BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 090009-EI

In the Matter of:

NUCLEAR COST RECOVERY CLAUSE.
_____/

VOLUME 9

Pages 1440 through 1688

ELECTRONIC VERSIONS OF THIS TRANSCRIPT ARE
A CONVENIENCE COPY ONLY AND ARE NOT
THE OFFICIAL TRANSCRIPT OF THE HEARING.
THE .PDF VERSION INCLUDES PREFILED TESTIMONY.

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:	Thursday, September 10, 2009
TIME:	Commenced at 9:30 a.m.
PLACE:	Betty Easley Conference Center Room 148 4075 Esplanade Way Tallahassee, Florida
REPORTED BY:	MARY ALLEN NEEL, RPR, FPR
PARTICIPATING:	(As heretofore stated.)

I N D E X

WITNESSES

WITNESSES CONTINUED

EXHIBITS

PROCEEDINGS

(Transcript continues in sequence from Volume 8.)

CHAIRMAN CARTER: We are back on the record. And when we last left, we had completed Progress with their witnesses. And now, Mr. Rehwinkel, good morning. You're recognized sir.

MR. REHWINKEL: Good morning, Mr. Chairman and Commissioners. Public Counsel and the citizens of Florida call Dr. William R. Jacobs to the stand.

Thereupon,

WILLIAM R. JACOBS, JR., Ph.D.

was called as a witness on behalf of the Citizens of the State of Florida and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. REHWINKEL:

Q. Dr. Jacobs, were you sworn yesterday?

A. Yes, I was.

Q. Could you state your name, address, employer, and who you represent for the record, please?

A. Yes. My name is William R. Jacobs, Jr. My business address is 1850 Parkway Place, Marietta, Georgia. I'm vice president of GDS Associates, and I am representing the Florida Office of Public Counsel in

this matter.

Q. Thank you. Dr. Jacobs, did you cause to be prepared prefiled direct testimony consisting of 28 pages in this docket?

A. Yes, I did.

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

A. Yes. I have four changes to that testimony.

On page 18, line 11, the last two words in that sentence on line 11, "the project," should be deleted and replaced with "completing the power plant."

On page 21, line 9, between the word "not" and "feasible," the word "be" should be inserted, so it would read "why the project may not be feasible."

On page 23, line 22, in the question there's a capital I-N-T. The "T" should be deleted so that the word is "in."

And the last one, on page 24, line 17, the word "upgrade" should be changed to "uprate."

That's all.

Q. Thank you, Dr. Jacobs. With those changes, if I asked you the questions contained in your prefiled direct testimony today, would your answers be the same?

A. Yes, they would.

MR. REHWINKEL: Mr. Chairman, I would move

that Dr. Jacobs' testimony, direct, prefiled direct testimony, with the changes and corrections made, be moved into the record, admitted into the record.

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

MR. REHWINKEL: Thank you.

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(PEF)-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 this testimony.

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 Progress Energy Florida (PEF) for authority to collect historical and projected costs associated with extended power uprate ("EPU") project being pursued at Crystal River Unit 3, and historical and projected costs associated with PEF's Levy County Units 1 and 2 project ("LNP") through the capacity cost recovery clause.

II. SUMMARY OF AUTHORIZATION TO COLLECT COSTS REQUESTS FOR

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

A. PEF is requesting in its original filing recovery of $446.3 million in 2010. This includes projected total revenue requirements of $142.2 million for calendar year 2010 and recovery of the actual/estimated under recovery from 2009 of $303.8 million. In addition, PEF has stated its willingness to amortize the year end under-recovery balance for 2009 over a 5 year period. This would reduce PEF's revenue requirements for 2010 from $446.3 million to $236.4 million.

III. METHODOLOGY

Q. PLEASE DESCRIBE THE METHODOLOGY THAT YOU USED TO REVIEW AND EVALUATE THE REQUESTS FOR AUTHORIZATION TO COLLECT COSTS SUBMITTED BY PEF 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.

Following my review of the documents produced by PEF, I assisted Office of Public Counsel attorneys in deposing PEF witnesses to further explore areas of interest.

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 prudently manage the projects 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 PEF.

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 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. PLEASE DESCRIBE THE ISSUES AND CONCERNS THAT YOU IDENTIFIED FROM YOUR REVIEW OF PEF'S REQUEST

A. I have identified issues and concerns in both the LNP and the EPU projects that raise questions concerning the sufficiency of PEF's demonstration that its risk-related decision making was adequate under the circumstances. While the Company has identified numerous risks with both projects, it is not clear that the Company has met

its burden to demonstrate that these risks have been adequately considered when making critical project decisions.

Q. PLEASE DESCRIBE EXAMPLES YOU HAVE IDENTIFIED WHERE PEF HAS FAILED TO DEMONSTRATE THAT IT HAS APPROPRIATELY MANAGED RISK RELATED TO THE LEVY NUCLEAR PROJECT.

A. Examples of where PEF has failed to demonstrate adequate risk management that I have identified at this time include the signing of the EPC contract with many known risks and the failure to perform an adequate feasibility analysis as required by Rule 25-6.0423(5)(c)5 and (8), F.A.C., which is part of the Nuclear Cost Recovery Rule ("NCRR").

ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) CONTRACT SIGNING

Q. PLEASE DESCRIBE YOUR CONCERNS WITH THE SIGNING OF THE EPC CONTRACT.

A. PEF executed the EPC contract with the consortium of Westinghouse Electric Company / Shaw, Stone, Webster (WEC/SSW) on December 31, 2008. In the months immediately preceding the time of EPC contract execution, PEF had identified many significant risks to the LNP project. Signing such a huge contract with so many risky issues remaining unresolved or the outcomes not fully understood can lead to renegotiation that can make the overall project cost more expensive. This has now happened less than four months after the signing. These unresolved risky issues include:

1. PEF had not received a schedule from the NRC for the NRC's review and approval of a requested Limited Work Authorization (LWA). The approval of the LWA was needed to construct the project on the schedule included in the EPC contract and upon which the contract pricing was based. This occurred despite the fact that the NRC had expressed serious doubt about the schedule on October 6, 2008. (NRC Letter Brian Anderson to James Scarola dated October 6, 2008, 09NC-OPCPOD3-64-000011; Exhibit WRJ(PEF)-3, Pages 1-10 of 233) Additionally, the NRC's decision was nearly 2 months past the expected 30 day traditional milestone letter delivery date. This alone should have raised concerns.

2. Although PEF had repeatedly identified that commitments from Joint Owners were critical to the success of the LNP and had linked their achievement to execution of the EPC contract, at the time of execution of the EPC contract, and in fact even today no joint owners were or are committed to the LNP. High level management reports repeatedly and consistently stated during the final months of 2008 that "JO work and EPC are closely tied". (Weekly reports to LINC of 9/22, 9/29, 10/6, 10/13, 10/22, 10/27, 11/3, 10/10, 10/17, 10/24, 12/01, 12/08, 12/15, 12/22, 12/29, Exhibit WRJ(PEF)-3, Pages 11-25 of 233.)

3. Receipt from the NRC of a Combined License (COL) to support the schedule was a risk given the status of design certification of the AP 1000 nuclear plant and the NRC's indication that it was unlikely that the NRC would be able to meet PEF's requested schedule.

4. Deterioration in the capital markets, broad economic weakness and legislative uncertainty were also identified by PEF as concerns.

Q. PLEASE DESCRIBE THE IMPACT OF THE COMPANY'S FAILURE TO RECEIVE THE LWA ON THE DESIRED SCHEDULE IN MORE DETAIL.

A. On July 28, 2008 PEF submitted its Combined License Application (COLA) for the LNP project to the Nuclear Regulatory Commission. In its application, PEF requested the following schedule for three of the major approvals from the technical staff review of their COLA:

- Final Environmental Impact Statement (EIS) issued June 2010
- Limited Work Authorization (LWA) issued September 2010
- Combined License (COL) issued January 2012

An October 6, 2008 letter from the NRC accepted the LNP's COLA for docketing but identified concerns related to the LNP site. The NRC's response stated:

> Although our acceptance review determined that the LNP COLA is complete and technically sufficient, the complex geotechnical characteristics of the Levy County site require additional information in order to develop a completed and integrated review schedule.

(NRC Letter Brian Anderson to James Scarola dated October 6, 2008, 09NC-OPCPOD3-64-000011, Exhibit WRJ(PEF)-3, Pages 1-10 of 233)

Concerning the requested schedule, the NRC specifically states:

> Because of the complexity of the site characteristics and the need for additional information, it is unlikely that the LNP COLA review can be completed in accordance with this requested [*by PEF*] timeline

(Explanation added.) (Ibid.)

In this letter, the NRC is clearly informing PEF that it was unlikely that the requested timeline could be met due to the complex geotechnical characteristics of the LNP site. It is not reasonable to assume that given the fact that the NRC made an effort to specifically mention the complexity of the site that it was only suggesting a brief

delay in the schedule. This is true when contrasted with the extensive effort PEF made to impress upon senior NRC staff of the need to meet its "aggressive" schedule. On December 31, 2008, PEF executed the EPC contract, which was based, in part, on the assumption that the requested LWA would be issued. Three weeks later during a January 23, 2009, conference call the NRC informed PEF that the "LWA as requested and COLA geotechnical scope require the same critical path duration" and "they do not have the resources to process an LWA." (Levy COL Schedule Jan 23rd 2009 NRC Telecon Preliminary Analysis, Jan 25, 2009 09NC-OPCPOD3-62-000003, Exhibit WRJ(PEF)-3, Pages 26-33 of 233.) As a result, PEF ultimately withdrew its request for an LWA in a May 1, 2009 letter where PEF informed the NRC that Company had decided to no longer pursue an LWA and notified the NRC that they were withdrawing their request. (PEF letter to NRC NPD-NRC-2009-061 dated May 1, 2009 09NC-OPCPOD3-64-000001. Exhibit WRJ(PEF)-3, Pages 34-36 of 233) Shortly thereafter they precipitously changed the project schedule by 20 to 36 months only three months after signing the largest contract in the Company's history and perhaps even the largest construction contract in Florida history.

On April 30, 2009, four months after contract execution, PEF issued a letter to Dr. Shawn Hughes, the consortium project director, requesting a partial suspension of work for the Levy Nuclear Project. (PEF letter from Jeff Lyash to Shawn Hughes dated April 30, 2009, 09NC-OPCPOD3-60-000089 Exhibit WRJ(PEF)-3, Pages 37-39 of 233.) This placed the company in the posture of renegotiating the EPC contract from a very weak position.

Q. HAVE ANY OTHER UTILITY COLA FILINGS FOR A NEW NUCLEAR PLANT INCLUDED A REQUEST FOR AN LWA IN THEIR COLA APPLICATION?

A. No they have not. The most somewhat similar filing is Georgia Power's request for an LWA in their Early Site Permit application for Vogtle Units 3 and 4. However, the Vogtle site is an existing nuclear plant site with well known geology and the geology at the Vogtle site is much less complex than the geology at the LNP site. It really holds little analogous value for the LNP site. PEF effectively had no precedent upon which to assume that the NRC would not take a conservative position regarding the review of the requested LWA especially in light of all the factors surrounding the October 6, 2008 letter.

Q. DID THE PEF CONTRACTOR RESPONSIBLE FOR THE GEOTECHNICAL INVESTIGATIONS AT THE LEVY SITE HAVE QUALITY ASSURANCE PROBLEMS?

A. Yes they did. PEF's subcontractor, CH2MHILL experienced numerous quality assurance breakdowns that required PEF to issue a stop work order until the deficiencies were corrected. In addition, there were other delays in completing the geotechnical work upon which the LWA and safety-related COLA determinations were jointly based. Although not known at this time, these quality assurance concerns and delays possibly could have impacted the NRC staff's willingness to accept the data to meet the very aggressive schedule for a unique and complex site. At a minimum the mere possibility of NRC concerns should have alerted PEF to proceed conservatively in its risk mitigation actions.

Q. IN YOUR OPINION WAS IT REASONABLE FOR PEF TO HAVE EXECUTED THE EPC CONTRACT WITHOUT KNOWING THAT THE NRC WOULD ISSUE THE LWA ON THE REQUESTED TIMELINE GIVEN THE NRC'S STATEMENT THAT IT WAS "UNLIKELY" THAT THE REQUESTED TIMELINE COULD BE MET?

A. In my opinion it was not reasonable. PEF signed what is likely the largest contract in the history of the State of Florida without any assurance that the LWA would be issued. Receipt of the LWA within the requested timeframe was a requirement for implementation of the contract on the schedule contained in the EPC contract. Not only did PEF not have any assurance that the LWA would be issued, the NRC specifically told them in the October 6, 2008 letter that it was unlikely that the requested timeline would be met. Under the totality of the circumstances, PEF should have assumed that an LWA review schedule different than the overall COLA review schedule would not have been adopted by the NRC. To assume otherwise and sign the EPC contract with this cloud hanging over this critical date was not reasonable.

Q. DO YOU HAVE ANY REASON TO BELIEVE THAT PEF WOULD HAVE EXECUTED THE EPC CONTRACT AS IT EXISTS TODAY IF IT HAD KNOWN THAT THE LWA WOULD NOT BE ISSUED?

A. No. This question was posed to Mr. Garry Miller during his deposition. The question and his response follow:

> Q If you had gotten the letter that you got on February 18th, if you had gotten that same letter on December 1st, would you have signed the EPC?
>
> A In the form that it was signed, no. We would have had to modify the EPC agreement for that shift in dates.

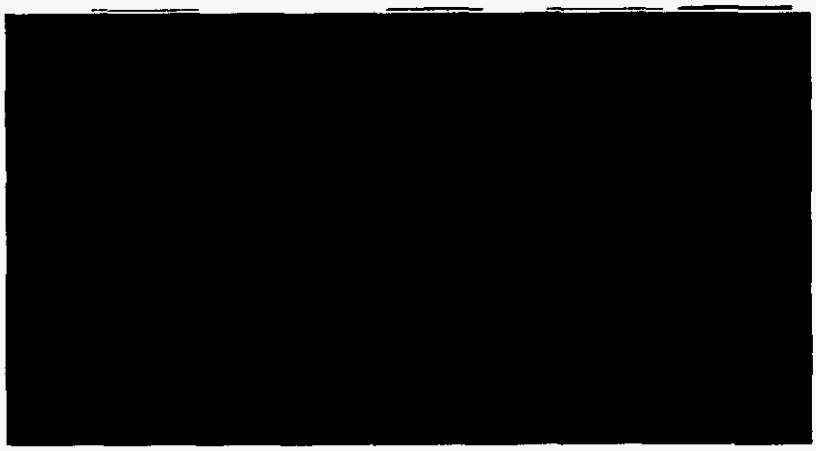
(Miller Deposition Transcript, Volume 1, page 43, lines 10-14, Exhibit WRJ(PEF)-3, Pages 40-41 of 233.)

The EPC contract would have required extensive revisions to the cost and schedule if the Company had known that the LWA would not be issued. It would have also not placed them in the weak renegotiating position in which they now find themselves.

Q. THE COMPANY APPEARS TO BLAME THE SUSPENSION OF THE PROJECT TOTALLY ON NOT RECEIVING THE LWA. DID YOU FIND EVIDENCE THAT THERE WERE OTHER REASONS FOR THE SUSPENSION?

A. Yes. PEF was clearly concerned about their capital plan for new nuclear units given the known risks.

In an April 15, 2009 letter to the Progress Energy Board of Directors, William D. Johnson, Progress Energy Chairman, President and Chief Executive Officer states:



[Emphasis Added]. (William D. Johnson letter to Progress Energy Board of Directors dated April 15, 2009 09NC-OPCPOD3-61-000049 Exhibit WRJ(PEF)-3, Pages 42-62 of 233.)

It is clear from this letter to the PGN Board and the Levy Nuclear Project Update dated April 17, 2009 (and attached to that letter) that many other factors contributed to the need to adjust the capital plan for new nuclear units.

Q. WHAT ARE THE "LANDSCAPE CHANGES" THAT ARE IDENTIFIED IN THE APRIL 17, 2009 BOARD PRESENTATION?

A. The April 17, 2009 presentation to the Progress Energy Board of Directors identifies the following "Landscape Changes" that have potential to impact the Levy project.

- **Capital Market Deterioration**
  - Share price near or below book value
  - Our sector no longer holding up
  - Debt market concerns (unsecured)
- **Federal Energy Policy Landscape**
  - Climate change
  - Nuclear/coal policies
  - Renewables
  - Environmental regulation
- **Broad economic indicators continue to show weakness**
  - Prospects for late 2009 / early 2010 recovery uncertain
  - Impact on load/energy
  - Customer ability to pay
- [redacted]
- **Florida regulatory / legislative climate**
  - Price Impact
  - Potential legislation

These landscape changes reveal a large number of concerns held by Progress Energy executive management. These concerns were evident even before the EPC contract was signed. Some of these concerns were evident as far back as September 2008 when a schedule contingency strategy was being discussed, continuing up through the 2009 EPC cost spending caps imposed in the fourth quarter of 2008.

Q. WHAT CONDITIONS ARE IDENTIFIED TO PROCEED WITH THE LEVY PROJECT?

A. The April 17 Board presentation identifies the following conditions to proceed with the Levy project:

- [redacted]

- [redacted]

Q. DOES THE APRIL 17 BOARD PRESENTATION IDENTIFY BENEFITS OF THE PROPOSED SCHEDULE DELAY FOR LNP?

A. Yes it does. The presentation identifies the benefits of delaying the LNP schedule including providing additional time for and certainty on:

- Obama Administration nuclear position
- Financial market and economic rebound
- Customer/policy maker support
- PEF rate case, first NCRC prudence hearing
- Federal policies on carbon, renewables and coal
- JO participation
- NRC COLA process
- Commodity/labor stabilization

Q. WHAT IS THE RELEVANCE OF THE ABOVE FACTORS TO THE COMPANY'S DECISION TO EXECUTE THE EPC CONTRACT?

A. These concerns are not new. They were all known well before (and on) December 31, 2008 when PEF executed the EPC contract. A more reasonable, cautions approach given the uncertainty in the LWA schedule and the list of concerns identified above would have been to continue to support development of the COLA while delaying signing of the EPC contract until the issuance of the LWA was known and the above concerns are resolved. Although the incremental impact of the signing of the EPC contract may not be known at this time, the Company believes that it is

likely that the overall cost of the project will increase. At this time the Commission does not likely have sufficient information to determine the short or long-term impacts of the premature signing of the EPC contract.

Q. PLEASE DISCUSS THE COMPANY'S FAILURE TO HAVE FIRM COMMITMENTS FROM JOINT OWNERS AT THE TIME OF THE SIGNING AND THE IMPACT OF THIS FAILURE.

A. Many project documents indicate that acquiring joint owner partners is a critical factor in the success of the project and that a strong tie existed between having joint owners committed to the project and execution of the EPC contract. The October 2008 and December 2008 Nuclear Plant Development Performance reports identify "Finalizing Joint Ownership decisions" and "Joint Ownership Discussions" as Key Issues. (Progress Energy Nuclear Plant Development Performance Report October 2008, page 5, 09NC-OPCPOD1-47-019364 and Progress Energy Nuclear Plant Development Performance Report December 2008, page 5, 09NC-OPCPOD1-47-013518, Exhibit WRJ (PEF)-3, Pages 63-109 of 233). The April 17, 2009 Board presentation discussed above identifies "Sufficient co-ownership" as a necessary condition to proceed with the project. As I discussed above, the Levy Integrated Nuclear Committee was told repeatedly that the joint owner negotiation and the signing of the EPC contact were closely tied. (See, Exhibit WRJ(PEF)-3, Pages 12-25 of 233.)

Inexplicably, despite these factors, PEF signed the EPC contract with no joint owner commitments.

Q. DID YOU FIND EVIDENCE THAT THESE RISKS WERE APPROPRIATELY ANALYZED AND THE INFORMATION WAS TRANSMITTED TO THE BOD?

A. No I did not. The December 10, 2008 Chairman's Report describes Mr. Johnson's discussion of the Levy Project with the Board. The report states that Mr. Johnson reviewed the conditions to proceed with the Project including an appropriate level of joint ownership. He also reviewed the status of co-owner negotiations. From this summary of the December 10 Board meeting, it is not evident that Mr. Johnson informed the Board of the lack of an LWA or the possible impact on the project of the failure to receive an LWA on the schedule requested by PEF. It is also not apparent that the Board was informed that no co-owners were likely to have committed to the project at the time the EPC contract would be signed. (Minutes of Regular Board of Directors Meeting, December 10, 2008, Chairman's Report 09NC09NC-OPCPOD7-89-000038, Exhibit WRJ(PEF)-3, Pages 110-111 of 233.)

Q. COULD THE COMPANY HAVE WAITED UNTIL THE NRC'S DECISION ON THE LWA WAS KNOWN AND JOINT OWNERS COMMITTED BEFORE SIGNING THE EPC CONTRACT?

A. Yes. The Company could have continued to support necessary activities such as support of the COLA and site characterization under existing agreements with the project contractors until the LWA schedule and joint owner participation was known. In addition, this would have allowed for additional clarity related to other concerns identified by the Company including the capital market deterioration, the indications of broad economic weakness and the legislative and regulatory climate.

Q. WHAT IS THE POTENTIAL IMPACT OF THE COMPANY SIGNING THE EPC CONTRACT WITH THE KNOWN OUTSTANDING RISKS?

A. The economic impact of PEF's execution of the EPC contract is unknown at this time. The Company is currently attempting to renegotiate the EPC contract with the consortium. From an overall project cost standpoint they are clearly in a weaker position to renegotiate the signed contract than if they had delayed signing until the LWA schedule and other risks were known or clarified. [redacted]. As a minimum the Company will incur additional carrying costs due to spending money under the EPC agreement earlier than would have been required if they had not signed. The answer to this question will become clearer once the EPC contract has been renegotiated.

Q. WHAT IS YOUR CONCLUSION REGARDING PEF'S EXECUTION OF THE EPC CONTRACT ON DECEMBER 31, 2008?

A. In my opinion, the Company's decision to sign the EPC contract on December 31, 2008 given the uncertainty that existed with the LWA, the lack of committed joint owners and the myriad of other uncertainties including the deteriorating economy, the chaos in the financial markets and the uncertain federal and state regulatory climate was not reasonable. I do not believe the company has met its burden of demonstrating that this action was reasonable or prudent. This decision may result in significant extra cost to the project that could have been avoided with a more cautious approach given the known risks and uncertainties at the time of signing. At the very least, the Commission does not have sufficient information to determine whether 2009 and 2010 EPC contract related costs are reasonable.

INADEQUATE FEASITILITY STUDY

Q. DID THE COMPANY CONDUCT AN ADEQUATE FEASIBILITY STUDY AS REQUIRED BY THE NUCLEAR COST RECOVERY RULES?

A. No, they did not.

Q. WHAT ARE THE RELEVANT REQUIREMENTS OF THE RULES?

A. Rule25-6.0423(5)(c)5, F.A.C., provides that:

> By May 1 of each year, along with the filings required by this paragraph, a utility shall submit for Commission review and approval a detailed analysis of the long-term feasibility of ~~the project~~ completing the power plant.

