPL is imprudent for not signing an EPC agreement. He incorrectly claims that an EPC contract is advantageous and points to a selectively limited group of projects, including Progress Energy Florida (PEF), that have entered into EPC contracts as justification. In this same docket Witness Jacobs criticizes PEF for entering into an EPC contract. Witness Jacobs's testimony is incorrect in this regard and should be rejected for several reasons, explained further in my testimony.

FPL's decision to implement its step-wise incremental approach to contracting, rather than myopically executing an EPC contract as was suggested by Witness Jacobs, is supported by the fact that the nuclear industry marketplace has not presented FPL with EP or EPC contract opportunities that are sufficiently advantageous to FPL and its customers in terms of cost and risk. Further, this testimony identifies other U.S. nuclear projects that have made decisions similar to FPL.

Witness Gundersen's testimony identifies uncertainties in the regulatory and execution aspects of deploying new nuclear generation. These uncertainties, all of which have been identified and discussed by FPL in preceding Need Determination and Cost Recovery filings, have been addressed in FPL's planning and inform our deliberate, stepwise approach. My rebuttal testimony will clarify some mischaracterizations made by Witness Gundersen, identify how FPL's project approach recognizes and addresses these uncertainties and describe how the feasibility analysis provides a sufficient basis for proceeding in a careful, stepwise manner.

Witness Cooper's testimony offers no thorough economic analysis or study of the feasibility of FPL's Turkey Point 6 & 7 project. It is clear that Witness Cooper's testimony did not include any detailed review or consideration of FPL's project at all. Instead, citing only a variety of secondary sources and

not one of the complete and voluminous FPL documents produced in discovery, Witness Cooper asserts that the existence of uncertainties regarding the economic aspects of new nuclear generation mandates stopping project development now. The rebuttal testimony of FPL Witness Sim discusses Witness Cooper's testimony in greater detail. My rebuttal testimony, however, will address the danger of adopting a selective review of secondary data compared with FPL's rigorous project-specific analyses.

Q. How is your rebuttal testimony organized?

A. I will address the issues presented by each witness separately; however, some themes are common to all three witnesses.

REBUTTAL TO OPC WITNESS JACOBS

Q. Do you have any initial observations with respect to Witness Jacobs's testimony?

A. Yes. As an initial matter, I notice that Witness Jacobs's testimony in this NCRC case criticizes FPL for not yet entering into an EPC contract. Witness Jacobs's testimony with respect to Progress Energy Florida (PEF) criticizes PEF for already having entered into an EPC contract.

Similarly, in the 2008 NCRC proceeding, Witness Jacobs criticized FPL's use of single and sole source contracts for specific specialized Turkey Point 6 & 7 project work. This year, however, he asserts that FPL is imprudent for not

having entered into probably the largest possible single or sole source contract, an EPC contract for the construction of a nuclear plant, which contracts are necessarily single or sole source because of the proprietary nuclear design technology of any chosen vendor.

These mutually contradictory and self-canceling criticisms suggest that Witness Jacobs is pursuing an opportunistic approach in his review of FPL's projects, finding fault with FPL management's decisions regardless of the course of action taken.

Q. Witness Jacobs discusses FPL's hiring of Black & Veatch/Zachry (BVZ). Has Witness Jacobs correctly characterized the FPL-BVZ contractual relationship?

A. No. Witness Jacobs identifies that FPL has "retained BVZ as **the** preliminary engineer" (Jacobs at page 6, line 19; emphasis added). This statement, and his subsequent focus on BVZ, indicates that he has concluded that FPL has made a commitment to engage BVZ as the sole firm providing preliminary engineering services. In fact, FPL has also engaged other national/international engineering firms to support the Turkey Point 6 & 7 project. Presently Bechtel, HDR Engineering, CH2M Hill and BVZ are conducting various scopes of work increasing FPL's pool of credible potential bidders for future work scope

Q. What specific scope of work was assigned to BVZ throughout 2008 and 2009 and what expenditures were made?

A. BVZ has been retained to provide specific services related to preliminary construction planning for the project. Construction planning reviews the necessary site preparation activities leading up to the major construction effort and helps identify risks that could impact project schedule and cost. For example, BVZ is analyzing the optimal sequence of access road development, site excavation and site improvements to efficiently prepare the site for construction of the nuclear islands, turbine islands, balance of plant equipment, switchyards and water treatment facilities. This work is not dependent upon specific detailed knowledge of the AP-1000 design, and is similar to work BVZ has successfully conducted for FPL in the construction of natural gas fueled generation and renewable projects. However, the retention of BVZ for this scope of work should not be misunderstood to imply that they have been or will be selected for subsequent Construction scope.

The work scope and payment summary for BVZ is described in Exhibit SDS-5. In summary, BVZ provided engineering services on five specific scopes of work associated with the construction planning, scheduling and conceptual design of the Turkey Point 6 & 7 project. The expenditures for this scope of work were $1,915,714 through December of 2008, with an additional $4,293,362 projected for 2009.

Q. Has FPL ensured that the scope of work conducted by BVZ meets all quality requirements and is in keeping with FPL policies and procedures?

A. Yes, as is the case for all contracts associated with the Turkey Point 6 & 7 project. The work is conducted under the supervision of Martin Gettler, Vice President of New Nuclear Projects and his construction staff. FPL's project controls procedures have been applied to ensure all requirements have been met. This includes monthly progress reports, progress meetings, schedule adherence reviews, invoice reviews and detailed reviews of all contract deliverables for content quality and sufficiency. Additionally, BVZ activity has been reviewed during internal and external project audits with no deficiencies identified.

Q. Witness Jacobs expresses concern over the retention of BVZ because of their lack of familiarity with the Westinghouse AP-1000 design. Please explain FPL's rationale for hiring BVZ and other qualified engineering firms for selected scopes of work on the Turkey Point 6 & 7 project.