Rule 25-6.0423(8), F.A.C., provides that,

> A utility shall, contemporaneously with the filings required by paragraph (5)(c) above, file a detailed statement of project cost sufficient to support a Commission determination of prudence…

Q. PLEASE DESCRIBE YOUR CONCERNS WITH THE COMPANY'S FEASIBILITY STUDY IN MORE DETAIL.

A. Mr. Miller in his testimony and in his deposition of July 2, 2009 stated that the project is feasible. He offers general statements concerning similar projects in China, project success in schedule, less greenhouse gases, energy diversity, less vulnerability to supply disruptions and foreign government influences and other favorable attributes. He offers no detailed costs as required by the rule except for an update of the fuel and emission costs with no discussion of the effects of such updates on overall feasibility. The Company simply did not conduct a detailed analysis of the long term feasibility of the project as required by the Rule.

Q. WHAT DOES PEF CLAIM TO CONSIDER IN ITS FEASIBILITY CONSIDERATIONS?

A. In Mr. Miller's deposition, he states:

> When we consider feasible, we consider is it technically feasible? Is the AP1000 design as deployed at this site, the Levy site, are there any technical issues that suggest that will not work? We also consider regulatory feasibility or, if you will, the legal feasibility. Can you secure all of the permits, approvals, authorizations, licenses, like zoning permits and comprehensive -- comprehensive land use amendment, things like that? And in those cases and for both the technical and, as I described, this regulatory feasibility, the project still is feasible. Now we also consider cost, and so as we go forward, as we said earlier, on an ongoing basis, we will always consider the total project cost and make informed decisions of moving the project forward.

(Miller deposition 7/2/2009, Volume 1, page 82, Exhibit WRJ(PEF)-3, Pages 112-114 of 233.)

Q. IS MR. MILLER CORRECT IN HIS ASSESSMENT OF THE LONG TERM FEASIBILITY OF THE PROJECT?

A. There is not enough information provided for Mr. Miller or the Commission to reach such a conclusion. He states that there are three areas of consideration by PEF: technical feasibility, regulatory feasibility and cost feasibility. There are major questions in each area.

Q. PLEASE EXPLAIN THESE MAJOR QUESTIONS.

A. I will address each area separately:

- Technical feasibility. In the EPC contractor's report of May2009, the contractor states [redacted] Letter from Shawn Hughes, Westinghouse-Shaw, to Jeff Lyash, May 11, 2009, page 6 of 52 of attachment. Exhibit WRJ(PEF)-3, Pages 115-168 of 233.)

- Regulatory Feasibility. The site problem discussed above is also a regulatory problem. Additionally, Mr. William D. Johnson, Chairman, President and CEO of Progress Energy told his Board of "Landscape Changes" affecting the project. These changes include federal energy policy landscape and Florida regulatory/legislative climate. (Letter from William D. Johnson to PEF Board, April 15, 2009, page 4 of attachment. Exhibit WRJ(PEF)-3, Pages 42-43 of 233.)
- Cost Feasibility. Mr. Miller states that they are sticking with their last year's (2008) cost estimate because they won't have an updated cost estimate that until after the EPC contract is renegotiated. The truth is that PEF does not currently have an accurate cost estimate. Among other things, to have such a plant cost estimate PEF will have to have a project schedule and a renegotiated EPC contract, and they have neither. Additionally, Mr. Johnson pointed out to his Board that in the document discussed above that there are other "Landscape Change" that are affecting cost feasibility. These include financial partner negotiations (no joint owner's as of yet) and capital market deterioration.

Q. IS MR. MILLER TELLING THE COMMISSION THE SAME THING THAT MR. JOHNSON IS TELLING HIS BOARD?

A. It appears not. Mr. Miller in his May 1 testimony states that "...the essential reasons the Company selected the LNP to meet customer needs for future generation capacity have not fundamentally changed." (Miller testimony, May 2, 2009, page 26, lines 5-7. Exhibit WRJ(PEF)-3, Pages 169-170 of 233.) A few days earlier, Mr. Johnson was

telling his Board that there are now conditions for PEF to consider in deciding whether and when to proceed with the Levy project. Among these conditions are a renegotiated EPC agreement, sufficient co-ownership, credible financing plan and continued regulatory support. He points out "landscape changes" and that a 20 or 36 month schedule change will allow "additional time for certainty" on a number of issues including Obama administration nuclear position, joint owner participation, and financial markets. A project is not feasible in just a theoretical sense; instead, Levy must be feasible to the Florida ratepayers and to PEF. Mr. Johnson pointed out to his board a number of reasons why the project may not be feasible for PEF and PEF has apparently made a decision to take a 20 or 24-36 month hiatus to allow further clarity on a number of key issues.

Q. IN HIS RESPONSE TO OPC'S INTERROGATORY 47, MR. MILLER CLAIMS THAT "THE COST OF A PROJECT IS NOT PER SE DETERMINATIVE OF PROJECT FEASIBILITY." DO YOU AGREE?

A. No. While project cost is not the sole factor in determining if a project is feasible, if the cost of a project is high enough, the cost may, in fact, determine the feasibility of the project. Cost cannot be ignored in the Commission's determination of feasibility.

Q. WHAT DO YOU CONCLUDE ABOUT PEF'S ANALYSIS OF PROJECT FEASIBILITY?

A. My conclusions are as follows:

- The requirements of the NCRR have not been met. At this time, there is no accurate plant cost data and no detailed analysis as required by the Nuclear Cost Recovery Rule.

- The feasibility of the project cannot be determined without an estimate of the project cost.
- Serious questions concerning plant technical feasibility exist.
- Mr. Johnson has raised other serious feasibility questions with his Board that Mr. Miller has not discussed with this Commission.

The Commission should either: (1) enter a finding rejecting the Company's claim of feasibility, (2) spin the issue off for a feasibility determination based on a more detailed inquiry or (3) defer its determination of this issue until next year.

CRYSTAL RIVER 3 EPU PROJECT

Q. PLEASE BRIEFLY DESCRIBE THE CRYSTAL RIVER UNIT 3 EXTENDED POWER UPRATE PROJECT.

A. The Crystal River 3 extended power uprate project adds a total of 180 MWe to the existing plant. This is accomplished by increasing reactor power output and thus steam output, increasing the size and efficiency of the steam turbine and generator and increasing the accuracy of instrumentation in the plant's steam system. The project is being carried out in three phases. The Phase 1 improved the steam plant measurement accuracy of process parameters and allowed the power output to be increased by about 12 MWe. These improvements were made in 2007 and were placed in service on January 31, 2008. Phase 2 of the project will replace large portions of the steam turbines and the electric generator thus increasing efficiency and output from the current steam flow while also giving the plant the ability to utilize more steam. Using the current ability of the reactor to produce steam, phase 2 will add 28 MWe additional output because of increased efficiency. Phase 2 will be

completed in 2009. Phase 3 will increase the reactor output of steam by an additional 15.5%. This additional steam will then utilize the increased capacity installed in phase 2 to provide an additional 140 MWe for a total 1080 MWe and an overall increase of 180 MWe. (Information from Crystal River Unit 3, Extended Power Uprate, Integrated Project Plan, 09NC-OPCPOD1-4-000001, Exhibit WRJ(PEF)-3, Pages 171-197 of 233.)

Q. DID YOU IDENTIFY AREAS RELATED TO THE CR3 EPU THAT YOU BELIEVE ARE EVIDENCE OF INADEQUATE RISK MANAGEMENT?

A. Yes. The CR3 reactor is manufactured by Babcock & Wilcox (B&W). CR3 is the first B&W reactor attempted to be uprated to power levels up to 1080 MWe. The B&W design incorporates steam generators with significantly less water in the steam generators than Westinghouse or Combustion Engineering plants and this means that in some accident analyses there is less capacity for reactor cooling by boiling water out of the steam generators in an accident scenario. This does not mean that the plant is unsafe, by any means, but the safety analysis for the CR3 uprate is different for than for the other pressurized water reactor designs. This size of uprate to a B&W reactor has never before been reviewed by the NRC. The outcome is not a foregone conclusion.

Q. ARE YOU QUESTIONING THE ENGINEERING APPROACH PEF IS UTILIZING IN ITS NRC APPLICATIONS?

A. No. My point is that PEF cannot say for certain that the NRC will approve its request to the extent or in the manner requested.

Q. DOES PEF RECOGNIZE THAT THESE RISKS EXIST?

A. Yes. In their Integrated Project Plan, PEF lists five NRC licensing related items as 'Rank 9', the highest category of risk. These issues must be resolved and the solutions approved by the NRC before Phase 3 of the uprate can be implemented. If the resolutions (changes to plant equipment or operating procedures) are not approved, then the result could be a lower approved uprate level or no allowed uprate in reactor power. If that occurs, then the money being spent for phase 2 in 2009 and for phase 3 in 2010 would be largely wasted.

Q. HOW IS PEF DEALING WITH THIS RISK?

A. PEF is planning to file License Amendment Requests (LAR's) with the NRC only after phase 2 is mostly or completely finished. Review and approval of the LAR's could take a year or more. If all goes well in the review, the upgrade should proceed as scheduled.

Q. ARE THERE REASONS TO BE CONCERNED?

A. Yes. On May 19, 2008 PEF met with the NRC staff to discuss the ~~upgrade~~ uprate project. At that meeting there were four reactor system issues discussed that would require filings with the NRC for review. Two filings were promised for August 2008, one for October 2008 and another for February 2009. Of these four promised dates, only the February date was achieved as PEF has decided to combine the remaining three filings with the License Amendment Request to be filed at a later date. (NRC Summary of meeting, Adams ML081480504, Exhibit WRJ(PEF)-3, Pages 198-203 of 233.) This deferral to the LAR filings possibly indicates that PEF is having difficulty in meeting NRC requirements. On the original schedule for filing the LAR's, PEF

could have had an approval or at least a good indication on likely approval before spending the money for phase 2. At this point, the money will be spent before PEF knows if their proposed solutions will be approved. The NRC noted in its meeting summary that "This project will position Crystal River Unit 3 as the first Babcock & Wilcox plant to operate at over 3000 MWth (1080 MWe)", thus recognizing the unusual nature of the expected request. PEF's response to OPC Interrogatory 71 states that as of July 8, 2009 the resolutions of these issues are not complete and will not be filed with the NRC until the fall of 2009. (PEF response to OPC INT Question 71, received 7/8/2009, Exhibit WRJ(PEF)-3, Pages 204-205 of 233.)

Q. WHAT ARE THE COSTS ASSOCIATED WITH THE EPU PROJECT?

A. Costs from a March 2009 management review are as follows:

Year	Cost (millions $ w/oAFUDC)	%of Total
2006	2.3 (actual)	0.5%
2007	38.4 (actual)	9.0%
2008	65.1 (actual)	15.2%
2009	141.4	33.1%
2010	85.5	20.0%
2011	89.2	20.9%
2012	4.6	1.1%
Total	426.6	

(Nuclear Project Management Review, March 31, 2009-09NC-OPCPOD1-7-000071, Exhibit WRJ(PEF)-3, Pages 206-233 of 233.)

Q. DID PEF FILE THE REQUIRED FEASIBILTY ANALYSIS?

A. No. PEF submitted the annual costs.

Q. HOW MUCH OF THE CR3 EPU BUDGET WILL HAVE BEEN SPENT BEFORE THE COMPANY KNOWS WHETHER OR NOT THE NRC WILL ISSUE A LICENSE FOR THE FULL UPRATE REACTOR POWER?

A. Assuming they will know the results of the NRC review by the end of 2010, approximately 80% of the money will have been spent before it is known if the NRC will grant the full requested power uprate.

Q. COULD THE COMPANY HAVE REDUCED THE RISK BY RESOLVING THE NRC LICENSING ISSUES BEFORE SPENDING THE LARGE SUMS TO MODIFY THE SECONDARY PLANT?

A. Yes. As I stated above, if they had been able to resolve the high risk issues in accordance with the schedule given to the NRC on May 19, 2008.

Q. WHAT ARE YOUR CONCLUSIONS CONCERNING THE EPU PROJECT?

A. Proceeding with phase 2 without completing the NRC review of what PEF themselves have said are high risk issues is comparable to building almost everything in a nuclear power plant except the reactor before knowing if the NRC will approve building the reactor. PEF has not carried its burden of showing that it has accurately assessed the possibility that the NRC will not approve of the full power uprate requested. A lower risk option would have been to receive reasonable assurance of NRC approval prior to spending large sums of money in the implementation of the phase 2 uprate.

V. CONCLUSIONS AND RECOMMENDATIONS

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

A. 1. PEF has not demonstrated that it appropriately considered the known risks to the project when the EPC contract was signed.

2. Premature signing of the EPC contract has exposed the Company to potentially significant additional costs over the life of the LNP project.

3. The cost of the work suspension and the costs during the remainder of 2009 and 2010 are unknown.

4. Since the impact of the suspension of the EPC contract is not known, PEF has not met its burden of demonstrating that the projected costs for 2009 and 2010 are reasonable.

5. PEF's analysis of the continued feasibility of the project is inadequate.

6. The CR3 EPU project faces significant licensing risks which may render the project uneconomic if the NRC does not allow the requested plant modifications to allow the uprate to the full reactor power requested.

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

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

1. PEF's total revenue requirements should be reduced to reflect elimination of carrying costs related to all estimated EPC costs in 2009 and 2010. Once actual costs are known the related carrying costs can be included in the true up during the next NCRC proceeding.

2. The Commission should consider opening a separate docket to evaluate the long-term feasibility of the LNP and also concurrently order PEF to conduct a detailed feasibility analysis once the EPC contract costs are known.

3. The Commission should order PEF to determine the additional costs that have resulted from signing the EPC contract in December 2008 compared to signing the EPC contract once the actual project schedule was known.

4. The Commission should inform PEF that a prudence review of phase 2 EPU costs will be conducted if the NRC does not grant a license amendment for the full requested uprated reactor power.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

BY MR. REHWINKEL:

Q. Dr. Jacobs, did you also cause to be prepared three exhibits, WRJ-1 PEF -- (WRJ)PEF-1, (WRJ)PEF-2, and (WRJ)PEF-3?

A. Yes, I did.

Q. Do you have any changes or corrections to make to those exhibits?

A. No, I do not.

MR. REHWINKEL: Mr. Chairman, I would ask that these exhibits be given a number.

CHAIRMAN CARTER: They are shown in staff's Comprehensive Exhibit List as 99, 100, and 101. Is that correct, staff, on page 14?

MR. YOUNG: Yes, sir.

(Exhibits Number 99, 100, and 101 were identified for the record.)

CHAIRMAN CARTER: You may proceed.

MR. REHWINKEL: Thank you, Mr. Chairman.

BY MR. REHWINKEL:

Q. Mr. Jacobs, Dr. Jacobs, do you have a summary of your testimony, mindful of the five-minute rule that the Chairman reviewed yesterday?

A. Yes, I do.

Q. Could you give that at this time?

A. Yes. I would be glad to.

Good morning, Mr. Chairman and Commissioners. I have identified several issues with PEF's LNP Crystal River EPU projects that I will describe briefly here.

Concerning the Levy nuclear project, I believe that PEF's signing of the EPC agreement on 12/31/2008 was premature, given the lack of a limited work authorization schedule and lack of committed joint owners to the project. The EPC contract, the schedule in the EPC contract required that the LWA be issued by September of 2010.

When PEF signed the EPC contract, they did not have a firm schedule for review and approval of the LWA by the Nuclear Regulatory Commission, although the NRC had indicated that it would issue the schedule by the end of January 2009. Three weeks after executing this multi-billion-dollar contract, the NRC informed PEF that they would not be able to issue the LWA on the schedule that had been requested and they would not be able to issue the LWA any sooner than issuing the full combined license for the project. So therefore, the LWA was really not of value to the project after that point.

Many of the key elements in the EPC contract that PEF had just signed, including the schedule, costs, milestones, and deliverables were now not achievable, and PEF is now having to renegotiate a contract

amendment to cover these changes.

Prior to signing the EPC contract, the NRC had indicated that it was unlikely that the requested schedule could be met due to the complexity of the site characteristics and the need for additional information. I believe that PEF should not have signed the EPC contract without assurance that the LWA would be approved on the schedule that was needed for the project.

In addition, although in many PEF documents the need for joint ownership was identified as critical to the project's success, PEF signed the EPC contract with no joint owners committed to the project, and in fact, to this day have no committed joint owners.

I have an issue with the -- a concern with the lack of a feasibility study. I don't believe that -- PEF did not provide an updated feasibility study as required by the nuclear cost recovery rule.

And finally, with the Crystal River 3 extended power uprate, PEF's planning of the CR3 EPU project will result in the majority of the money for the project, hundreds of millions of dollars, being spent before PEF knows affirmatively if the NRC will allow the reactor power increase that would be needed to reach the full level of the project and to achieve the full benefit of

the EPC project.

While many nuclear plants have been uprated, this is the first Babcock & Wilcox plant to attempt an uprate of this magnitude, and the NRC's approval of the full power of this uprate is not assured at this point in time. The requested uprate requires solutions to several technical challenges, and these have resulted in the delayed submission of the license amendment request to the NRC.

That concludes my summary.

CHAIRMAN CARTER: Outstanding.

MR. REHWINKEL: Mr. Chairman, before I tender Dr. Jacobs for cross-examination, I just would like to make it -- remind the witness and make it clear that his testimony contains confidential information in it, so there is a public version and a confidential version. A significant amount of confidential information is in Exhibit 101, and I just want to caution the witness that any answer that he gives that requires him to refer to the confidential information, that he take his time and make sure that he does not disclose information. And I would also ask the other parties to be careful not to seek to inadvertently solicit that.

CHAIRMAN CARTER: Thank you.

MR. REHWINKEL: So with that, Mr. Chairman, I

tender Dr. Jacobs for cross-examination.

CHAIRMAN CARTER: Thank you, Mr. Rehwinkel. And again, as we handle -- I think everybody here should be abreast and aware of how we handle confidential information and govern ourselves accordingly. Thank you for that information.

Mr. Brew, you're recognized.

MR. BREW: Thank you. I have no questions for Dr. Jacobs.

CHAIRMAN CARTER: Mr. Davis.

MR. DAVIS: Thank you, Mr. Chair. I just have a few.

CROSS-EXAMINATION

BY MR. DAVIS:

Q. Dr. Jacobs, you have your testimony in front of you?

A. Yes, I do.

Q. On pages 18, 19, and 20, I believe you discuss the issue of feasibility.

A. Yes.

Q. And I would like to direct a few questions to you about that. Let me know when you're there.

A. I'm on 18.

Q. Now, there's some confidential information on those pages, and I don't intend to ask you about that.

A. Yes.

Q. So let me just ask the first question. You agree that an economic evaluation of the feasibility of the Levy 1 and 2 projects should be performed as part of a detailed analysis of long-term feasibility?

A. Yes, definitely.

Q. And do you have your deposition in front of you? You probably recall --

A. I have it, but I also probably recall.

Q. You recall that the company, Progress, did a cost-effectiveness test for its need determination; is that correct?

A. Yes.

Q. And at that time, the company used information available about fuel forecasts, forecasts of carbon dioxide costs, and other costs to justify the cost-effectiveness of Levy 1 and 2?

A. Yes.

MR. WALLS: Can I object to this line of questioning? This is friendly cross. They have the same position on this issue, and this is not an impeachment line of questioning.

CHAIRMAN CARTER: To the objection, Mr. Davis.

MR. DAVIS: Yes. This witness has not fully addressed the cost-effectiveness test for feasibility,

and there is a contention that Progress has made in its rebuttal submittals that this witness did not address cost-effectiveness, and I'm trying to pin him down on what his testimony is on that, that's all.

CHAIRMAN CARTER: Ms. Helton, good morning.

MS. HELTON: Good morning, Mr. Chairman. I'm struggling with how this is adverse to SACE and whether SACE could have presented its own testimony with respect to this issue, so maybe if Mr. Davis could help me out.

MR. DAVIS: Yes, I'll explain that some more. Thank you. We did present testimony that supports our position on this issue. However, you should be aware that Progress has claimed that this witness has testified adversely to our position in his deposition, and Progress has attached portions of Dr. Jacobs' deposition to its rebuttal testimony with a statement that misrepresents what Dr. Jacobs's opinions are on the issues that I am cross-examining him on. And so if the Commission were to accept Progress's interpretation of Dr. Jacobs' deposition testimony, that would definitely be adverse to our position on cost-effectiveness.

CHAIRMAN CARTER: Mr. Walls.

MR. WALLS: Well, what they're trying to do is have SACE rehabilitate the witness before he has been impeached.

CHAIRMAN CARTER: All right. We're not --

MR. DAVIS: Mr. Chair --

CHAIRMAN CARTER: Hold it, hold it. Sustained. Move on. We're not going to have any friendly cross. Move on. That's the ruling. Let's go.

MR. DAVIS: Thank you, Mr. Chair. That's all I have.

CHAIRMAN CARTER: Okay. Mr. Moyle, you're recognized.

MR. MOYLE: Thank you.

MR. REHWINKEL: Mr. Chairman, before we move on, I just would like to address something Mr. Walls said. When he said, "They are trying to rehabilitate Dr. Jacobs," there's no "they" involved. I have not solicited in any way any friendly cross of this witness. I just want to state that for the record.

CHAIRMAN CARTER: I take you at your word, Mr. Rehwinkel.

MR. WALLS: And let me apologize. I did not mean to include Mr. Rehwinkel in my objection.

CHAIRMAN CARTER: Duly noted. Let's get going, guys. Mr. Moyle.

CROSS-EXAMINATION

BY MR. MOYLE:

Q. Sir, I have just a couple of points of

clarification that I would like to ask you. In your summary, you talked about the NRC has not yet approved the uprate project, and I'm unclear. What is it that you're asking that this Commission do with respect to the fact that the NRC has not approved it, yet moneys are being spent? Are you suggesting it be at risk, or what's the --

A. Yes, I believe that money is at risk. I've suggested that the Commission take note of this. And when the final decision is identified by the NRC regarding the level of power uprate, if it's less than the full amount that the company has requested, then they should investigate the prudence of those expenditures.

Q. And you talked about the EPC contract. You're of the view that it was prematurely executed?

A. Yes.

Q. That's a disputed issue. To the extent that the Commission were to adopt your view that it was prematurely executed, what are you asking that -- be done about that, that the Commission do?

MR. WALLS: I'm going to object again to friendly cross. It's in his testimony.

CHAIRMAN CARTER: Mr. Moyle, to the objection.

MR. MOYLE: Well, it was an effort to try to

get clarification on that point.

CHAIRMAN CARTER: Ms. Helton.

MS. HELTON: If you'll give me one minute, Mr. Chairman, I want to read the positions in the Prehearing Order. I have, though, for the record, told the parties that, you know, a short line of clarification questions would be appropriate and would not be considered prohibited friendly cross. But let me look at the positions, please, and see if --

CHAIRMAN CARTER: Okay. Take a minute.

MS. HELTON: -- I think that clarification is necessary.

CHAIRMAN CARTER: Take a minute. We've been doing well so far, so let's don't mess it up on the last day.

MR. MOYLE: Hopefully last day.

CHAIRMAN CARTER: Oh, it's the last day, or maybe the last night.

MS. HELTON: Mr. Chairman, I'm looking at Issue 23, which is on page 26 of the Prehearing Order, and I see Public Counsel's position listed there. And when you turn to the next page, FIPUG's position is, "Concurs with OPC." So I'm struggling how clarification is necessary here.

CHAIRMAN CARTER: Objection sustained. Move

on.

MR. MOYLE: That's all I have.

CHAIRMAN CARTER: Thank you. Staff.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Whoa. Sorry. Mr. Walls, you're recognized for cross-examination.

MR. WALLS: Thank you.