A. As described above, BVZ has been retained for a scope of work that is not unique to the AP-1000 technology. BVZ is a joint venture staffed by a major international engineering and construction firm with recent experience in nuclear power generation construction and has the necessary qualifications and talent to conduct work on new nuclear generation in the U.S. Further, BVZ has successfully performed as a constructor on gas fueled generation projects for FPL (Turkey Point 5, West County Energy Center, Martin Unit 8 and Manatee Unit 3). So, BVZ is fully qualified to conduct the scope of work assigned and is a proven provider of engineering services that have benefited FPL customers.

The rationale for hiring such qualified firms is based on developing a credible pool of qualified service providers, improving the opportunity for competition. FPL has successfully delivered the benefits of creating competition for Construction work on generation projects and intends to do so where possible on the Turkey Point 6 & 7 project. The retention of qualified providers to conduct small, defined scopes of work early in the project is a way to expand the base of credible construction firms that could potentially compete for larger segments of the construction later on in the project.

Q. Witness Jacobs also discusses a concern over FPL's contracting strategy. Did FPL foreclose the possibility of entering into either EP or EPC contracts through its management decisions and actions to date?

A. No. Throughout the discussion on contracting, Witness Jacobs seems to have concluded that FPL has made a final decision to split the Engineering and Procurement (EP) scope from the Construction (C) scope. This is not the case as FPL has not entered into any contract for these services. To be clear, FPL has not entered into an EPC contract, an EP contract or a C contract. FPL's strategy involves creating an opportunity for future competitive bidding, preserving its options. Either EP and C or EPC contracting arrangements remain alternatives available to FPL.

Q. Why has FPL not entered into an EPC contract or an EP and C contract?

A. Fundamentally, FPL has chosen to defer the commitment associated with either contracting approach because a compelling proposal of scope, schedule,

price and terms has not been offered to FPL. In the absence of a compelling contract offer, FPL has chosen to pursue further resolution of the key uncertainties I identified in my May 1, 2009 testimony; primarily those relating to the future permitting timeline and commercial negotiations.

Q. What is unique about new nuclear deployment that would allow for competition for Construction scope, but not for the Engineering and Procurement scope?

A. Due to the nature of new nuclear licensing, the EP scope is not something that can be competitively bid. Owners obtain licenses that are specific to a single proprietary technology with a sole provider. Many aspects of plant construction, however, are not unique to the specific technology and can be competitively bid. For example, activities involving civil work, non-safety related buildings, and other associated facilities can be separated into packages allowing for competition to be engendered. It is important that a body of credible qualified vendors be available to participate in the bidding in order to take advantage of this opportunity. Logically, one would think that the Westinghouse/Shaw consortium would be in an advantaged position to provide the most competitive bid under such a scenario. However, FPL has found that cultivating a competitive structure, where possible, ensures that its customers receive the best value for its investment.

Q. Do you agree with Witness Jacobs's assessment of EPC contracts currently being offered for new nuclear deployment?

A. No. Witness Jacobs's criticisms of FPL's strategy are based on a mistaken assumption that EPC contracts with suitable scope, pricing, schedule and terms providing significant risk protection are available and that FPL has just passed them up. Nothing could be further from the truth. Witness Jacobs is mistaken in assuming that the benefits of the EPC contracting approach, such as FPL and its affiliates have successfully used in gas-fired and wind generation construction are, or will be, available in new nuclear projects.

The EPC model provides benefits of efficiency and risk control in situations where there is a high level of industry experience and competition to accomplish the engineering, procurement and construction facets of a project. For example, this strategy can be effectively employed in the design and construction of natural gas fired combined cycle generation where the construction and fabrication risks are well defined, multiple capable suppliers exist and the contractors have experience that limit their execution risk. These characteristics do not currently exist in the new nuclear construction market to the same level as with other technologies. Therefore, there is little expectation that a new nuclear EPC contract will exhibit any of the beneficial attributes of EPC contracts that have been utilized before.

FPL understands that EPC contracts that are currently being offered for new nuclear generation provide little benefit in terms of cost control or risk management. Vendors offer a small fixed price portion, with the majority of

costs being either firm (fixed with an agreed upon index for escalation) or on a time and materials basis. In practice, EPC contracts for new nuclear do not offer the risk management features Witness Jacobs identifies. Therefore Witness Jacobs's conclusion that an "EPC-type contract... clearly reduces the risk" (See Jacobs at page 8, lines 5-6) is misinformed, misleading and does not reflect the realities of the market in which the initial units of the next generation of U.S. nuclear power will be built.

Q. Do you agree with Witness Jacobs's characterization regarding the universal adoption of an EPC contract by all other utilities?

A. No. While it is true that "all other U.S. utilities that have signed a contract for construction" have signed EPC agreements, the characterization is misleading. It is also true that many utilities have chosen to defer entering into EPC agreements for the very reasons FPL has identified; that terms available in the market are simply not compelling for all project owners. A broader review of the U.S. project listing results in a range of project management team decisions, only three of which have resulted in EPC contracts.

FPL understands that some U.S. utilities using the AP-1000 design (Georgia Power Company, SCANA Corporation, Progress Energy Inc.) have entered into contracts with the Westinghouse/Shaw Consortium that provide for consolidated Engineering, Procurement and Construction of the project – but contain scope, pricing, schedule and terms that make them significantly different from the EPC contracts that Witness Jacobs describes. Other AP-

1000 projects that have filed applications for NRC license review (Duke, Progress Energy Carolinas (Harris), and TVA) have not entered into EPC contracts.

Several U.S. utilities (Entergy, Ameren, Unistar (Nine Mile Point)) have chosen to suspend their projects awaiting resolution of uncertainties prior to entering into any large contracts. These projects are based on designs other than the Westinghouse AP-1000.

FPL expects that future contract structures will better recognize the realities of risk allocation and leverage the benefits of competition. For example, Luminant and Mitsubishi have recently announced that they have signed a memorandum of understanding detailing their plans to finalize an overall EP agreement associated with the Comanche Peak project. They are developing a separate construction plan. This approach mirrors that being considered by FPL.

Q. What are the benefits of FPL following its alternative contracting strategy, compared with having entered into an EPC contract?

A. The FPL step-wise approach benefits customers in five ways.

- FPL maintains progress on the overall project and towards the inherent benefits offered by conducting all work necessary using qualified vendors at market rates.

- The option of an EPC contract is preserved. Creating competition for the C scope of work will encourage Westinghouse/Shaw to bring the best price and terms to the table and may enhance a future EPC offer.
- The contractual commitment to Construction expenditures (whether through a combined or separated approach) is deferred until a later point in time when the detailed design is further developed and the market costs of materials and labor can be more accurately estimated. The Construction bidding is therefore expected to reflect a reduced "risk premium", additional costs that would otherwise be added to the current bid or assigned to the Owner through the contract terms.
- The strategy increases the number of credible providers resulting in a greater likelihood of competitive bidders and/or better industry "bench strength" to support the project.
- The process of defining a distinct demarcation between the EP and C scopes has produced added clarity for all parties involved. Requiring the delineation of work responsibility is necessary under EPC or EP and C structures. However, the transparency of that allocation and the ability to ensure that confusion does not create inefficiencies or added costs is greater when approached from a potential EP and C perspective. Without this driver, it would be difficult for FPL to ensure that the demarcation was clear within an EPC framework. In FPL's experience, delegation of management of the interfaces between EP and C functions is no guarantee that inefficiencies or

miscommunication are eliminated. Recognizing that, for new nuclear deployment, providers will have limited capacity to take on the "burden and risk". Therefore, it is incumbent upon FPL to play a role in proactively managing these interfaces.

Q. What is the alternative to FPL's contracting strategy?

A. As Witness Jacobs suggests, FPL could simply accept an EPC contract with a sole provider. FPL has not done so to date because a) the benefits of an EPC contract cited by Witness Jacobs are not available, b) it is unnecessary and unwarranted at this time based on FPL's assessment and desire to further resolve key uncertainties, c) the project is able to maintain progress without doing so, and d) it is not in the best interest of our customers to do so.

As previously discussed, FPL will necessarily be required to sole source the EP portion of the project to Westinghouse/Shaw due to the proprietary nature of the AP-1000 design. In the absence of credible additional service providers for the C scope of work, FPL would also be required to sole source the C scope. Ultimately, such a decision may be identified as the most cost-effective route. However, in order to minimize the likelihood and magnitude of sole source contracts, and provide a means to test the market for competitive services where possible, we have chosen to manage our near term procurement decisions in a way that fosters optionality, better pricing and more favorable terms for our customers in the future. Such an approach is in keeping with FPL procurement policies.

Q. Is Witness Jacobs's current position consistent with comments provided in the 2008 Nuclear Cost Recovery docket?

A. No. In that docket Witness Jacobs was critical of sole and single source procurement decisions on a number of smaller contracts, while this year he seems to advocate doing so on one of the largest cost components of the project. FPL remains consistent with our view that competitive bidding is preferred, but under certain specific circumstances sole or single source procurement may be the appropriate or only available method.

Q. What was Witness Jacobs's criticism regarding FPL's feasibility analysis?

A. Witness Jacobs criticizes FPL for not updating the capital cost of the new nuclear units indicating that not doing so results in a feasibility analysis "of little value to the Commission to determine the long term feasibility of the units". (See Jacobs page 9 lines 25-25).

Q. Why did FPL choose to conduct the feasibility analysis based upon its existing capital cost estimate?

A. Simply stated, the capital cost estimate range developed in 2007 remains a valid estimate of the potential capital cost of the Turkey Point 6 & 7 units and provides an appropriate comparison for the breakeven capital cost produced in the feasibility analysis. FPL developed the cost estimate range through a careful and well-informed process that recognized the potential escalation in materials and labor costs into the future as well as potential differences in project scope. This estimate, developed for the Need Determination filing,

remains a valid cost estimate for the project. The validity of the FPL cost estimate range is confirmed by comparisons to the published cost estimates of other AP-1000 projects at Progress Energy, Georgia Power and SCANA. Exhibit JJR-1 (page 36 of 36) to FPL Witness Reed's May 1, 2009 testimony provides a comparison of these published costs to FPL's cost estimate range. The comparison shows that the high end of FPL's cost estimate range is comparable to recent estimates provided by these leading AP-1000 projects.

Q. Have there been any significant developments in the past year that warrant a revision to FPL's cost estimate range?

A. No. Near term market prices for materials and labor have moderated in the past year, reversing an escalating trend seen prior to 2008. However, given that the project schedule is several years away from considerable expenditures on materials and labor services, these near term fluctuations do not signal a significant or long term trend that would warrant a revision. Further, while FPL's negotiations with Westinghouse/Shaw have yielded progress, a clear and specific proposal (one including cost and schedule commitments tied to a specific set of contract terms) has not been developed. Without such a specific proposal, any updates would not provide an improvement in the clarity of the cost estimate range beyond that in the current cost estimate range. Thus, FPL's cost estimate range is reasonable, appropriate for its use in the feasibility analysis and is based upon the best information currently available.

Q. Does the comparison of this cost estimate to the updated breakeven cost provide the Commission with a valid and current feasibility analysis?

A. Yes. By design, the annual feasibility analysis compares a current breakeven capital cost to the high end of FPL's cost estimate range. This provides an updated comparison of the most competitive generation alternative to a market validated capital cost estimate for new nuclear.