CROSS-EXAMINATION

BY MR. WALLS:

Q. Good morning, Mr. Jacobs.

A. Good morning.

Q. Dr. Jacobs, you have no opinion that any cost incurred by Progress Energy Florida on the CR3 uprate for 2006, 2007, and 2008 is imprudent; correct?

A. That's correct.

Q. And as well, for the CR3 uprate project, you do not identify any specific cost projections for 2009 and 2010 that you challenge as unreasonable; correct?

A. That's correct.

Q. And would you also agree with me that your testimony includes no opinion that Progress Energy Florida's Levy nuclear project costs for the years 2006, 2007, and 2008 are imprudent?

A. I agree. That's correct.

Q. And you also do not question the

reasonableness of any specific 2009 and 2010 costs that the company identified for the Levy nuclear project; correct?

A. That's correct.

Q. And you would agree with me that your opinion, after reviewing PEF's project management control -- I'm sorry, project management contract and oversight controls, is that you found nothing unreasonable or imprudent in those controls; correct?

A. That's correct.

Q. And you would also agree with me that nowhere in your testimony do you express an opinion that Progress Energy Florida's accounting and cost oversight controls were unreasonable or imprudent; correct?

A. That's correct.

Q. And with respect to the Levy nuclear project, it's fair to say that your opinions are, one, that PEF was unreasonable in executing the engineering, procurement and construction contract when it did on December 31, 2008; and two, PEF's analysis of the feasibility of completing the nuclear power plant is inadequate; correct?

A. That's correct.

Q. Starting first with your opinions on the EPC contract, Dr. Jacobs, did you review the EPC before you

filed your direct testimony and before your deposition was taken in this proceeding?

A. No, I did not review the Levy EPC. I had reviewed two other very similar EPC contracts, and based on that and what I had read of the Levy EPC contract, I believed they were similar. Subsequently, I did review the Levy EPC contract, and that confirmed my belief that they are in fact quite similar.

Q. But at the time you filed your direct testimony and at the time I took your deposition, you had not read the EPC contract for the Levy nuclear project; correct?

A. That's correct.

Q. Have you ever negotiated an engineering, procurement and construction contract for a nuclear power plant?

A. I'm sorry. Could you --

Q. Have you ever negotiated an engineering, procurement and construction contract for a nuclear power plant?

A. No, I have not. Not many people have done that.

Q. Have you ever managed the application process for a new nuclear power plant at the Nuclear Regulatory Commission?

A. No, I have not.

Q. And you admit that your opinion is that the company -- your opinion is not that the company should not build the Levy nuclear power plant; correct?

A. That's correct.

Q. And you would agree with me that the decision by the company to sign the EPC agreement was a decision to proceed forward with construction of the nuclear power plant; correct?

A. That's correct.

Q. And prior to filing your direct testimony, you were aware that the company had expressed to you in discovery in this case and through documents that there were benefits to signing the EPC by December 31, 2008; correct?

A. That's correct.

Q. And prior to filing your direct testimony, you will admit you did not do any analysis to weigh the benefits of signing the EPC on December 31, 2008, against any perceived risks to determine that signing at that point in time with those risks was not beneficial; correct?

A. I'm sorry. Could you repeat that? It was a little lengthy.

Q. Prior to filing your direct testimony, you did

not do any analysis to weigh the benefits of signing the EPC by December 31, 2008, against any perceived risks to determine that signing at that point in time with those risks was beneficial; correct?

A. Well, I did not do a quantitative analysis, but I did reach the conclusion that the risks -- that the benefits did not outweigh the risks of signing at that point.

Q. And you did that based on no quantitative analysis; correct?

A. That's correct.

Q. You would agree --

A. I'm not sure. I'm sorry. I'm not sure. A lot of those, it would be very difficult to quantify. It's more of a qualitative judgment.

Q. Would you agree with me that at the time of filing your direct testimony and your deposition that it would have been reasonable for Progress to sign the EPC agreement on December 31, 2008, if it had the review schedule with the LWA and joint owners signed up?

A. If it had the review schedule that met the needs of the EPC contract, yes.

Q. Now, let's turn to your argument about the reasonableness of executing the EPC on December 31. I believe you identified two reasons in your summary, the

lack of LWA and lack of joint owners; correct?

A. Yes.

Q. Now, you reviewed the risk management process that the company had; correct?

A. Yes.

Q. And that was part of the project management documents and processes that you reviewed and found to be reasonable and prudent; correct?

A. That's correct.

Q. And the risk management process included a risk matrix that the company had; right?

A. Yes.

Q. And in that risk matrix, there was a licensing issue with the NRC. The submittal of the COLA was a risk that was identified; correct?

A. That's correct.

Q. And you understand that when Progress submitted its COLA application to the NRC, it included a limited work authorization; correct?

A. That's correct.

Q. And at the time, they identified that COLA as a risk on its risk matrix; correct?

A. Yes.

Q. And once you identify an item on a risk matrix, you have come up with a risk mitigation or

action plan; correct?

A. That's correct.

Q. And you agree that the action plan or mitigation strategy that Progress Energy Florida developed for that risk was what most utilities would do; correct?

A. Yes, I do. Their actions to mitigate the COLA risk and the LWA risk I thought were reasonable and appropriate.

Q. And you would agree with me that Progress Energy Florida implemented its action plan and risk mitigation strategy with respect to the COLA application, including the LWA; correct?

A. Yes. But I want to clarify that it would not include signing the EPC contract without the LWA approval.

Q. Well, you don't have any opinion in your testimony that Progress did not do something that it should have done with respect to that risk mitigation strategy; correct?

A. Well, what they did that they should not have done was sign the EPC contract.

Q. Do you have your deposition testimony with you?

A. Yes.

Q. Could you turn to page 48, lines 23 to 25, and page 49, lines 1 to 3?

A. Okay.

Q. Where I ask you the following question, and you gave the following answer.

Question: "I didn't see anywhere in your opinion -- in your testimony where you had an opinion that Progress did not do something that it should have done with respect to that risk mitigation strategy; is that correct?"

Answer: "That's correct."

A. That's correct. It did not do something it should have done, I agree with that. It did something it should not have done.

Q. Now, would you agree with me that after submitting the COLA application to the NRC, at that point in time, the utility did not have control over the project schedule, rather, the NRC had control over the project schedule; correct?

A. I would agree the NRC had control, but the company certainly was in the position to influence that schedule. For example, they had to respond to requests for information from the NRC, and their ability to respond sufficiently and in a timely manner to those requests for information would have an influence on the

COLA proceeding.

Q. Dr. Jacobs, turning back to joint ownership for a second, you would agree with me that it's not unreasonable for Progress Energy Florida to sign the EPC first and then joint ownership agreements; correct?

A. It's not unreasonable, but I believe that throughout the many PEF documents, it was identified that joint ownership was critical to the project. And in my view, they should have had joint owners committed before signing, not necessarily signed on the dotted line, but committed to the project.

Q. I understand your view, but you would agree that it was not unreasonable for them to sign the EPC first and then sign up joint owners in a separate agreement; correct?

A. I agree.

Q. Now, would you also agree with me that the decision for joint owners to sign up to a joint ownership agreement is ultimately the decision of those joint owners, and Progress does not have control over those joint owners to make them sign a joint ownership agreement?

A. That's true. They can certainly influence the joint owners in that regard, but they don't have -- it's ultimately the decision of the joint owners.

Q. And by the way, Progress also had a risk mitigation strategy for dealing with joint ownership that involved continued communication and providing information to them, to work with them to convince them to join the project; correct?

A. That's correct.

Q. And that was Progress's -- I'm sorry. And Progress in fact undertook and engaged in that risk mitigation strategy, didn't it?

A. Yes.

Q. And you do not have an opinion in your testimony that Progress Energy Florida did not do something that it should have done with respect to that risk mitigation strategy for joint owners; correct?

A. That's correct.

Q. Now, I want to turn to your second opinion regarding the feasibility analysis that PEF provided for the Levy project.

A. Yes.

Q. And I'm sure you're familiar with the cumulative present value revenue requirements cost-effectiveness analysis that PEF provided for the Levy units in the need case; correct?

A. Yes.

Q. And you agree with me that you cannot show me

in the rule where it tells the company that a CPVRR analysis is a test that it's supposed to undertake; correct?

A. That's true, not specifically.

Q. And you will admit that if in 2010 the load forecast or the gas forecast or the emission forecast changes such that the CPVRR analysis showed that the LNP would not prove cost-effective that year, the Commission should not make a determination that the project should not go forward based just on that analysis; correct?

A. Yes, I would agree with that. These projects are long-term projects. They're planned to run 60 years.

You know, need determination is a very difficult thing to do. There's not one formula that you can put numbers in and the answer comes out. There are many, many factors that have to be considered. And the fact that on one specific snapshot in time, due to a variety of factors, the CPVRR calculation indicates that the project is not economic at that time, that in and of itself would not be a reason to not go forward with the project. You would need to look at all -- the whole spectrum of factors involved in the project.

Q. And just to confirm, you wouldn't think that a one-year change in any of those conditions or factors is

sufficient to consider stopping the project; right?

A. That's true. But it is one factor, you know, among many factors that would need to be considered.

Q. But you would agree, as you said, this is a long-term project?

A. Yes, sir.

Q. For 60 years or more?

A. That's correct.

Q. And no one builds a nuclear power plant for what's going to happen even in the next five years; correct?

A. That's correct.

Q. And in fact, you would agree that the time period you should look at for determining whether it's feasible to build this project is over the time period the project is going to operate, 60 years or more; correct?

A. That's correct.

Q. And so you can't look at year to year about changes in gas forecasts, for example, and decide not to build a nuclear power plant; correct?

A. Not that in and of itself, but I think those factors need to be considered in -- you know, under the nuclear cost recovery rule, the company is receiving a significant benefit and recouping their costs ahead of

time. And as part of that bargain, there's also a responsibility and obligation to show that the project continues to be feasible and the most economic project for the customers, given the long time frame and all the various factors involved.

Q. So you agree with me you wouldn't build any long-term nuclear power plant on that basis, would you?

A. On what basis?

Q. On the basis of that one year change in the CPVRR.

A. That's right. I agree.

Q. I want to turn to your last issue with respect to the CR3 uprate project, Dr. Jacobs.

A. Okay.

Q. And as I understand, your concern is that PEF is spending money on the balance of plant portion of the uprate work before PEF receives the LAR for the project; correct?

A. That's right. I think from an engineering and operation perspective, the sequence of events is probably reasonable that they undertook, but from a risk management perspective, it results in PEF spending a significant fraction of the money for this project before knowing that the desired outcome will be achievable.

Q. And your concern is that the uprate project may not be cost-effective unless PEF receives the LAR for the project; correct?

A. That's correct.

Q. And with respect to that opinion, you admit that you do not have an economic analysis to support your opinion other than what you've called a "back of an envelope" calculation that someone else did for you; correct?

A. That's correct, but I still hold to that opinion that $400 million for a 40 megawatt increase would not be economic.

Q. Are you finished?

A. Yes, I am.

Q. Okay. You admit that no matter whether or not PEF gets the LAR, the uprate will lead to 28 megawatts of increased nuclear energy; correct?

A. Well, including the MUR, I think it's 40 megawatts, but that's correct.

Q. And your specific concern regarding the LAR for the project is what you call a possibility that PEF will not be granted a license for the full additional power for the uprate; correct?

A. That's correct. This is the first Babcock & Wilcox reactor that has been attempted to be uprated to

this magnitude. I think there are some technical challenges involved, and there is a possibility that they will not be granted the full uprate that's requested.

Q. You're not aware of any NRC disapprovals of any uprate project, are you?

A. No. But again, this is the first B&W plant to be uprated to this level.

Q. And there were 104 approved uprate projects by the NRC; correct?

A. Correct, and none of them B&W plants to this level.

MR. WALLS: I have no further questions.

CHAIRMAN CARTER: Thank you. Staff.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners. Commissioner McMurrian, you're recognized.

COMMISSIONER McMURRIAN: Dr. Jacobs.

THE WITNESS: Yes, ma'am.

COMMISSIONER McMURRIAN: I just wanted to get a little clarification. With your statements about how Progress Energy has prematurely signed the EPC contract, I want to clarify. What is your recommendation to us to do about that if we were to agree with you that they signed prematurely?

THE WITNESS: Well, I think generally -- I don't know exactly. I do have a recommendation in my testimony, but the general recommendation would be to identify any additional costs that result from this premature signing, be they additional carrying costs for procurement of equipment earlier than needed or additional costs that result from the renegotiation of the contract. I think these should be withheld from the recovery.

COMMISSIONER McMURRIAN: And that's in this case, or are you really talking about more in the future?

THE WITNESS: I think it would be in the future. We don't know at this time exactly what the ramifications of this will be, so it would be for a future case.

COMMISSIONER McMURRIAN: Okay. Thank you.

THE WITNESS: Yes, ma'am.

CHAIRMAN CARTER: Commissioners, anything further from the bench?

COMMISSIONER SKOP: Just one.

CHAIRMAN CARTER: Commissioner Skop, you're recognized.

COMMISSIONER SKOP: Thank you, Mr. Chairman. Good morning, Mr. Jacobs, or Dr. Jacobs.

THE WITNESS: Good morning.

COMMISSIONER SKOP: Just a quick follow-up question to, I believe, a question you were previously asked with respect to your experience evaluating EPC contracts.

THE WITNESS: Yes.

COMMISSIONER SKOP: Have you ever participated or been involved in a nuclear contract or any contract of this type of magnitude?

THE WITNESS: Well, there are not many contracts of this type of magnitude. I have been involved on the two other AP-1000 contracts.

I testified for the Georgia Public Service Commission staff regarding the Vogtle contract, and I am -- I have been identified as the independent construction monitor for the Georgia Public Service Commission, so I'll be monitoring that project throughout its life.

I also work for the South Carolina Office of -- regulatory staff in the evaluation of that contract for the Summer project. So I've been deeply involved in those two projects.

COMMISSIONER SKOP: And with respect to that last response about your testimony before the Georgia Public Service Commission, and also in South Carolina,

have either of those commissions or respective utilities entered into an EPC contract at this time?

THE WITNESS: Yes, both of them.

COMMISSIONER SKOP: Okay. And in your testimony or consulting to those respective commissions, did you ever in your testimony indicate that those respective decisions by those utilities were imprudent or improper?

THE WITNESS: No, I did not.

I would like to point out that there's one difference there, and I think it puts a slightly higher burden in Florida. In both Georgia and South Carolina, there is a cap on the amount that can be spent on the project that the utility will be able to recover, so it -- the liability to the ratepayer is capped at a certain amount. In Florida, as I understand it, there is no cap, so I think that adds an additional burden to the Florida utilities to continue to demonstrate the ongoing feasibility of the projects.

COMMISSIONER SKOP: Thank you.

CHAIRMAN CARTER: Thank you, Commissioners. Anything further from the bench?

Redirect, Mr. Rehwinkel.

MR. REHWINKEL: Just a few. Thank you, Mr. Chairman.

REDIRECT EXAMINATION

BY MR. REHWINKEL:

Q. Dr. Jacobs, Mr. Walls asked you about whether you had ever negotiated an EPC. Do you remember that question?

A. Yes. I think he said for a nuclear power plant or --

Q. Exactly.

A. -- some specific . . .

Q. And I think your response was that very few people have done that?

A. That's correct.

Q. Do you believe that you have to have negotiated a nuclear power plant EPC in order to offer an opinion or an expert opinion about one?

A. No, I don't. And in fact, to elaborate a little bit on this, I have negotiated EPC contracts for other power generating projects, and I'm on the management committee for a 600 megawatt coal project that's being constructed under an EPC contract, so I'm very familiar with how those contracts operate.

Q. Would anyone be able to offer an expert opinion before a regulatory body if the requirement was that you had to have negotiated a nuclear power plant EPC?

A. Well, very few people, and I think they would have a significant conflict to offer such opinions.

Q. And why would that be?

A. Because the only people with that experience would be the utility employees that negotiated this type of contract.

Q. You were asked some questions about feasibility analysis.

A. Yes.

Q. And I think you agreed that you would not make a decision to build a nuclear power plant based on a one-year snapshot of a feasibility analysis; is that correct?

A. That's correct.

Q. Are there, though, circumstances where changes in costs or circumstances could occur that would make a utility take a closer look at a feasibility analysis?

A. Oh, certainly. There are many things that could change. The cost, the projected cost of the project could change dramatically. The schedule, if the schedule shifted, that could cause it.

One thing that came to my mind would be -- most of these nuclear -- probably all of them are dependent on carbon, the costs for carbon in their analysis. And if something happened such that it became

clear that there would be no additional carbon tax on carbon-generating plant, that would have a dramatic impact on the economics. So there are many factors that could happen that would cause you to take a close look at the feasibility.

Q. In order to know whether factors influence the outcome of your feasibility analysis, wouldn't you have to do one first?

A. Yes, sir.

Q. Did Progress Energy Florida do one?

A. No, they did not.

Q. Why didn't they? Well, let me ask you this. Could they have done one?

A. Well, it would have been difficult, because the cost of the project is unknown at this point in time, so I think that may be one reason why they didn't do one.

Q. You were asked a question about a "back of the envelope" calculation relating to the CR3 EPU. Do you recall that question?

A. Yes.

Q. Is that an analysis that you did?

A. It was done by Mr. Jim McGaughy, one of my colleagues.

Q. Did you ask him to do it?

A. No, I did not.

Q. Did you rely on it in any way in your testimony?

A. No, I did not.

Q. With respect to the states of South Carolina and Georgia Public Service Commission testimonies, I think you testified that you did not make any recommendation about prudence or reasonableness of the EPC contracts in those states; is that correct?

A. Well, actually, I think we found that they were reasonable.

Q. Okay. Were there any analogous situations, such as a two-month -- I mean 20- to 36-month schedule shift at issue in those cases?

A. No, there were not.

MR. REHWINKEL: That's all the questions I have, Mr. Chair.

COMMISSIONER EDGAR: Mr. Chairman.

CHAIRMAN CARTER: Commissioner Edgar.

COMMISSIONER EDGAR: Thank you. Just to follow up so that -- I think I understand what I just heard. I believe I heard you say in response to questions that Progress did not do a feasibility analysis and that they would not have been able to do one because costs were unknown. Is that --

THE WITNESS: Yes. Yes, ma'am.

COMMISSIONER EDGAR: Okay. How are you defining feasibility analysis in that context?

THE WITNESS: Well, in that context, I think Mr. Rehwinkel was referring to a present value revenue requirements type of analysis.

COMMISSIONER EDGAR: And if, from your comments, they would not have been able to do that feasibility analysis or present value revenue analysis, what, in your opinion, would be, under the circumstances available to them, the appropriate analysis to do?

THE WITNESS: They could have filed a sensitivity type study with a bound of potential capital costs to sort of demonstrate at what levels of capital costs the project would continue to be economic. That would have been one possibility.

COMMISSIONER EDGAR: And is it your testimony that at the point that the decision was made to pursue this project, that that was an incorrect or imprudent decision?

THE WITNESS: I'm sorry. At what point? During the need determination? Is that --

COMMISSIONER EDGAR: Well, start there.

THE WITNESS: Well, I -- no. I think they did an appropriate analysis during the need -- although I

was not involved in that docket, I believe their analysis was appropriate.

COMMISSIONER EDGAR: Okay. And I'm not trying to mischaracterize, so please make sure that I don't. Is it your testimony now that with the information that is available to the company, and perhaps now during this proceeding to us as well, that the project should not go forward?

THE WITNESS: No, that's not my testimony at all. My testimony was that they did not file a detailed feasibility study as required by the rule, and one reason being that due to the delay in the contract -- the delay in the project, the contract is being renegotiated at this time with Westinghouse, and so the final price and cost of the project is unknown at this point in time.

COMMISSIONER EDGAR: I just feel like I'm getting in a circular -- and maybe it's just me, because we're at day whatever --

THE WITNESS: I'm sorry.

COMMISSIONER EDGAR: No, no, no, no. Don't you be.

So is it that your testimony, part of it is that they didn't file a feasibility analysis as required, but yet they couldn't because the costs are

unknown?

THE WITNESS: Yes.

COMMISSIONER EDGAR: Okay. Thank you.

MR. REHWINKEL: Mr. Chairman, may I ask --

CHAIRMAN CARTER: Hang on. I'll come back to you. Commissioner Skop.

COMMISSIONER SKOP: Thank you, Mr. Chairman.

Dr. Jacobs, I just want to follow up on a question that you were asked by Mr. Rehwinkel on redirect. In your response, you discussed about your work on reviewing the prudency of a coal plant, a large coal plant; is that correct?

THE WITNESS: Not the prudency. I'm on the management committee for the project, so I'm involved in the dealings with the EPC contractor, negotiating change orders, schedule delays, and that type of thing.

COMMISSIONER SKOP: Okay. Well, let's just briefly discuss, or I would like to clarify the EPC contract for a coal plant versus a nuclear plant. Would you agree, generally speaking, there's a substantial difference between those two types of contracts?

THE WITNESS: Yes.

COMMISSIONER SKOP: Okay. You would also agree that with respect to a nuclear contract versus a coal contract that there would be a substantial

difference between availability of long lead materials for a nuclear plant?

THE WITNESS: Yes.

COMMISSIONER SKOP: Would you also agree that between a coal plant and a nuclear plant, there would also be a substantial difference between the availability of ultraheavy forgings and queue limitations associated with those?

THE WITNESS: Yes. Those aren't required for a coal plant.

COMMISSIONER SKOP: And also, the difference between a coal plant and a nuclear plant, would you also agree that with respect to the overall length of the respective construction cycles, that the nuclear plant would be much longer?

THE WITNESS: The actual construction cycle is not significantly different between a coal plant and a nuclear plant. The lengthy part of the nuclear plant is the licensing part of the project.

COMMISSIONER SKOP: Okay. And with respect to the licensing part of the program, I think that in a response that you mentioned -- talking about the 20- to 24-month delay and how the other respective states, the Georgia Public Service Commission and South Carolina Public Commission have not been faced with such a delay

for their respective utilities. If the NRC continues to have problems with its ability to review submittals in a timely manner, in your professional opinion, would it be reasonably expected that additional delays could occur for those states who have not yet experienced them?

THE WITNESS: It's possible. There's a fair amount of margin in the schedule, so it would take a significant delay to impact the commercial operation dates of these units. I would be very surprised if it were on the magnitude of the 20- to 36-month delay that we're anticipating with Levy, but there could be some.

COMMISSIONER SKOP: Okay. Thank you.

CHAIRMAN CARTER: Anything further from the bench before I go back to Mr. Rehwinkel?

Mr. Rehwinkel.

BY MR. REHWINKEL:

Q. Yes. Just redirect, for clarification. I would ask Dr. Jacobs to turn to page 28 of your testimony. And I ask this just to try to help with clarity. You're not asking -- and look at item 3 there on lines 5 through 8. You are not asking the Commission through your testimony to take action with regard to the project based on the deficiencies in the feasibility analysis that you found; is that correct?

A. That's correct, yes.

Q. Your purpose here is to ask the Commission to require Progress to do the feasibility once they have gotten the project costs from the renegotiation; is that right?

A. That's correct. I should have made that more clear. Yes.

MR. REHWINKEL: Thank you.

CHAIRMAN CARTER: Okay. Anything further? Thank you, Mr. Rehwinkel, for that.

Exhibits.

MR. REHWINKEL: I would move 99 through 101.

CHAIRMAN CARTER: Are there any objections? Without objection, show it done. Thank you.

(Exhibits Number 99, 100, and 101 were admitted into the record.)

MR. REHWINKEL: May Dr. Jacobs be excused?