Comparison of the break-even cost under nine scenarios demonstrates that eight of nine scenarios result in a break-even cost (the cost where nuclear is economically equivalent to combined cycle natural gas generation) well above the high end of FPL's cost estimate range, while the ninth scenario is consistent with FPL's high end estimate. FPL Witness Sim provides a complete discussion of the feasibility analysis in his testimony in this docket.

REBUTTAL TO SACE WITNESS GUNDERSEN

Q. Please provide your assessment of Witness Gundersen's testimony on behalf of the Southern Alliance for Clean Energy.

A. In order to form an opinion about a company's management actions and decisions it is necessary to have knowledge of what their actions and decisions are. It is apparent from statements in Witness Gundersen's testimony that he has no specific knowledge of FPL's Turkey Point 6 & 7 project.

Exhibit SDS-6 is an excerpt from the recent deposition taken by Progress Energy Florida (PEF) where Witness Gundersen describes the time he spent reviewing documents and information prior to drafting his testimony. In his deposition Witness Gundersen identifies he invoiced SACE for 31 hours, approximately 80 percent of which was spent reviewing documents. That results in 25 hours of review for both new nuclear projects in this docket. He also states in his deposition that he has not reviewed any of the thousands of FPL documents provided in discovery, including management reports, contracts, schedules, or budgets. Witness Gundersen merely refers to and extrapolates from general press articles which are not specific to FPL's project. The information shown in Exhibit SDS-6 reflects so little review and understanding of FPL's project that his opinions provide no value in assessing the reasonableness of FPL's management decisions with respect to the project in general or its stepwise approach to licensing, schedule and contracting practices.

Q. Please respond to Witness Gundersen's assertion that FPL has failed to consider specific issues in its planning and therefore has not shown the long term feasibility of the project.

A. Among the many uncertainties constantly factored into FPL's project management decisions, FPL has recognized the uncertainties pointed to by Witness Gundersen – namely 1) the untested nature of the NRC's Part 52 licensing process, 2) material and labor challenges for new nuclear construction, and 3) the complex nature of nuclear construction. From the

earliest stages of the project FPL has chosen to manage these issues by developing an approach that mitigates these issues by pursuing resolution of uncertainty at each step of the process, and makes judicious and careful decisions regarding the commitment of funds toward the project. For example, the original project schedule envisioned that FPL would expend funds in late 2008 to secure additional long lead materials for the project. The market forces that would have made that expenditure warranted did not develop. In response, FPL was able to defer approximately $35 million of those costs to later in the project schedule. This approach provides the best opportunity to develop the option for new nuclear generation with transparent decision making and cautious investments.

The annual feasibility analysis sponsored by FPL Witness Sim inherently quantifies the margin between the expected high-end capital cost of the Turkey Point 6 & 7 project and an economically equivalent alternative. The format of the analysis was developed for the Need Determination process. Recognizing the uncertainties in the future, the feasibility analysis considers a range of potential future outcomes. As discussed in FPL Witness Sim's testimony, only when natural gas costs and emission compliance costs are at their lowest does the natural gas fired combined cycle technology come close to competing economically with the high end of the Turkey Point cost estimate range. So, under that single scenario natural gas fueled generation would be about the same cost for customers - without the qualitative fuel

diversity, zero greenhouse gas emissions and energy security benefits offered by nuclear generation. The margin averages 44% (or approximately $2,000/kW) above the high end of FPL's cost estimate range for 8 of 9 scenarios. The cost impacts of delays that may be created by project uncertainties are addressed by FPL's active management approach and the annual cost recovery process that authorizes the next increment of project investment every year following a review of the best information available. By this I mean to point out that the stepwise and transparent process itself allows for the control of commitment in relation to the risks of taking the next step. FPL concludes that the annual feasibility analysis clearly justifies taking the next step in the project.

Q. Please comment on Witness Gundersen's assertion that FPL has not taken into account scheduling uncertainty in licensing delays associated with the AP-1000.

A. FPL has at all times accounted for scheduling uncertainty. For example, in my May 1, 2009 testimony (see Scroggs, May 1, 2009 at page 18-19) I identify the uncertain nature of the license and application review schedules and how that might affect the overall pace of the project. Further, I identify (see Scroggs, May 1, 2009 at page 21) that FPL has slowed the pace of project expenditures and accepted pressure on maintaining the project schedule as a means of responding to this uncertainty. Following the initial reviews of the state and federal license and permit applications submitted on June 30, 2009, state and federal agencies will publish review schedules that will be

incorporated into FPL's overall project schedule. Accordingly, Witness Gundersen's claim is false and should be rejected.

Q. Please comment on Witness Gundersen's assertion that FPL has not taken into account the worldwide demand for construction materials, nuclear grade materials, construction complexity and skilled labor.

A. FPL has at all times taken into account the uncertainties referred to by Witness Gundersen. In fact, FPL's cost estimate range was developed recognizing the potential impacts of all of these issues. In constructing its cost estimate range, FPL reviewed independent government studies, consulted with nuclear vendors, constructors and engineers and applied its own considerable experience in the construction and management of conventional and nuclear generation. This analytical effort resulted in recognizing the need to communicate the estimated cost of the project as a range dependent on many market and regulatory factors. For example, the cost estimate range was developed with a range of assumptions for cost escalation to acknowledge the potential cost impacts of a tight market. The cost estimate range remains a relevant and appropriate way to express the potential for these uncertainties to impact the final cost of the project. Accordingly, Witness Gundersen's claim should be rejected.

Q. Please comment on Witness Gundersen's statement that the "earliest practical" schedule does not imply that it is the most likely schedule to be achieved.

A. Witness Gundersen's statement demonstrates a lack of knowledge concerning FPL's active management of project schedule. The Turkey Point 6 & 7 project is highly complex. FPL's management approach to this project recognizes uncertainty and is designed to take advantage of every opportunity to expedite the delivery of new nuclear generation benefits to our customers when such steps are reasonable, cost-effective and do not introduce unacceptable risks. The project is approached with a sense of urgency so as to continuously identify all reasonable opportunities for schedule improvement and therefore deliver the "earliest practical" schedule. By contrast, approaching the project targeting a "most likely schedule" for a complex and uncertain project would accept potential delays and introduce an excuse for not doing all things reasonably possible to expedite the schedule. For example, FPL has selectively undertaken preconstruction planning efforts to help chart the most efficient path forward and resolve schedule uncertainty. This will place FPL in a position of being able to identify critical path items and needed resources to minimize construction time and cost when those steps are warranted.

Q. Does Witness Gundersen make any statements that lead you to believe that he is not familiar with the Turkey Point site and factors related to the Turkey Point 6 & 7 project?

A. Yes. There are several statements that indicate that Witness Gundersen is poorly informed with respect to the Turkey Point 6 & 7 project. Given these serious and obvious errors, it is not surprising that he reached incorrect

conclusions regarding uncertainties that he identifies as site specific concerns. For example, in his discussion of the site, Witness Gundersen indicates that the two existing reactors share the site with three coal plants (see Gundersen at page 10, lines 11-12) that are all cooled by saltwater through a cooling tower connected to the cooling canals (see Gundersen at page 12, lines 2-3) and connected to the transmission grid through a single coastal transmission corridor (see Gundersen at page 11, lines 20-23). None of these statements are correct. Units 1 and 2 are natural gas and oil fired boilers while Unit 5 is a combined cycle natural gas unit. Units 1 through 4 share the closed loop cooling canal system (without cooling towers) while Unit 5 uses a modern cooling tower with makeup water supplied from a Floridan (non-drinking water) aquifer. The existing units are connected to the transmission grid by two independent transmission corridors; one running north of the plant and a second running west prior to turning north along the western developed areas of Miami-Dade County. It is clear that Mr. Gundersen has not undertaken even the most rudimentary due diligence.

Q. Please comment on Witness Gundersen's concern related to grid stability at Turkey Point.

A. Grid stability is fully addressed in FPL's project analysis. Witness Gundersen's concern may be a result of his extremely limited review of project documents and his lack of understanding about how the site is currently connected to the grid and how the Turkey Point 6 & 7 project is proposed to be interconnected. Grid stability is achieved by careful

engineering design, integration of necessary transmission system improvements and proper interconnections that are not overly reliant on any one substation or transmission corridor. The Transmission Plan for Turkey Point 6 & 7 will meet the reliability standards of the North American Electrical Reliability Corporation (NERC), the Florida Reliability Coordinating Council (FRCC) and the offsite power requirements of the Nuclear Regulatory Commission (NRC). The analyses necessary to establish this plan were conducted early in the site selection process and include an Interconnection and Integration Study, a Grid Stability Analysis Study and a Facilities Study. These thorough and comprehensive studies conducted by FPL's Transmission Planning and Transmission and Substation Engineering departments and expert consultants provide the information necessary to design a robust and reliable interconnection. The interconnection and integration plan will receive peer review through the FRCC. As it historically has, FPL takes seriously its obligations to fully comply with all applicable regulations governing transmission interconnection and integration. Accordingly, Witness Gundersen's assertion should be rejected.

Q. Does Witness Gundersen's CV include experience in transmission system design or Grid Stability analysis subject matters that he discusses?

A. No. In contrast, FPL relies on fully qualified transmission system planning and grid stability experts for the Turkey Point 6 & 7 project.

Q. Please comment on Witness Gundersen's concern related to saltwater intrusion at Turkey Point.

A. The Turkey Point 6 & 7 project will not contribute to saltwater intrusion, a topic that will be reviewed in the state Site Certification process and the NRC Environmental Review. Saltwater intrusion results from a lowered water table on shore being replaced by ocean water transmitted underground through the South Florida geology. The development of the Turkey Point 6 & 7 project has been educated by over 40 years of experience at the site. The design features of the project actually help directly and indirectly address saltwater intrusion. FPL is teaming with Miami-Dade County to redirect treated wastewater away from ocean outfalls and deep well injection to the site to provide the cooling water for the new units and replacing a Floridan aquifer source that serves Unit 5. This indirectly addresses saltwater intrusion by reducing the demand on higher value water sources in the region using "recycled" water. The environmental plan includes projects that would redirect surplus treated reclaimed water to rehydrate historic wetlands in the region, directly addressing the progression of saltwater intrusion. Accordingly, Witness Gundersen's assertion should be rejected.

Q. Does Witness Gundersen's CV include experience in geology, hydrology or saltwater intrusion subject matters that he discusses?

A. No. In contrast, FPL relies on fully qualified experts in geology, hydrology and salt water intrusion for the Turkey Point 6 & 7 project.

REBUTTAL TO SACE WITNESS COOPER

Q. Please provide your assessment of Witness Cooper's testimony on behalf of the Southern Alliance for Clean Energy.

A. Witness Cooper does not provide a competent or accurate review and should not be relied upon, as further discussed in Witness Sim's testimony. In my Need Case testimony (Document number 09467-07, page 37, lines 8-15) I included a discussion of the potential for temporal shifts in markets affecting future feasibility analyses. At that time, I cautioned such shifts "almost certainly will occur, but should be reviewed in the proper perspective for their long term implications." Witness Cooper has taken a selective and skewed view of current trends as they apply to the feasibility analysis, and his claims should be rejected.

Q. Witness Cooper discusses developments in the areas of energy conservation and renewables. Has FPL continued to monitor and evaluate the developments in conservation and renewables?