CHAIRMAN CARTER: Yes. Thank you very much. You're excused.

THE WITNESS: Thank you.

CHAIRMAN CARTER: Have a great day.

I think, Mr. Brew, you're up next. Is that correct?

MR. BREW: Yes, Mr. Chairman. We call Peter Bradford.

CHAIRMAN CARTER: Just one second, Mr. Brew.

Okay. You may proceed.

Thereupon,

PETER A. BRADFORD

was called as a witness on behalf of White Springs Agricultural Chemicals and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BREW:

Q. Good morning, Mr. Bradford.

A. Good morning, Mr. Brew.

Q. Could you please state your name and address for the record?

A. My name is Peter A. Bradford. I live -- my address is P.O. Box 497, Peru, Vermont.

Q. And who are you appearing for or on behalf of in this proceeding?

A. I'm appearing on behalf of PCS Phosphate, White Springs.

Q. And did you prepare in this matter testimony consisting of 24 pages of questions and answers?

A. Yes.

Q. And do you have any corrections to that testimony?

A. No, I do not.

Q. So if I were to ask you the questions

contained in that testimony, would your answers be the same today?

A. They would.

MR. BREW: Mr. Chairman, I ask that the prefiled direct testimony of Peter Bradford be incorporated into the record.

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

MR. BREW: Thank you.

IN RE: NUCLEAR COST RECOVERY CLAUSE

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 090009-EI

DIRECT TESTIMONY OF
PETER A. BRADFORD

Q. PLEASE STATE YOUR NAME, ADDRESS AND CURRENT POSITION.

A. My name is Peter A. Bradford. My business address is PO Box 497, Peru, Vermont, 05152. I am an adjunct professor at Vermont Law School and President of Bradford Brook Associates.

Q. PLEASE STATE YOUR EXPERIENCE IN THE FIELD OF UTILITY REGULATION.

A. I was a utility regulatory commissioner almost continuously from 1971 until 1995. I chaired the Maine Public Utility Commission (1974-5 and 1982-87) and the New York Public Service Commission (1987-95). During this time, I was involved in many rate proceedings determining the prudence of utility construction expenditures, including expenditures on nuclear power plant construction. I was also a commissioner on the U.S. Nuclear Regulatory Commission (1977-82) during which time the Commission issued more than twenty nuclear power construction permits and operating licenses. I was Maine's Public Advocate in early 1982. Since 1995, I have taught several courses related to energy policy, utility regulation and nuclear power at Yale and at Vermont Law School as well as in seminar programs at the Institute of Public Utilities and elsewhere. I have also worked with the Regulatory

Assistance Project and have testified before numerous state utility regulatory commissions.

I have consulted in several countries – including China, India, Russia and Indonesia – on issues pertaining to utility regulation and to nuclear power.

I was a member of the National Association of Utility Regulatory Commissioners ("NARUC") from 1971 until 1995 and served as its president in 1987. I served on NARUC's Electric, Gas and Communications Committees as well as on the Subcommittees on Nuclear Waste and Nuclear Economics. I was also the liaison between the Nuclear Regulatory Commission and NARUC and have testified before the U.S. Congress at least 50 times on issues relating to nuclear power.

My complete resume is attached as Exhibit PAB-1.

Q. PLEASE DISCUSS YOUR EXPERIENCE WITH ECONOMIC REGULATION OF NUCLEAR POWER PLANTS.

A. My first experience with regulating rate impacts of nuclear power came when the Maine Yankee nuclear power plant came on line in 1972. Like the operating Florida plants, Maine Yankee was a relatively inexpensive unit, and the impacts were not large. However, early good experiences turned out not to guarantee that later ones would go as well.

In New York and Maine, I chaired commissions deciding cases involving rate implications and prudence concerning the Seabrook plant in Maine, Millstone 3 in Connecticut, and the Shoreham and Nine Mile Point II plants in New York. I chaired the New York and Maine commissions when those states disengaged

from the Shoreham and Seabrook plants in ways that resulted in adequate power supplies, improved economic development and produced electric rate impacts lower than would otherwise have occurred. We also decided several proceedings allocating the costs of cancelled plants. I also reviewed proposals to spread the cost of cleaning up the Three Mile Island accident across all nuclear power plants.

More recently, I participated in the 2005 National Research Council of the National Academy of Sciences panel that evaluated the alternatives to continued operation of the Indian Point nuclear units in New York. I was also a member of the 2007 Keystone Center Nuclear Power Joint Fact Finding project, which identified points of agreement among a broad range of constituencies, including nuclear power plant owners and builders, on issues relating to nuclear power costs and the role of nuclear power in combating climate change. In 2008-2009, I was a member and co-chair of Vermont's statutory Public Oversight Panel that oversaw preparation of a report on the reliability implications of extending the operation of the Vermont Yankee nuclear power plant for 20 more years beyond 2012.

In other countries, I have participated in evaluating the need for new nuclear units as an option in Ukraine for the European Bank for Reconstruction and Development, in evaluating new nuclear power and decommissioning costs in Armenia and in evaluating the regulatory structure that would oversee the operating of the Mochovce nuclear plant in Slovakia.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am submitting this testimony on behalf of White Springs Agricultural Chemicals, Inc. d/b/a PCS Phosphate- White Springs ("PCS Phosphate"). PCS Phosphate is a manufacturer of fertilizer products with plants and operations located within Progress Energy Florida's ("PEF" or "Progress") electric service territory. PCS Phosphate receives service under various PEF rate schedules. In the last 12 months, PCS Phosphate has paid tens of millions of dollars for electric power purchased from PEF.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN FLORIDA REGARDING THE PROPOSED LEVY NUCLEAR UNITS?

A. Yes. I testified in 2008 in Docket No. 080148 (Progress Energy Florida's petition for a Determination of Need for Levy Nuclear Power Units 1 and 2).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I will show that the feasibility of constructing the Levy units as described by PEF in the certificate of need proceeding has since evaporated. The costs for customers will be greater than thought. The economic feasibility of the project may now be nonexistent. The company's filing in this case does not adequately take the changed feasibility into account. Whether the Levy project is to become a major burden on the economy in the PEF service area depends on decisions the Commission will make in this proceeding. Only by insisting that PEF demonstrate the economic feasibility and the reasonableness of spending money on the Levy units and by establishing adequate customer

protections can the Commission ensure just and reasonable rates for Florida customers, if these units are to be built at all.

This docket is the Commission's first opportunity to assess the prudence and reasonableness of PEF expenditures relating to its nuclear construction program under the nuclear cost recovery rule. It is also the Commission's first chance to evaluate the on-going feasibility of the Levy nuclear units since the issuance of the determination of need. The prudence and reasonableness of several key PEF decisions and actions need to be examined in detail. The magnitude of the changes in circumstances that have occurred in the past year has a direct bearing on the on-going feasibility of the Levy units

Q. PLEASE SUMMARIZE THE MAIN POINTS THAT YOU WILL MAKE IN YOUR TESTIMONY.

A. The rule governing the cost recovery for nuclear power plant construction requires that Progress Energy establish the prudence of its past expenditures and the reasonableness of those that it is proposing in future. The rule further requires that PEF provide a "detailed analysis of the long term feasibility of completing the power plant".

Given the magnitude of the changes in the last 12 months, Progress has not performed a review adequate to comply with the Commission's rule. In fact, the basic cost and schedule assessments necessary to a review of project feasibility are not available and apparently have not yet been done.

Furthermore, Progress' filing in this proceeding does not provide an adequate basis to "determine the reasonableness of projected preconstruction

expenditures" as required by the Nuclear or Integrated Gasification Combined Cycle Power Plant Cost Recovery Rule, Rule 25-6.0423, F.A.C. The Commission should decline to issue such a determination and should decline to permit recovery of costs incurred in the absence of such a determination because such expenditures made without such a determination would be imprudent as well as unreasonable.

Q. WOULD SUCH AN ACTION BY THE COMMISSION UNDERMINE FLORIDA'S INTENTION TO PROMOTE ELECTRIC UTILITY INVESTMENT IN ECONOMICALLY JUSTIFIED NUCLEAR POWER PLANTS?

A. No. The Commission, by requiring periodic reviews of feasibility and reasonableness of utility plans, has shown that it understands the clear difference between promoting investment and granting a blank check. The very strength of the incentives to new nuclear investment – rapid reviews, early cost recovery, repeal of the used and useful requirement for cost recovery and attenuated prudence reviews – underlines the need for the Commission to be diligent in establishing the reasonableness of PEF's potentially immense construction expenditures in this, the one forum that exists to review them.

Two decades ago, when nuclear cost overruns led to customer revolt against the resulting rate increases, the National Regulatory Research Institute ("NRRI"), the research arm of the nation's utility regulators, correctly noted that "In applying the standard of reasonableness under the circumstances, commissions, in some instances of high risk projects, have required a higher-than-normal standard of care to compensate for the high risks associated with

project decisions.....the public has the right to demand the use of superior tools and techniques to build nuclear generating facilities at the lowest reasonable costs. When the risk of harm to the ratepayer is greater, the standard of care expected from a reasonable person is higher" (NRRI, "The Prudent Investment Test in the 1980s", p. 59).

Q. WHAT ARE THE ELEMENTS THAT SHOULD BE CONSIDERED IN DETERMINING WHETHER PLANS FOR THE LEVY UNITS REMAIN REASONABLE AND FEASIBLE?

A. The Florida Commission is charged by Section 366.06 of the Florida statutes with assuring that Florida electric rates are "fair, just and reasonable". In terms of Florida Commission jurisdiction, economic feasibility must therefore be the overriding concern. The technical feasibility of the project is largely the responsibility of Progress Energy and the federal Nuclear Regulatory Commission ("NRC"). The Florida Commission has little technical jurisdiction because of the preemptive features of the federal Atomic Energy Act.

Economic feasibility is not simply a matter of determining that enough money can somehow be extracted from PEF customers to pay for the plant. The term has to mean what it would for any comparable commercial undertaking, namely that the product of the facility will not cost more than other ways of meeting the same customer needs. If it does cost more than this, it will violate the Commission's duty to set reasonable rates and will therefore not be economically feasible. Costing no more than other ways of meeting the same customer needs is, of course, necessarily the standard for a new paper mill or

refinery or computer chip plant if it is to be commercially feasible. It is also the standard that a new nuclear power plant must meet if it is being built in a state (such as Texas or Maryland) where the output must be sold into a competitive power generation market.

Q. DO ACTIONS BY OTHER APPLICANTS FOR NRC LICENSES TO CONSTRUCT AND OPERATE NUCLEAR POWER PLANTS PROVIDE A BASIS BY WHICH TO ASSESS THE PRUDENCE, REASONABLENESS AND FEASIBILITY OF THE LEVY UNITS?

A. Yes. Nine of the seventeen entities with NRC applications docketed have, according to a Moody's Investor Services report issued in June 2009, maintained only a "low" level of activity in pursuit of their projects in the last 6-12 months. One of these is Progress Energy in North Carolina. Three others, including PEF, have a "medium" level. Five others have a level of effort rated "high". Two of the applicants rated as "low" by Moody's (Exelon and Ameren) have in 2009 announced suspension or cancellation of their projects. None of the applicants proceeding at a "low" or a "medium" rate other than PEF is currently requiring its customers to pay for the plant.

Q. DOES THE MOODY'S REPORT PROVIDE OTHER REASONS FOR CONCERN AS TO REASONABLENESS AND FEASIBILITY?

A. The Moody's Report states "We view new 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. While we continue to view operating nuclear units positively, we increasingly sense that none of the issuers

actively pursuing these endeavors have taken any material actions to strengthen their balance sheets.

"In order to defend existing ratings, or to limit negative rating actions, we will look for investor-owned utilities to:

- create strategic partnerships, to share costs and risks;
- increase reliance on equity as a component to financing plans;
- moderate their dividend policies to retain cash flow; and
- adopt a "back-to-basics" focus on core electric utility operations, posing less distraction for management"

Q. HOW ARE THE CONCERNS THAT YOU HAVE EXPRESSED CONNECTED TO THE CHANGED CIRCUMSTANCES FACING THE LEVY PROJECT?

Completing the Levy units on the terms proposed by Progress one year ago is no longer feasible. A year ago, Progress hoped to be near the head of various regulatory and vendor queues. The Company also insisted that substantial overall project cost savings could be realized by constructing the two units on schedule such that Levy Unit 2 would be completed in 2017, within 18 months of Unit 1, even though this course would create substantial excess generating capacity at that time.

These crucial assumptions are no longer valid. Today, Progress cannot state how far the Levy project has fallen behind schedule, whether PEF can (or should) maintain its queue position for critical long lead time items, whether Unit 2 can be completed within 18 months of Unit 1 (or even if the second unit can be justified at all), or what the cost consequences to customers would be if

the second unit is further deferred. Neither can Progress provide answers in this docket to many other related questions.

At the same time, declining growth in customers and load have pushed both units to the fringes or beyond PEF's ten year resource planning horizon, the cost of natural gas-fired alternatives has significantly declined, and both renewable energy and energy efficiency resources are more likely to expand pursuant to federal law.

The fact that PEF has not provided, and apparently does not yet possess, essential updated expected in-service dates and total project cost undermines the justification for continuing the extraordinary measure of charging this project to customers many years before it can possibly be of any use to them. PEF's request for the Commission to approve $446 million in nuclear spending for cost recovery, approve the prudence of such amounts, and defer roughly $300 million to be amortized over five years cannot be reconciled with either the Commission's overarching obligation to require fair, just and reasonable rates or the requirements of the nuclear cost recovery rule.

Q. WHAT SHOULD THE COMMISSION DO TO ADDRESS THESE CONCERNS?

A. This project is showing symptoms of the same failure to respond to major changing circumstances that caused Forbes magazine to proclaim nuclear power "the largest managerial disaster in business history" in 1985.

I recommend the following measures:

1. The Commission should admonish PEF to the effect that its current filing does not meet the standards of thoroughness expected of a utility undertaking a project with multi-billion dollar impacts on Florida customers.

2. The Commission should state that PEF's filings must establish the economic reasonableness and feasibility of each Levy unit;

3. The Commission should suspend Levy Project nuclear cost recoveries in 2010 until PEF completes its assessment of project schedule options, negotiates whatever changes the utility deems necessary to its EPC agreement with Westinghouse/ SSW, files a detailed updated feasibility assessment, based on a current cost estimate as well as a realistic estimate of future natural gas prices, demonstrating the continuing cost-effectiveness of each Levy unit compared to alternative supply and demand resources (subject to further hearings), and receives findings of on-going feasibility and reasonableness from the Commission.

4. The Commission should schedule a separate prudence proceeding on costs related to the issues identified at pages 15-16 as well as the prudence of downsizing the planned 1,200 MWs of new combined cycle capacity at Suwannee to some 380 MWs of peaking turbines. Recovery of actual Levy costs in the nuclear capacity recovery clause for 2010 should be limited to costs actually incurred in 2008 and should be subject to final determination in the prudence docket.

5. The Commission should indicate that failure of PEF to live up to the standards to be expected of an entity undertaking construction of projects of this magnitude will result in appointment of a special master empowered to take all necessary measures to assure PEF customers of the prudence and reasonableness of PEF decision-making with regard to each Levy unit.

Q. WHICH "EVENTS SINCE THE CONCLUSION OF THE LAST PROCEEDING" HAVE CALLED THE CONTINUING FEASIBILITY AND REASONABLENESS OF THE LEVY UNITS INTO QUESTION?

A. Five events are particularly important.

First, Progress Energy has announced a delay of at least 20 months in the construction schedule, which will require revised cost estimates. At this point, the magnitude of the delay, the respective schedules of Units 1 and 2, and project cost impacts have not been determined, and, PEF maintains, will be determined in part by necessary renegotiation of the EPC contract executed at the end of 2008. Even a two year delay, which seems the minimum likely under the circumstances that PEF has described, pushes Unit 2 beyond PEF's ten year planning horizon. Further delays, which are likely, will take Unit 1 beyond the normal planning horizon as well. Similarly, the project delays also postpone and extend the time necessary for Florida ratepayers to realize any net savings even according to PEF cost-benefit calculations.

Second, the sharp drop in demand for electricity that has accompanied the national recession has postponed PEF's need for baseload generating capacity

by several years. Considered in tandem with the Levy project delay, the reasonableness of completing either unit at all is in question.

Third, the dramatic fall in natural gas prices and the accompanying rise in gas supply projections have increased the rate impacts to consumers of proceeding with the Levy Units relative to other supply alternatives. In this regard, PEF's decision, announced in its most recent Ten Year Site Plan, to downsize its planned 1,200 MWs of new combined cycle capacity at Suwannee to roughly 380 MWs of peaking turbines seems particularly perplexing.

Fourth, the availability and cost of capital on the scale required to build the plants is less foreseeable in light of the turmoil in U.S. and world capital markets.

Finally, changes affecting Nuclear Regulatory Commission licensing of the AP-1000 nuclear power plant design have introduced greater uncertainty into the licensing schedule for the Levy units.

Q. HAVE ANY EVENTS FAVORABLE TO THE FEASIBILITY OF THE LEVY UNITS OCCURRED SINCE THE NEED PROCEEDING?

A. Yes. Some decline in the cost of materials such as steel and concrete will have occurred. This reverses a trend that had driven the cost estimates for new nuclear plants up so rapidly in the years before 2008.

Q. HAVE OTHER EVENTS OCCURRED WITH IMPLICATIONS FOR THE FEASIBILITY OF COMPLETING THE LEVY UNITS ON REASONABLE TERMS?

A. Yes. The progress of climate change legislation through the U.S. Congress is important. This legislation recently passed the U.S. House of Representatives in a form containing requirements to increase energy efficiency and renewable energy production that were not reflected in the Progress petition for a certificate of need. It also contained measures to mitigate the rate impact of utility carbon cap and trade compliance actions. This legislation may also result in a charge for green house gas emissions that will favor nuclear power relative to fossil fuels, though not in relation to other low carbon sources. But, as the legislation now stands, the efficiency and renewable requirements are relatively clear. The carbon price impact for nuclear is quite uncertain.

Q. DO ANY OF THESE EVENTS HAVE PARTICULAR SIGNIFICANCE FOR THE CONSTRUCTION OF UNIT 2?

A. Yes. In its Need filing in Docket No. 080148 and its 2008 Ten Year Site Plan, Progress showed a capacity reserve margin of 33% in 2017 once Unit 2 is in service. PEF's justification of that expensive excess capacity has been that Unit 2 needed to be completed within 12 to 18 months of Unit 1 in order to realize significant capital cost savings that helped keep the original total project cost estimate below $20 billion. With the dramatic decline in demand and the project delay, completing Unit 2 within 18 months of Unit 1 may no longer be reasonable or economically feasible. In that case, not only will the substantial

savings associated with Unit 2 not be realized, but the composite costs of the two units together will rise significantly, conceivably undermining the feasibility of Unit 1 as well. If both units are deferred far enough into the future, the reasonableness of charging today's customers any part of their costs will be open to question. Clearly, the Commission needs a detailed Levy project update to be able to assess these matters. Imposition of project costs on customers should be kept to a minimum until that can be accomplished.

Q. PLEASE DISCUSS THE SPECIFICS AND THE IMPORTANCE OF THE LEVY PROJECT DELAY IN MORE DETAIL.

A. The project delay undermines PEF's objective of controlling project costs by being an "early mover." PEF needs to demonstrate both that it can maintain its place in long lead time equipment queues as a result of these delays, and that it is reasonable to do so even if it is contractually possible. The actual extent of the project delay, at this juncture, has not been determined (or at least disclosed) by Progress. This raises project feasibility questions that cannot be answered on this record. The reasonableness of building the second Levy unit slips from tenuous toward non-existent given the delay and the absence of joint owners to support the project. Captive customers should not be expected to fund in current rates a project that may be 12 years or more from entering commercial service, especially in today's difficult economy.

Finally, there are several Progress decisions and actions that led to the schedule delay that require a detailed prudence evaluation before cost recovery

is authorized by the Commission. At a minimum, the Commission should investigate the following:

1. Did Progress reasonably manage its request for the Limited Work Authorization ("LWA") upon which the project schedule (and therefore economics) vitally depended?
2. Was it reasonable and prudent for PEF to execute its EPC contract with Westinghouse/ Shaw Stone & Webster at the end of 2008 in light of the NRC's expressed concerns and the importance of receiving an LWA to maintain project schedule?
3. Was it reasonable and prudent for Progress to file its request for a Need determination and COLA in advance of securing joint ownership for the excess capacity associated with two 1,100 MWs generating units at Levy?

In the present proceeding, the Commission need only determine the prudence of the actual construction costs incurred in 2008. As a result, the Commission does not need to determine costs associated with Progress' decision to enter into the EPC agreement prior to the receipt of the LWA, as the contract was not executed until the end of 2008. For this issue, the Commission should conduct a detailed examination of the EPC execution in view of the known and reasonably expected ramifications of an unfavorable NRC reaction to the LWA request.

PEF's expectation that it would secure one or more joint owners for the Levy County units, and its failure to do so to this point, have become critical issues relating to this project. With the project delays and inevitable cost increases that

will result, the Levy project not only will create more generating capacity than PEF requires, but it will impose a major cost burden on its captive customers and their economy. This burden may prove particularly unfair if some part of the capacity for which the customers are paying is to be sold to someone else, who will not have paid their share of the construction cost.

Progress already deferred $198 million of 2009 nuclear cost recovery to mitigate near term rate impacts, and has proposed in this docket a five year amortization of roughly $300 million of the costs it claims are eligible for recovery in 2010. Of course, the deferrals eventually have to be paid, with interest, while new nuclear recovery charges are added each year. The Commission needs to reserve judgment as to the prudence of PEF's actions regarding joint ownership of the project.

Q. PLEASE DISCUSS THE SPECIFICS AND THE IMPORTANCE OF THE DECLINE IN DEMAND IN MORE DETAIL.

A. The national recession has dramatically affected the demand for electricity. Florida businesses and consumers certainly are using less electricity as a result. Progress now expects substantially slower long term growth in load. As shown in its 2009 Ten Year site Plan:

- PEF has reduced its long term customer growth assumption to 1.5 % from 2.0%.
- PEF has reduced its forecasted growth in net Energy for Load to 1.5% from 2.2%.
- PEF has reduced its forecasted growth in summer peak demand to 1.4% from 1.9%.

With these revised forecasts Progress is unlikely to need 2,200 MWs of new baseload nuclear capacity in its normal resource planning horizon.

Furthermore, there is no certainty that the recession has hit bottom or that, once it does, electricity demand will grow at nearly the rates that PEF now projects. While PEF in the Need proceeding drew repeated assurance from the fact that "no party has challenged" the forecasts which it put forward, it must now contend with the fact that reality has challenged them more devastatingly than any party could have.

Q. PLEASE DISCUSS THE SPECIFICS AND THE IMPORTANCE OF THE DECLINE IN NATURAL GAS PRICES IN MORE DETAIL.

A. The NYMEX price for natural gas today is roughly one-third the level seen during the Levy Need determination hearings last year. Scarcely a year from the date that PEF assured this Commission that "the likelihood of the low fuel price forecast occurring at all in the future is improbable" (PEF post-hearing brief in Docket No. 080148-EI, p, 25), the low fuel price forecast in fact now seems too high. Gas can now be purchased at prices that are close to, or below, the PEF low fuel price forecast for years into the future. Moreover, long term estimates of gas supply and price are being adjusted as well. The March 2009 Long Term Energy Outlook released by the Energy Information Administration shows a substantial decline in projected natural gas prices through 2030 in all five scenarios studied. See Exhibit PAB-2.