A. Yes. FPL is a world leader in both areas and has long been involved in the implementation of cost-effective conservation and demand side management programs and the development of wind, solar thermal and solar photovoltaic generation. FPL's experience allows us to recognize the realistic potential for optimizing the use of these resources and incorporate those in our planning. In contrast, Witness Cooper points to developments within the past year or that are expected to occur within the next several years as justification for

abandoning progress on nuclear generation, a known and tested emission free generation source that is available now.

Q. Please comment on Witness Cooper's assertion that FPL's cost estimate of the project was derived from an early low estimate for a different type of reactor and its current estimates remain in the low range of projections.

A. Witness Cooper's testimony fails to reflect any understanding of the function of FPL's non-binding cost estimate in the need determination and NCRC proceedings. The cost estimate was developed prior to the selection of the AP-1000 using the best information developed by industry and government sources. The relevant issue is whether or not the cost estimate range is a sufficient estimate for the Turkey Point 6 & 7 project given what is known today. The answer to this is a resounding "yes". As the project has evolved, FPL has reviewed the adequacy of the cost estimate to represent the anticipated costs of the AP-1000 project at Turkey Point. As discussed earlier in this testimony, the cost estimate incorporates the best information available to represent the range of costs expected. Particularly, the feasibility analysis assumes the high end of that cost estimate range when drawing its conclusions. Also refer to Exhibit JJR-1 (page 36 of 36) to Witness Reed's May 1, 2009 testimony which provides a comparison of the published costs of other AP-1000 costs to the high end of FPL's cost estimate range.

Q. **Should the Commission accept Witness Cooper's assertion that it is unreasonable or imprudent to continue to incur costs to develop the Turkey Point 6 & 7 project?**

A. No. FPL is making prudent management decisions and taking concrete actions that result in the right work being done for the project at a reasonable cost. FPL's approach is helping create contracting options that benefit our customers while deferring decisions that are not required or warranted at this stage of the project. This deliberate, stepwise approach is the best way to make progress towards the many benefits of new nuclear generation recognizing and resolving uncertainties as we proceed.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In re: Nuclear Power Plant Cost Recovery Clause	))	DOCKET NO. 090009-EI FILED: September 4, 2009

ERRATA SHEET

TESTIMONY OF STEVEN D. SCROGGS, MARCH 2, 2009

PAGE#	LINE #	CHANGE
30	7	"The NuStart Consortium" to "NuStart"

EXHIBIT SDS-3 (MARCH)

PAGE#	LINE #	CHANGE
1	3	"10 CFR Part 50" to "10 CFR Part 52"
1	4	"10 CFR Part 51, 10 CFR Part 52" to "10 CFR Parts 52 and 51"

EXHIBIT SDS-4 (MARCH)

PAGE#	LINE #	CHANGE
1	N/A	"E&C Project Controls Process Overview_04-24-08" to "E&C Project Controls Process Overview_03-12-09"
1	N/A	"E&C Accrual Process Narrative rev 03-28-08" to "E&C Accrual Process Narrative rev 03-31-09"
1	N/A	"E&C Utility Fixed Assets Process narrative_03-31-08" to "E&C Utility Fixed Assets Process narrative_03-31-09"

TESTIMONY OF STEVEN D. SCROGGS, MAY 1, 2009

PAGE#	LINE #	CHANGE
32	6	"the NuStart Consortium" to "NuStart"

EXHIBIT SDS-1 (MAY)

PAGE#	LINE #	CHANGE
2	22-32	Sponsor from "W. Labbe" to "S. Scroggs"
21	11	"Single Source" to "Competitively Bid"
32	"Brief Description of Selection Process"	"Single Source" to "Competitively Bid"

EXHIBIT SDS-3 (MAY)

PAGE#	LINE #	CHANGE
1	1	"NuStart Consortium, LLC" to "NuStart Energy Development"

BY MR. ANDERSON:

Q You're sponsoring two exhibits?

A I am.

Q STS-5 and 6?

A Correct.

MR. ANDERSON: Chairman Carter, these have been previously marked on the staff composite list as 71 and 72.

CHAIRMAN CARTER: For the record, 71 and 72. You may proceed.

(Exhibit Nos. 71 and 72 admitted into the record.)

BY MR. ANDERSON

Q Have you prepared a summary of your rebuttal?

A I have.

Q Please provide your summary.

A Thank you.

Mr. Chairman and Commissioners, the purpose of my rebuttal testimony is to address the direct testimony provided by witnesses Jacobs, Gundersen and Cooper as such testimony relates to the Turkey Point 6 and 7 project.

Witness Jacobs' testimony seems to conclude that FPL has made an unalterable commitment to a specific contracting strategy for the project, one that

would not result in a consolidated engineering procurement and construction contract to a single provider.

My testimony provides a clarifying discussion of the nature of FPL's decisions to date and how those decisions have retained and created optionality for our customers that offer five specific benefits. Our approach maintains the option for a consolidated EPC contract. It maintains project progress through the hiring of qualified engineering service providers. It creates a pool of credible vendors for future competitive bidding, and provides -- it defers expenditures to a point in time where the design will be more refined and therefore the cost estimate can be more accurate, and provides significant clarification of roles and responsibilities associated with the project.

Witness Jacobs also describes his preference for an EPC contract based on assumptions regarding the nature of these contracts and the current market for new nuclear projects. My testimony will describe how FPL's experience in the current market does not support these assumptions, a fact that has been a significant influence in shaping our contracting strategy.

Finally, I defend FPL's assessment that the cost estimate range for the project remains a sufficient

and valid basis for the feasibility analysis.

Witness Gundersen discusses uncertainties in the regulatory and execution aspects of deploying new nuclear generation and claims that FPL has not taken these issues into consideration. My rebuttal testimony corrects factual errors made by Witness Gundersen, clarifies mixed characterizations, and describes how uncertainties are recognized in the project management and how the feasibility analysis provides the basis for proceeding with the project in a careful step-wise manner.

Witness Cooper discusses uncertainties in the economic aspects of new nuclear generation. My rebuttal testimony cautions against the selective nature of Witness Cooper's review and describes how economic uncertainties are recognized in project planning and the feasibility analysis.

That concludes my summary.

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

CHAIRMAN CARTER: Mr. McGlothlin on rebuttal, you're recognized, sir.

CROSS EXAMINATION

BY MR. McGLOTHLIN:

Q Thank you.

Mr. Scroggs, first turn to page two of your rebuttal testimony. At line 18, referring to Dr. Jacobs, you say, "Dr. Jacobs incorrectly claims that an EPC contract is advantageous and points to a selectively limited group of projects, including Progress Energy Florida, that have entered into EPC contracts as justification." Are you there?

A Yes, sir.

Q Let's start with your phrase "selectively limited group of projects." Is it true that Dr. Jacobs included all of the utilities who have signed contracts for the AP1000?

A No. Dr. Jacobs has included all the utilities that signed EPA contracts for the AP1000 but not all the utilities that have submitted applications for the AP1000.

Q Okay. Of those -- of that larger universe of those utilities who are pursuing the AP1000, have any of the utilities that have not signed an EPC contract committed to a different course?

A No, they have not committed to a different course.

Q So the selectively limited group consists of all of those utilities pursuing the AP1000 who have elected one form or the other, correct?

A Who have taken the initiative to sign an EPC contract, yes, sir.

Q Any contract?

A That's correct.

Q So selectively limited group is 100 percent of those who have made an election, correct?

A Correct, but not 100 percent of the projects pursuing the AP1000.

Q And those have not made a choice one way or the other?

A Correct.

Q Including FPL?

A Correct.

Q Now, you also say that Dr. Jacobs incorrectly claims that an EPC contract is advantageous. Do you have Dr. Jacob's testimony available to you?

A No, I do not.

Q Well, I think we can manage this fairly. I'm going to read you individual sentences from page eight of his prefiled testimony. If at any point you need me to repeat it or if I'm going too far, let me know.

At page 8, line 6, referring to the EPC form of contracting, he says, "This type of contract places the burden and risk on the Consortium, Westinghouse and Shaw Stone & Webster, to manage the interface between

the engineering, procurement and construction areas. The consortium would be fully accountable for any delays resulting from these interfaces." Were you able to follow what I read or do you have it available to you now?

A I have it available to me.

Q Do you agree with that observation on the part of Dr. Jacobs?

A No, sir; I do not.

Q On what basis do you disagree?

A Well, first the -- line 6 and 7, Dr. Jacobs implies that the contract places the burden and risk on the consortium, implying solely places that burden and risk on the consortium. Our understanding through the construction of or the structure of these EPC contracts is there are certain areas that are firm-priced with escalators, certain areas that are fixed price, meaning there's one price, and then there's areas that are target-priced, and those target-priced are sort of good faith efforts to we'll try to hit this price, but there's limited -- in terms of bearing the burden and risk, those are limited by the structure of these contracts.

Secondly, as we move down to line 9, and it says, "The Consortium would be fully accountable for any

delays resulting from these interfaces." In the execution of complex, large-scale construction, there are many factors that affect the potential for delay in these construction projects, and FPL's perspective is that it would be difficult to assume and improper to assume at this stage that 100 percent of these types of delays could be laid at the foot of an EPC contractor and have reasonable expectation that all of these delays would be their responsibility.

Q With respect to your first statement and referring back to lines 6 and 7 and 8, the observation was that the Consortium would manage the interface between the engineering, procurement and construction areas. Aside from your comments on fixed and variable prices, isn't it true that the Consortium would manage the interfaces between those functions?

A They would definitely manage the interface.

Q And with respect to the -- who is accountable for any delays resulting from interfaces, that would be a matter and term of the ultimately-negotiated contract; would it not?

A That would be part of the negotiated contract. It would be very specific to the terms and the pricing structure.

Q Next, at lines 10 and 11, Dr. Jacobs says,

"Each member of the Consortium could, in most circumstances, be jointly and severally liable for the actions of the others, thus reducing the risk to FPL if one entity fails to perform." Would you agree that such an arrangement in an EPC contract would be advantageous to FPL?

A Such an arrangement would be possible and could be advantageous, yes.

Q And then he says, "The Westinghouse/Shaw Consortium will have gained significant experience from earlier AP1000 projects and will incorporate the lessons learned into the TP 6&7 project." Would you agree that having the benefit of earlier experiences would be advantageous to a utility?

A Yes, and we think that would be why Westinghouse/Shaw would be in a really good position to offer a competitive bid for the construction contract.

Q Would you agree that, under an EPC form of contract, the Consortium would provide the utility a single point of contact such that any disagreements over scope and responsibilities are more easily managed?

A If that was the result of the terms of the EPC contract, yes. In our experience in these large-scale projects, there's more of a group management approach that this is taken care of through.

Q That also would be a function of the ultimately-negotiated terms of the contract, would it not?

A That would be, sir.

Q At line 21 of the same page, you say, "In this same docket, Witness Jacobs criticizes PEF for entering into an EPC contract," and you repeat that assertion on page 5, lines 16 and 17. You say, "As an initial matter, I notice that Witness Jacobs" testimony against the NCRC criticizes FPL for not yet entering into an EPC contract. Witness Jacobs' testimony with respect to Progress Energy Florida criticizes PEF for already having entered into an EPC contract."

Do those statements in your testimony constitute everything you know about the nature of Dr. Jacobs' criticism of the PEF?

A No, sir.