Astonishingly, PEF's updated fuel price forecast in this docket (Exhibit GM-1) fails to take into account this major shift in price and perhaps supply. The

Commission should require Progress to provide a current update to its fuel price forecasts with its updated feasibility analysis.

Q. PLEASE DISCUSS THE SPECIFICS AND THE IMPORTANCE OF THE CHANGE IN CAPITAL MARKETS IN MORE DETAIL.

A. As to new nuclear reactors, Moody's recent report observed that

> recent broad market turmoil calls into question whether new liquidity is even available to support such capital-intensive 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.

Lower debt ratings mean higher costs of capital, all other things being equal. Higher capital costs were a major cause of nuclear delays and cost overruns in the past and could easily be again, especially when combined with falling costs of alternatives.

Q. PLEASE DISCUSS THE SPECIFICS AND THE IMPORTANCE OF THE UNCERTAINTIES IN THE NRC LICENSING PROCESS IN MORE DETAIL.

A. Correspondence between the NRC and Westinghouse in April 2009 indicates that the schedule for completion of the review of the pending design amendment for the AP-1000 has slipped to August 2011. See Exhibit PAB-3. This means that the design that PEF intends to reference will not be finally approved much in advance of the date that PEF hopes to receive its license for the Levy units. Clearly the potential for delay is much larger than PEF acknowledged when it assured the Florida Commission in the need proceeding

that it was using "a standard design that the NRC has already approved" (Roderick prefiled testimony in Docket No. 080148-EI, page 16, line 6).

A further indication of uncertainty in the rollout of the AP-1000 design has been the decision to shift the reference plant designation from Bellefonte to Vogtle. While this decision may be sensible in itself, it suggests that the AP-1000 consortium's best laid plans remain subject to much more substantial changes than PEF anticipated in its testimony just a year ago.

Progress has relied heavily on the NRC's meeting of its announced schedules despite the facts a) that the revised licensing process is untested and b) that the industry has presented the NRC with a consistently changing profile rather than the firm commitment to certified designs on which those schedules have been based. Reasonableness criteria require that a considerable degree of uncertainty be attached to these schedules and reflected in decisions to make commitments having large implications for customer rates. The fact that Florida law largely assures that customers will pay for the consequences of these decisions heightens rather than diminishes the degree of prudence that Progress owes to its customers.

Q. PLEASE SET FORTH ANY ASPECTS OF YOUR PRIOR TESTIMONY THAT ARE RELEVANT TO THIS PROCEEDING.

A. In my testimony a year ago, I expressed concern that Progress was underestimating well known nuclear construction risks that it was seeking to shift onto its customers. Events have borne this out. Significant delays in the Levy project have occurred at the outset that will have material cost

consequences. The "streamlined" NRC licensing process also is not going as planned. The NRC has run into difficulties as the standard designs – as yet unbuilt in the U.S. - have fallen behind the individual license applications for projects that will use those designs, so much so that Chairman Jaczko has indicated that the industry as a whole would benefit if the NRC slowed down some individual applications to focus on completing the generic design reviews. Any problems in coordinating completion of these reviews could affect the Levy project timetable.

My previous testimony noted the risks in relying on an "Economic Benefits Assessments" that treated construction costs and schedules as if they were etched in stone in comparing them to speculative projections of natural gas and CO2 compliance costs in the years 2040 and beyond. Of course, the construction schedule has indeed slipped, while natural gas costs have fallen dramatically. Yet Progress has reduced its future gas generation while insisting on continuing to expose its customers to nuclear costs that it cannot now estimate. Adherence to a pre-determined path in the face of changed circumstances was a hallmark of troubled nuclear projects in the past, and remains a red flag today.

I also cautioned that the year-by-year prudence reviews set in motion by the certificate of need would largely insulate Progress from the large consequences of any imprudent decisions, because the consequences would reveal themselves years after the decisions had been made. PEF's decisions regarding the LWA, the decision to sign an EPC last December, and the

circumstances regarding PEF's pursuit of joint owners are concrete examples of this. No prudence review of those decisions has been conducted. Such reviews are needed before final cost recovery is permitted. However, even if imprudence were found, the dollar consequences are likely play out over many years, years during which they may not be subject to commission review at all unless protections are put in place now.

In the need docket, I concluded that "To protect customers, and restore some of Progress' incentive to control project cost and schedule, the Commission should establish reasoned limits or conditions on its finding of need for the Levy units". That remains my view as to Commission findings of the reasonableness of PEF's future plans. The NRRI publication that I cited above notes that such limits were established not only in New York, as I testified in 2008, but twice in Connecticut and in New Jersey (pp. 76-78). They were also part of a settlement at Diablo Canyon in California. Both the customers and the utility require a clear statement as to the highest acceptable price for the power from the Levy units.

Finally, I indicated that new nuclear power was not necessarily an essential part of a least cost strategy to combat climate change. The changes discussed above tend to confirm this point. They increase the likelihood that measures such as efficiency, renewables and grid enhancement will be able to shoulder the burden in the electric sector for years to come, especially given the lower cost projections for natural gas as a swing fuel. However, the more committed

Progress becomes to both Levy units, the less willing it becomes to consider competing solutions.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AS TO MEASURES THAT FLORIDA REGULATORS SHOULD ADOPT IN THIS PROCEEDING.

A. My conclusions are as follows:

- The Commission should confine the scope of any prudence determination to costs actually incurred in 2008.
- The Commission should conduct separate prudence hearings on the LWA and EPC contract issues discussed above.
- The Commission should reserve a prudence determination on PEF's pursuit of joint owners for the Levy project for an appropriate time and make all cost recoveries subject to the outcome of that review.
- The Commission should limit or suspend all future Levy project cost recovery pending receipt and public review of a detailed updated project reasonableness and feasibility analyses that contain updated total project cost and schedule evaluations and a thorough cost-effectiveness demonstration.
- The Commission should admonish PEF to the effect that its current filing does not meet the standards of thoroughness expected of a utility undertaking a project with multibillion dollar impacts on Florida customers.
- The Commission should state that PEF's filings must establish the economic reasonableness and feasibility of each Levy unit.

- The Commission should indicate that failure of PEF to live up to the standards to be expected of an entity undertaking construction of projects of this magnitude will result in appointment of a special master empowered to take all necessary measures to assure PEF customers of the prudence and reasonableness of PEF decision-making with regard to each Levy unit.
- Finally, to reassert a point that I made a year ago, the Florida Commission faces a crucial need to avoid commitments to costs that are open-ended and unlimited. Investors have proven unwilling to shoulder such exposure. Regulators should be clear as to the limits on the amounts that can be charged to the customers, and those limits should not exceed the costs of the next best alternatives. By setting and enforcing such limits, the Commission will be benefiting both customers and utility investors as well as the Florida economy.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes.

BY MR. BREW:

Q. Mr. Bradford, did you also cause to be filed three exhibits that accompanied your prefiled testimony?

A. Yes.

MR. BREW: Your Honor, I note that they are labeled PAB-1 through 3, and on the Composite Exhibit List, they're labeled or numbered 102 through 104.

CHAIRMAN CARTER: That's on page 16. Thank you, Mr. Brew.

(Exhibits Number 102, 103, and 104 were identified for the record.)

BY MR. BREW:

Q. Mr. Bradford, do you have a summary of your testimony?

A. I do.

CHAIRMAN CARTER: Mr. Brew, has Mr. Bradford been sworn already?

BY MR. BREW:

Q. Excuse me. Were you sworn yesterday?

A. I was.

CHAIRMAN CARTER: Okay. Good. Thank you.

BY MR. BREW:

Q. Do you have a summary of your testimony?

A. Yes.

Q. Would you please give it now?

A. I want to emphasize the following points from my testimony:

First, the concept of feasibility as used in the Commission's cost recovery rule must encompass economic feasibility. The Commission is, after all, fundamentally an economic regulatory agency, and more reactors have been canceled because they became economically unfeasible than for all other causes combined. Moreover, builders of nuclear power reactors in regions where cost recovery occurs through power markets routinely recognize that projects that are not economically feasible cannot be built.

Economic feasibility means that the plant must be expected, using current and realistic assumptions, to produce power that will yield lower electric bills for PEC territory than any reasonable alternative, with allowance for the public policies in Florida and the nation. The present PEF filing makes no detailed feasibility showing, and therefore cannot be a basis for cost recovery.

Second, the changes in the circumstances confronting the Levy project over the past 12 months are no ordinary year-to-year fluctuations. No other year in my 30 years of experience with the electric industry has seen such a combination of demand drop, economic

slowdown, capital market contraction, natural gas price decline, and potential changes in national energy legislation. In addition, the project is delayed a minimum of 20 months.

These changes are fundamental, and many were in prospect when the EPC was signed in late December. They have altered the structure of long-term electricity and energy markets in Florida and elsewhere. If they were ordinary fluctuations, a reasonable likelihood would exist that the next year or two would erase them, restoring the PEF 2008 view of Florida energy markets. No such likelihood exists.

In the face of such changes, somewhere between one-quarter and one-third of the U.S. renaissance fleet, including most of the AP-1000s, were canceled or deferred for several years during the first half of 2009, largely because the proposed plants were no longer economically feasible.

To protect Florida customers, I urge the Commission to take the following steps:

The Commission should confine the scope of any prudence determination in this proceeding to costs actually incurred in 2008.

The Commission should conduct separate prudence hearings as to the EPC issues discussed in my

testimony, hearings at which the Commission staff and other parties have a full opportunity to examine the entire range of prudence issues and their consequences.

To this end, the Commission should limit or suspend all future Levy cost recovery pending receipt and public review of detailed, updated project reasonableness and feasibility analyses that contain updated total project costs and schedule evaluations and a detailed cost-effectiveness demonstration.

The Commission should state that PEF's filings must establish the economic reasonableness and feasibility of each Levy unit individually.

The Commission should admonish PEF to the effect that its filings in this proceeding do not meet the standards of thoroughness expected of a utility undertaking a project with multi-billion-dollar impacts on Florida customers.

The Commission should indicate that continued failure of PEF to live up to the standards to be expected of an entity undertaking construction of such a project will result in the appointment of a special master empowered to take all necessary measures to assure PEF customers of the prudence and reasonableness of PEF decision-making with regard to each Levy unit.

Finally, to reassert a point I made in the

need proceeding, the Florida Commission faces a crucial need to avoid commitments to costs and rate impacts that are open-ended and unlimited. Investors in other utilities have proven unwilling to shoulder such exposure. This does not mean that the Commission should somehow cancel the Levy units. Rather, by setting and enforcing clear limits on the amounts that can be charged to customers, the Commission will be benefiting both the customers and the utility investors as well as the Florida economy.

With such limits in place, the interests of Progress Energy shareholders will be properly aligned with those of its customers. The company could then decide for itself whether the Levy units are in the best interest of its service territory and the company itself.

MR. BREW: Mr. Chairman, I tender the witness for examination.

CHAIRMAN CARTER: Thank you. Great summary, great summary.

Mr. Davis.

MR. DAVIS: No questions.

CHAIRMAN CARTER: I was going to ask Mr. Rehwinkel, but I assume he has no cross.

Mr. Moyle.

MR. MOYLE: No questions, Mr. Chairman.

CHAIRMAN CARTER: Mr. Walls. Oh, Ms. Triplett.

MS. TRIPLETT: Thank you.

CROSS-EXAMINATION

BY MS. TRIPLETT:

Q. Good morning, Mr. Bradford.

A. Good morning.

Q. You spent about 25 hours in preparing your testimony in this proceeding; is that right?

A. I -- yes.

Q. Thank you. And in your testimony, you did not challenge the prudence of any costs with respect to the CR3 uprate project; is that right?

A. That's right.

Q. You also did not challenge the prudence of PEF's accounting and cost controls oversight -- cost oversight controls for the CR3 uprate project; is that right?

A. That's correct.

Q. And you further did not challenge the project management, contracting, or cost oversight controls for the CR3 uprate project; correct?

A. Correct.

Q. And turning to the Levy project, you did not

challenge the prudence of PEF's costs for the Levy project for 2006 through 2008; correct?

A. Correct.

Q. And you're also not challenging any of PEF's project management policies and procedures that apply to the Levy project; correct?

Do you need me to repeat the question?

A. No. I'm weighing -- let me just ask you to be clear what you mean by policies.

Q. Well, let me ask you again. You are not challenging any of PEF's project management policies and procedures that apply to the Levy project, just the policies and procedures themselves?

A. Let me answer it this way. I am challenging the wisdom of the decision to sign the EPC. If within your question you would consider that a management policy, then I'm challenging it.

Q. Do you remember -- do you have your deposition transcript with you?

A. I do.

Q. Could you just turn to page 15 of that transcript? And on line 5, I asked you the same question there. I asked you, "Are you challenging any of the company's project management policies and procedures that apply to the Levy project?" And you

answered, "No." Is that answer -- was that answer correct?

A. You have correctly read my deposition, yes.

Q. And you were under sworn -- you were sworn under oath when you gave your deposition testimony; is that right?

A. That's true. And I'll stand, though, by my answer today, that if by the concept of project management policy you include the actual decision to sign the EPC, my testimony does challenge that.

Q. Do you have your direct testimony?

A. Yes.

Q. Can you turn to page 16?

Are you there?

A. I'm there.

Q. And looking at this page, we can see the three things that you were challenging in this case regarding the Levy project; is that right?

A. Yes.

Q. And the first thing you challenge there are PEF's actions regarding the limited work authorization or the LWA that PEF requested for the Levy project; right?

A. Yes.

Q. And your opinion with regard to the LWA is

that there is a, quote, substantial likelihood that PEF should not have gone forward with the Levy EPC contract until it had the LWA in hand; is that right?

A. I'm sorry. Are you quoting from my testimony?

Q. I'm quoting from your deposition. Do you want me to point you to that?

A. I think you should, because my recollection is that the sentence is a little longer than that and that it refers not only to having it in hand, but also having a more definite schedule as to when it could be expected.

Q. Can you turn to page 18 of your deposition transcript?

A. Yes.

Q. And on line 8, I asked you, "What do you opine that PEF should have done differently regarding the LWA?"

A. Right.

Q. And you answer, "What I'm opining is that there is a substantial likelihood that Progress should not have gone forward with the EPC until it either had the LWA in hand or a much higher degree of assurance than turns out to be the case that it would have had the LWA in hand." Do you see that?

A. Yes. That's correct.

Q. When I asked you what you meant by the term "substantial likelihood," you told me that your opinion is that there is a better than 50-50 chance that PEF should not have signed the EPC without the LWA in hand; is that right?

A. Or a much higher degree of assurance, yes.

Q. And with respect to your opinions in this regard, you do not allege that there will certainly be any negative financial impact to PEF's customers stemming from PEF's actions regarding the LWA; is that correct?

A. Let's see. Are you quoting my deposition again, and if so, can you point me to the line?

Q. Certainly. Page 19, and I'm on line 18.

A. The last line, yes. And what I said was that it's a possibility, but not a certainty.

Q. So your testimony is that it's possible, but not a certainty, that there would be any negative financial impact to PEF's customers?

A. That's correct.

Q. And the next issue you raise on page 6 of your prefiled testimony is PEF's actions regarding the engineering, procurement and construction contract for the Levy project; is that correct?

A. Yes.

Q. And your opinion in this regard is that there is a substantial likelihood that PEF should have waited until it had the LWA for Levy before signing?

MR. BREW: Excuse me, Mr. Chairman. It's a little confusing when she shifts between the deposition and the testimony. If she's referring to a source, could I ask that she indicate what she's working off of?

CHAIRMAN CARTER: Well, she can ask her question, and if he's not sure, he can -- like he said before, "Are you at my deposition." He can just say that. He'll be able to have her point it to him before he answers.

MR. BREW: Thank you.

CHAIRMAN CARTER: You may proceed.

BY MS. TRIPLETT:

Q. Do you need me to repeat the question?

A. Yes, would you?

Q. Sure. I think we just talked about this. Your opinion is that there is a substantial likelihood that PEF should have waited until it had the LWA for Levy before signing the EPC?

A. And you're taking the phrase "substantial likelihood" from my deposition?

Q. Yes, sir.

A. Okay. And --

Q. Page 25.

A. I'll give you the same answer, then. I used the phrase "substantial likelihood" in the context of a sentence that said not only had the LWA in hand, but also allowed for a much higher degree of assurance than turns out to be the case that it would have the LWA in hand.

Q. And again, your definition of "substantial likelihood" is greater than a 50-50 chance?

A. Yes.

Q. And using your words from your deposition, you would have to speculate as to whether or not PEF's actions regarding the EPC contract have caused PEF's customers any financial harm; is that right?

A. Yes.

Q. And the final issue you raise on page 16 of your direct testimony is with respect to PEF's actions regarding the joint ownership for the Levy units; is that right?

A. Yes.

Q. And your opinion for this last issue is that --

A. Actually, Ms. Triplett, if I could, let me just be clear, though. When you say the final issue, all three of those issues are in the context of the

sentence that comes ahead of them, which says, "At a minimum, the Commission should investigate the following." So I don't need to confine the investigation to those three issues.

Q. Understood. So back to the third issue on page 16 of your testimony, your opinion for this one is that there is a reasonable likelihood that PEF should have obtained joint owners before going forward with the determination of need and the COLA for Levy; is that right?

A. Yes.

Q. And unlike your earlier two opinions where you say there is a substantial likelihood of something happening, for this opinion you used the different term of "reasonable likelihood"; correct?

A. In my deposition I did, yes.

Q. And when I asked you in your deposition what the term "reasonable likelihood" means, you told me it means something significantly more than a slight possibility, but somewhat less than certainty; is that correct?

A. That certainly sounds right, but why don't you point me to the lines and I'll verify it.

Q. Sure. Starting on page 28, lines 18 to 19, and going forward to the next page, 29.

A. Yes.

Q. So your opinion regarding joint ownership for the Levy project is that there is significantly more than a slight possibility, but somewhat less than a certainty, that PEF should have acquired joint ownership for the Levy project prior to filing a need case or a COLA application; is that right?

A. Yes.

Q. And my final line of questioning, sir, with respect to a feasibility analysis for a nuclear plant such as the Levy project, you agree with me that there is more than one way to do an economic feasibility analysis, and that there is no doubt several different methodologies that could be deemed reasonable; right?

A. I agree with you. It does sound as though you're quoting from my deposition again. Can you give me the lines?

Q. Sure. Page 59, lines 4 through 9.

A. Yes, you've quoted it accurately.

Q. And in determining what kind of feasibility analysis to perform and submit to a regulator, you agree with me that it is up to the utility as to how to do that; correct?

A. Certainly in the first instance. I mean, they must ultimately comply with the relevant regulatory

requirements, but, yes.

MS. TRIPLETT: Thank you, sir. No further questions.

CHAIRMAN CARTER: Thank you. Staff.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners, anything from the bench?

Redirect.

MR. BREW: None, Mr. Chairman.

CHAIRMAN CARTER: Exhibits. You're showing 102, 103, and 104.

MR. BREW: Yes. I would like to move 102 through 104.

CHAIRMAN CARTER: Are there any objections? Without objection, show it done.

(Exhibits Number 102, 103, and 104 were admitted into the record.)

CHAIRMAN CARTER: Thank you, Mr. Brew. Thank you, Mr. Bradford. I think you can be excused. Nothing further for this witness; right? Thank you very kindly.

Mr. Davis, you're recognized?

MR. DAVIS: Thank you, Mr. Chair. SACE calls Dr. Mark Cooper to the stand.

CHAIRMAN CARTER: You may proceed.

Thereupon,

MARK COOPER, Ph.D.

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

DIRECT EXAMINATION

BY MR. DAVIS:

Q. Good morning, Dr. Cooper. Can you state your name and your business address, please?

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

Q. And have you filed prefiled testimony in this proceeding consisting of 39 pages?

A. Yes, I have.

Q. If I were to ask you the same questions as posed in your prefiled testimony today, would you respond in the same fashion?

A. Yes, I would.

Q. Are there any corrections to your testimony?

A. No.

MR. DAVIS: Mr. Chair, we tender the testimony of Dr. Cooper.

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

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/EERSessavings.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

treated separately form overnight costs. FPL assumes a zero real cost escalation. That is, the rate of increase in the cost of construction equals the rate of inflation. Many other studies assume significant, real cost escalation.

FPL calculated a fixed cost recovery factor, which is the cumulative present value of the revenue requirement per $1/kW of overnight capacity (the $1/kW factor). It is not clear to me how the escalation of construction costs is included in the calculation of the revenue requirement. It could have been embedded in the stream of costs as a percentage of the construction cost. If one wants to test an alternative escalation rate, one would have to modify the calculation of the $1/kW recovery factor. The $1/kW factor has changed significantly between 2007 and 2009, as shown in Exhibit MNC-13. The decline in the implicit $1/kW factor accounts for between one-tenth and one-quarter of the increase in the breakeven capital figure.

Q. Please describe your concerns about excess capacity.

A. The breakeven analysis essentially calculates how much nuclear capacity can be purchased with the variable cost savings from building new nuclear reactors. Over 90 percent of the savings comes from variable costs, largely fuel costs. In other words, nuclear capacity is paid for with fuel cost savings. The analysis proceeds in two steps. First, the system costs are calculated with and without nuclear capital costs, then the cost of building nuclear reactors is compared to the amount of money available from the savings.

The operating cost estimates should not include excess production and the 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.

BY MR. DAVIS:

Q. And, Dr. Cooper, have you also attached exhibits to your prefiled testimony, which are in this particular case numbered 46 through 69?

A. Yes, I have.

CHAIRMAN CARTER: It would be 46 through 60.

MR. DAVIS: I'm sorry. I jumped ahead.

CHAIRMAN CARTER: Forty-six through 60.

MR. DAVIS: Thank you.

CHAIRMAN CARTER: That's fine. No problem. You may proceed.

(Exhibits Number 46 through 60 were identified for the record.)

BY MR. DAVIS:

Q. Have you prepared a summary of your testimony, Dr. Cooper?

A. Yes, I have.

Q. Would you present that, please.

A. Mr. Chairman and members of the Commission, 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 Progress's reactors. Demand projections have declined sharply, and federal policy-makers are contemplating substantial reductions in demand as a part of climate

policy. The costs of reactors have 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 cost has yet to be defined. As a result, the financial risk of these plants has grown dramatically.

Moody's now considers the decision to build 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 canceled plants.

Because of the dramatic shift in load growth and the other factors I mentioned, there are much less costly, much less risky options available in the near term to meet the need for electricity and buy time for greater certainty before a commitment is made to place the burden of major nuclear construction costs on ratepayers. My testimony shows that not only cost, but also uncertainty and diversity, all argue for pursuing alternatives rather than nuclear reactors at this time.

The economic analysis presented by Progress does not fully reflect the economic reality that the Levy reactors face today. The economic recession and the unfolding transformation of economic activity have

pushed any possible need for the new reactors out by a half a decade or more, and that is without any major change in federal policy promoting efficiency. In fact, however, federal requirement 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 the reactors even longer. If the full target of a 20 percent reduction in demand for renewable generation is achieved -- for non-renewable generation is achieved, the peak load projection for 2017 made in the 2008 ten-year plan would not be reached until two decades later. The pending legislation also will decrease the cost of carbon mitigation, further undermining the economics of the reactor.

The price of natural gas has tumbled and separated from the price of oil. Our estimates of natural gas resources have increased dramatically, further undermining the long-term economic feasibility of the reactors. The natural gas prices used in the recent analyses reflect a bubble in natural gas which has burst and is not likely to return.