Q Can you think of any -- are you -- can you think -- of that knowledge of which you're aware, can you think of any circumstance that might be a distinguishing feature of the PEF circumstance relative to FPL's?

A The circumstances in terms of the timing of the projects and the level of commitment of the projects are definitely different between the two utilities.

Q In what respect?

A That FPL has not signed an EP or an EPC contract and has not committed funds related to that engineering and design effort at this stage.

Q Mr. Scroggs, what is a limited work authorization in the context of NRC regulations?

A A limited work authorization is a component of an overall combined operating license application that asks the NRC to review specific sections of the application in advance so that they could be potentially approved for earlier initiation in the construction cycle.

Q Now, if you would accept for the purpose of my question that Dr. Jacobs' comments with respect to the PEF situation had to do with the fact that PEF signed a contract prior to receiving the limited work authorization, in your mind would that constitute a distinguishing feature between that situation and FPL's case?

A Yes, sir.

Q At page 3, line 7, you say, "Further, this testimony identifies other U.S. nuclear projects that have made decisions similar to FPL." Do I assume correctly that, by "this testimony," you mean your testimony?

A That's correct.

Q And with respect to the statement that "other projects have made decisions similar to FPL," do you mean they have decided not to decide?

A I think in general -- if you'll allow me, I'll find the section in my testimony and elaborate through that.

Q Go ahead.

A On page 12, beginning at line 10, specifically Luminant Utility in Texas has recently announced a memorandum of understanding with Mitsubishi where they intend to pursue an EP contract strategy and following with a construction contract strategy at a later point in time. That's the most pertinent project that is taking a strategy similar to what FPL has expressed. And the lines above, 5, 6, 7, 8, identify projects that have, through their inability or desire to move forward, chosen to suspend their pursuit of applications at this time or taking an offering, so to speak.

Q Well, taking that last reference first, as I understand it, your testimony is that they are delaying a decision until certain uncertainties are resolved; correct?

A That's my understanding; yes, sir.

Q So that is the decision that is similar to

FPL's?

A Both decisions that I speak of here on page 12 are similar to what FPL has espoused.

Q Well, when you say that Luminant and Mitsubishi have signed a memorandum of understanding detailing their plans to finalize an overall EP agreement and then add they are developing a separate construction plan, that suggests to me that there is a decision to pursue an EP&C contract as opposed to EPC. Am I mistaken in my understanding of that language?

A You can read it that way. My understanding is it articulates a desire to take a step-wise approach, first committing to an EP. They would have the same optionality that FPL is hoping to create through that process to at a later point enter into a C contract that could be essentially the same as an EPC contract.

Q Okay. So, like FPL, Luminant and Mitsubishi have decided to not yet decide what the ultimate form will take?

A It appears that -- that's what that appears to me; yes, sir.

Q If you'll turn to page 5 of your rebuttal testimony, and the sentence actually begins at the bottom of page 4, and again, referring to Dr. Jacobs, you say, "This year, however, he asserts that FPL is

imprudent for not having entered into probably the largest single or sole source contract, an EPC contract for the construction of a nuclear plant which contracts are necessarily single or sole source because of the proprietary nuclear design technology of any chosen vendor." Do you see that statement?

A Yes, sir.

Q Is the AP1000 an example of a proprietary nuclear design technology?

A Yes, it is.

Q In addition to the proprietary design, isn't it true that there is a proprietary aspect to the manufacturing or construction of -- portion of the AP1000 project?

A Yes, there is in certain respects, in modular construction, and again, that would be, again, parsing of the construction to what is proprietary and what is not proprietary, if that was appropriate.

Q Please elaborate for the Commissioners on what you meant by the "modular construction."

A One of the design features of the AP1000 is that it is being designed in modular components, smaller components that can be constructed similar to shipyard construction, be in a controlled environment, constructed, placed on a barge or a truck and shipped to

site as a completed module.

Q If a utility pursuing AP1000 design were to contract with anyone other than Westinghouse/Shaw Consortium for the construction portion, based upon the proprietary aspects of the modular design, with whom would they have to deal in order to obtain the modules?

A Well, again, this would be a form of the supply chain in the nuclear industry that we believe is developing. If the AP1000 becomes a popular design, as it seems to be in the southeast, the capacity of Shaw Stone Webster to be the sole proprietor of modules may be limited and they may look to partner with other manufacturers who can provide some or all of the component modules. I think what FPL is looking for is staying in a flexible position so that we can take advantage of the modifications in the supply chain as it occurs over the next several years and be in a position to make the best decision at the right time with a more refined design and construction process.

Q You do agree with me that Westinghouse/Shaw does have the proprietary command of the modular aspects of the construction?

A Yes. I think it's also important to realize that, in our estimate of cost, that represents about three billion dollars of the $18-billion project. So

the component that is proprietary is fairly contained. Other costs related to site preparation, construction of non-proprietary buildings and support facilities wouldn't fall into that category, and therefore there is the opportunity, again, to bring competitive bidding to certain select aspects, reap the benefits there, and limit the sole or single source procurement to a smaller subsection of the overall construction costs.

Q With respect to the portion of the construction that is contained to only three billion dollars, would you agree that, whether it's Westinghouse/Shaw or in partnership including Westinghouse/Shaw, that entity will be prominent in the construct phase of the project?

A That's correct, and we have already engaged Shaw. Shaw is working with us on certain engineering aspects that are proprietary and that we need their support in order to support our NRC combined operating license application.

(The transcript continues in sequence with Volume 4.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA)

COUNTY OF LEON)

I, RAY D. CONVERY, do hereby certify that I was authorized to and did stenographically report the foregoing proceedings at the time and place herein stated.

IT IS FURTHER CERTIFIED that the foregoing transcript is a true record of my stenographic notes.

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

DATED this 9th day of September, 2009, at Tallahassee, Leon County, Florida.

RAY D. CONVERY