There's also growing concern about the execution risk of building a new generation of nuclear

reactors. In contrast, confidence in efficiency has grown.

These dramatic changes in the decision-making environment mean that the analysis presented by Progress is centered on a set of assumptions that do not reflect the current or likely future reality in which the reactors would proceed. If they had a realistic set of scenarios, the preponderance of the evidence would be negative, and they would not pursue these plants in a logical management analysis.

This does not mean the Commission should stop evaluating the nuclear option. On the contrary, in my testimony I stress that prudent action requires constant evaluation and re-evaluation. And therefore, I recommend key steps to ensure that the Commission does in fact have a full and comprehensive record before it. These include ensuring the most up-to-date assumptions about critical economic parameters, factoring excess capacity into the analysis so that the costs of carrying excess capacity are fully recognized in the economic analysis, integrating resource planning into the feasibility analysis, and pinning down the cost of nuclear with binding cost estimates. Only with a full and comprehensive clean slate review can consumers in Florida be protected from the costs of making decisions

that are infeasible in the long term.

Thank you.

CHAIRMAN CARTER: Thank you.

MR. DAVIS: We tender Dr. Cooper.

CHAIRMAN CARTER: Thank you. Mr. Brew.

MR. BREW: Thank you. I have no questions for Dr. Cooper.

CHAIRMAN CARTER: Mr. Moyle.

MR. MOYLE: No questions.

CHAIRMAN CARTER: Ms. Triplett or Mr. Walls. Ms. Triplett, you're recognized.

MS. TRIPLETT: Thank you.

CROSS-EXAMINATION

BY MS. TRIPLETT:

Q. Good morning, Dr. Cooper.

A. Good morning.

Q. Could you please remind me as to the educational degrees that you hold?

A. I hold a bachelor's in English, a master's in sociology, and a Ph.D. in sociology.

MS. TRIPLETT: Thank you, sir. No further questions.

CHAIRMAN CARTER: Thank you. Staff?

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners, anything from

the bench? Redirect.

REDIRECT EXAMINATION

BY MR. DAVIS:

Q. Dr. Cooper, what is your experience in analyzing the factors that you've described in your testimony?

A. I have been analyzing -- doing economic analysis and analyzing energy and communications policy from an economic point of view for about 30 years. The first utility case in which I participated 27 years ago was in fact a case involving a nuclear reactor.

Q. And do you perform research and publish in the area of analysis of policy and issues such as we're dealing with in this --

A. Yes. I have published both chapters and articles in law reviews and trade publications dealing with energy analysis, electricity analysis.

And in fact, the analysis of economics as we know it has in recent years been scrambled by behavioral economics, which is a very large discipline. Numerous Nobel Laureates have been named in behavioral economics in the past decade. And so the traditional approach to economics, which is very formal in the U.S. discipline in economics departments, has in fact been expanded, and I frankly find that the sociology training, which sort

of stands between the psychology of behavioral economics and the structural analysis of the traditional economics profession, provides a really solid basis for looking at these complex factors. And as I show in my testimony, it's not only economics, but uncertainty that really determines prudent decisions and reasonable decisions.

Q. Have you recently performed a study and published a record about the economics of the new nuclear power plants?

A. Yes, I have. Much of the analysis I presented in my testimony was based on that, and a copy of that study was provided in response to a discovery request.

MR. DAVIS: Thank you, Doctor.

CHAIRMAN CARTER: Thank you very kindly.

Exhibits 46 through 60. Are there any objections? Without objection, show it done.

(Exhibits Number 46 through 60 were admitted into the record.)

CHAIRMAN CARTER: Thank you, Dr. Cooper. You are excused, and have a great day.

MR. DAVIS: SACE would next call Arnold Gunderson.

Thereupon,

ARNOLD GUNDERSEN

was called as a witness on behalf of Southern Alliance

for Clean Energy and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DAVIS:

Q. Good morning, Mr. Gundersen.

A. Good morning.

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

A. My name is Arnold Gundersen, spelled with an E. I'm chief engineer with Fairewinds Associates, 376 Appletree Point Road, in Burlington, Vermont.

Q. Mr. Gunderson, have you filed prefiled testimony in this matter?

A. Yes, I have.

Q. And have you also prepared exhibits and attached those to your testimony?

A. Yes, I have.

Q. If I were to ask you the same questions as posed in your prefiled testimony today, would your answers be the same?

A. There was a typo on page 10, line 12. I wrote "coal." I should have put "fossil". With that exception, the answer is yes.

MR. DAVIS: Okay. We tender his testimony for the record.

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.

THIS PAGE IS LEFT BLANK

FOR PAGINATION PURPOSES

BY MR. DAVIS:

Q. And do you have exhibits that are numbered 61 through 69 that have been attached to your prefiled testimony?

A. Yes, I do.

CHAIRMAN CARTER: For the record, Commissioners, that's on page 16.

(Exhibits Number 61 through 69 were identified for the record.)

MR. DAVIS: At this point, we tender the witness for cross.

CHAIRMAN CARTER: Do you want to do a summary?

MR. DAVIS: I'm sorry.

CHAIRMAN CARTER: That's fine. That's okay.

BY MR. DAVIS:

Q. Mr. Gunderson, do you have a summary that you would like to provide to the Commission?

A. Yes, I do.

Q. Please provide it.

A. Good morning, Mr. Chairman and Commissioners. In my 35 years as a nuclear engineer and a senior vice president of a nuclear licensee, including work at 70 reactors nationwide during the last industry boom, I never saw a reactor completed on schedule or on budget, yet the whole industry was positive at that time about

schedules and budgets, just like Progress is today.

On Tuesday I addressed four problems impacting the schedule, and thus the cost of Turkey Point 6 and 7. All of these problem areas, licensing, equipment delays, personnel shortages, and the complications involved in the construction, are present on Progress's Levy site, and in most cases, they're more advanced. The reason that is is that Levy started sooner than Progress and has already had to face the reality of an overly aggressive schedule.

I would like to focus on just the distinctions between Levy and Progress as they relate to the Levy site. One key difference is that the Levy reactors were planned to enter operation sooner, in 2006 -- in 2016, rather, instead of 2018 for the Turkey Point units. That had a greater impact on Levy's licensing schedule. I stated that the licensing process is strewn with obstacles, which I described in my testimony. It's obvious that the process did not -- it's obvious that Progress did not allow for significant licensing delays that have occurred, and I predicted further licensing delays would occur.

Since I wrote that opinion seven weeks ago, I've been proven correct. On July 28, the NRC notified Progress that the COL would be delayed because of

geology at the Levy site, and then on August 28th, the NRC notified all the AP-1000 applicants that the AP-1000 applications would be delayed further because of containment sump design problems.

I am not clairvoyant. These and other licensing delays were foreseeable long before I wrote my opinion. While both Levy and Turkey Point are what are called first wave nuclear plants, Levy is at the beginning of the first wave, while Turkey Point is further behind on the wave.

Additionally, I note in the report that further licensing delays may occur at the back end. This Part 52 license is designed to push the burden to the front. However, there are opportunities for intervention at the end, and this is a process that has not been tested. I also note that the AP-1000 design has never been constructed and has never been operated, so that there are risks for schedule change in the future.

Now, there's two types of schedule change that I want to touch on. The first type is what I would call sliding, and that would be taking a five-year construction schedule and pushing it back by 20 or 36 months, and that seems to be what we're talking about so far. But what I'm talking about in addition to sliding

the schedule is elongating the schedule. And by that, the construction delays I'm talking about, the equipment availability delays I'm concerned about, and the shortage of skilled personnel are not going to slide the schedule. They're going to elongate the schedule.

So the four types of problems that I have acknowledged have been and will continue to be foreseeable. PEF has been forced to accept the schedule slide of at least 20 months because its original schedule was overly aggressive. I believe, based on my experience, that schedule elongation from construction delays is also inevitable and is not now being addressed.

The Public Service Commission has not been provided with a feasible Levy plant schedule, and hence there's no reliable cost estimate, and hence the long-term feasibility of Levy has not yet been demonstrated.

Thank you.

MR. DAVIS: We tender the witness for cross-examination.

CHAIRMAN CARTER: Thank you. Mr. Rehwinkel. Mr. Moyle.

MR. MOYLE: No questions.

CHAIRMAN CARTER: Ms. Triplett or Mr. Walls.

Ms. Triplett, you're recognized.

MS. TRIPLETT: Thank you.

CROSS-EXAMINATION

Q. Good morning, Ms. Gunderson.

A. Hi. Nice to meet you in person.

Q. You too. With respect to your testimony in this case, you did not look at the Crystal River 3 uprate project at all; correct?

A. That's correct.

Q. And logically, then, you did not provide any opinions on the CR3 uprate project in this matter; correct?

A. That's correct.

Q. And with respect to the Levy project, your testimony does not address the Levy costs for 2006 through 2008; is that correct?

A. My testimony addressed the long-term schedule and the long-term ramifications on cost, but no specific costs in 2006 or 2007, that's correct.

Q. Well, let me just make sure. For 2006, 2007, and 2008 actual Levy costs, your testimony does not provide any opinions regarding those costs; correct?

A. That's correct. I only looked at the schedule and long-term effect on cost.

Q. Nor does your testimony address the actual or

projected costs for 2009 and 2010 for the Levy project; correct?

A. I only looked at schedule slippages, and that then trickles down into cost.

Q. And your testimony further does not offer any opinion on PEF's accounting and cost oversight controls for the Levy project; correct?

A. I had only looked at the schedule, and I did not look at the accounting oversight controls; that's correct.

Q. Just a few more questions. Are you familiar with a column that ran in *The Vermont Tiger* on July 3, 2008, called "Emerson Lynn on Politics: Politics vs. Truth"?

A. I remember an article in *The Vermont Tiger* blog, but if you could refresh my memory, I'm -- I'm pretty sure I remember it.

MR. DAVIS: I'm going to object to the question. I don't even know what this is, Mr. Chair, but if it's going to be used for impeachment, she hasn't lain the proper foundation.

CHAIRMAN CARTER: Okay. To the objection, Ms. Triplett.

MS. TRIPLETT: I'm trying to lay a foundation. He hasn't let me ask any questions about it. And he

just testified that he's generally aware, and then he asked me to refresh his memory, which my next question may in fact do.

CHAIRMAN CARTER: Okay. Let's tread lightly, though.

MS. TRIPLETT: I only have a couple of questions on it.

CHAIRMAN CARTER: Okay.

BY MS. TRIPLETT:

Q. Mr. Gundersen, are you aware in that column that the author spoke about you and stated that your opposition --

MR. DAVIS: Objection.

Q. -- to nuclear power is well documented?

MR. DAVIS: Objection. I believe that's hearsay. I believe that it is not proper impeachment because this witness is not being asked -- I've got a prior statement that he made that he's being impeached with. Both of those are reasons why that question is objectionable and should be stricken from the record.

CHAIRMAN CARTER: Ms. Helton. Briefly, Ms. Triplett, very briefly, to the objection.

MS. TRIPLETT: I believe that this goes to the potential bias of the witness, and I think that it's a proper question for an expert who's providing expert

testimony.

MR. DAVIS: You can't impeach a witness --

CHAIRMAN CARTER: Whoa, whoa, whoa. Hold it. Let's don't get crazy on me.

MS. DAVIS: I'm sorry, Your Honor.

CHAIRMAN CARTER: I heard both of you. Ms. Helton.

MS. HELTON: This seems to me to be reliance on a hearsay statement and is not -- it doesn't go to the testimony of the witness, so I believe it's improper.

CHAIRMAN CARTER: Okay. Objection sustained. Move on.

MR. DAVIS: Thank you, Mr. Chair.

BY MS. TRIPLETT:

Q. Well, let me ask you this, Mr. Gundersen. Have you ever made the statement that you would rather see windmills on ridge lines and solar panels reflecting across all Vermont roofs than risk the environmental purity of our state to the silent menace of radioactive contamination?

A. After being an expert witness on the Vermont Yankee uprate and on the Vermont Yankee fuel case and reading 200,000 pages of documentation, I came to the conclusion that for Vermont Yankee, not nuclear power in

general, but Vermont Yankee is not safe and should not be allowed to run after 2012.

MS. TRIPLETT: Thank you. No further questions.

CHAIRMAN CARTER: Staff.

MR. YOUNG: No questions.

CHAIRMAN CARTER: Commissioners.

Redirect?

MR. DAVIS: No.

CHAIRMAN CARTER: Okay. Exhibits. Sixty-one through 69; is that right, Mr. Davis?

MR. DAVIS: Yes. SACE would move those into evidence.

CHAIRMAN CARTER: Are there any objections? Without objection, show it done.

(Exhibits Number 61 through 69 were admitted into the record.)

CHAIRMAN CARTER: Anything further for this witness?

Thank you very kindly, Mr. Gundersen. Have a great day.

Staff, you're recognized.

MR. YOUNG: Mr. Chairman, per the agreement from all the parties, Jeffrey A. Small's testimony -- at this time, we ask that Jeffrey A. Small's testimony and

exhibits be inserted into the record.

CHAIRMAN CARTER: Are there any objections? Without objection, show it done. The prefiled testimony of the witness will be inserted into the record as though read.

DIRECT TESTIMONY OF JEFFERY A. SMALL

Q. Please state your name and business address.

A. My name is Jeffery A. Small and my business address is 4950 West Kennedy Blvd, Tampa, Florida, 33609.

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

A. I am employed by the Florida Public Service Commission as a Professional Accountant Specialist in the Division of Regulatory Compliance.

Q. How long have you been employed by the Commission?

A. I have been employed by the Florida Public Service Commission (FPSC) since January 1994.

Q. Briefly review your educational and professional background.

A. I have a Bachelor of Science degree in Accounting from the University of South Florida. I am also a Certified Public Accountant licensed in the State of Florida and I am a member of the American and Florida Institutes of Certified Public Accountants.

Q. Please describe your current responsibilities.

A. Currently, I am a Professional Accountant Specialist with the responsibilities of planning and directing the most complex investigative audits. Some of my past audits include cross-subsidization issues, anti-competitive behavior, and predatory pricing. I also am responsible for creating audit work programs to meet a specific audit purpose and integrating EDP applications into these programs.

Q. Have you presented expert testimony before this Commission or any other regulatory agency?

A. Yes. I testified in the Southern States Utilities, Inc. rate case, Docket No. 950495-WS, the transfer application of Cypress Lakes Utilities, Inc., Docket No. 971220-WS, and the Utilities, Inc. of Florida rate case, Docket No. 020071-WS.

Q. Have you provided testimony before the Commission in a prior Nuclear Cost Recovery Clause (NCRC) docket.

A. Yes, I provided testimony in the Progress Energy Florida, Inc., Nuclear Cost Recovery Clause filing, Docket No. 080009-EI.

Q. What was the purpose of your testimony in Docket No. 080009-EI?

A. The purpose of my testimony was to sponsor the staff audit reports of Progress Energy Florida, Inc. (PEF, Utility, or Company) in Docket No. 080009-EI which addressed the Utility's application for nuclear cost recovery in 2007. We issued three audit reports on PEF in that docket. The first audit report was issued May 30, 2008, to address the 2007 power uprate costs for the Crystal River Unit 3 nuclear power plant. The second audit report was issued July 25, 2008, to address the pre-construction costs as of December 31, 2007, for Levy County Units 1 & 2. The third audit report was issued July 25, 2008, to address the site selection costs as of December 31, 2007, for Levy County Units 1 & 2. The three audit reports were included as separate exhibits with my testimony.

Q. Was your testimony entered into the record for Docket No. 080009-EI?

A. Yes, however, the second audit report which was issued July 25, 2008, to address the pre-construction costs as of December 31, 2007, for Levy County Units 1 & 2 is being resubmitted in this docket because the issue regarding land costs was deferred and was to be addressed in Docket No. 090009-EI.

Q. What is the purpose of your testimony today?

A. The purpose of my testimony is to sponsor three staff audit reports of PEF which address the Utility's application for nuclear cost recovery in 2007 and 2008. The first audit report was issued July 25, 2008, and addressed the pre-construction cost as of December 31, 2007, for Levy County Units 1 & 2. This audit report is filed with my testimony and is identified as Exhibit JAS-1. The second audit report was issued April 3, 2009, to address the

2008 power uprate costs for the Crystal River Unit 3 nuclear power plant. This audit report is filed with my testimony and is identified as Exhibit JAS-2. The third audit report was issued June 10, 2009, to address the site selection, pre-construction and construction costs as of December 31, 2008, for Levy County Units 1 & 2. This audit report is filed with my testimony and is identified as Exhibit JAS-3.

Q. Were these audits prepared by you or under your direction?

A. Yes, these audits were prepared by me or under my direction.

Q. Please describe the work you performed in these audits.

A. For the first audit report, to address the prior period pre-construction costs as of December 31, 2007, for Levy County Units 1 & 2, we reconciled the Company's filing to the general ledger and verified that the costs incurred were posted to the proper account, as prescribed by Rule 25-6.014, Florida Administrative Code. We reconciled and recalculated a sample of the monthly revenue requirement accruals displayed on Schedule T-I to the supporting schedules in the Company's 2007 Nuclear Cost Recovery Clause (NCRC) filing. We reconciled and recalculated a sample of the carrying cost accruals displayed on Schedule T-3 to the supporting schedules in the Company's 2007 NCRC filing. We recalculated a sample of the AFUDC balances displayed as "Other Adjustments" in the filing and reconciled the rates applied by the Company to its approved AFUDC rates in Commission Order No. PSC-05-0945-FOF-EI, issued September 28, 2005. We reconciled and recalculated a sample of the monthly deferred tax carrying cost accruals displayed on Schedule T-3A to the supporting schedules in the Company's 2007 NCRC filing. We recalculated a sample of the monthly carrying cost balances for deferred tax assets based on the equity and debt components established in Order No. PSC-05-0945-FOF-EI. We reconciled and recalculated a sample of the monthly CPI accruals displayed on Schedule T-3B to the supporting schedules in the Company's 2007 NCRC filing. We recalculated the Company's Consumer Price Index

(CPI) rate and reconciled the component balances to the Company's general ledger. We recalculated a sample of monthly jurisdictional nuclear construction expenditures displayed on Schedule T-6 of the Company's 2007 NCRC filing. We sampled and verified the construction and transmission cost expenditures and traced the invoiced amounts to supporting documentation. We reconciled the jurisdictional factors applied by the Company to the eligible carrying cost to the factors approved in Order No. PSC-06-0972-FOF-EI, issued November 22, 2006, in Docket No. 060007-EI.

For the second audit report, to address the uprate cost as of December 31, 2008, for Crystal River Unit 3, we reconciled the Company's filing to the general ledger and verified that the costs incurred were posted to the proper account, as prescribed by Rule 25-6.014, Florida Administrative Code. We reconciled and recalculated a sample of the monthly revenue requirement accruals displayed on Schedule T-1 to the supporting schedules in the Company's 2008 NCRC filing. We also reconciled and recalculated a sample of the carrying cost accruals displayed on Schedule T-3 to the supporting schedules in the Company's 2008 NCRC filing. We recalculated a sample of the Allowance for Funds Used During Construction (AFUDC) balances displayed as "Other Cost" in the filing and reconciled the rates applied by the Company to its approved AFUDC rates in Commission Order No. PSC-05-0945-FOF-EI, issued September 28, 2005. We reconciled and recalculated a sample of the monthly deferred tax carrying cost accruals displayed on Schedule T-3A to the supporting schedules in the Company's 2008 NCRC filing. We recalculated a sample of the monthly carrying cost balances for deferred tax assets based on the equity and debt components established in Commission Order No. PSC-05-0945-FOF-EI. We reconciled and recalculated a sample of the monthly CPI accruals displayed on Schedule T-3B to the supporting schedules in the Company's 2008 NCRC filing. We recalculated the Company's CPI rate and reconciled the component balances to the Company's general ledger. We recalculated a sample of the

monthly jurisdictional O&M costs accruals displayed on Schedule T-4 of the Company's 2008 filing. We sampled and verified the administrative and general cost accruals and traced the invoiced amounts to supporting documentation. We recalculated a sample of monthly jurisdictional nuclear construction accruals displayed on Schedule T-6 of the Company's 2008 NCRC filing. We sampled and verified the project management and power block engineering accruals and traced the invoiced amounts to supporting documentation. We sampled Company salary expense accruals and the respective overhead the Company applied. We recalculated and verified the joint owner billings that reduced the Company's eligible carrying cost for the CR3 Uprate project. We reconciled the jurisdictional factors applied by the Company to the eligible carrying cost to the factors approved in Commission Order No. PSC-06-0972-FOF-El, issued November 22, 2006. We reconciled and recalculated a sample of the monthly true-ups displayed on Schedule T-9 to the supporting schedules in the Company's 2008 NCRC filing.

For the third audit report, to address the site selection, pre-construction and construction costs as of December 31, 2008, for Levy County Units 1 & 2, we reconciled the Company's filing to the general ledger and verified that the costs incurred were posted to the proper account, as prescribed by Rule 25-6.014, Florida Administrative Code. We reconciled and recalculated a sample of the monthly revenue requirement accruals displayed on Schedule T-I to the supporting schedules in the Company's 2008 NCRC filing. We reconciled the monthly site selection and preconstruction carrying cost balances displayed on Schedule T-2 to the supporting schedules in the Company's 2008 NCRC filing. We recalculated the schedule and reconciled the AFUDC rates applied by the Company to the rates approved in Order No. PSC-05-0945-FOF-EI, issued September 28, 2005. We reconciled the monthly construction carrying cost balances displayed on Schedule T-3 to the supporting schedules in the Company's 2008 NCRC filing. We recalculated the schedule and reconciled the AFUDC

rates applied by the Company to the rates approved in Order No. PSC-05-0945-FOF-EI. We recalculated a sample of the monthly recoverable O&M expenditures displayed on Schedule T-4 of the Company's 2008 NCRC filing. We sampled and verified the O&M cost accruals and traced the invoiced amounts to supporting documentation. We verified the Company salary expense accruals and recalculated the respective overhead burdens the Company applied. We reconciled the jurisdictional factors applied by the Company to the eligible carrying cost to the factors approved in Order No. PSC-06-0972-FOF-EI, issued November 22, 2006, in Docket No. 060007-EI. We recalculated a sample of monthly jurisdictional nuclear construction accruals displayed on Schedule T-6 of the Company's 2008 NCRC filing. We sampled and verified the generation and transmission cost accruals and traced the invoiced amounts to supporting documentation. We verified a sample of Company salary expense accruals and recalculated a sample of the respective overhead burdens that the Company applied. We reconciled the jurisdictional factors applied by the Company to the eligible carrying cost to the factors approved in Order No. PSC-06-0972-FOF-EI, issued November 22, 2006, in Docket No. 060007-EI.

Q. Please review the audit findings in the audit report, JAS-1, which addresses the prior period pre-construction costs as of December 31, 2007 for Levy County Units 1 & 2.

A. **Audit Finding No. 1**

Audit Finding No. 1 concerns the utility's calculation and allocation of the cost of the land purchased for generation, transmission and future use purposes. I provide two alternative methods of allocating the costs between generation, allocation and future use purposes for the Commission to consider. In addition, I disclose the existence of a contingent deferred purchase price related to the purchase of one of the land parcels. This is discussed in greater detail in Exhibit JAS-1, Finding No. 1.

Q. Please review the audit findings in the audit report, JAS-2, which addresses the 2008 power uprate costs for the Crystal River Unit 3 nuclear power plant.

A. **Audit Finding No. 1**

Audit Finding No. 1 provides information concerning the Company's correction of a calculation error in its 2007 filing. This is discussed in greater detail in Exhibit JAS-2, Finding No. 1.

A. **Audit Finding No. 2**

Audit Finding No. 2 provides information concerning the underbilling of the Company's joint owners during 2007 and 2008. This underbilling of the uprate costs was corrected in March 2009. This is discussed in greater detail in Exhibit JAS-2, Finding No. 2.

A. **Audit Finding No. 3**

Audit Finding No. 3 provides information concerning potential royalty payments from contractors that could reduce the overall cost of the CR3 Uprate in future periods. This is discussed in greater detail in Exhibit JAS-2, Finding No. 3.

A. **Audit Finding No. 4**

Audit Finding No. 4 provides information concerning the Company's adjustment to transfer the cost associated with the Measurement Uncertainty Recapture (MUR) phase of the CR3 Uprate from Construction Work in Progress to plant-in-service in 2008. This is discussed in greater detail in Exhibit JAS-2, Finding No. 4.

Q. Please review the audit findings in the audit report, JAS-3, which addresses the site selection, pre-construction and construction costs as of December 31, 2008 for Levy County Units 1 & 2.

A. There are no findings in the third audit report, JAS-3.

Q. Does this conclude your testimony?

A. Yes, it does.

MR. YOUNG: And that's Exhibit Numbers 105, 106, and 107, on page 17 of the Comprehensive Exhibit List.

CHAIRMAN CARTER: Are there any objections to Exhibits 105, 106, and 107? Without objection, show it done staff. You're recognized.

(Exhibit Numbers 105, 106, and 107 were identified and admitted into the record.)

CHAIRMAN CARTER: Staff, you're recognized.

MR. YOUNG: At this time, Mr. Chairman, we call William Coston and Carl Vinson to the stand. And for the record, Mr. Chairman, Mr. Coston and Mr. Vinson have not been sworn.

CHAIRMAN CARTER: Have not been sworn?

MR. YOUNG: No, sir, they have not.

CHAIRMAN CARTER: Okay. I'll give you guys a chance to get settled in, and then I'll swear you in in just a second.

Mr. Young, what page of the exhibits for these witnesses.

MR. YOUNG: Page 17, Number 108. And just for the record, Mr. Chairman, all the parties have agreed, as we took up in preliminary matters, Mr. Vinson is adopting Mr. Cryan's testimony and exhibits.

CHAIRMAN CARTER: Is that the understanding of

the parties.

Okay. Would you gentlemen please stand and raise your right hand. I guess I should have said right hands.

(Witnesses collectively sworn.)

CHAIRMAN CARTER: Thank you. Please be seated. Mr. Young, you may proceed.

MR. YOUNG: Thank you, sir.

Thereupon,

WILLIAM COSTON and CARL VINSON

were called as witnesses on behalf of the Florida Public Service Commission Staff and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. YOUNG:

Q. Can you please state your name and business address for the record?

A. (By Mr. Vinson) Carl Vinson, 2540 Shumard Oak Boulevard, Tallahassee, 32399.

A. (By Mr. Coston) William Coston, 2540 Shumard Oak Boulevard, Tallahassee, Florida, 32399.

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

A. (By Mr. Vinson) I'm employed by the Florida Public Service Commission as a public utilities

supervisor.

A. (By Mr. Coston) I'm employed by the Florida Public service commission as an operation review specialist.

Q. Have you jointly prefiled testimony consisting of four pages in this case, in this docket?

A. (By Mr. Vinson) Yes.

A. (By Mr. Coston) Yes.

Q. Do you have any changes or corrections to that testimony at this time?

A. (By Mr. Vinson) No.

A. (By Mr. Coston) No.

Q. If I were to ask you the same questions as those in your joint prefiled testimony, would your answers be the same?

A. (By Mr. Vinson) Yes.

A. (By Mr. Coston) Yes.

MR. YOUNG: Mr. Chairman, at this time, staff requests that the joint prefiled testimony of Mr. Vinson and Mr. Coston be entered into the record as though read.

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

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

COMMISSION STAFF

DIRECT JOINT TESTIMONY OF WILLIAM COSTON AND GEOFF CRYAN

DOCKET NO. 090009-EI

JULY 27, 2009

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

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

Q. By whom are you employed?

A. I am employed by the Florida Public Service Commission as an Operations Review Specialist, for the Bureau of Performance Analysis in 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. Cryan and I jointly conducted the 2009 review of Progress Energy Florida's project management internal controls for the nuclear plant uprate at the Crystal River Unit 3 and new construction underway at the Levy site.

Q. Please describe your educational and relevant experience.

A. I earned Bachelor of Arts and Master of Public Administration degrees from Valdosta State University in 1993 and 1995, respectively. I have worked for the Commission for six years conducting operations audits and investigations of regulated utilities. Prior to my

employment with the Commission, I worked for six years at Bank of America in the Global Corporate and Investment Banking Division.

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

A. Yes. In 2005 I filed testimony in Docket 050078. This testimony consisted of an audit of distribution electric service quality for Progress Energy Florida's Vegetation Management, Lightning Protection, and Pole Inspection processes.

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

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

Q. By whom are you employed?

A. I am employed by the Florida Public Service Commission, as a Regulatory Analyst II, for the Bureau of Performance Analysis in 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. Coston and I jointly conducted the 2009 review of Progress Energy Florida's project management internal controls for the nuclear plant uprate at the Crystal River Unit 3 and new construction underway at the Levy site.

Q. Please describe your educational and relevant experience.

A. I earned a Bachelor of Science degree in Finance from Florida State University in

2005. Prior to my employment with the Commission, I worked for Wachovia Bank as a Financial Center Manager. Prior to that, I was employed as a law enforcement officer for approximately 10 years.

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 Progress Energy – Florida's Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects*** (Exhibit CC-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 Crystal River 3 Uprate project and the Levy project. The report also presents detailed descriptions of the current project management internal controls employed by Progress Energy Florida.

Q. Please summarize the areas examined by your review.

The Bureau of Performance Analysis conducted a review of the internal controls and management oversight of the nuclear projects underway at Progress Energy Florida. We examined the organizations, processes, and controls being used by the company to execute the Extended Power Uprate of Unit 3 at the Crystal River Energy Complex and the construction of Levy Nuclear Plant Unit 1 and Unit 2. This is the second review of the company's controls for its nuclear construction projects. The first report, *Progress Energy Florida's Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects,* was

published in August 2008 and filed in Docket 080009-EI.

The primary objective of this review was to document project key developments, along with the organization, management, internal controls, and oversight that PEF has in place or plans to employ for these projects. The internal controls examined were related to the following key 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 audit report is attached as Exhibit Numbers CC-1.

Q. Does this conclude your testimony?

A. Yes.

BY MR. YOUNG:

Q. Did you have one exhibit attached to your prefiled testimony as relates to Progress Energy which is entitled "Progress Energy Florida's Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects?

A. (By Mr. Coston) Yes.

Q. Do you have any corrections or changes to that exhibit?

A. No.

A. (By Mr. Vinson) No.

MR. YOUNG: Mr. Chairman, as stated for the record, that Exhibit is marked as CC-1, and it's Number 108 on staff's Comprehensive Exhibit List.

CHAIRMAN CARTER: For the record, on page 17, it's 108.

(Exhibit Number 108 was identified for the record.)

BY MR. YOUNG:

Q. Have you prepared a summary of your testimony today?

A. (By Mr. Coston) Yes, we have.

CHAIRMAN CARTER: Are you guys familiar with the lights. Okay. Good.

BY MR. YOUNG:

Q. Can you please provide that summary?

A. (By Mr. Coston) Yes. Good morning. Our testimony presents the management audit review of the project management internal controls that Progress Energy is using and managing the Crystal River nuclear unit uprate and the construction of its Levy nuclear project. The primary objective of this review was to document project key developments along with the organizational management internal controls and oversight that Progress Energy has in place for these projects. The internal controls examined were related to the following key project activities: Planning, management and organization, cost controls and schedule controls, contractor selection and management, and auditing and quality assurance.

This concludes our summary.

MR. YOUNG: Madam Chair, at this time I tender the witnesses for cross.

COMMISSIONER EDGAR: Thank you. Mr. Walls.

THE WITNESS: We have no questions for this witness, but we would ask that we reserve any questions pending any other questions the parties may have.

COMMISSIONER EDGAR: Well, let's see where we are. Mr. Rehwinkel, questions?

MR. REHWINKEL: No questions, but I'm -- this

is not Progress's witness. I don't know why they should reserve the opportunity to redirect.

COMMISSIONER EDGAR: Well, I was not actually sure what was the appropriate way, so I started at one end to walk down to the other, since it is a staff witness and neither an intervenor witness nor the petitioner's witness. So let me ask Ms. Helton what her recommendation is as to the best way to proceed with cross.

MS. HELTON: My initial reaction, Madam Chairman, is, since it's Progress's petition, I think it would be appropriate for the intervenors to cross-examine the witness first and then for Progress to go last.

COMMISSIONER EDGAR: Okay. Then my apologies for calling for cross in the wrong order.

Mr. Rehwinkel, any questions?

MR. REHWINKEL: I have no questions.

MR. BREW: I have a couple of questions, Madam Commissioner, but I am concerned that if the company has cross-examination as opposed to redirect off of my cross, then that's a separate issue from them wanting to go -- simply to go last.

COMMISSIONER EDGAR: If indeed that comes up, 265I'm sure we'll be able to discuss it at the time.

MR. BREW: Thank you.

COMMISSIONER EDGAR: We'll proceed accordingly. And so you are recognized for cross.

CROSS-EXAMINATION

BY MR. BREW:

Q. Good morning, gentlemen?

A. (By Mr. Vinson) Good morning.

A. (By Mr. Coston) Good morning.

Q. Gentlemen, your prefiled testimony at page 3, line 13, says that your report describes key project events and contract activities. Do you see that?

A. (By Mr. Coston) Is that the testimony or --

Q. The testimony, the testimony.

A. And the line?

Q. It's page 3, line 13.

A. We're there.

Q. What I'm trying to get to, is the purpose of your report to describe those activities, or do you have any opinions as to the reasonableness or prudence of any of the activities that you document?

A. (By Mr. Vinson) Our assignment was to describe the activities, to document the controls that we described in the summary. It largely does not put forward an opinion on the prudence and adequacy.

Q. You said largely. Are there decisions that

the companies made or actions that were taken that you do have opinions on?

A. At places in the report, we do bring to the attention some suggestions or observations. I'm not sure if that qualifies for what you're asking about.

Q. Okay. Let me take it up. In the Prehearing Order, it states that your testimony goes to Issue 21A, which was whether it was reasonable and prudent for Progress to execute its EPC contract. And what I'm trying to ask is, are you offering testimony one way or the other on that issue?

A. I would say that we offer information that's relevant for consideration by staff and by the Commission in dealing with Issue 21A. However, I do not have -- I do not believe that our report issues an opinion about whether it was reasonable or prudent.

Q. So you were endeavoring to offer facts, not opinion?

A. Offer facts; right.

Q. Now, in the report, on page 16, if you can, the first paragraph, the second sentence says, "Once the company submits a request with a regulatory entity, the company, albeit temporarily, relinquishes its ability to control the forward progress of the project." Do You see that?

A. (By Mr. Coston) Yes.

Q. Do you have any opinion on whether it would be reasonable for the company to believe it can control the progress of the project when the ball is in the NRC's court?

A. (By Mr. Vinson) Could you repeat the question, please?

Q. Sure. Based on your statement here, taking it more specifically, because you're describing in this section the progress of the Levy project, are you not?

A. Yes.

Q. Okay. So what I'm asking is, once Progress filed its COL application with the NRC, did it relinquish control over the review schedule at that point?

A. Over the review schedule, yes. It's largely in the NRC's court at that point.

Q. Okay. And would it be reasonable for Progress to believe it could control the review schedule at that point?

A. At that point, they would not be controlling the NRC's review. They are a participant in the request for additional information process.

Q. But the control at that point was with the NRC and its staff?

A. Right.

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

COMMISSIONER EDGAR: Thank you. Mr. Davis.

MR. DAVIS: Nothing, thank you.

COMMISSIONER EDGAR: Okay. Mr. Moyle.

MR. MOYLE: Just a couple of questions.

CROSS-EXAMINATION

BY MR. MOYLE:

Q. In your summary, you indicated that part of your work entailed or dealt with a review of cost controls; is that right?

A. (By Mr. Coston) Yes.

Q. Now, did you also endeavor to look at cost controls as it relates to your understanding of the total project costs for this -- for the Levy nuclear power project?

A. We did look at how the company documents within their internal controls, how they monitor internally the project costs, the anticipated project costs.

Q. You would agree that a key component for making those judgments with respect to cost controls is having a good understanding as to what the ultimate cost number is; correct?

A. Yes.

Q. And as we sit here today, presumably you've been in the room for the last couple of days or had access to the information. You would agree, would you not, that the all-in number as to what the Levy nuclear power project is going to cost is, shall we say, less than certain?

MR. YOUNG: Objection. Calls for speculation.

CHAIRMAN CARTER: To the objection, Mr. Moyle. To the objection.

MR. MOYLE: Well, I don't know that I'm asking them to speculate. They said they've been here for two days, and there has been a lot of testimony about the need to renegotiate the amendment, and the price of that process is unknown. I don't think it's calling for speculation.

CHAIRMAN CARTER: Ms. Helton.

MS. HELTON: Can I ask, have they testified to the costs in their report or in the prefiled testimony?

MR. VINSON: The report discusses the current cost estimate. I'm not sure if I understand your question fully.

MS. HELTON: Well, maybe if Mr. Moyle can rephrase the question.

CHAIRMAN CARTER: Hang on one second. Mr. Young.

MR. YOUNG: Mr. Chairman, the reason I objected is because Mr. Moyle is asking them to speculate as to the uncertainty of the costs. What the staff witnesses have done is basically document the internal controls. It never speculated as to the costs. And Mr. Moyle is basing his question on whether the witnesses have heard the testimony here today and wants them to draw a legal conclusion on that, and I think that calls for speculation.

CHAIRMAN CARTER: To the objection, Mr. Moyle.

MR. MOYLE: I would agree with Mr. Young if my question was, "What do you think this is going to cost at the end of the day?" They probably don't have that frame of reference, but I think their testimony is that they've evaluated cost, that the long-term cost is a key component. And I'm just getting them to admit, or trying to get them to admit that the long-term cost is an unknown factor as we sit here today.

CHAIRMAN CARTER: What was your question again?

MR. MOYLE: Whether they would agree that the ultimate all-in cost for Levy is uncertain as we sit here today.

MR. YOUNG: And again, Mr. Chairman, what the staff witnesses have done was not focus on a review of

prospective -- the focus of review is not prospective cost. It was just documenting internal controls and internal management. To me, what Mr. Moyle is asking relates to speculating on prospective costs and in terms of the uncertainty of that, and that's the basis for my objection.

CHAIRMAN CARTER: Rephrase, Mr. Moyle.

BY MR. MOYLE:

Q. Did you rely on a cost number -- for looking at future costs, did you rely on an all-in cost number for performing your analysis?

A. (By Mr. Coston) In our review, in looking over the company's responses and documents, we looked at their internal documents that laid out their anticipated project cost. The company has a master document that lays that out, and we reviewed that.

Q. And as we sit here today, what is that cost, if you know?

MR. WALLS: Can I interject here? Is this asking for a confidential number?

MR. MOYLE: That's not the intent. I mean, I thought you all had set out a number of 17.2 billion.

MR. WALLS: I'm just being cautious because I don't know what's on the document he said he reviewed as the cost.

MR. VINSON: I think I can answer that without divulging confidential information.

CHAIRMAN CARTER: Okay. You can answer the question.

MR. VINSON: The current cost estimate is $17.2 billion.

CHAIRMAN CARTER: Okay. Mr. Moyle, you may proceed.

MR. MOYLE: Thank you.

BY MR. MOYLE:

Q. And you're aware that there's a need to renegotiate the EPC contract; correct?

A. (By Mr. Vinson) Yes.

Q. And you're also aware that that renegotiation has the potential to increase project costs; correct?

A. Yes.

Q. Have you had an opportunity to review the testimony of Mr. Lyash in this case, who has filed rebuttal testimony?

A. I have not.

MR. YOUNG: Mr. Chairman, if I can inquire on the relevancy of Mr. Moyle's question in terms of reviewing Mr. Lyash's testimony.

CHAIRMAN CARTER: Mr. Moyle, to the objection.

MR. MOYLE: Sure. The relevancy goes to the

cost component, Mr. Young. Specifically, the question I wanted to ask, and I'll do it in a way that won't reveal confidential information. If you look at page 7 of Mr. Lyash's testimony -- sir, can I just have one minute to consult with counsel for Progress?

CHAIRMAN CARTER: Sure, absolutely.

MR. MOYLE: I don't want to spill the beans on something that's confidential.

CHAIRMAN CARTER: Mr. Moyle.

MR. MOYLE: Yes, sir. I'm trying to respond to Mr. Young's objection. The question was going to relate to the first bullet point on page 7 of Mr. Lyash's testimony, which in my discussions with Progress, they indicated I can reveal what that bullet point speaks to without revealing the percentages, but the percentage of fixed or --

CHAIRMAN CARTER: Hang on, hang on, hang on. We're speaking to the objection right now.

MR. MOYLE: Right.

CHAIRMAN CARTER: Let's don't go to --

MR. MOYLE: The question is going to be with respect to did they review this information with respect to fixed or firm contract pricing in terms of making a judgment about the overall total project cost.

CHAIRMAN CARTER: Okay. To the objection,

Mr. Young.

MR. YOUNG: That's fine. I just want to let you know that, you know, I understand where you're going. And tread lightly, please, because we didn't talk about dealing with Mr. Lyash.

CHAIRMAN CARTER: I hope you're not trying to get staff to adopt Mr. Lyash's testimony. That dog won't hunt.

Mr. Moyle, you may proceed.

MR. MOYLE: I would object to that. I'm sorry. And this is the first time I've had two witnesses at once, so it's a little interesting.

MR. COSTON: Should we sit closer together?

BY MR. MOYLE:

Q. Did you all review Mr. Lyash's confidential testimony?

A. (By Mr. Coston) I did not.

A. (By Mr. Vinson) Not the confidential.

Q. Well, you would agree, would you not, with respect to determining cost ultimately, the all-in cost, that a key component of that could be how much of those costs are fixed as compared to how much of those costs are variable or subject to change based on, you know, indexes or CPI or anything like that? You would agree with that, wouldn't you?

A. (By Mr. Vinson) Yes.

A. (By Mr. Coston) Yes.

MR. MOYLE: That's all I have, Mr. Chairman:

CHAIRMAN CARTER: Thank you, Moyle. Did we get all the intervenors?

Okay. Mr. Walls.

MR. WALLS: This makes it easy. No questions.

CHAIRMAN CARTER: Redirect. Wait a minute. Hang on. Commissioners, anything from the bench? Redirect.

MR. YOUNG: No redirect.

CHAIRMAN CARTER: Okay. Exhibit Number 108. Any objections? Without objection, show it done.

(Exhibit Number 108 was admitted into the record.)

MR. YOUNG: And can my witnesses be excused?

CHAIRMAN CARTER: You may be excused. Have a great day.

Okay. Mr. Walls, or is it Ms. Triplett. Ms. Triplett, you're recognized. Call your next witness.

MS. TRIPLETT: PEF calls Jon Franke.

CHAIRMAN CARTER: You may proceed.

MS. TRIPLETT: Thank you.

Thereupon,

JON FRANKE

was called as a rebuttal witness on behalf of Progress Energy Florida and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. TRIPLETT:

Q. Mr. Franke, you were sworn yesterday?

A. That is correct.

CHAIRMAN CARTER: Excuse me. Mr. Roach, could you push that microphone down, because it's blocking the camera for Ms. Triplett. There you go.

MS. TRIPLETT: I want to make sure I have my 15 minutes of fame.

BY MS. TRIPLETT:

Q. Would you please reintroduce yourself to the Commission?

A. I'm Jon Franke, and I'm the vice president of the Crystal River Nuclear Plant.

Q. Mr. Franke, have you refiled rebuttal testimony with an exhibit in this proceeding?

A. Yes, I have.

Q. And do you have that prefiled rebuttal testimony and exhibit with you?

A. I do.

Q. Do you have any changes to make to your

rebuttal testimony?

A. I have none.

Q. If I asked you the same questions asked in your prefiled testimony today, would you give the same answers that are in that testimony?

A. Yes, I would.

MS. TRIPLETT: We request that the prefiled rebuttal testimony be moved into evidence as though read.

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

IN RE: NUCLEAR COST RECOVERY CLAUSE

BY PROGRESS ENERGY FLORIDA

FPSC DOCKET NO. 090009-EI

REBUTTAL TESTIMONY OF JON FRANKE

I. INTRODUCTION AND SUMMARY.

Q. Please state your name and business address.

A. My name is Jon Franke. My business address is 15760 W. Powerline St., Crystal River, FL 34442.

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

A. I am employed by Progress Energy Florida, Inc. ("PEF" or the "Company") in the Nuclear Generation Group and serve as Vice President of Crystal River Unit 3 ("CR3"), PEF's nuclear plant.

Q. Have you previously filed testimony in this docket?

A. Yes, I filed direct testimony on May 1, 2009.

Q. Have you reviewed the Intervener testimony filed in this docket?

A. Yes, I have reviewed and will provide rebuttal testimony to the testimony of William R. Jacobs, Jr. ("Jacobs") filed on behalf of the Office of Public

Counsel ("OPC"). I also reviewed that portion of Dr. Jacobs' deposition testimony with respect to the CR3 Uprate Project.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to the testimony and recommendation presented by Jacobs on behalf of OPC regarding the CR3 Uprate Project.

Q. Do you have any exhibits to your rebuttal testimony?

A. Yes, I have the following exhibit:

- Exhibit No. ___ (JF-1), Excerpts of the Jacobs Deposition in this proceeding.

This exhibit is true and correct.

Q. What does Jacobs have to say about the CR3 Uprate Project?

A. Jacobs has two primary criticisms. First, he claims that the fact that the CR3 unit is a Babcock & Wilcox ("B&W") nuclear reactor presents unique challenges to obtaining Nuclear Regulatory Commission ("NRC") approval of the extended power uprate ("EPU") at the unit after the 2011 refueling outage Uprate project work is complete. (Jacobs Test., p. 23, L. 8-19). He concedes he is not questioning the Company's engineering approach to the Uprate project, (Jacobs Test., p. 23, L. 21-24); he is only "concerned" that certain "issues" he identifies in PEF meetings with NRC

staff may not be addressed to the satisfaction of the NRC such that the NRC approves the full 140 megawatts ("MWs") uprate from the EPU after the 2011 refueling outage work is completed. (Jacobs Test., pp. 24-25). He admits the NRC might approve the full uprate despite his concerns, but because the NRC might not, according to him, he claims PEF should not have incurred the bulk of the costs spent for the Balance of Plant ("BOP") work for the 2009 refueling outage and the EPU work for the 2011 refueling outage until the Company had "reasonable assurance" from the NRC that the full uprate would be approved. (Jacobs Test., p. 26, L. 20-22).

Second, Jacobs' sole criticism of the Company's feasibility analysis for the CR3 Uprate Project is that the Company did not "file" a feasibility analysis. (Jacobs Test., p. 25, L. 25-27).

As I explain below, both of Jacobs' criticisms are without merit.

Q. Please summarize your testimony.

A. Jacobs' criticisms are unfounded. Jacobs' wholly unsupported concerns that the NRC might not approve the full uprate demonstrate only that Jacobs would manage the Uprate project differently and in a way that is not consistent with the efficient management of the project in accordance with industry practice.

The Company was and is prudent in its approach to the planning and execution of the CR3 Uprate Project. PEF appropriately evaluated the

licensing risks associated with the approval of the full uprate by the NRC and PEF continues to monitor and manage those risks as the project progresses. Indeed, PEF has reasonable assurance that the NRC will approve the full uprate because PEF, working with our vendor Areva, continues to find confidence from the engineering analyses which addresses Uprate project licensing issues. Through this process, PEF has in fact addressed all the issues that Jacobs raises so his concerns are unfounded. All our engineering and licensing reviews continue to indicate that the plant can and will achieve an uprated license.

PEF's approach to the CR3 Uprate project is reasonable, consistent with industry practice, and provides benefits to PEF's customers. Any prudent utility would work with the NRC staff prior to the submittal of its license application to ensure the successful approval of the application after it is submitted. That is what PEF has done and continues to do. Further, PEF has prudently incurred costs for the Uprate project consistent with the industry approach to Uprate projects. Jacobs ignores the complex interrelationship between the Uprate modifications and the engineering analyses to support the license submittal such that a substantial portion of the Uprate costs must be spent to support the license submittal. Further, PEF is procuring equipment for the Uprate as PEF develops the engineering analyses for the uprate license submittal to ensure the Uprate work can be timely completed during the refueling outages just as other utilities have done on their uprate projects. Jacobs' approach would delay

the Uprate work, is not consistent with utility practice, and would delay the Uprate fuel savings benefits to customers.

Jacobs' criticism that PEF did not "file" a feasibility analysis is hardly worth addressing. In my May 1, 2009 direct testimony, I explained that the Company's feasibility analysis is contained in the Company's updated Integrated Project Plan ("IPP") for the project, which I discussed in detail in my direct testimony. I further testified that the IPP itself is a confidential document, but it was provided in discovery to Commission Staff and parties to this proceeding, and I provided the Bates number for that document. The rule says the Company is supposed to submit its feasibility analysis to the Commission and PEF has submitted it to the Commission staff and all parties to this proceeding. Jacobs cannot claim he does not have it, in fact, he attaches it as part of his Exhibit WRJ(PEF)-3 at pages 171-197 of 233. Jacobs has no substantive criticism of the Company's CR3 Uprate feasibility analysis.

II. CR3 UPRATE PROJECT RISK MANAGEMENT.

Q. Does Jacobs claim PEF's risk management with respect to the CR3 Uprate Project is inadequate?

A. Yes, he does, but he fails to support this assertion with any substantive analysis whatsoever. In fact, his testimony reveals that he actually agrees that PEF has appropriately identified these risks, developed appropriate risk mitigation engineering solutions for them, and is implementing those

solutions. What he really means by his "concerns" is that he would manage the uprate project differently.

Q. Can you please explain what you mean?

A. Yes. Jacobs claims that there are five NRC licensing related items that PEF has identified that must be resolved by solutions approved by the NRC before the uprate can be implemented but he is apparently concerned only with the four that were discussed with the NRC at a May 19, 2008 meeting. (Compare Jacobs Test., p. 24, L. 2-7 and p. 24, L. 16-25.) Essentially, he is concerned about these items because, in his view, they have not been resolved for an uprate at a B&W reactor like CR3. He believes the Company should not spend unspecified amounts for the BOP and EPU work until the NRC has provided PEF reasonable assurance that the items can be resolved by the solutions PEF proposes for them. (Jacobs Test., p. 23, L. 8-19, p. 24, L. 7-8.).

Jacobs cannot and does not say that (1) PEF has not identified these items as potential issues, (2) PEF does not have engineering solutions to mitigate the risks associated with them, or (3) that PEF is not working on the engineering solutions for them. In fact, Jacobs says that he is <u>not</u> questioning PEF's engineering approach to these items. (Jacobs Test., p. 23, L. 21-24). Jacobs also reviewed PEF's project management, contract, and oversight controls, which include PEF's risk management processes and practices, and found nothing unreasonable or imprudent in

them. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt pp. 36-37). His "concerns," then, are not evidence of inadequate risk management.

Rather, Jacobs "concerns" focus on the expected outcome when the Company's engineering solutions to the items he is concerned about are submitted with the License Amendment Request ("LAR") to the NRC for approval of the 140 MW uprate. The LAR is what the NRC reviews and approves for uprates at existing nuclear power plants. Jacobs claims that because LAR approval for the full uprate is "somewhat uncertain" because of his "concerns," PEF should not spend unspecified dollars on the BOP and EPU work until PEF has reasonable assurances from the NRC that the NRC will approve the LAR. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt, p. 177).

Jacobs, however, has done no analysis whatsoever of the items he is concerned about to express any opinion regarding the likelihood of NRC approval. Additionally, Jacobs admits he has not reviewed the Company's technical analysis with respect to the LAR. He did review some documents prepared by AREVA which analyzed some of the issues and alternatives and found nothing that was inaccurate in that analysis. See Exhibit No. __ (JF-1) (Jacobs Dep. Excerpt, p. 171-172). He cannot and therefore does not claim the technical engineering analysis and solutions for the CR3 Uprate Project, including the analysis and solutions for the four issues he is apparently concerned about, cannot be performed. In fact, he has never done a technical analysis to support a LAR for an

uprated facility. (Id. at 172). He must admit, then, that the full 140MW uprate could be approved. (Jacobs Test., p. 24, L. 13-14). He also concedes that it is possible that the NRC could approve some percentage of the 140 MW requested increase, rather than outright denying the request altogether. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt, p. 171). Jacobs is just speculating that the full uprate might not be approved and, therefore, his argument that PEF should not incur certain uprate costs until it has reasonable assurance that the LAR will be approved is nothing more than his unsupported personal opinion that he would manage the project differently.

Q. Does Jacobs in fact recommend that the Company stop work on the BOP or EPU portions of the CR3 Uprate Project until the NRC approves the LAR?

A. No, he does not. He recommends only that the Commission conduct a prudence review of EPU costs incurred during phase 2 if the NRC does not grant the LAR, an event which of course has not yet happened. And, as I explained above, his recommendation is unsupported by any technical analysis whatsoever. Essentially Jacobs wants to be able to use information he might have in the future, even though he hasn't reviewed the relevant information available now, to second guess a prudence decision made today.

Q. Does Dr. Jacobs express an opinion that any cost incurred by PEF for the CR3 Uprate Project for 2008 is imprudent?

A. No, he does not.

Q. Given his recommendation, does Jacobs identify any specific cost that the Company should not have incurred for the CR3 Uprate Project?

A. No, he does not identify a specific amount of cost that the Company should not have incurred.

Q. Is the Company appropriately managing the Uprate project?

A. Yes. PEF's approach is consistent with the industry approach to EPU projects. The NRC has reviewed and approved several other EPU license amendment requests at other nuclear plants. The NRC therefore has a very developed set of rules and procedures for the submittal, review, and approval of power uprates like the CR3 Uprate Project. PEF has benefited from lessons learned by these other EPU requests as well as from our internal lessons learned from the EPU at the Brunswick Nuclear Plant. PEF also fully understands the framework in which the NRC reviews these EPU requests and therefore has been able to craft the CR3 Uprate LAR to meet the expectations of the NRC.

The engineering studies to support the EPU and the LAR are extensive and take over two years to finalize. Because much of the details for each of the modifications to the plant and equipment have to be

finalized in order to complete the engineering analyses for the LAR, these costs are incurred as part of the LAR preparation. A significant portion of the total uprate project costs would therefore have to be spent in order to support the LAR submittal anyway. This is typical of our experience with the CR3 Uprate Project, the Brunswick EPU, and the industry's experience with uprate projects.

Q. When will the Company submit the LAR for the CR3 EPU to the NRC for approval?

A. PEF is currently finalizing its LAR submittal and plans to submit it to the NRC in early 2010. NRC approval is expected in mid-2011, before the start of the 2011 outage.

Q. Does PEF have reasonable assurances that its LAR will be approved by the NRC?

A. Yes, it does. Jacobs asserts that reasonable assurance of NRC approval exists when the Company files its LAR, looks at the type of Requests for Additional Information ("RAIs") it is getting, and has discussions with the NRC to get a feel for if it is being accepted by the NRC. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt, p. 166). To the extent possible, we are doing exactly that.

PEF regularly interacts with the NRC regarding the preparation of its LAR for the CR3 Uprate Project. Rather than choose a course of action

in a vacuum, without input from the NRC, PEF is more proactive in raising and discussing issues and solutions with the NRC. Even when PEF is fairly certain about how an issue should be resolved, we discuss it with the NRC in an abundance of caution. As PEF works through these issues, and learns the NRC's preferences with respect to the solution, we gain more confidence that our ultimate LAR submittal will be complete and acceptable to the NRC.

PEF, therefore, is communicating with the NRC at each stage of developing its LAR, before it files its LAR. PEF regularly contacts and meets with the NRC to discuss its engineering analyses and solutions for the Uprate Project that will be supplied in its LAR when filed with the NRC. As a result, PEF has received the "reasonable assurance" that Mr. Jacobs describes that its LAR submission will be acceptable and will be on track to be timely approved.

Q. Is there any other reason for PEF to be confident that the NRC will approve its LAR?

A. Yes. In addition to the industry uprate precedent and our company uprate experience, we feel our internal review process and completed engineering analysis position us well to have our EPU approved. We recognize that as the first B&W plant to apply for an EPU we must produce a high quality submittal. We have added additional levels of review to ensure the quality of the submittal and to reduce the risk of delays in the NRC's review.

Specifically, PEF has implemented an Independent Review for the LAR. The purpose of this review is to ensure that experienced individuals review the draft LAR for completeness, correctness, clarity, and conformance with industry best practices. The review will also ensure that the LAR contains sufficient detail to allow the NRC to independently conclude the acceptability of the CR3 EPU. PEF has brought in Progress Energy employees from the Company's Brunswick plant and corporate offices, as well as outside contractors, to conduct this Independent Review.

Further, we have completed the primary safety and transient analysis and the results have been satisfactory. We can demonstrate compliance with all regulatory requirements, we have generally reduced operator burdens, and we have carefully monitored the experience of other plants that have applied for EPUs. As I explained above, we have also been communicating with the NRC frequently. We have purposely visited with their technical staff face to face regarding our application. Indeed, PEF has conducted three pre-application meetings with the NRC to be as transparent as possible.

Q. Is there any reason for concern simply because the CR3 Uprate is the largest uprate of a Babcock &Wilcox plant?

A. No. While Dr. Jacobs is correct that the CR3 Uprate project will be the largest uprate at a B&W plant, there is nothing particular about the B&W

plant design that presents insurmountable challenges to obtaining the requested uprate. Dr. Jacobs, in fact, does not present any analysis to support his sweeping statement about the nature of a B&W design. He indicated that the fact that B&W units have a small steam generator feed inventory would be a concern. This issue, as with other technical issues, has been fully evaluated as having no impact. Had he reviewed the technical information available he would have known that. During the last year and a half, PEF has been working on a detailed engineering analysis of the uprate and its effect on CR3.

All Mr. Jacobs has claimed is that certain modifications, namely a Low Pressure Cross tie system and the use of safety related Atmospheric Dump Valves, are unusual and, apparently to him, therefore at risk of not being approved by the NRC. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt, pp. 154-155). But these items are not unusual at all. In fact, of the seven B&W nuclear units in operation, four already have the Low Pressure Cross tie system and CR3 will be the fifth to have it when the Uprate Project is completed. The use of Atmospheric Dump Valves is already an approved design feature required by the technical specifications for three of the B&W units. Also, the safety related Atmospheric Dump valves are a design feature on many Westinghouse PWR designs and similar to a design feature that is part of almost all Boiling Water Reactors. In fact, similar systems to depressurize the reactor to mitigate a

plant transient are one of the most common designs of U.S. commercial nuclear plants in one form or another.

In addition, the requested uprate represents only a modest increase from the current licensed power level at other B&W plants. For example, in 2008 the NRC approved an uprate at the Davis-Besse unit to 2817 MWt, meaning that our proposed power level will only be an approximate 7% increase from the currently approved power level at Davis-Besse.

Q. What about Jacobs' "concerns" about the four issues addressed in the May 2008 PEF meeting with the NRC, is there any reason for concern with respect to the LAR approval as a result of these issues?

A. No. To begin with, as I described above, this meeting is just one of many instances in which PEF has interacted with the NRC on various technical issues as they arise regarding the CR3 Uprate Project. The discussion involved four potential early submittals with the NRC which were: (1) core flood line break; (2) boron precipitation mitigation; (3) small break loss of coolant accident (LOCA); and (4) control rod ejection analysis. As I explain below, all of these issues have been resolved.

Q. Can you please describe the first submittal issue, the core flood line break, and explain how the Company has addressed it.

A. Yes. A large part of analyzing any proposed change in a nuclear plant is the consideration of various potential scenarios occurring within the plant

and devising ways to safeguard and mitigate the consequences of those potential scenarios. One such scenario involves losing coolant through a break in a safety system (Core Flood), in conjunction with a specific electrical system loss of power. There are two options to address this potential scenario. We could seek an exemption from the original design criteria upon which the plant was originally licensed. Or we could include a modification in the scope of the uprate project to mitigate the hypothetical scenario.

We discussed with the NRC whether they were confident that we could obtain an exemption for this scenario under the regulations. An exemption is allowed if the utility can show that the probability that the particular event is extremely low, thus eliminating the need to study the impact of the hypothetical event. The NRC indicated that an exemption would be challenging to review. As a result of our review and the feedback from the NRC, we decided to implement a modification. The NRC has been strongly supportive of our decision to address this issue through a modification which creates a cross tie in the Low Pressure Injections systems, thereby eliminating the need for the exemption.

In the May 2008 meeting, the NRC indicated that if we still choose to request an exemption for the core flood line break, we should submit the exemption request by August 2008. Because we decided to implement a modification to address this issue, there was no need to submit anything further in August.

Q. Please describe the second submittal issue, boron precipitation mitigation methods, and explain how the Company has addressed it.

A. Boron precipitation is a phenomenon that can occur following a Loss of Coolant Accident. Boron precipitation can cause blockages in the reactor coolant system. Under the current rating of the plant, PEF has an exemption with respect to the method by which a boron precipitation event is handled. During the May meeting, the NRC indicated that, if the Company intended to seek the same exemption with respect to boron precipitation at uprated conditions, it would need to be separately reviewed by the NRC. In other words, PEF would have to submit a separate filing from the LAR to support the effectiveness of the current exemption.

After the May NRC meeting, PEF determined that the same modification used to address the core flood line break issue above could be expanded to fully address the boron precipitation issue. This determination eliminated the need for PEF to seek a further exemption. Thus we do not need to get separate approval for the continued exemption, and we did not need to make any submittal by October 2008. By addressing the boron precipitation issue through modifications, which eliminates the need for any exemption, we make the EPU much more acceptable to the NRC.

Q. Please describe the third submittal issue, the Small Break Loss of Coolant Accident (LOCA), and explain how the Company has addressed it.

A. The NRC is concerned about the temperature of the fuel if a Small Break LOCA occurs. As indicated in the May 2008 meeting we intend to mitigate this issue by using larger Atmospheric Dump Valves. At the time of the May 2008 meeting, the proposed mitigation was believed to be a first of a kind design answer to an issue. In this case, the NRC expressed a preference for the Company to make a separate submittal from the LAR to allow additional review time. Since the May 2008 meeting, however, we have identified a directly applicable precedent at another B&W plant, in which the same proposed Atmospheric Dump Valves mitigation was approved by the NRC. PEF therefore determined that it was not necessary for PEF to validate the feasibility of the mitigation strategy or obtain conceptual concurrence from the NRC by making a separate submittal with the NRC. We have communicated this approach with the NRC, and they have agreed with our assessment. Therefore, although the May 2008 NRC meeting minutes indicated that we needed to make this separate submittal by August 2008, this separate submittal is now unnecessary.

Q. Finally, please describe the fourth submittal issue, the control rod ejection analysis, and explain how the Company has addressed it.

A. We have submitted a separate LAR to adopt a more robust and modern methodology for the control rod ejection analysis. This scenario involves the instantaneous ejection of a control rod, resulting in increased reactivity. Consistent with the information in the May 2008 meeting minutes, we submitted the LAR in February 2009. We have received minor Requests for Additional Information with respect to this LAR and have timely submitted our responses. The NRC has indicated they are close to approving the new methodology, which will allow us to close this issue. With this approval, we will be able to make the base submittal for the LAR.

Q. If these submittal issues have been resolved with the NRC, why are there still high-rated risks related to these submittal issues in the risk documents for the CR3 Uprate Project?

A. None of the risks on the risk matrix are risks related to achieving the LAR. They are related to cost and schedule. For example, the core flood line break remains red, because the Company is still drafting the details of the planned modification. We want to gain confidence that when the modification is finalized, we have budgeted enough money to install the modification. It is not a risk of obtaining the license from the NRC. Jacobs chooses to ignore the fact that these risks in the risk matrix have nothing to do with the LAR approval or he simply does not understand the risk matrix.

Q. If PEF waited to incur the BOP and EPU equipment procurement costs until LAR approval, as suggested by Jacobs, what effect would that have on the project?

A. The uprate work on the project would be delayed with a corresponding delay in the fuel savings benefits to PEF and its customers and potentially higher uprate project costs. Many of the items necessary for the work in both the 2009 and 2011 outages require lead time. The Company must either issue a Request for Proposal and analyze the resulting bids, or perform an analysis to support a sole or single source contract. Once a vendor is chosen, additional time is required for the vendor to manufacture the equipment. Even Jacobs agreed that his approach would result in a project delay of at least one refueling outage. See Exhibit No. ___ (JF-1) (Jacobs Dep. Excerpt, p. 170). Additionally, by delaying the implementation of the BOP modifications until after the 2009 outage, the customer would experience an additional 30 to 40 day nuclear outage duration during the implementation year. During 2009 the station has the benefit of installing the modifications within the timeframe required to replace the steam generators which are being replaced for reasons other than the EPU.

III. **FEASIBILITY.**

Q. What is Jacobs' opinion with respect to the feasibility of completing the CR3 Uprate Project?

A. Jacobs claims PEF did not file the required feasibility analysis. He does not say what that required analysis is in his view and he does not explain why he believes PEF has not submitted the "required" feasibility analysis.

Q. Does Jacobs make any recommendation regarding the feasibility analysis for the CR3 Uprate project?

A. No.

Q. Do you believe that the Company submitted a detailed feasibility analysis for the CR3 Uprate project, in compliance with Rule 25-6.0423?

A. Yes. For all the reasons stated in my May 1, 2009 testimony, PEF has demonstrated the detailed analysis necessary to show the long-term feasibility of completing the CR3 Uprate Project. Part of my feasibility testimony relies upon the updated IPP, dated March 2, 2009. I note that the Company supported the feasibility of the CR3 Uprate Project in the 2008 cost recovery docket by relying on the original IPP. Based on that feasibility analysis, this Commission approved the Company's 2006 and 2007 actual costs as prudent.

Q. Does Dr. Jacobs reference the updated IPP for the CR3 Uprate Project?

A. Yes, he does, he even attaches it as an exhibit to his testimony beginning at page 171 of Exhibit WRJ(PEF)-3, but nowhere does he address the economic evaluation contained in that updated IPP in his testimony. He simply ignores it.

Q. Does this conclude your testimony?

A. Yes, it does.

BY MS. TRIPLETT:

Q. Do you have a summary of your rebuttal testimony?

A. I do, and I am prepared to give it at this time.

Q. Okay. Please proceed.

A. The Office of Public Counsel witness Jacobs' sole criticism of the Crystal River 3 uprate project is that he would have managed the project differently. He questions the company's decision to incur certain costs for the project before receiving reasonable assurance from the NRC that the full uprate power level would be approved. He does not, however, testify that Progress Energy Florida should not have incurred any particular costs for the uprate project.

Contrary to Jacobs' assumptions and assertions, the extended power uprate request is no unusual challenge to be licensed by the NRC, in my opinion. Progress Energy Florida has received reasonable assurance from the NRC regarding its license amendment request through multiple discussions and interactions with the Commission regarding its submittal. Progress Energy Florida is confident that the NRC will approve its uprate and witness Jacobs' concerns are unfounded.

That is the summary of my testimony.

MS. TRIPLETT: We tender Mr. Franke for cross-examination.

CHAIRMAN CARTER: Mr. Rehwinkel.

MR. REHWINKEL: Thank you, Mr. Chairman. Mr. Chairman, with your indulgence, before I engage in cross-examination of Mr. Franke on his rebuttal, I would like to ask a question that was left over from direct yesterday with the agreement of the company and other parties.

CHAIRMAN CARTER: Okay. You may proceed.

CROSS-EXAMINATION

BY MR. REHWINKEL:

Q. Mr. Franke, do you recall me asking you questions yesterday about the percentage or the portion of the uprate costs that related to the measurement uncertainty recapture?

A. I certainly do.

Q. Did you check -- and I asked you if you could identify that portion, and I think you have done that; is that correct?

A. Yes, I have. What I have identified is that in 2008, for the measurement uncertainty recapture portion or Phase 1 of our power uprate program, the total cost experienced, $1.97 million associated with

that portion of the cost for 2008 for the program.

Q. Okay. And after removing the joint owner portion of $162,000, that yields a PEF portion of the MUR cost of 1.8 million?

A. That is correct, 1.8 million.

Q. And with a jurisdictional factor of 93.753, the jurisdictional 2008 MUR capital spending is 1,699,222; is that correct?

A. That is correct.

Q. Okay. Thank you very much.

Can I ask you to turn to page 4 of your rebuttal testimony?

A. I'm at page 4.

Q. You state on line 3 that you have reasonable assurances that the NRC will approve the full uprate, and you state the reasons for that; is that correct?

A. Yes.

Q. And is it your opinion -- is your testimony here today that you should have reasonable assurances in order to go forward with this project?

A. Yes.

Q. On line 5, as part of that sentence, you state -- well, on line 4, you say working with your vendor, Areva, you continue to find confidence from the engineering analysis which addresses uprate project

licensing issues. Do you see that?

A. Yes, I do.

Q. Now, does the statement -- isn't it true that the statement "continuing to find confidence" means that you're still working on solutions to certain engineering problems or engineering issues that have arisen as a part of implementing the uprate project?

A. Yes. We are continuing to -- we finalized the analyses, and we are providing detail now to some of the modifications required to be installed in 2011. The details of those modifications in some areas, in some conditions, are part of that license amendment request. So until the modifications work is done and the license amendment has been fully approved, there always will be some issues that will be resolved. But as of now, we have high confidence that all of our solutions as prescribed will be successful.

(Transcript follows in sequence in Volume 10.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA:

COUNTY OF LEON:

I, MARY ALLEN NEEL, Registered Professional Reporter, do hereby certify that the foregoing proceedings were taken before me at the time and place therein designated; that my shorthand notes were thereafter translated under my supervision; and the foregoing pages numbered 1440 through 1687 are a true and correct record of the aforesaid proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor relative or employee of such attorney or counsel, or financially interested in the foregoing action.

DATED THIS 11th day of September, 2009.

MARY ALLEN NEEL, RPR, FPR
2894-A Remington Green Lane
Tallahassee, Florida 32308
(850) 878-2221